PRELIMINARY DRAINAGE & WATER QUALITY SUMMARY
OTAY MESA CENTRAL VILLAGE SPECIFIC PLAN (PTS 408329)
CITY OF SAN DIEGO, CA
JANUARY 22, 2016

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1.0 INTRODUCTION

This report describes the existing and proposed storm water drainage and storm water quality conditions within the Otay Mesa Central Village Specific Plan area. The Specific Plan designates land uses and rezones parcels within the proposed village area to accommodate future development consistent with the Otay Mesa Community Plan Update. This report addresses the drainage and water quality aspects of the Specific Plan area on a programmatic level rather than at a parcel level. More specific information for future parcels will be developed as subsequent development plans are proposed by individual owners of land within the Specific Plan boundary.

The Otay Mesa Central Village Specific Plan is a smaller portion of the overall community of Otay Mesa. Specifically, the Specific Plan boundary area is generally located south of State Route 905, and north of Siempre Viva Road, and east of the northerly branch of Spring Canyon Creek. The majority of the area is located west of Cactus Road, but also includes a portion of land near the northeast quadrant of the Cactus Road and Airway Road intersection. Refer to the drainage exhibits included in Appendix 1 for the limits of the Specific Plan area.

2.0 BACKGROUND

This report builds on the work done previously for the Otay Mesa Community Plan Update (CPU) and its associated EIR. Specifically, the Otay Mesa CPU Drainage Study that was part of the EIR outlined the drainage and water quality requirements for future development within Otay Mesa and identified some of the regional drainage and flooding issues within the area. The report is titled *Drainage Study for the Otay Mesa Community Plan Update,* and was prepared by Kimley-Horn and Associates in April 2007. Included in that report is as a companion study entitled *Review of Otay Mesa Drainage Studies*, prepared by Tetratech. For a copy of this previously approved CPU Drainage report, refer to Appendix 3.

The report outlines the history and drainage challenges associated with the development of the Otay Mesa Community Plan Area. For example, for most of its early history, Otay Mesa was used for agriculture and farming. As industrial and commercial development started taking place in the 1960s, the City of San Diego recognized the need for a comprehensive

drainage Master Plan for the Mesa. The topography of the majority of the area is mostly flat and some of the areas experience flooding during moderate storm events, particularly within the East Watershed (per the Watershed Map in the CPU Drainage Study). There was concern that the new development would increase the stormwater runoff crossing the border into Mexico. In 1987, the City Council approved a contract to prepare the Otay Mesa Master Drainage Plan and published a Notice to "All Private Engineers" that established drainage requirements for development within the East Watershed of Otay Mesa. (Refer to page 2 of the CPU Drainage Study). The Notice required no increase in the rate of stormwater runoff from the property after development, by construction of stormwater detention basins. Most of the drainage analysis associated with the CPU Drainage Study focused on the East Watershed, but the CPU Drainage Study also addressed the other areas within the CPU boundary. The Central Village Specific Plan is within the West Watershed, which is less developed than the East Watershed but still has some of the same drainage challenges. Per Section VII of the CPU Drainage report, the following describes the recommended drainage design criteria for future development within the West Watershed (which includes the Specific Plan Area):

> The West Watershed consists of smaller Mesa-top watersheds that drain into the tributary canyons of Spring Canyon. All of the flow from the watershed flows into Mexico at the Spring Canyon concentration point. Detention basins will be required to reduce the post-development peak flows to predevelopment levels for the 50-year and 100-year storm. If the detention basins concentrate flows at the upper edge of canyons, care must be taken to ensure that erosion potential is not increased downstream.

Therefore, the requirements of the West and East watersheds are different. While developments in the East watershed requires conformance with the Notice to "All Private Engineers", the West watershed is not subject to the same requirements, but it is subject to the 50-year and 100-year storm detention requirement, as outlined in the above paragraph.

Subsequent to the preparation of the previous Otay Mesa Drainage Studies, Caltrans has built the new State Route 905 and there have been other changes and development within the watershed. Some of the regional drainage improvements proposed in the original studies and master plans to alleviate regional flooding issues have still not been resolved. Therefore, this report establishes the guidance for future development within the Specific Plan boundary. The guidance will require compliance with the overall goals of the CPU (reduce post-

development peak flows) and will also require compliance with the applicable stormwater quality regulations.

3.0 EXISTING DRAINAGE CONDITIONS

Topography within the project site is characterized by mostly gently sloping areas, with portions of the perimeter of the property within steep canyon areas. There are currently minimal drainage improvements within the specific plan boundary. The majority of the project drains to the south to multiple finger canyons (Wruck Creek) located to the west of the existing Cactus Road/Siempre Viva Road intersection. Two of the finger canyons drain to sump areas that are collected and drained to the west and discharged downstream within the canyon via an existing RCP storm drain per City Drawing 23871-21-D. A large portion of the Specific Plan area drains to the northwest to a canyon (North tributary of Spring Canyon) on the north side of the proposed Airway Road. The portion of the Specific Plan area located to the northeast of the Airway Road/Cactus Road intersection drains to the northwest and drains into a culvert underneath Cactus Road. After crossing Cactus Road, the runoff commingles with other runoff draining from upstream areas including Caltrans right-of-way and then drains to the upstream point of the North Canyon.

Floodplains

The project is located within an area of the non-printed FEMA Firm Panel 06073C2200G. Per the FIRM index sheet, the panel is not printed is because there are no special flood hazard areas within the panel sheet. Therefore, there are no FEMA special flood hazard areas within the project. However, although there is no FEMA special flood hazard areas, there may be areas of localized flooding in the canyon and other drainage concentration points.

4.0 PROPOSED DRAINAGE CONDITIONS

Under developed conditions, the Specific Plan area will consist of high density residential developments, mixed use developments, public roads, public parks, a school site, and open space areas. The proposed grading concepts being developed for the Specific Plan illustrate that the site can be graded to generally maintain the same drainage areas draining north and south in order to preserve existing drainage patterns. Each future development proposal

should strive to maintain the overall drainage patterns of the site and also reflect the overall drainage master plan for the area.

Potential storm drain outfall locations are illustrated on the conceptual drainage plan to identify potential suitable major discharge locations. The final location of all of the outfalls will be developed during future site planning efforts, and the specific locations may be further refined to minimize environmental disturbance, minimize erosion potential, or other refinements to the grading plan.

Drainage design policies and procedures for the City of San Diego are given in the City of San Diego's "Drainage Design Manual," dated April 1984. This Manual provides information to assist in the processing and review of applications. The "Drainage Design Manual" provides a guide for designing drainage and drainage-related facilities for developments within the City of San Diego. New development projects for the Specific Plan Area will be required to adhere to these existing criteria. The City of San Diego will be responsible for reviewing hydrologic and hydraulic studies and design features for conformance to criteria given in the "Drainage Design Manual" for every map or permit for which discretionary approval is sought from the City of San Diego. These project specific studies for each development will need to address potential impacts to downstream storm drainage facilities with sufficient detail to support the discretionary action. In addition, the new development projects will need to be able to demonstrate that the 50-year and 100-year detention requirements have been addressed (in order to satisfy the design criteria of the CPU Drainage Study). Therefore, for projects that propose an increase in imperviousness, detention mitigation will likely be required. In addition to providing detention for peak flows, stormwater quality and hydromodification requirements will also need to be met. Based on preliminary estimates, the hydromodification mitigation volumes may govern the size of any detention facilities, so it is possible that a basin sized to meet hydromodification requirements will likely also meet the peak flow detention requirement. These assumptions will need to be confirmed during the development of future site plans.

5.0 PROPOSED WATER QUALITY/HYDROMODIFICATION STRATEGIES

The Specific Plan will accommodate a regional drainage/water quality concept that will maintain existing drainage patterns and will serve the drainage conveyance needs of the

future build-out of the community. There are several ways that the drainage/water quality requirements can be addressed. Because the Specific Plan area in its current condition is relatively undeveloped, it is recommended that the master plan concept for storm drain design be developed concurrently with the land use planning because the storm drain design and basin locations will directly affect the layout of the community. Also, because the requirements of peak flow drainage, water quality, and hydromodification requirements are so interdependent, it is important to plan in advance to anticipate the land area requirements for detention, water quality, and hydromodification requirements.

There are multiple land owners within the Specific Plan area, and it is likely that potential development would be phased over several years. Any proposed project would need to satisfy the requirements of the City of San Diego Storm Water Standards Manual at the time of permit issuance. Pursuant to the new Municipal Storm Water Permit (Order No. R9-2013-0001) requirements, the City of San Diego is currently updating their Storm Water Standards Manual to incorporate the new permit requirements by February 16, 2016. At the time of preparation of this study, the City of San Diego has released its new draft Stormwater Standards Manual to the public, but the final version is not yet available. For the purposes of this report, it is anticipated that the majority of future development projects will be subject to the new stormwater requirements to be enforced starting February 16, 2016. However, the Municipal Storm Water Permit is generally re-issued every 5 years, so developments that are proposed after the next permit cycle may be subject to future requirements that are not currently known. The discussion below presents the considerations for complying with the requirements per Order No. R9-2013-0001, which will be enforced starting February 16, 2016.

The Municipal Storm Water Permit requires all development and redevelopment projects to implement storm water source control and site design practices to minimize the generation of pollutants. Additionally, the Permit requires new development and significant redevelopment projects that exceed certain size thresholds (referred to as Priority Development Projects) to implement Structural Storm Water Best Management Practices (Structural BMPs) to reduce pollutants in storm water runoff. In addition, Priority Development Projects are also required to address hydromodification requirements to control runoff volumes and flow durations (hydromodification requirements) for non-exempt projects.

The BMP Design Manual and permit requirements identify a specific hierarchy for selection of Structural pollutant control BMPs. In particular, the first priorities for pollutant control BMPs are BMPs that achieve retention and/or harvest and re-use of stormwater. If it is not technically feasible to implement retention or harvest/re-use BMPs for the full design capture volume (DCV) onsite for a Priority Development Project, then the project shall utilize biofiltration BMPs for the remaining volume not reliably retained. Biofiltration BMPs must be sized to treat 1.5 times the DCV not reliably retained onsite or must be sized to treat the DCV not reliably retained onsite with a flow-thru design that has a total volume, including pore spaced and pre-filter detention volume, sized to hold at least 0.75 times the portion of the DCV not reliably retained onsite. Or, the biofiltration BMPs must meet proprietary biofiltration BMP sizing criteria and other requirements, as outlined in the City Stormwater Standards. If none of these BMPs are proposed for a Priority Development Project, the project applicant can use an alternate BMP (flow-thru treatment control BMP) in combination with an Alternative Compliance approach, which will require approval through the agency and will require providing mitigation offsite in addition to providing BMPs onsite.

Opportunities and Constraints

The Specific Plan area from a water quality and hydromodification standpoint has significant constraints and minimal opportunities from a land planning perspective. One major constraint is that the Specific Plan area is comprised of loamy and clayey soils (Hydrologic Soil Group classification of "D" type soils). This soil condition significantly limits the possibility of the use of retention and/or partial retention BMPs onsite. Therefore, biofiltration BMPs are recommended for a pollutant control BMP approach if participation in an Alternative Compliance program is not selected. Another major constraint for the project is that it is not exempt from hydromodification requirements. From a planning perspective, there are also spatial and timing constraints due to the multiple outlet locations and multiple landowners with varying interests and land holdings. Steep topography may limit the ability to develop some areas within the perimeter canyon areas. However, the steepness of the canyon areas near the proposed outfall locations provides an opportunity utilize the available head to use deep detention and/or deep biofiltration basins to minimize the land areas required for treatment and detention.

Recommended BMP Strategy

Future development of the Specific Plan area will require detention facilities for peak flows, water quality treatment, and hydromodification management controls. To address water quality concerns, LID Site Design and Source Control BMPs will be incorporated into each project's site plans in accordance with the City's Stormwater Standards. Treatment Control BMPs will also be incorporated into the future projects within the Specific Plan Area in accordance with the City's Stormwater Standards, and may include regional and/or project-specific treatment control BMPs. These facilities may also be used for detention and/or hydromodification requirements, in addition to fulfilling treatment requirements. These detention facilities can be designed either as regional facilities to accommodate the post-project drainage from multiple developments, or as individual on-lot facilities to mitigate onsite post-project flows on a project-by-project basis, or a combination of the two approaches. The Specific Plan land use plan has identified potential detention basin/biofiltration basin locations based on the existing drainage patterns, with the understanding that future developments will generally preserve existing drainage patterns. The locations of the basins and the final number of basins will depend on future regional planning to best determine the optimum design to best serve the needs of the Specific Plan Area.

As part of the initial due diligence phase for the Specific Plan, several drainage options were considered as possible scenarios for future site planning. It is recommended that multiple alternatives be explored before selecting the most appropriate design approach for each regional drainage area within the Specific Plan area. The recommended BMP strategy options for future study include:

1) At the downstream end of each regional drainage area, incorporate hydromodification and pollutant control requirements in a combined hydromodification/biofiltration basin.

2) At the downstream end of each regional drainage area, implement hydromodification BMP(s) in series with a downstream pollutant control BMP to achieve pollutant control requirements.

3) Implement hydromodification controls on each lot and (and Public street right-of-ways separately) and address pollutant control requirements in a downstream BMP at the downstream end of each regional drainage area.

4) Implement both hydromodification controls and pollutant control requirements on each lot separately (and Public street right-of-ways separately).

5) Implement controls in any of the above categories but participate in an alternative compliance project to minimize the onsite impacts of compliance.

In comparing the alternative strategies, many of the options listed above are likely not the most optimum approach for most cases within the Specific Plan area. For example, there are several benefits for treating runoff in a regional fashion, including the elimination of duplicate storm drain systems, maximizing the economies of scale with larger BMPs, respecting drainage areas through various build-out scenarios, reduced clogging potential, and ease of maintenance. Therefore, for the purpose of this Specific Plan discussion with respect to pollutant control and hydromodification requirements, it is assumed that Option 1 would be preferred, but this does not preclude other alternatives from moving forward if it is determined at a later date that other options are preferred. Due to the complexity of designs for hydromodification facilities, a simplistic approach was needed to quantify the land area that could be lost for development for initial planning purposes. For rough approximation purposes, the default sizing factor method was used to show what size of a biofiltration basin would be required to comply with both water quality and hydromodification requirements.

For hydromodification analyses, the default low flow threshold is 0.1Q2. A higher low-flow threshold of 0.3Q2 or 0.5Q2 could potentially be used for this project in the future if a geomorphic channel assessment analysis (SCCWRP Analysis) is completed for the project's discharge locations and the results indicate a medium or low susceptibility to erosion for the project's receiving streams. A SCCWRP analysis cannot be completed at this time due to the preliminary nature of the proposed grading plan, however, it is recommended that the option of pursuing a SCCWRP analysis be considered during future site planning. The default low-flow threshold of 0.1Q2 is required if a SCCWRP Analysis is not performed, which would result in larger hydromodification mitigation volumes.

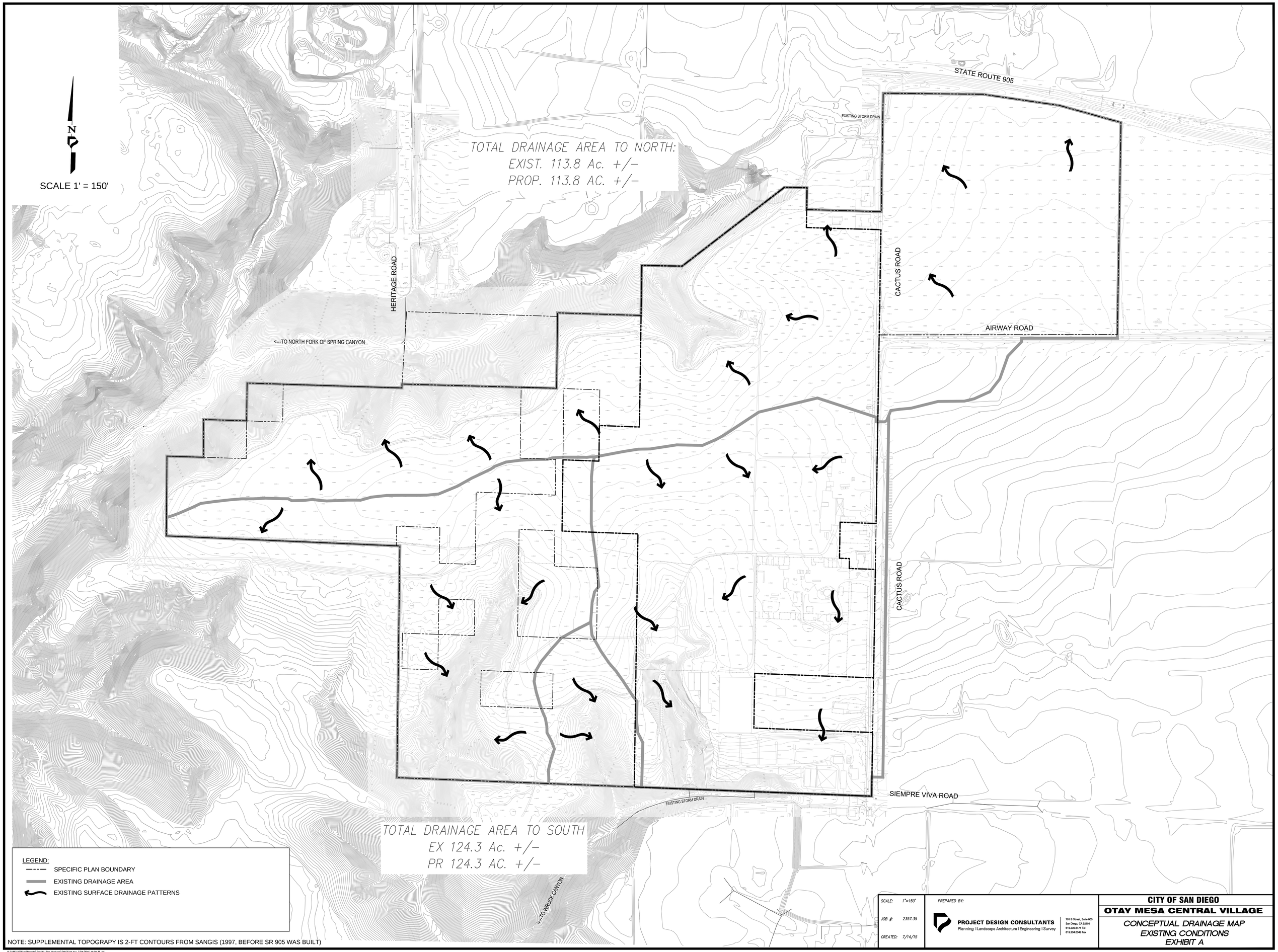
Conceptual Sizing Results

Each potential detention basin was identified on the Specific Plan graphics and sized based on rough approximation methods (based on a percentage of the drainage area that each basin serves). The results are shown on the Proposed Condition Exhibit B in Appendix 1 for the default basin sizes and the supporting conceptual calculations are included in Appendix 2.

The sizing and design of these facilities will be designed in more detail during the future entitlement phases. The basin sizing will be studied in the future Drainage studies and Water Quality Technical Reports and Hydromodification Studies to be prepared during the future entitlement projects. These future studies will help determine the location and sizing of the areas that will need to be set aside for drainage/water quality purposes. It is recommend that the future site-specific studies use continuous simulation models to potentially reduce the basin sizes necessary to comply with the hydromodification requirements. It has been confirmed with City staff that the City will allow the use of the Lindberg gauge or Bonita gauge rainfall data to be used instead of the Lower Otay gauge due to the higher quality of the data in comparison to the Lower Otay gauge and the closer resemblance of the average annual rainfall relationship per Figure 1-2 of the County Drainage Design Manual. (Refer to Appendix 2 for the rainfall gauge location map).

APPENDIX 1

Drainage Exhibits



NOTE: SUPPLEMENTAL TOPOGRAPHY IS 2-FT CONTOURS FROM SANGIS (1997, BEFORE SR 905 WAS BUILT)

SCALE: 1"=150'	PREPARED BY:		CITY OF SAN DIEGO
JOB #: 2357.35	PROJECT DESIGN CONSULTANTS Planning I Landscape Architecture I Engineering I Survey	701 B Street, Suite 800 San Diego, CA 92101 619.235.6471 Tel 619.234.0349 Fax	OTAY MESA CENTRAL VILLAGE
CREATED: 7/14/15			CONCEPTUAL DRAINAGE MAP EXISTING CONDITIONS EXHIBIT A

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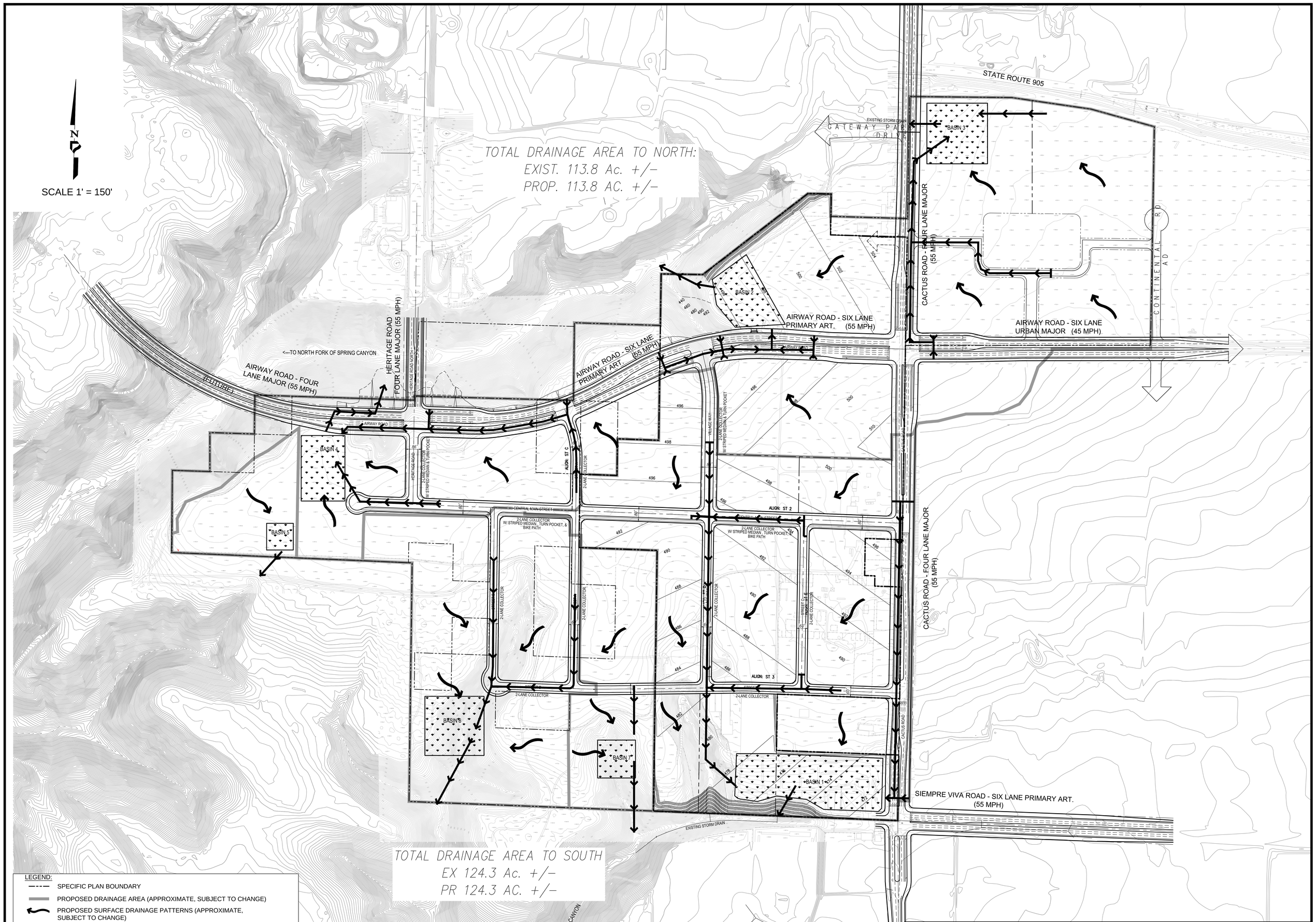

LEGEND:

- SPECIFIC PLAN BOUNDARY
- PROPOSED DRAINAGE AREA (APPROXIMATE, SUBJECT TO CHANGE)
- PROPOSED SURFACE DRAINAGE PATTERNS (APPROXIMATE, SUBJECT TO CHANGE)
- LOCATION OF PROPOSED HYDROMODIFICATION / BIOFILTRATION BASIN (APPROXIMATE, SUBJECT TO CHANGE)
- PROPOSED DRAINAGE LINE (APPROXIMATE, SUBJECT TO CHANGE)

NOTE: SUPPLEMENTAL TOPOGRAPY IS 2-FT CONTOURS FROM SANGIS (1997, BEFORE SR 905 WAS BUILT)

SCALE: 1"=150'

JOB #: 2357.35

CREATED: 7/14/15

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CITY OF SAN DIEGO

OTAY MESA CENTRAL VILLAGE

CONCEPTUAL DRAINAGE MAP
PROPOSED CONDITIONS
EXHIBIT B

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APPENDIX 2

Other Supporting Material and Conceptual Calculations

Otay Mesa Central Village Regional Biofiltration Basin Conceptual Sizing Summary

Option #1: Concept-level sizing for regional basins for hydromodification and water quality based on Sizing Factor Method
(June 2015 Model BMP Design Manual tables)

Assumptions: 0.5Q2 low flow threshold, Pre-project = Flat, D soils, Grass
Post-project = D soils, 80% Impervious
Note: These calculations are for concept planning level only.

Basin#	Approx. Drainage Area (acres)	Area Required for Hydromod Based on Sizing Factor (acres)
1	68.2	4.8
2	29.3	2.0
3	39.7	2.8
4	27.5	1.9
5	6.8	0.5
6	28.4	2.0
7	12.1	0.8

Note: Basin sizes are conceptual only. Site-specific studies will fine-tune design.
Continuous simulation is recommended for future studies.

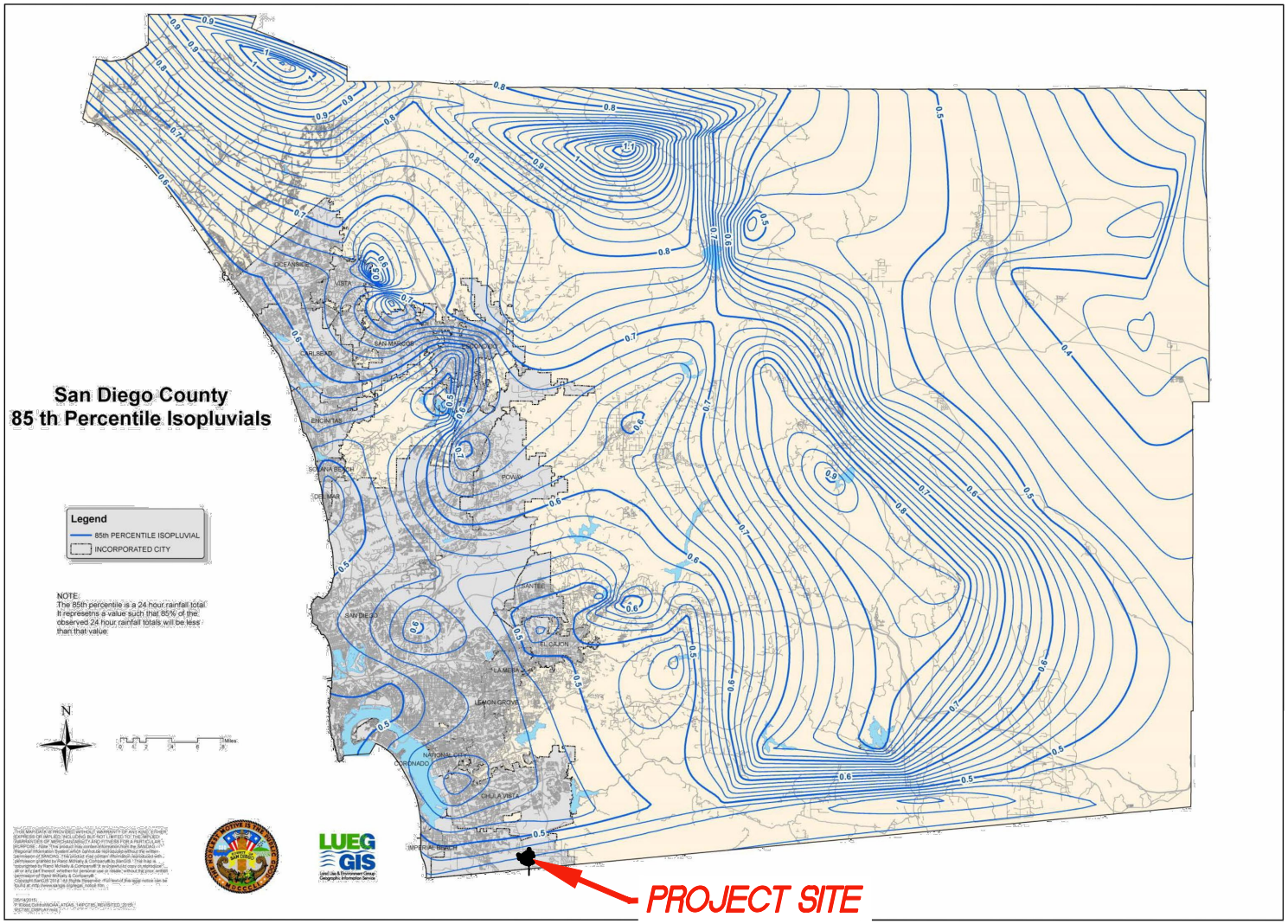
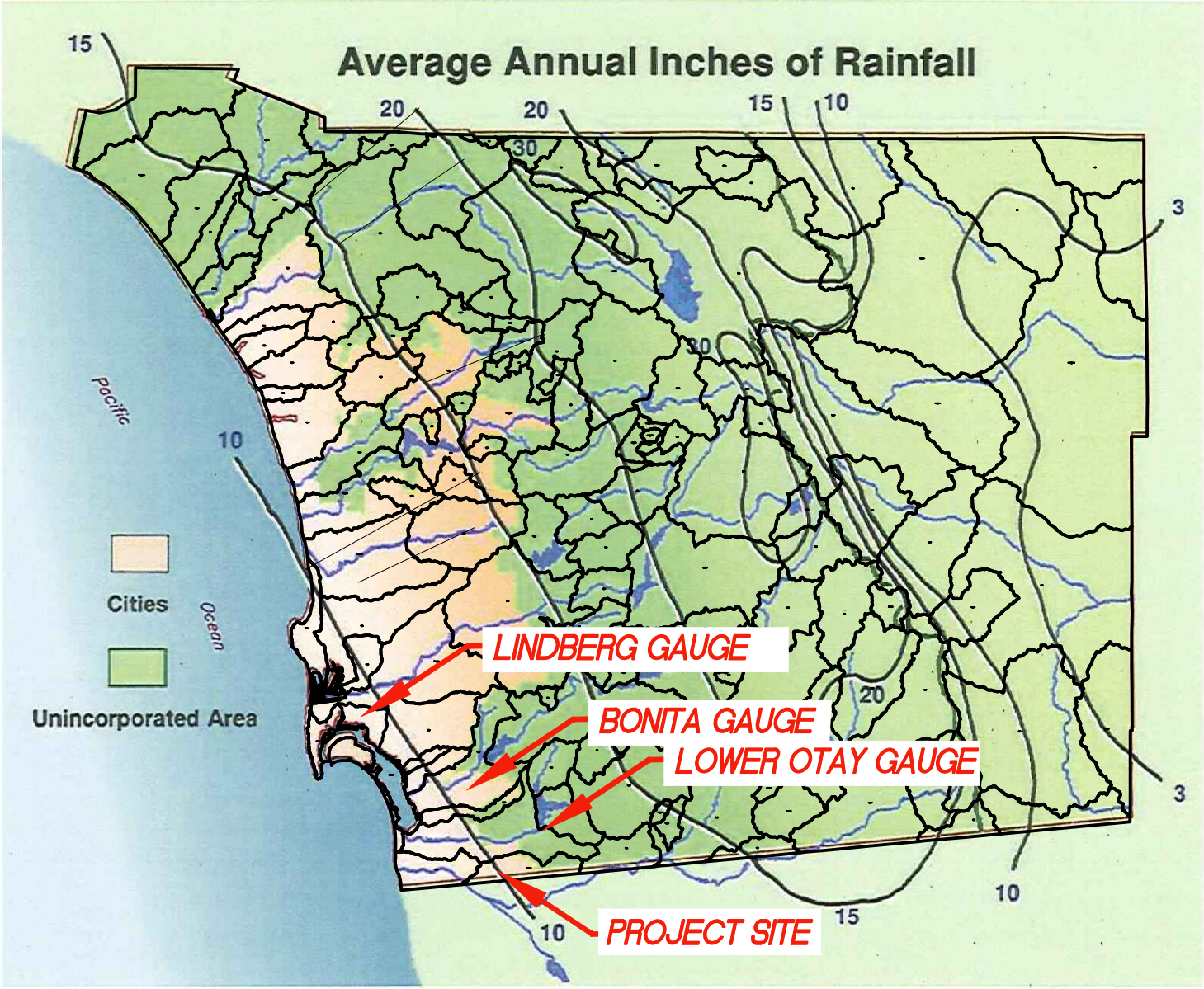


Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

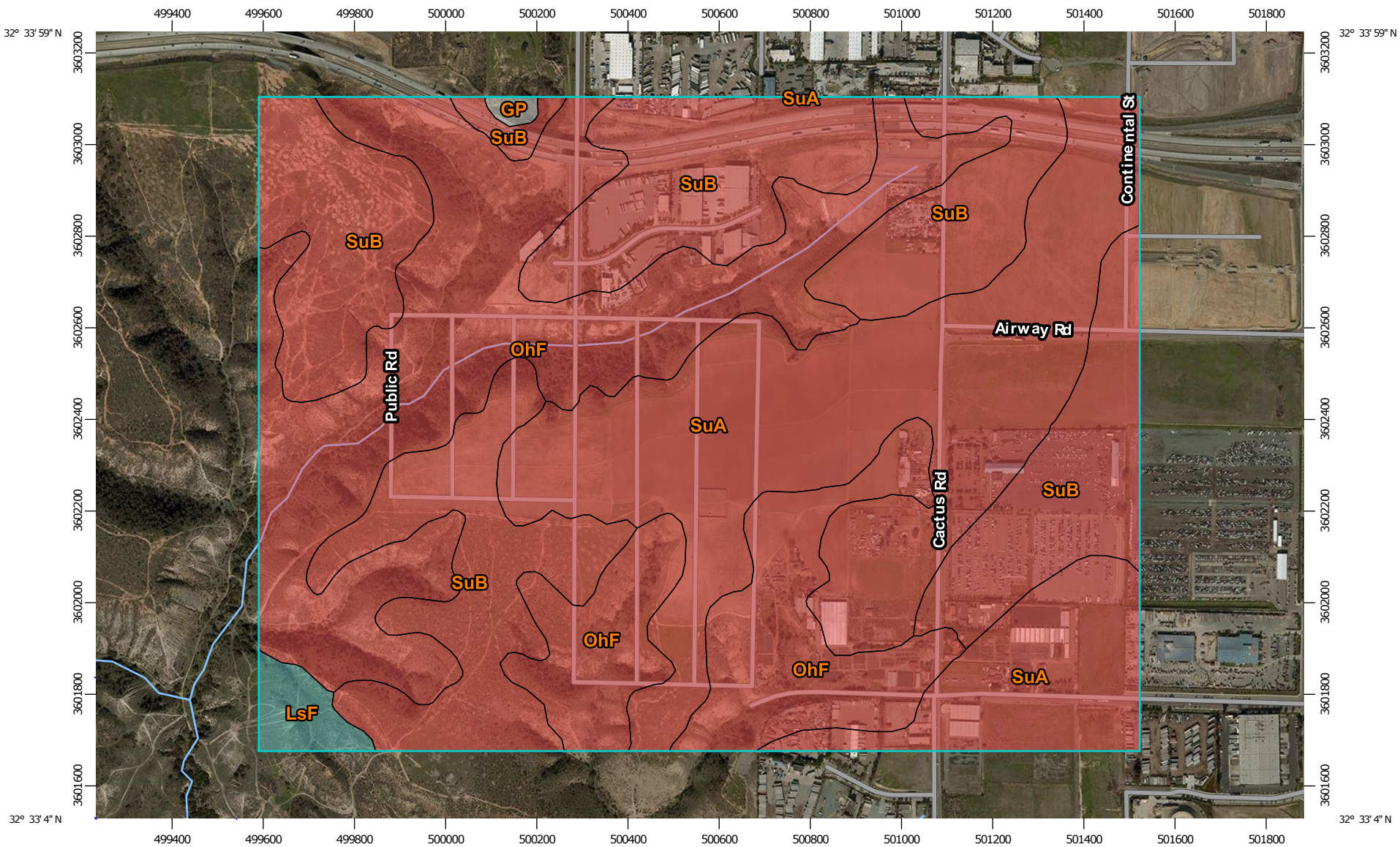


Average Annual Inches of Rainfall in San Diego
(not to be used for design calculations)

FIGURE

1-2

Hydrologic Soil Group—San Diego County Area, California



Map Scale: 1:12,100 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 8, Sep 17, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 7, 2014—Jan 4, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — San Diego County Area, California (CA638)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
GP	Gravel pits		1.5	0.2%
LsF	Linne clay loam, 30 to 50 percent slopes	C	8.5	1.2%
OhF	Olivenhain cobbly loam, 30 to 50 percent slopes	D	236.4	34.5%
SuA	Stockpen gravelly clay loam, 0 to 2 percent slopes	D	205.2	30.0%
SuB	Stockpen gravelly clay loam, 2 to 5 percent slopes	D	233.4	34.1%
Totals for Area of Interest			**684.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

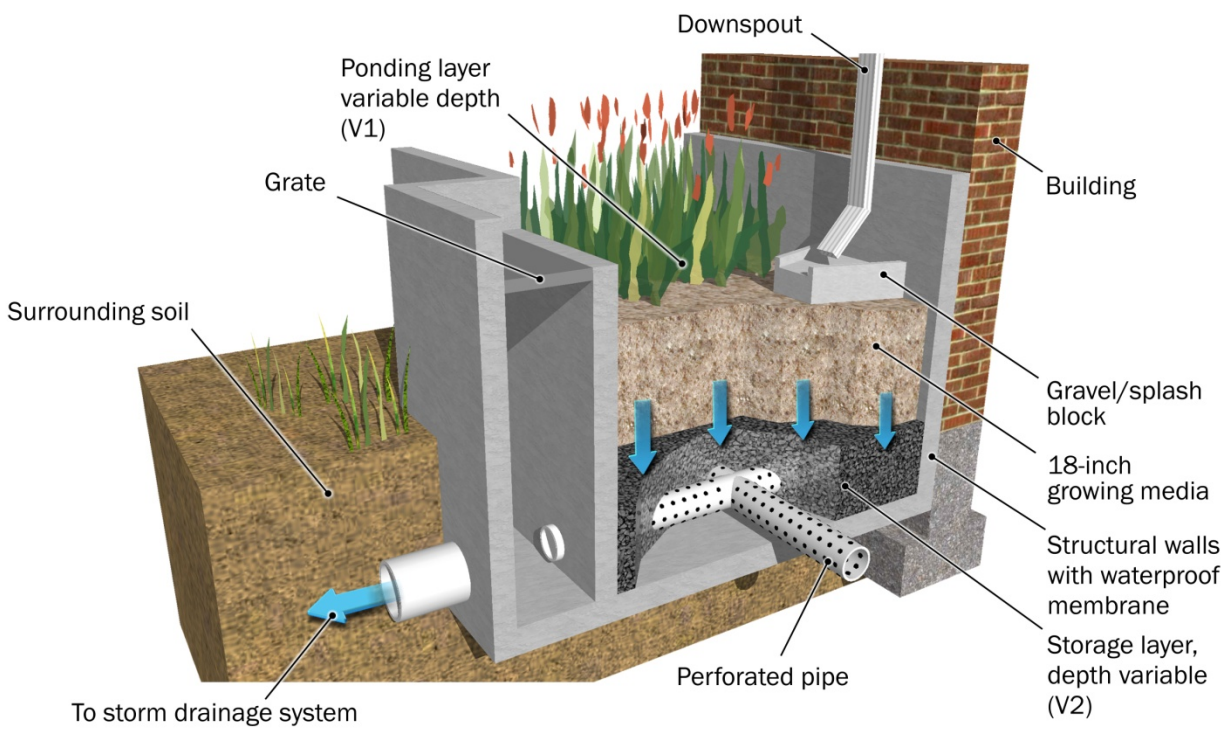
Tie-break Rule: Higher

G.2.5 Sizing Factors for Biofiltration with Impermeable Liner

Table G.2-6 presents sizing factors for calculating the required surface area (A), surface volume (V1), and sub-surface volume (V2) for a biofiltration BMP with impermeable liner (formerly known as flow-through planter). The BMP consists of three layers:

- Ponding layer: 10-inches active storage, [minimum] 2-inches of freeboard above overflow relief
- Growing medium: 18-inches of soil [bioretention soil media]
- Storage layer: 30-inches of gravel at 40 percent porosity [18 inches active storage above underdrain is required, additional dead storage depth below underdrain is optional and can vary]

This BMP includes an underdrain with a low flow orifice 18 inches (1.5 feet) below the bottom of the growing medium. This BMP includes an impermeable liner to prevent infiltration into underlying soils.



Biofiltration with impermeable liner BMP Example Illustration

Reference: "San Diego BMP Sizing Calculator Methodology," prepared by Brown and Caldwell, dated January 2012

How to use the sizing factors for flow control BMP Sizing:

Obtain sizing factors from Table G.2-6 based on the project's lower flow threshold fraction of Q2, hydrologic soil group, post-project slope, and rain gauge (rainfall basin). Multiply the area tributary to the structural BMP (A, square feet) by the area weighted runoff factor (C, unitless) (see Table G.2-1) by the sizing factors to determine the required surface area (A, square feet), surface volume (V1, cubic feet), and sub-surface volume (V2, cubic feet). Select a low flow orifice for the underdrain that will discharge the lower flow threshold flow when there is 1.5 feet of head over the underdrain orifice. The civil engineer shall provide the necessary volume and surface area of the BMP and the underdrain and orifice detail on the plans.

Additional steps to use this BMP as a combined pollutant control and flow control BMP:

To use this BMP as a combined pollutant control and flow control BMP, determine the size using the sizing factors, then refer to Appendix B.5 and Appendix F to check whether the BMP meets performance standards for biofiltration for pollutant control. If necessary, adjust the surface area, depth of growing medium, or depth of storage layer as needed to meet pollutant control standards.

Table G.2-6: Sizing Factors for Hydromodification Flow Control Biofiltration BMPs (formerly known as Flow-Through Planters) Designed Using Sizing Factor Method

Sizing Factors for Hydromodification Flow Control Biofiltration with Impermeable Liner BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	A	Flat	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	A	Moderate	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	A	Steep	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	B	Flat	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	B	Moderate	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	B	Steep	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	C	Flat	Lindbergh	0.115	0.0958	0.0690
$0.5Q_2$	C	Moderate	Lindbergh	0.115	0.0958	0.0690
$0.5Q_2$	C	Steep	Lindbergh	0.080	0.0667	0.0480
$0.5Q_2$	D	Flat	Lindbergh	0.085	0.0708	0.0510
$0.5Q_2$	D	Moderate	Lindbergh	0.085	0.0708	0.0510
$0.5Q_2$	D	Steep	Lindbergh	0.065	0.0542	0.0390
$0.5Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	A	Steep	Oceanside	N/A	N/A	N/A

Sizing Factors for Hydromodification Flow Control Biofiltration with Impermeable Liner BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	B	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	B	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	B	Steep	Oceanside	N/A	N/A	N/A
$0.5Q_2$	C	Flat	Oceanside	0.075	0.0625	0.0450
$0.5Q_2$	C	Moderate	Oceanside	0.075	0.0625	0.0450
$0.5Q_2$	C	Steep	Oceanside	0.065	0.0542	0.0390
$0.5Q_2$	D	Flat	Oceanside	0.070	0.0583	0.0420
$0.5Q_2$	D	Moderate	Oceanside	0.070	0.0583	0.0420
$0.5Q_2$	D	Steep	Oceanside	0.050	0.0417	0.0300
$0.5Q_2$	A	Flat	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	A	Moderate	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	A	Steep	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	B	Flat	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	B	Moderate	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	B	Steep	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	C	Flat	L Wohlford	0.070	0.0583	0.0420
$0.5Q_2$	C	Moderate	L Wohlford	0.070	0.0583	0.0420
$0.5Q_2$	C	Steep	L Wohlford	0.050	0.0417	0.0300
$0.5Q_2$	D	Flat	L Wohlford	0.055	0.0458	0.0330
$0.5Q_2$	D	Moderate	L Wohlford	0.055	0.0458	0.0330
$0.5Q_2$	D	Steep	L Wohlford	0.045	0.0375	0.0270
$0.3Q_2$	A	Flat	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	A	Moderate	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	A	Steep	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	B	Flat	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	B	Moderate	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	B	Steep	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	C	Flat	Lindbergh	0.130	0.1083	0.0780
$0.3Q_2$	C	Moderate	Lindbergh	0.130	0.1083	0.0780
$0.3Q_2$	C	Steep	Lindbergh	0.100	0.0833	0.0600
$0.3Q_2$	D	Flat	Lindbergh	0.105	0.0875	0.0630
$0.3Q_2$	D	Moderate	Lindbergh	0.105	0.0875	0.0630
$0.3Q_2$	D	Steep	Lindbergh	0.075	0.0625	0.0450

Sizing Factors for Hydromodification Flow Control Biofiltration with Impermeable Liner BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.3Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	A	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	B	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	B	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	B	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	C	Flat	Oceanside	0.105	0.0875	0.0630
$0.3Q_2$	C	Moderate	Oceanside	0.105	0.0875	0.0630
$0.3Q_2$	C	Steep	Oceanside	0.085	0.0708	0.0510
$0.3Q_2$	D	Flat	Oceanside	0.090	0.0750	0.0540
$0.3Q_2$	D	Moderate	Oceanside	0.090	0.0750	0.0540
$0.3Q_2$	D	Steep	Oceanside	0.070	0.0583	0.0420
$0.3Q_2$	A	Flat	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	A	Moderate	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	A	Steep	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	B	Flat	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	B	Moderate	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	B	Steep	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	C	Flat	L Wohlford	0.085	0.0708	0.0510
$0.3Q_2$	C	Moderate	L Wohlford	0.085	0.0708	0.0510
$0.3Q_2$	C	Steep	L Wohlford	0.060	0.0500	0.0360
$0.3Q_2$	D	Flat	L Wohlford	0.065	0.0542	0.0390
$0.3Q_2$	D	Moderate	L Wohlford	0.065	0.0542	0.0390
$0.3Q_2$	D	Steep	L Wohlford	0.050	0.0417	0.0300
$0.1Q_2$	A	Flat	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	A	Moderate	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	A	Steep	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	B	Flat	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	B	Moderate	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	B	Steep	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	C	Flat	Lindbergh	0.250	0.2083	0.1500
$0.1Q_2$	C	Moderate	Lindbergh	0.250	0.2083	0.1500
$0.1Q_2$	C	Steep	Lindbergh	0.185	0.1542	0.1110

Sizing Factors for Hydromodification Flow Control Biofiltration with Impermeable Liner BMPs Designed Using Sizing Factor Method						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.1Q_2$	D	Flat	Lindbergh	0.200	0.1667	0.1200
$0.1Q_2$	D	Moderate	Lindbergh	0.200	0.1667	0.1200
$0.1Q_2$	D	Steep	Lindbergh	0.130	0.1083	0.0780
$0.1Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	A	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	B	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	B	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	B	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	C	Flat	Oceanside	0.190	0.1583	0.1140
$0.1Q_2$	C	Moderate	Oceanside	0.190	0.1583	0.1140
$0.1Q_2$	C	Steep	Oceanside	0.140	0.1167	0.0840
$0.1Q_2$	D	Flat	Oceanside	0.160	0.1333	0.0960
$0.1Q_2$	D	Moderate	Oceanside	0.160	0.1333	0.0960
$0.1Q_2$	D	Steep	Oceanside	0.105	0.0875	0.0630
$0.1Q_2$	A	Flat	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	A	Moderate	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	A	Steep	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	B	Flat	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	B	Moderate	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	B	Steep	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	C	Flat	L Wohlford	0.135	0.1125	0.0810
$0.1Q_2$	C	Moderate	L Wohlford	0.135	0.1125	0.0810
$0.1Q_2$	C	Steep	L Wohlford	0.105	0.0875	0.0630
$0.1Q_2$	D	Flat	L Wohlford	0.110	0.0917	0.0660
$0.1Q_2$	D	Moderate	L Wohlford	0.110	0.0917	0.0660
$0.1Q_2$	D	Steep	L Wohlford	0.080	0.0667	0.0480

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records
A = Surface area sizing factor for flow control
V_1 = Surface volume sizing factor for flow control
V_2 = Subsurface volume sizing factor for flow control

Definitions for "N/A"

- Soil groups A and B: N/A in all elements (A, V1, V2) for soil groups A and B means sizing factors were not developed for biofiltration (i.e., with an underdrain) for soil groups A and B. If no underdrain is proposed, refer to Appendix G.2.3, Sizing Factors for Bioretention. If an underdrain is proposed, use project-specific continuous simulation modeling.

APPENDIX 3

Drainage Study for the Otay Mesa Community Plan Update

(For Reference Only)

Drainage Study for the Otay Mesa Community Plan Update

April, 2007

Prepared for:
MNA Consulting
427 C Street, Suite 308
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Drainage Study For The Otay Mesa Community Plan Update

April, 2007

REGISTERED PROFESSIONAL ENGINEER
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Chuck Spinks Exp. Date 03/31/08

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I. BACKGROUND

This report has been prepared as an appendix to the Otay Mesa Community Plan update EIR. Its purpose is to provide a summary of the existing drainage situation and facilities and proposed future facilities, including alternatives for draining the large central watershed. In addition, this report presents recommendations for drainage design criteria and storm water quality requirements for each of the watersheds on the Mesa. A detailed pre-design report to be approved by the City of San Diego will be required before initiating the design.

For most of its early history, Otay Mesa was used for agriculture and farming was the primary land use. As industrial and commercial development started taking place in the 1960s, the City of San Diego recognized the need for a comprehensive drainage Master Plan for the Mesa. Because most of the Mesa drains to the South into Mexico, there was concern that the new development would increase the runoff crossing the border. The City needed to establish criteria for the new development such that there was no increase in runoff as a result of the new construction.

In May of 1987, the City Council approved a contract to prepare the Otay Mesa Drainage Master Plan. In August of 1987, the City published a Notice to "All Private Engineers" that established "Drainage Requirements for Development in Otay Mesa" (attached). The Master Plan was published in January, 1988, and included a proposed concrete Channel from Airway Road to Siempre Viva Road that followed the existing drainage channel.

The Master Plan was updated with the "Otay Mesa Drainage Study" published in August, 1999. The most significant recommendation change was moving the proposed new channel from the creek alignment to a new location directly adjacent to La Media Road and Siempre Viva Road. This report utilizes the hydrologic models and analyses prepared for the 1999 Master Plan.

Reproduction of 1987 NOTICE from Engineering and Development Department

NOTICE

Date: August 7, 1987

To: All Private Engineers

From: Subdivision Engineer

Subject: Drainage requirements for development in Otay Mesa

In order to minimize the effects of increased storm water runoff in Mexico, due to development of property in Otay Mesa, all property in Otay Mesa that is within the water shed that drains into Mexico, shall be developed with the following requirements:

1. Each property owner shall provide storm water detention facilities so that there will be no increase in the rate of runoff due to development of the property.

2. The detention facilities shall be designed so that the rate of runoff from the property will not be greater after development than it was before development for a 5 year, 10 year, 25 year and 50 year storm.

3. All drainage facilities crossing four-lane major or higher classification streets shall be designed for a Q100 (existing). Other facilities, except the major channel referred to in paragraph 5, may be designed for Q50 (existing).

4. The Drainage Design Manual shall be used as guidelines for design of drainage facilities and computing design discharges.

5. The City Engineer's Office, Flood Control Section, is preparing a preliminary plan for the main north-south channel from Otay Mesa Road near La Media to the Mexican Border. The preliminary design will include the design "Q" (Q100 existing), the invert grade, and the water surface elevation at the major road crossings.

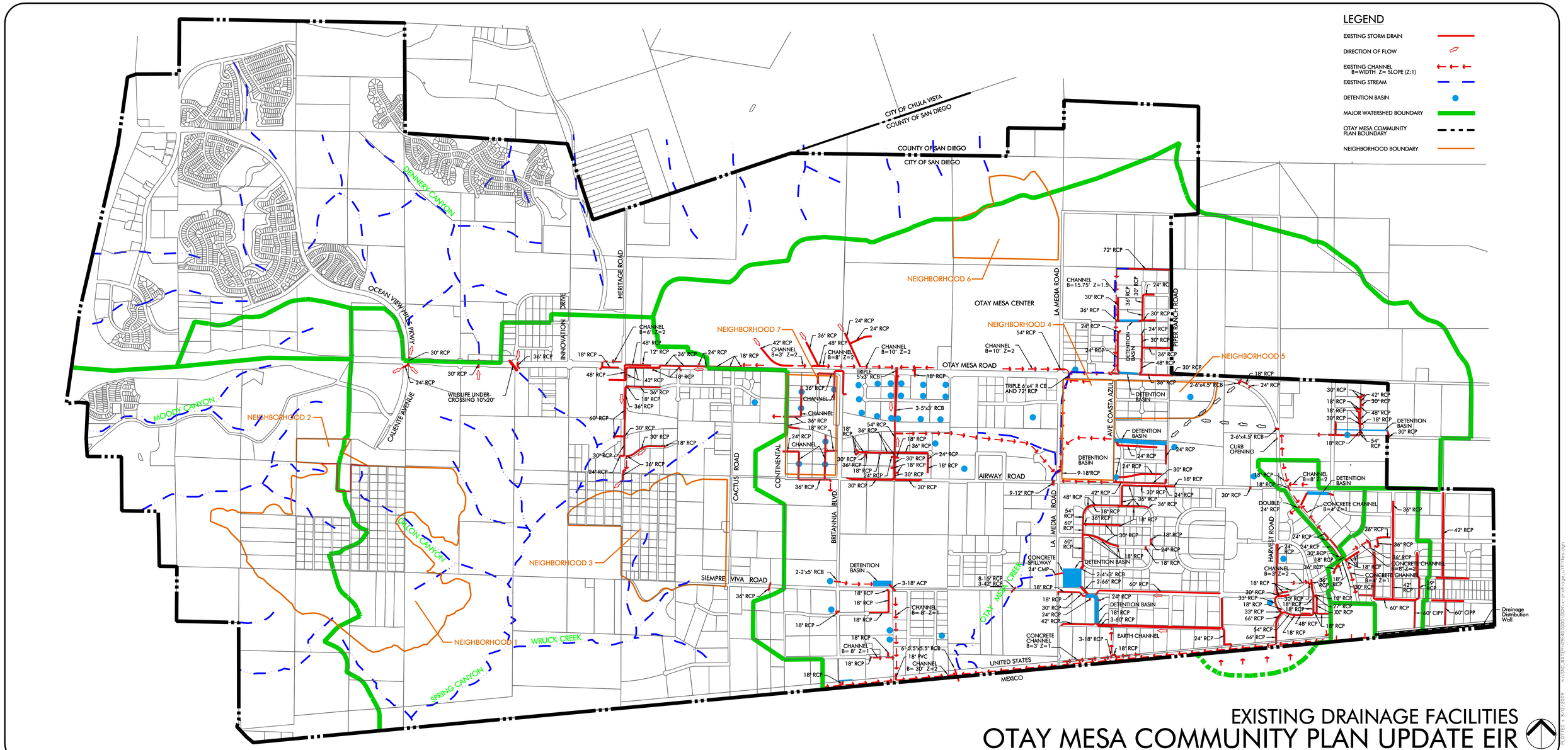
C.R. Lockhead
Subdivision Engineer

II. EXISTING DRAINAGE FACILITIES

Information was collected for existing drainage and flood control facilities on Otay Mesa through as-built plans, SanGIS maps, and site visits. Most of the existing drainage facilities were constructed as part of the private development that is taking place on the Mesa. Many of these facilities are not continuous because of the piecemeal nature of the development. This creates challenges for the subsequent developers that need to tie into the existing facilities. Many of the existing facilities are temporary. We were not able to obtain details on the drainage facilities in Mexico that receive most of the runoff.

Most of the development to-date has occurred in the East Watershed, which therefore includes most of the existing drainage facilities on the Mesa. The existing system is a combination of storm drains, improved channels, and detention basins, which in many areas discharge to natural drainage paths that do not have adequate hydraulic capacity.

The "Existing Drainage Facilities" drawing shows the facilities as-of the date of this report. The area is developing rapidly, and therefore new facilities are continuously being constructed. There are currently no dedicated drainage rights-of-way on the Mesa. Many of the projects, as they were mapped and constructed, dedicated portions of the properties to the city as drainage easements or flood water storage easements. Eventually, the systems and their easements will be continuous.



EXISTING DRAINAGE FACILITIES
OTAY MESA COMMUNITY PLAN UPDATE EIR

Scale: 1"=1000'
November 2006

KIMLEY-HORN AND ASSOCIATES

III. HYDROLOGIC ANALYSIS

The Otay Mesa Study area is shown on the Watershed Map, and includes all of the Mesa area within the City of San Diego divided into five watersheds (with the exception of the far northwest arm of the Mesa, which is fully developed).

Watersheds	Acres	mi^2
West Perimeter Watershed	258	0.40
West Watershed	2,190	3.42
North Perimeter Watershed	590	0.92
East Watershed	3,864	6.04
Border Crossing Watershed	223	0.35
TOTAL	7,125	11.13

Most of the Mesa slopes from North to South, with the flow entering Mexico at several points. The northern and western perimeters of the Mesa flow into the adjacent Canyons. These perimeter watersheds are divided into several independent smaller watersheds. The watershed boundaries on the Mesa are not well defined because the Mesa is so flat. There are very few defined natural drainage paths, with much of the runoff sheet-flowing across the Mesa. The watershed boundaries shown are based on field investigations and best available mapping, but the actual drainage boundaries may be very different.

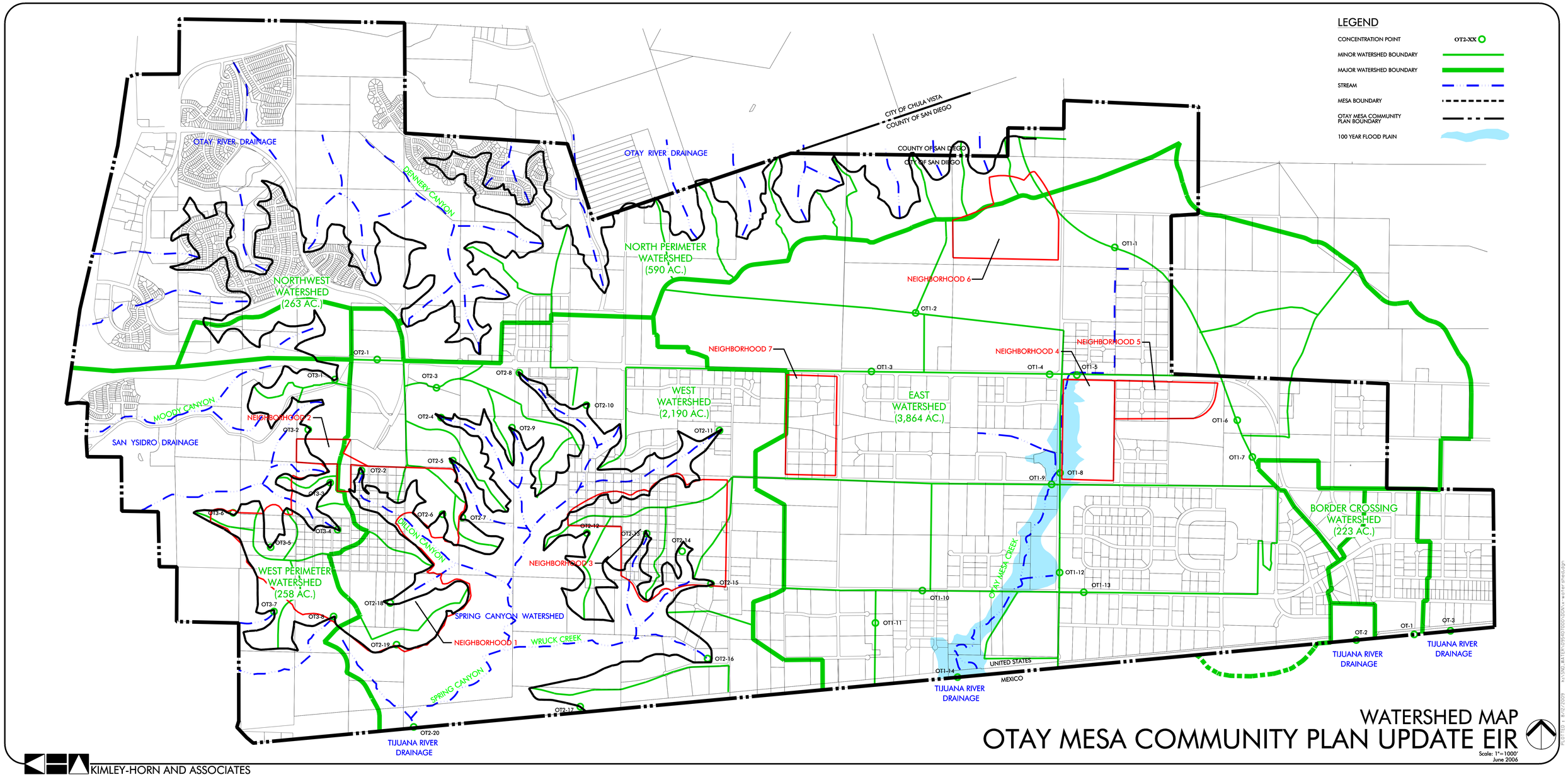
The only watershed that has been studied significantly from a drainage perspective is the East Watershed. Hydrologic models have been prepared for both of the previous drainage studies. The peak flows calculated in the two studies are different, primarily because of different assumptions relative to developed area, proposed drainage facilities, and watershed areas. The East Watershed includes a large area of unincorporated County property. The hydrologic model assumed the same industrial development for the unincorporated area. If land uses change in the County area, it may change the runoff rates. The differences for the concentration point at the border are shown below.

Q100 at Border East Watershed		
	Area (mi^2)	Q100(cfs)
1988 Study	5.72	5,050
1999 Study	6.63	3,529
2004 CPU	6.78	3,673

As part of this study, new hydrologic models have been prepared for the main watersheds which flow into the Tijuana River. For the East Watershed, HEC-1 has been used, since both previous studies used this model. For the other watersheds, the standard City of San Diego Modified Rational Method (AES) has been used. The results of these analyses are shown in the table below.

Hydrologic Analysis Summary			
	Area (mi^2)	Q50(cfs)	Q100(cfs)
West Perimeter Watershed	0.40	170	444
West Watershed	3.42	672	1,676
East Watershed	6.78	1,280	3,673
	10.60	2,122	5,793

In addition to the above flows, the Spring Canyon open space area contributes 109 cfs (Q50) and 257 cfs (Q100) from 1.2 mi^2. Since the Tijuana River Watershed is a water-quality impacted watershed, the quality and quantity of flow will need to be addressed before additional development takes place.



KIMLEY-HORN AND ASSOCIATES

WATERSHED MAP
OTAY MESA COMMUNITY PLAN UPDATE EIR

Scale: 1"=1000'
June 2006

FILE: TEST-8.8.07.DWG

WATERSHED	CONCENTRATION POINT	AREA (ACRES)	Q_{50}	Q_{100}
WEST PERIMITER	OT3-1	19.4	18.3	51.4
	OT3-1A	14.8	12.0	32.1
	OT3-2	47.1	26.7	67.3
	OT3-3	11.8	10.6	29.3
	OT3-4	35.0	22.4	57.5
	OT3-5	16.5	13.3	35.8
	OT3-6	12.2	10.9	30.3
	OT3-7	46.1	27.7	70.4
	OT3-8	51.4	27.7	69.4
		254.3	**169.5**	**443.5**
WEST	OT2-1	33.3	17.1	42.6
	OT2-2	126.2	41.4	99.5
	OT2-18	97.1	47.7	118.2
	OT2-19	27.7	22.3	60.1
	OT2-3	20.1	14.6	38.4
	OT2-4	67.8	38.5	96.9
	OT2-5	40.8	20.1	49.7
	OT2-6	34.8	17.1	42.4
	OT2-7	14.9	17.9	43.2
	OT2-8	81.3	43.0	108.7
	OT2-9	36.9	23.6	60.6
	OT2-9A	12.9	11.5	31.8
	OT2-10	128.4	43.1	103.8
	OT2-11	275.6	112.2	279.9
	OT2-12	23.6	17.5	46.0
	OT2-13	61.5	42.1	109.3
	OT2-14	48.4	26.1	65.3
	OT2-15	153.8	57.2	138.8
	OT2-16	121.7	40.8	98.4
	OT2-17	60.3	17.8	42.5
		1467.1	**671.6**	**1676.1**
MEXICO	Canyon Area	**774.8**	**109.3**	**257:0**

May 23, 2005

IV. HYDRAULIC ANALYSIS

Most of the Mesa is very flat, resulting in local flooding during storms at the low points and along some drainage ditches. The only significant creek on the Mesa is the main channel in the East Watershed, Otay Mesa Creek, which flows from North to South along La Media Road and crosses the border into Mexico just north of the Tijuana Airport.

A HEC-RAS hydraulic model was prepared for this channel from the border north to Otay Mesa Road. The purpose of this model was to identify the 100-year floodplain for this reach for present conditions. The proposed future drainage project along this alignment will be designed to contain the 100-year flow, reducing or eliminating flooding impacts to adjacent properties.

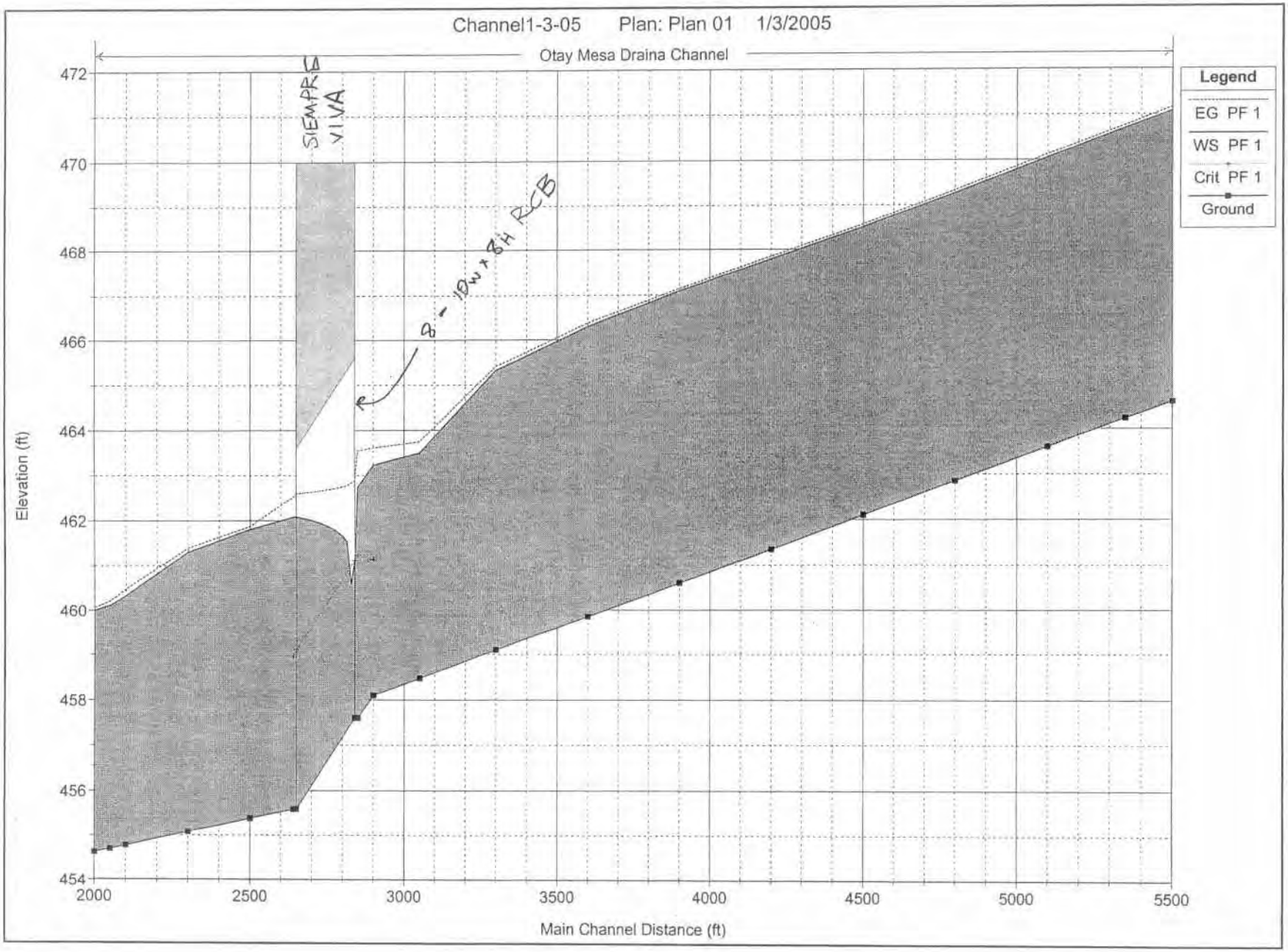
The HEC-RAS model was also used to size the proposed new channel from Airway Road to just south of Siempre Viva Road. Several alternative cross-sections were modeled to reflect input on the environmental aspects of the channel.

A significant tributary to the main channel enters just upstream of the Siempre Viva Road crossing. This tributary conveys flow from the De La Fuente Business Park and the Siempre Viva Business Park. The existing channel from La Media Road to the proposed main channel is approximately 15 feet wide and 4 feet deep, with a hydraulic capacity of approximately 120 cfs. The 100 year flow in this channel is 1116 cfs. A proposed new channel has a 50 ft bottom width with 1.5:1.0 side slopes and will convey the 100 year flow. A double 10’ x 4.5’ RCB will also be required for the flow under La Media Road. The cost estimate does not include these facilities.

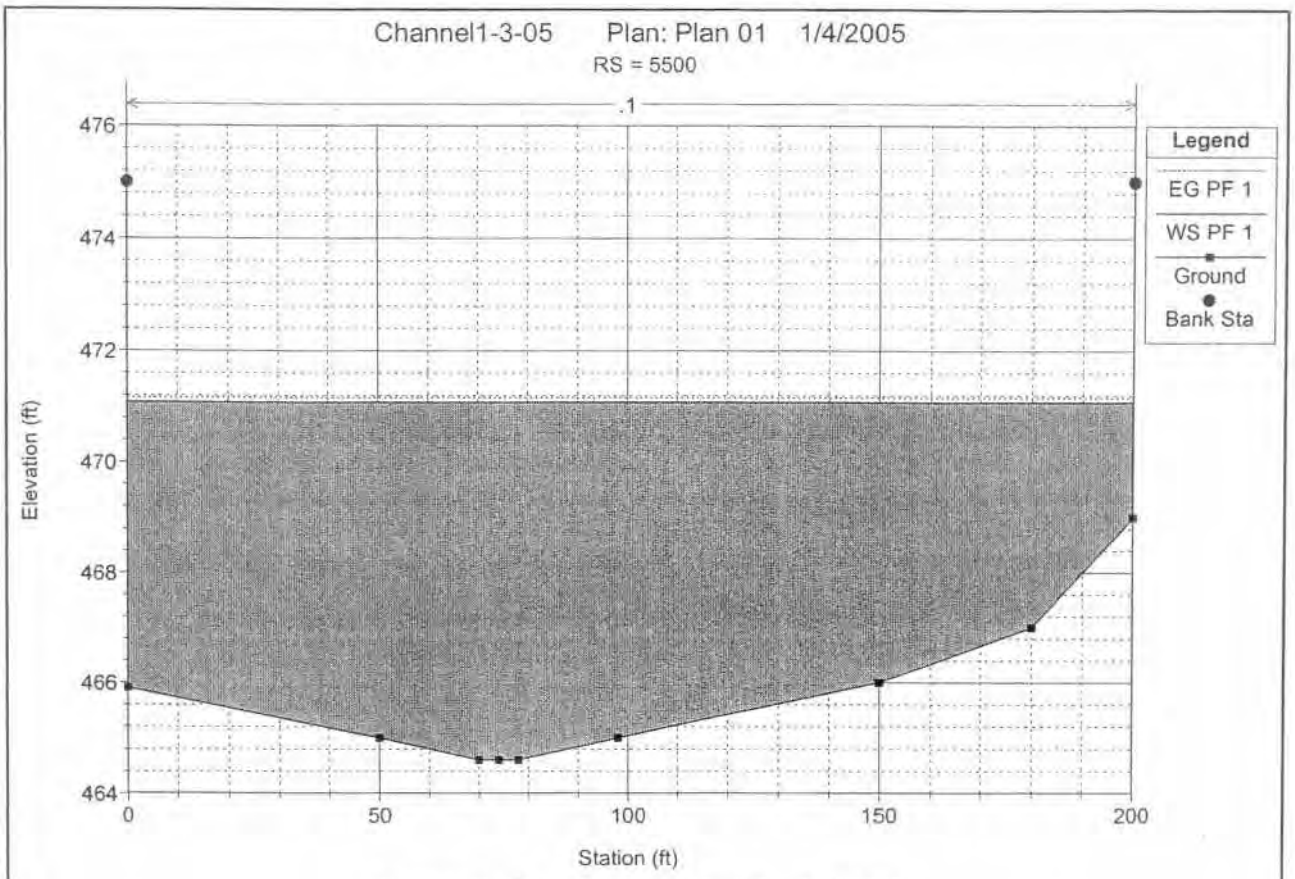
OTAY MESA CPU 1-4-05

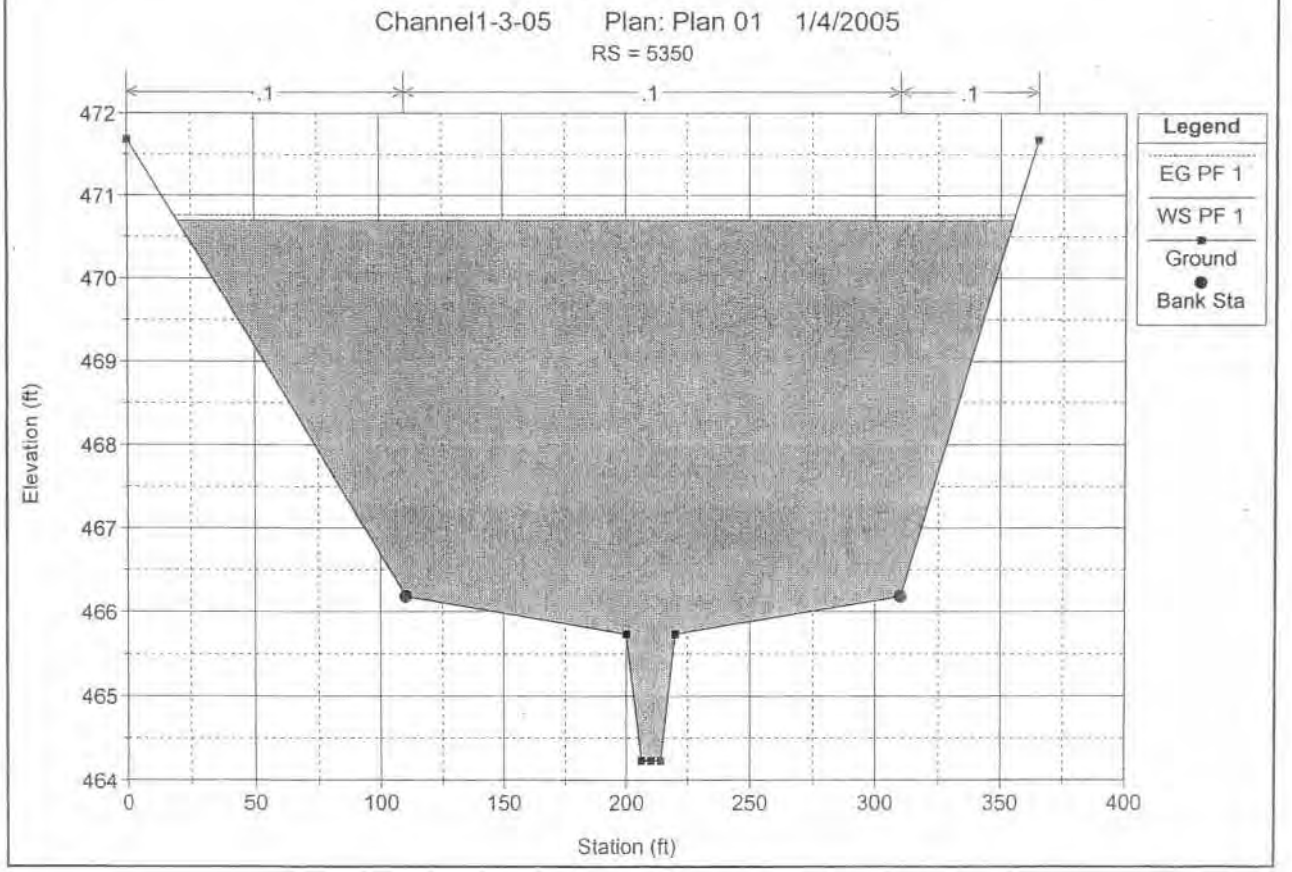
HEC-RAS Plan: Plan 01 River: Otay Mesa Draina Reach: Channel Profile: PF 1

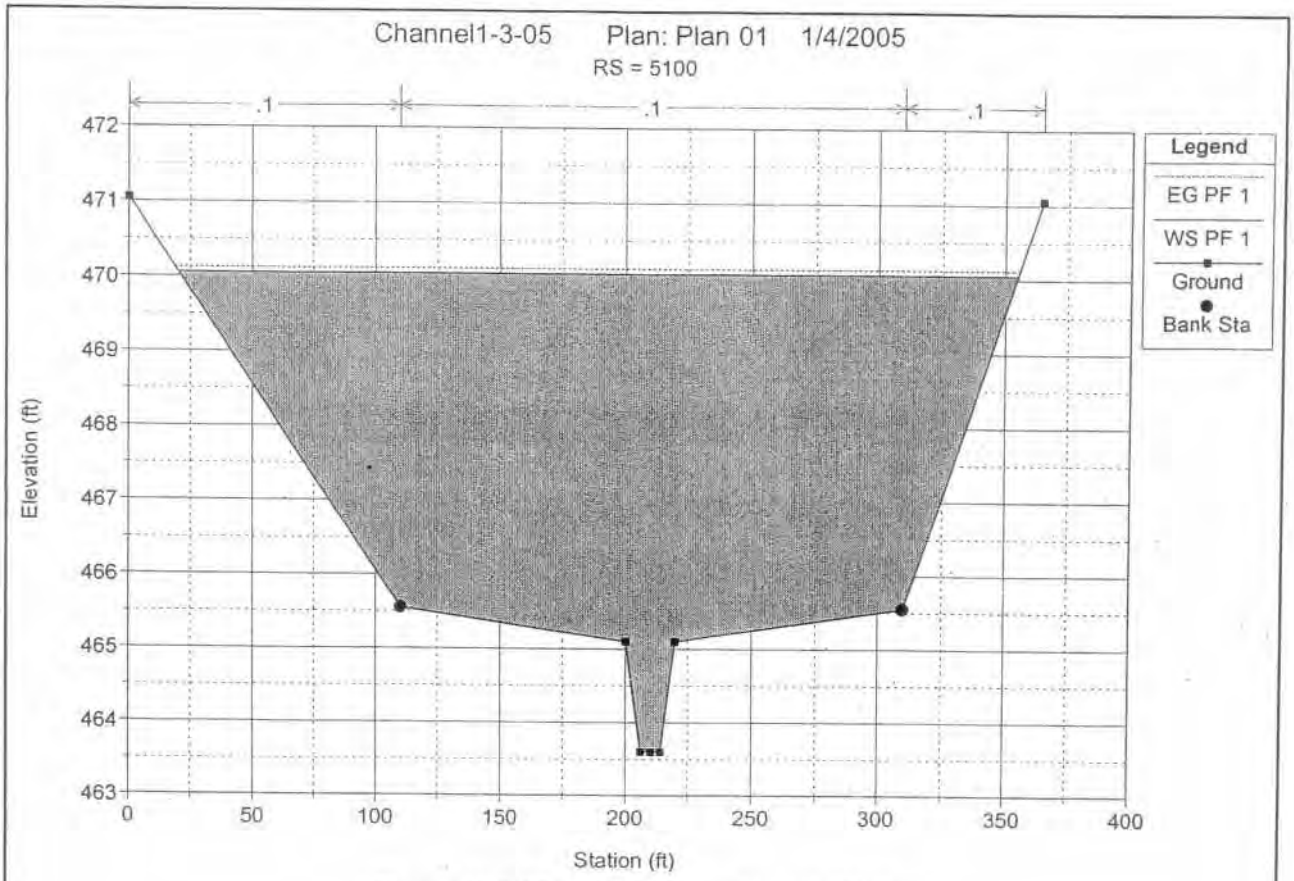
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Channel	5500	PF 1	2500.00	464.60	471.08		471.16	0.002743	2.33	1073.59	200.00	0.18
Channel	5350	PF 1	2500.00	464.23	470.69		470.76	0.002572	2.16	1279.19	335.44	0.17
Channel	5100	PF 1	2500.00	463.60	470.06		470.12	0.002591	2.17	1275.99	335.16	0.17
Channel	4800	PF 1	2500.00	462.85	469.27		469.33	0.002666	2.19	1263.56	334.04	0.18
Channel	4500	PF 1	2500.00	462.10	468.51		468.56	0.002430	2.08	1358.84	378.24	0.17
Channel	4200	PF 1	2500.00	461.35	467.79		467.85	0.002365	2.07	1371.79	379.61	0.17
Channel	3900	PF 1	2500.00	460.60	467.09		467.15	0.002266	2.04	1392.50	381.79	0.16
Channel	3600	PF 1	2500.00	459.85	466.30		466.37	0.002969	2.32	1153.04	281.59	0.19
Channel	3300	PF 1	2500.00	459.10	465.33		465.42	0.003423	2.41	1109.99	285.62	0.20
Channel	3050	PF 1	3000.00	458.48	463.50		463.74	0.014532	4.06	777.90	261.33	0.39
Channel	2900	PF 1	3000.00	458.10	463.23	461.14	463.61	0.000245	4.97	603.31	222.92	0.41
Channel	2850	PF 1	3000.00	457.60	462.74	461.24	463.55	0.000521	7.22	415.32	168.05	0.58
Channel	2750		Culvert									
Channel	2640	PF 1	3000.00	455.59	462.07	458.95	462.52	0.011957	5.38	557.46	183.64	0.37
Channel	2500	PF 1	3000.00	455.38	461.81		461.87	0.001846	2.07	1492.22	277.64	0.15
Channel	2300	PF 1	3000.00	455.08	461.31		461.40	0.003272	2.45	1261.91	277.98	0.19
Channel	2100	PF 1	3000.00	454.78	460.34		460.48	0.006864	3.05	1006.36	275.43	0.27
Channel	2050	PF 1	3000.00	454.70	460.11		460.21	0.003838	2.56	1191.75	275.37	0.21
Channel	2000	PF 1	3000.00	454.63	460.00	456.55	460.06	0.002196	2.06	1582.39	378.00	0.16

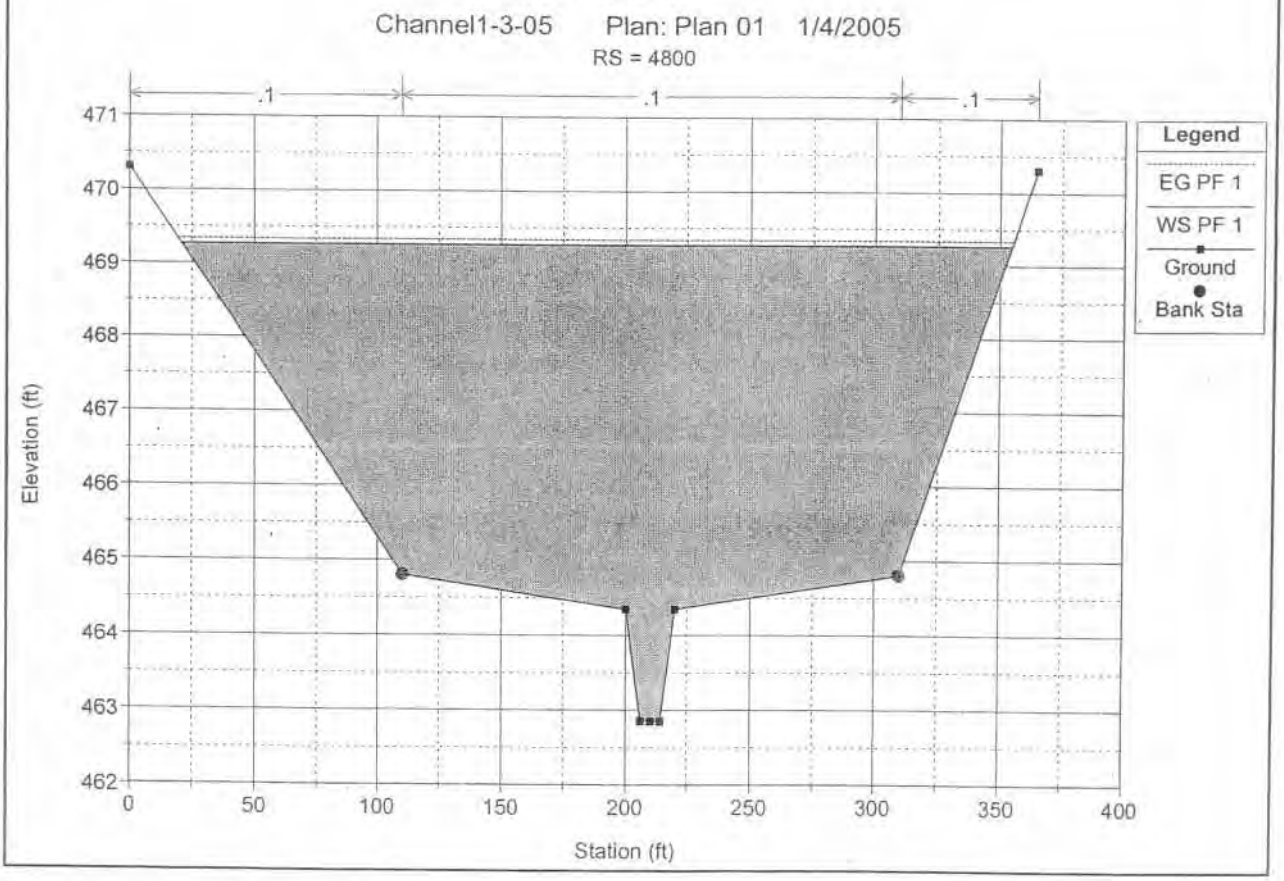


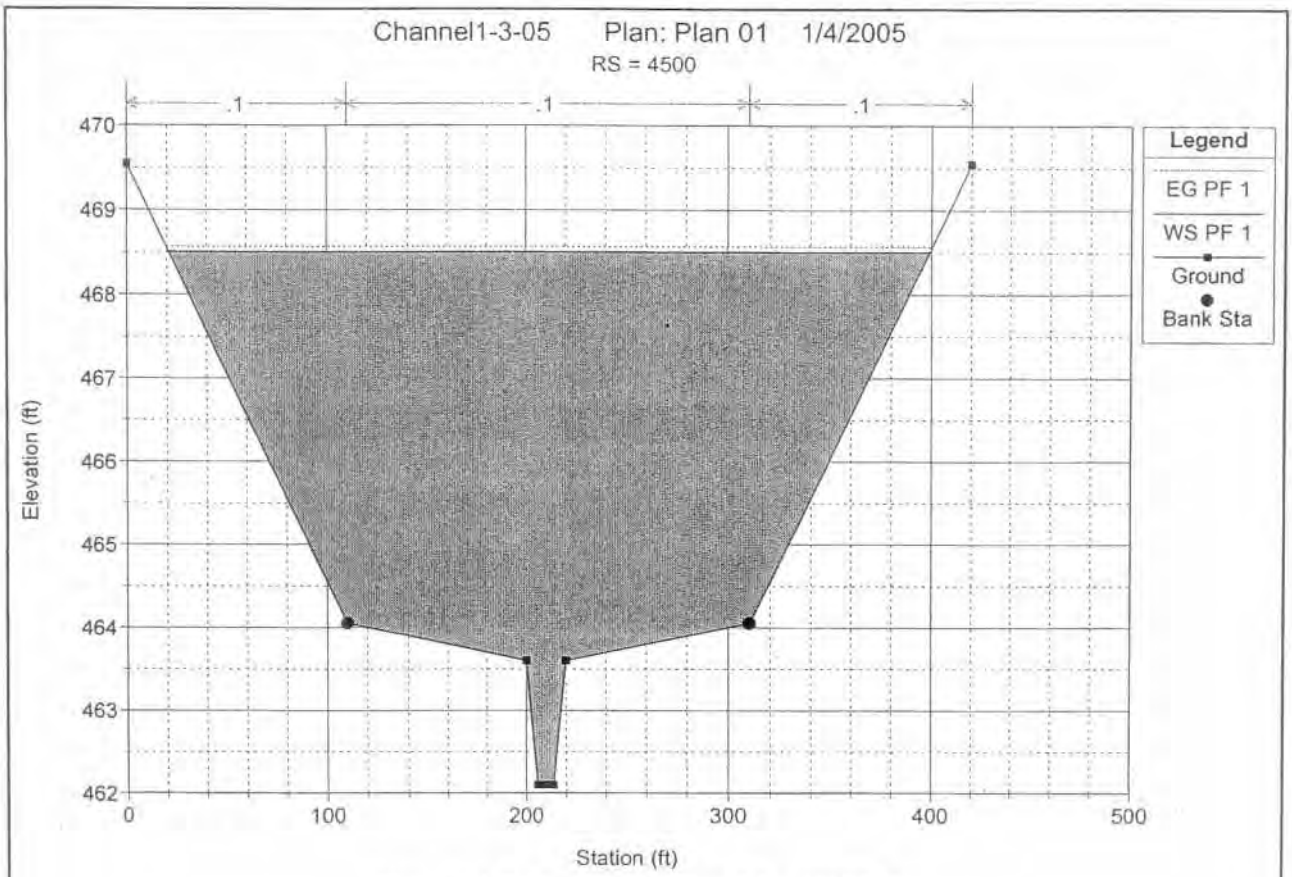
Channel1-3-05 Plan: Plan 01 1/3/2005
Otay Mesa Draina Channel
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
SIEMPRE VIVA
8 - 10w x 8H RCB
Elevation (ft)
Main Channel Distance (ft)
472
470
468
466
464
462
460
458
456
454
2000
2500
3000
3500
4000
4500
5000
5500

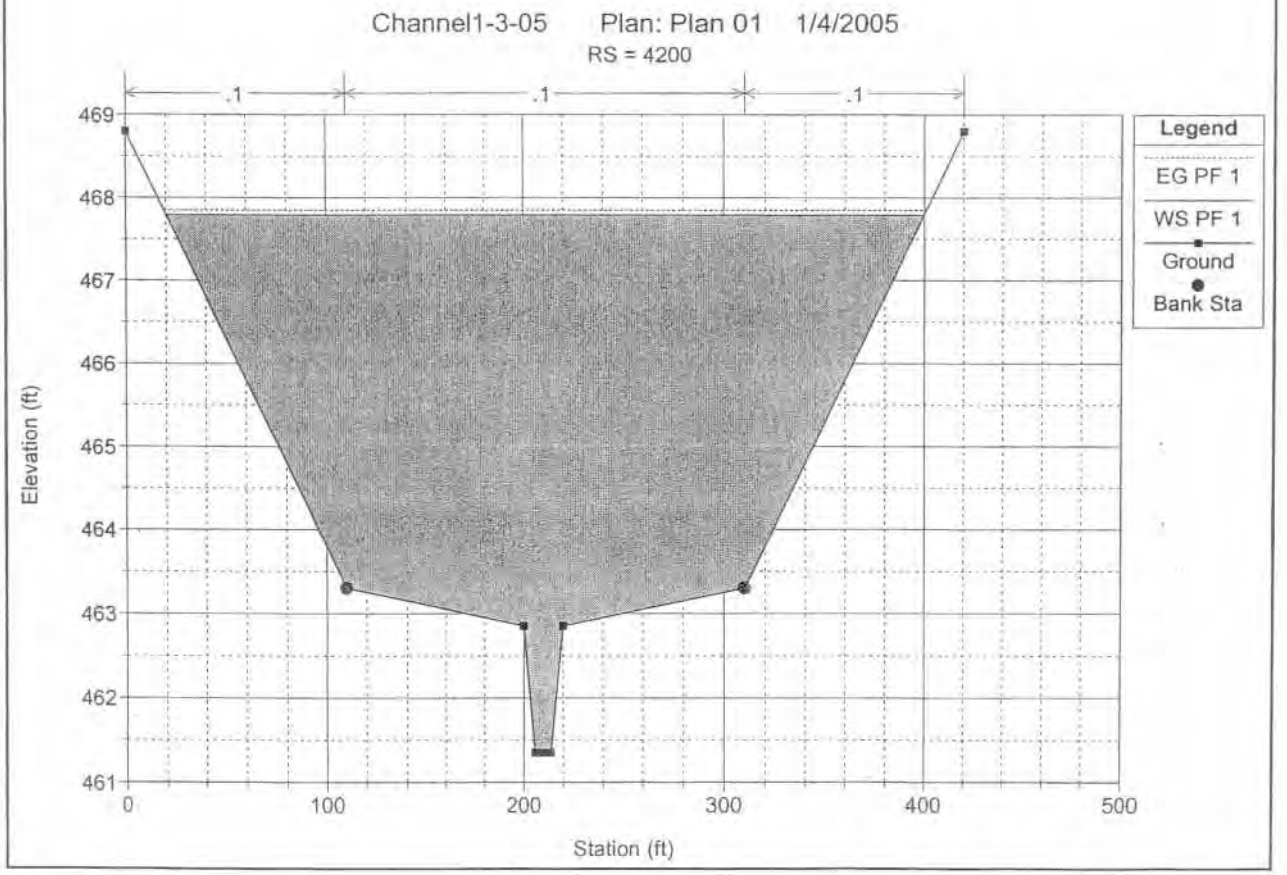

Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 5500
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
476
474
472
470
468
466
464
0
50
100
150
200

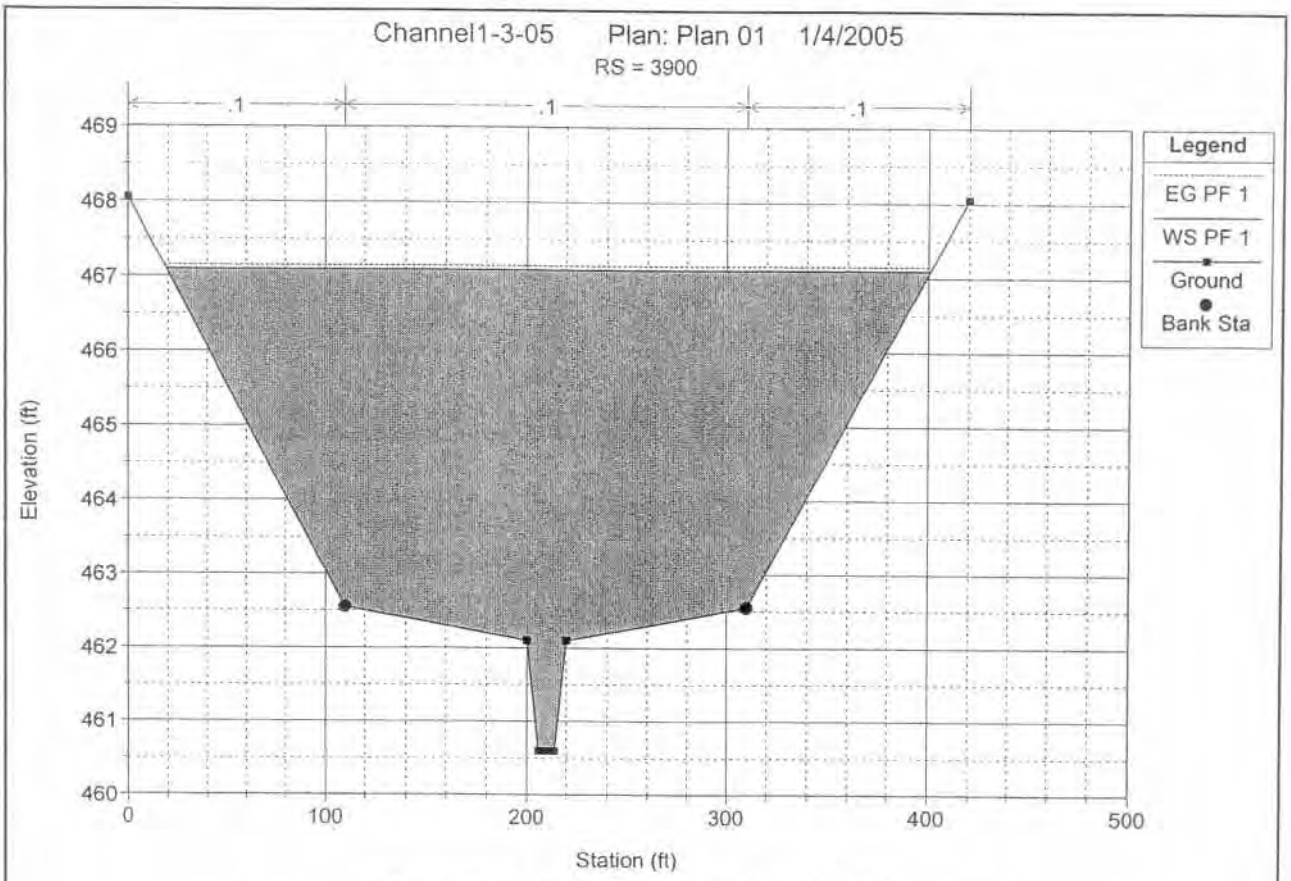

Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 5350
.1
.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
472
471
470
469
468
467
466
465
464
0
50
100
150
200
250
300
350
400

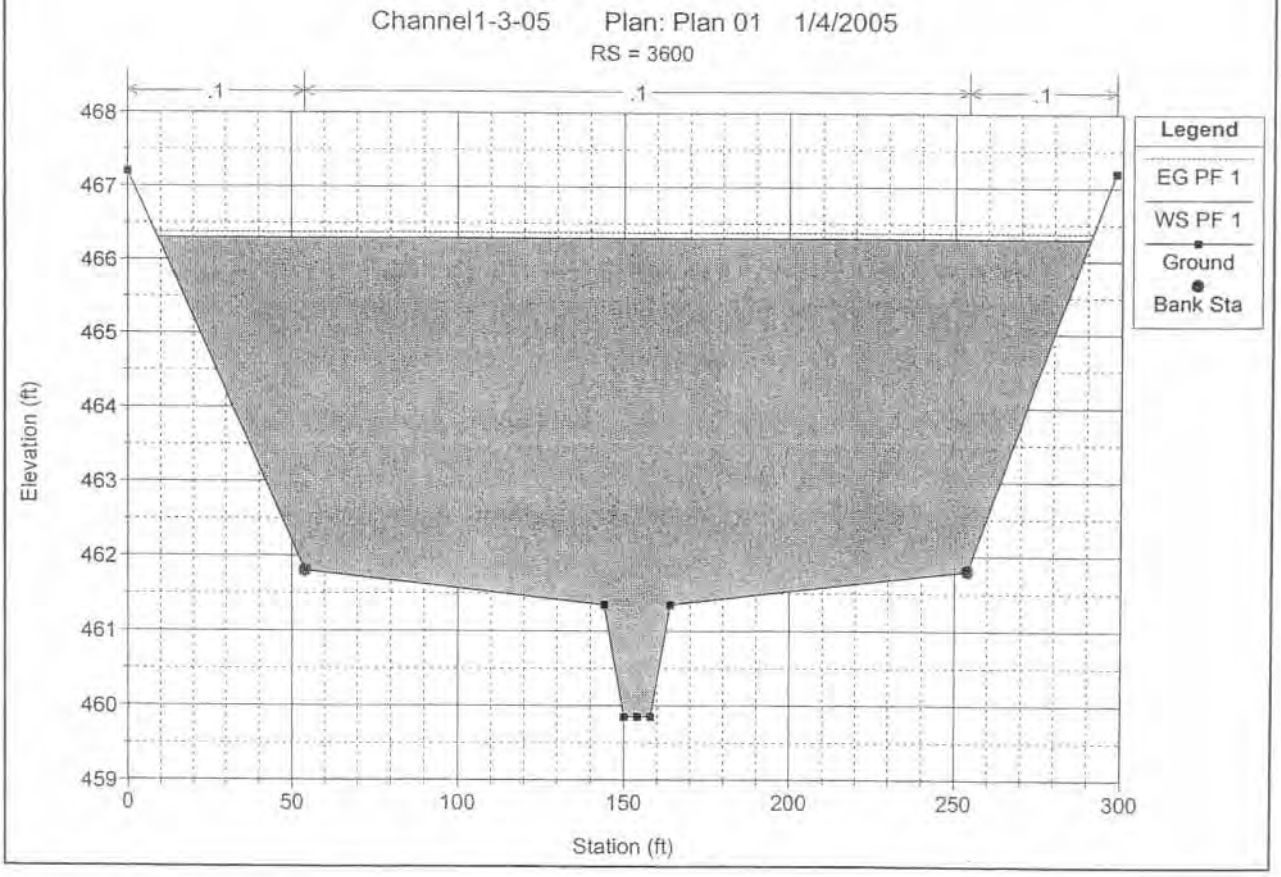

Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 5100
.1
.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
472
471
470
469
468
467
466
465
464
463
0
50
100
150
200
250
300
350
400
Station (ft)

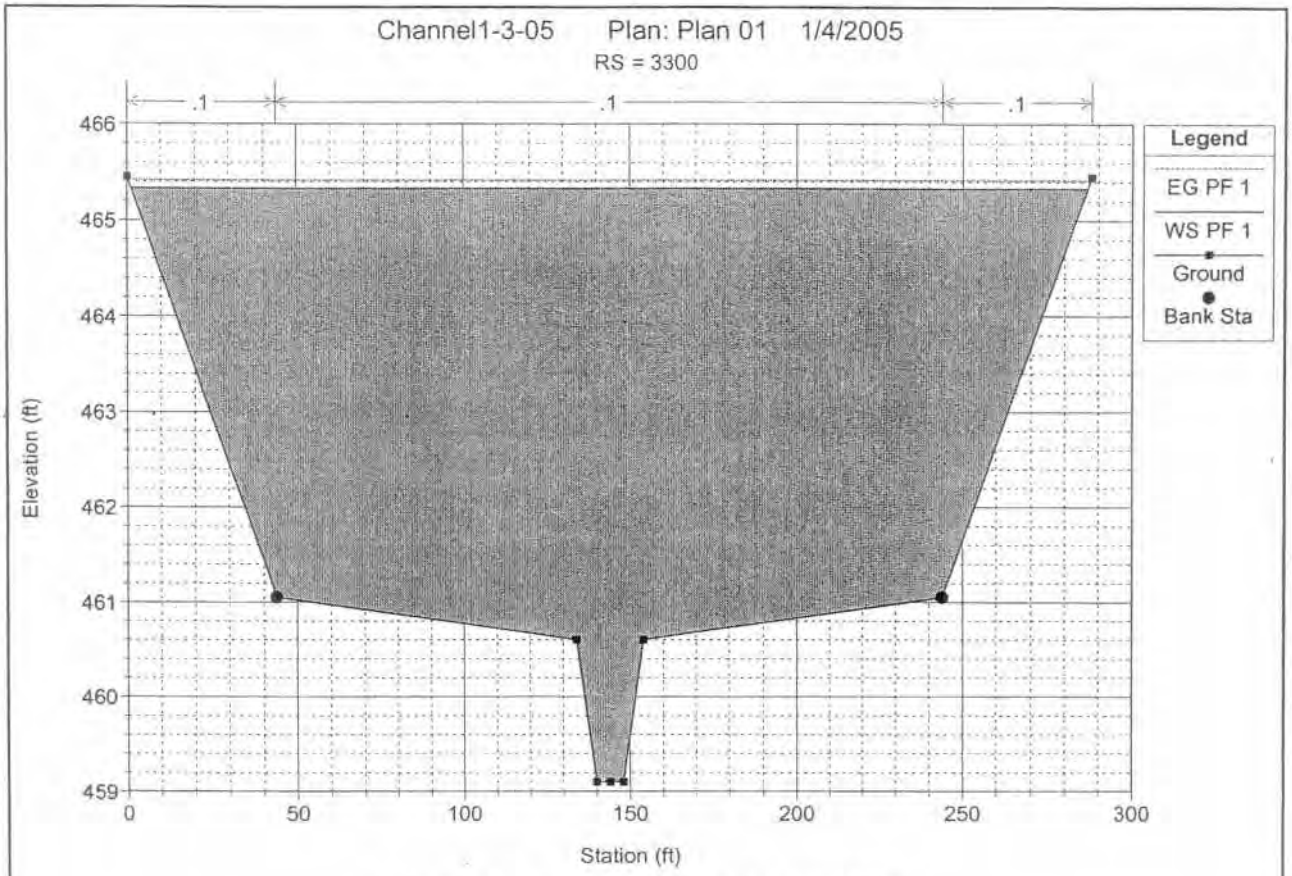

Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 4800
.1
.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
471
470
469
468
467
466
465
464
463
462
0
50
100
150
200
250
300
350
400
Station (ft)

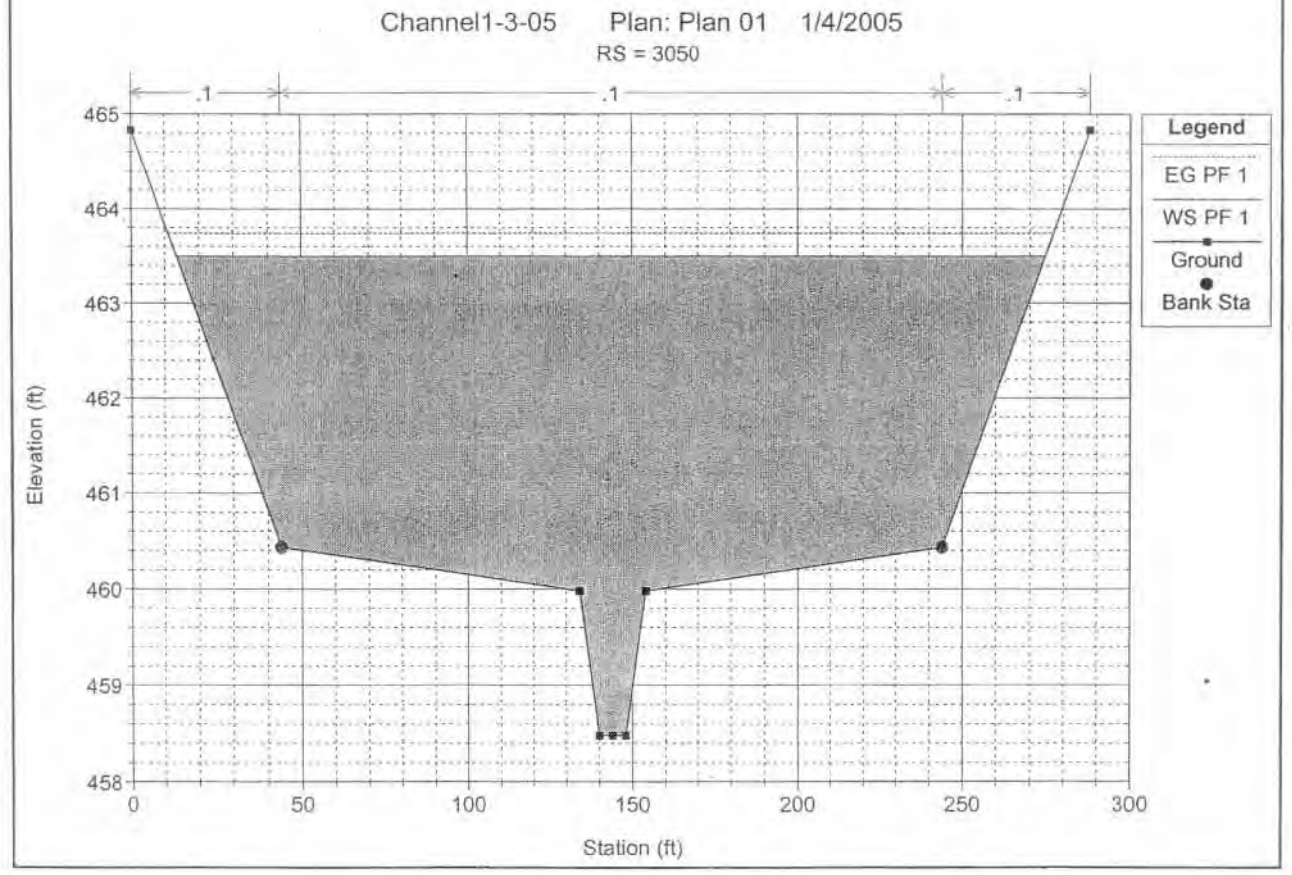

Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 4500
.1
.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
470
469
468
467
466
465
464
463
462
0
100
200
300
400
500
Station (ft)

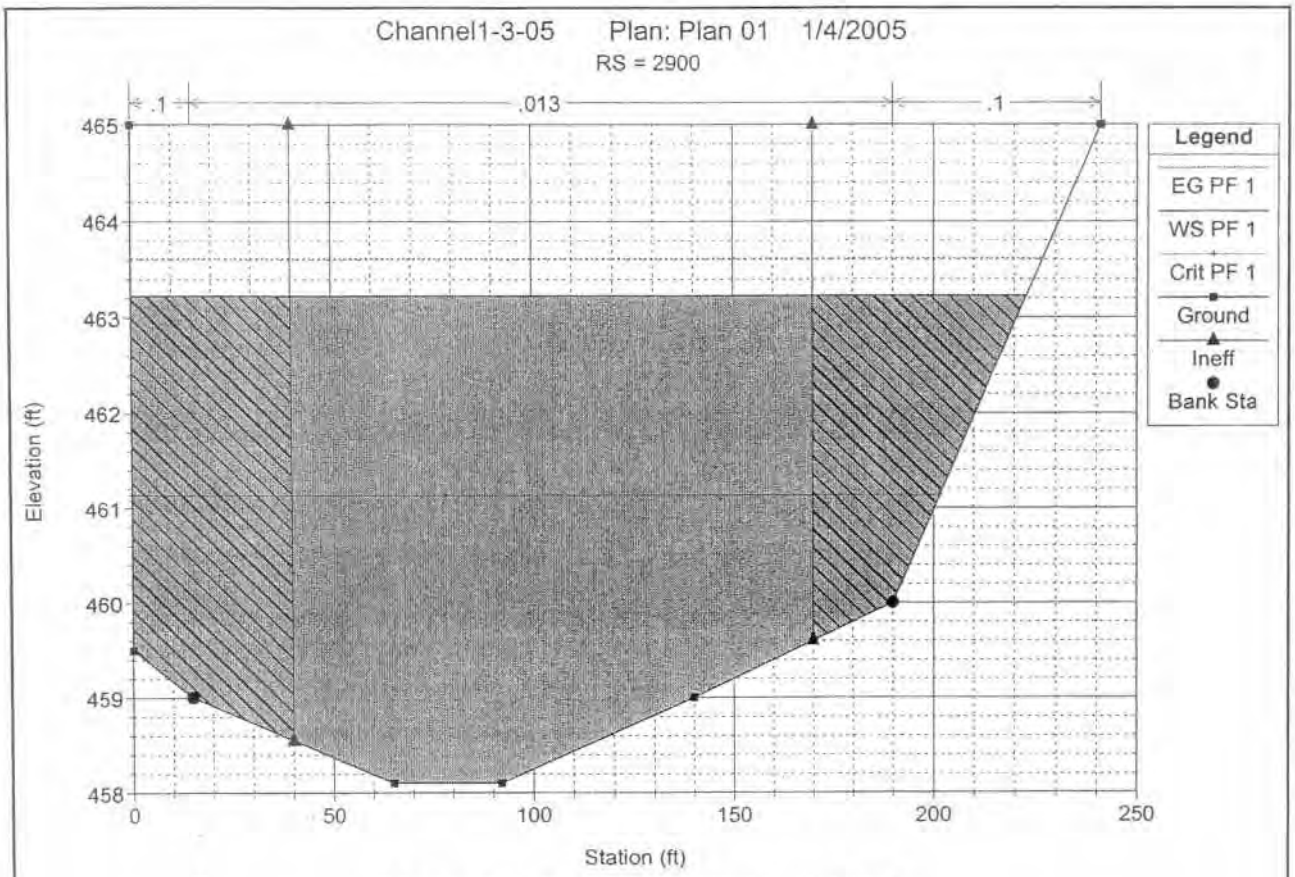

Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 4200
.1
.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
469
468
467
466
465
464
463
462
461
0
100
200
300
400
500
Station (ft)

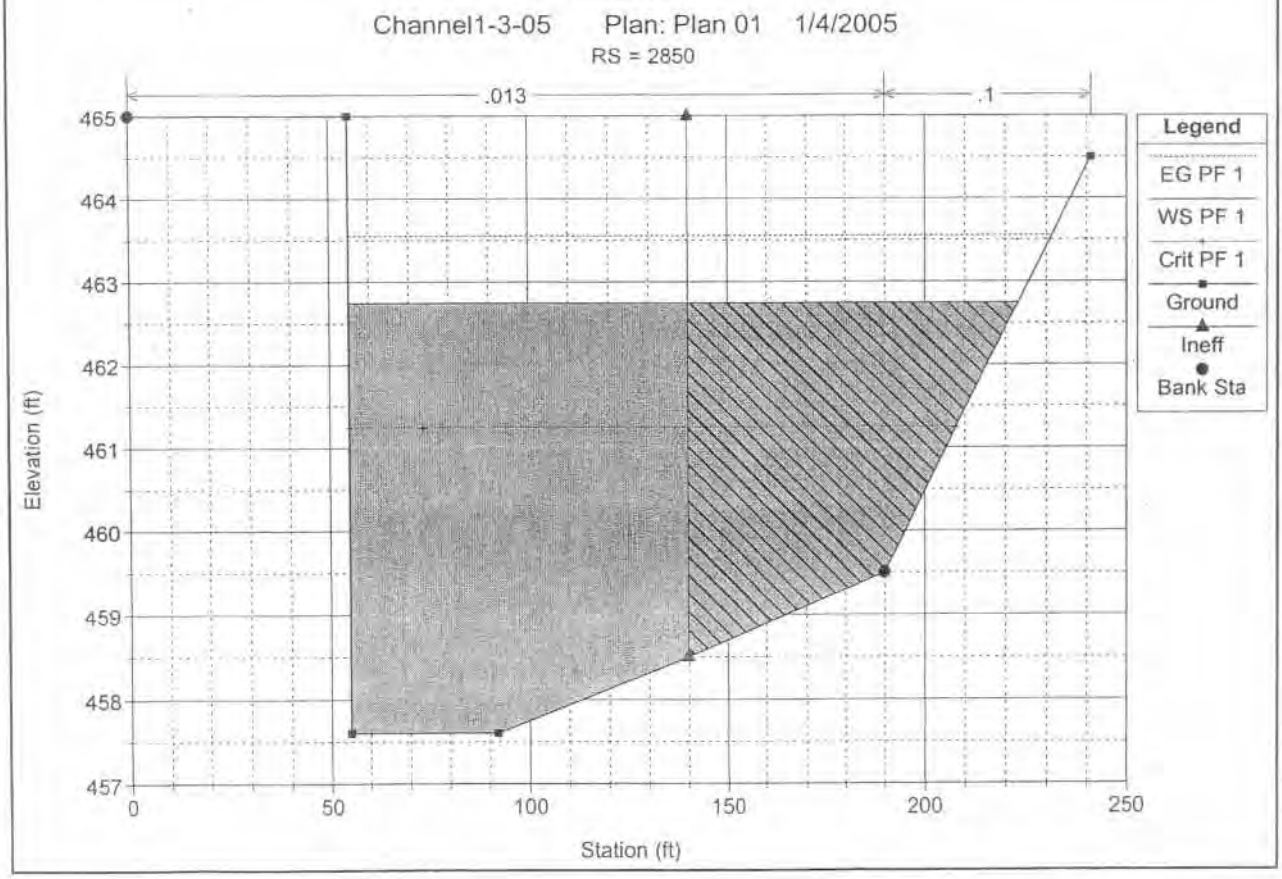

Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 3900
.1
.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
469
468
467
466
465
464
463
462
461
460
0
100
200
300
400
500
Station (ft)

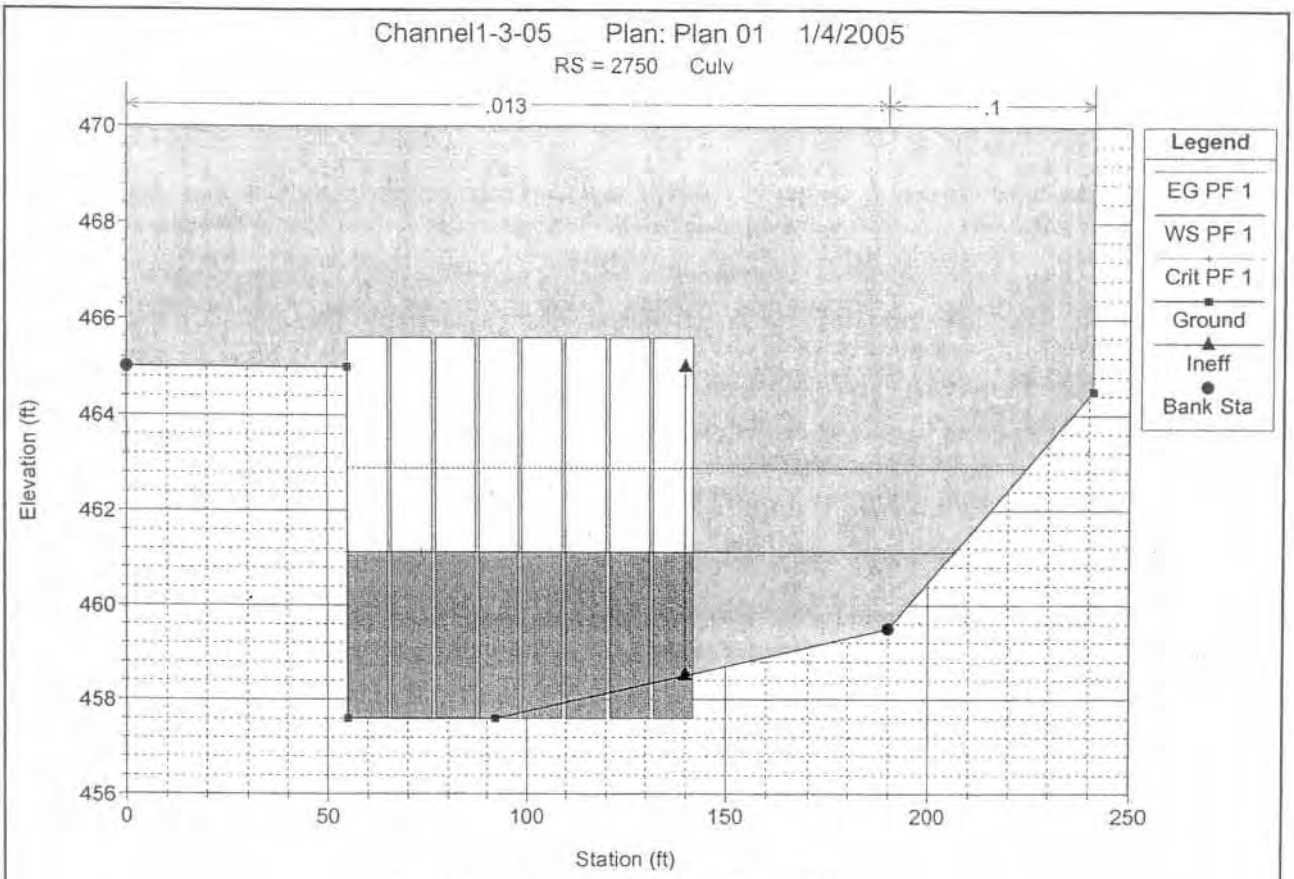

Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 3600
.1
.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
468
467
466
465
464
463
462
461
460
459
0
50
100
150
200
250
300
Station (ft)

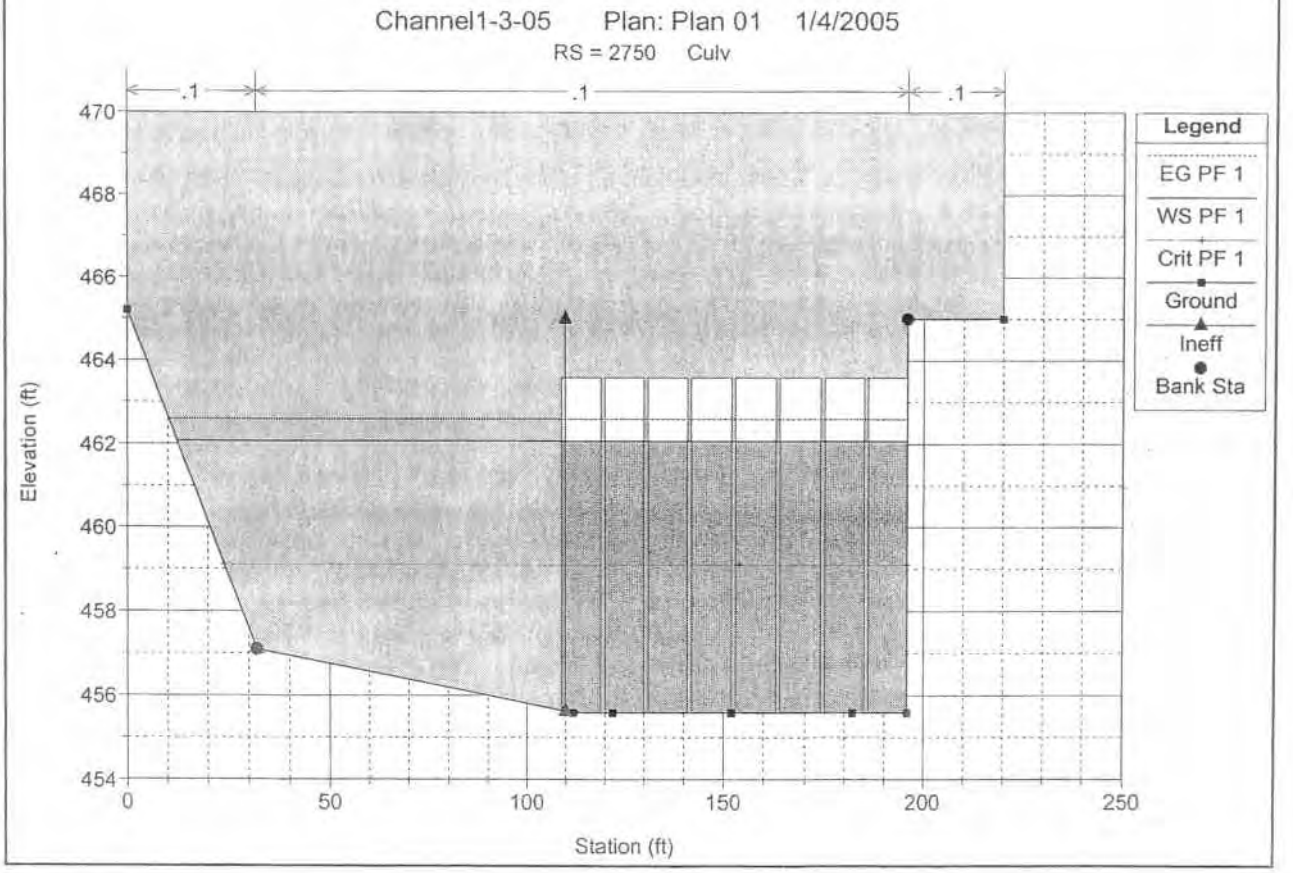

Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 3300
.1
.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
466
465
464
463
462
461
460
459
0
50
100
150
200
250
300

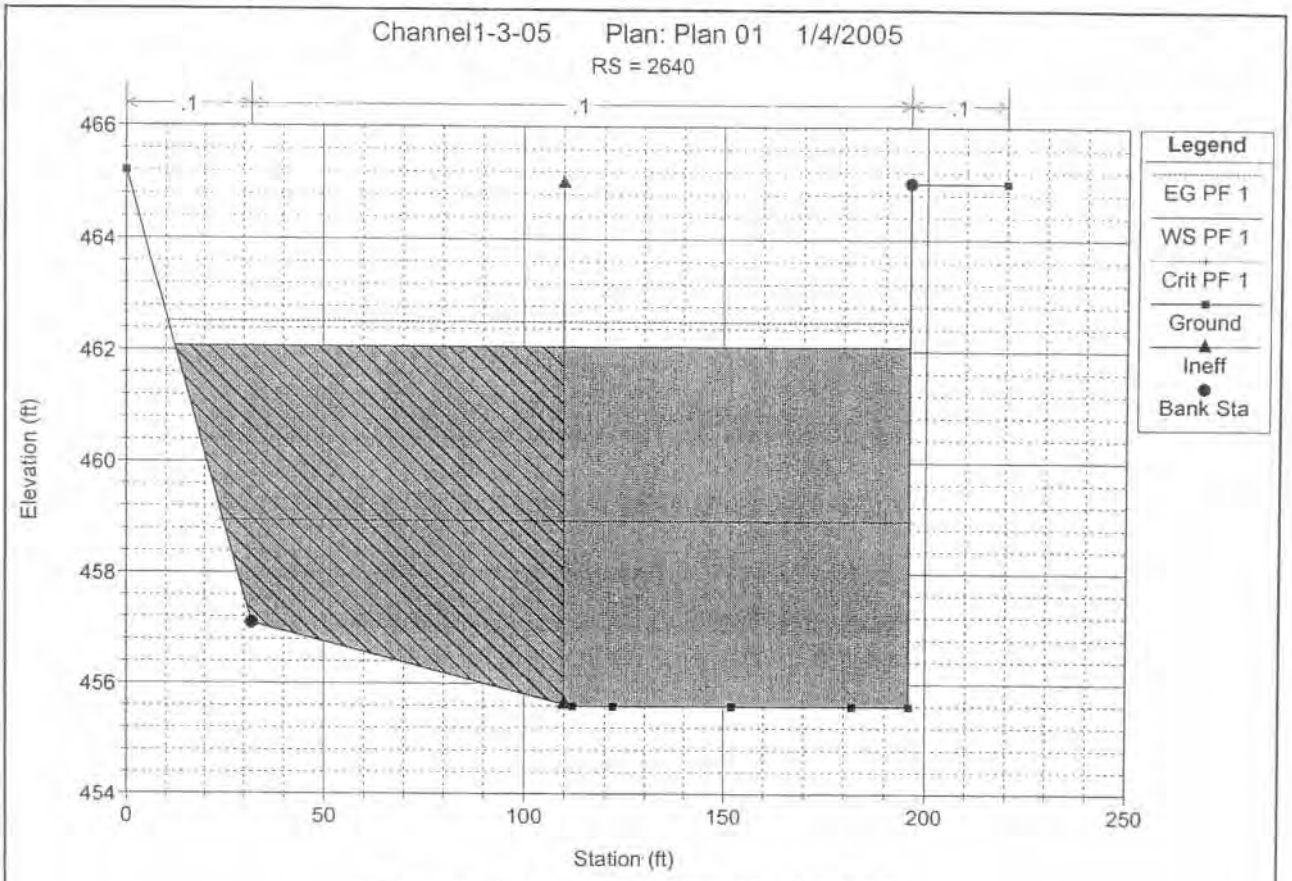

Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 3050
.1
.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
465
464
463
462
461
460
459
458
0
50
100
150
200
250
300

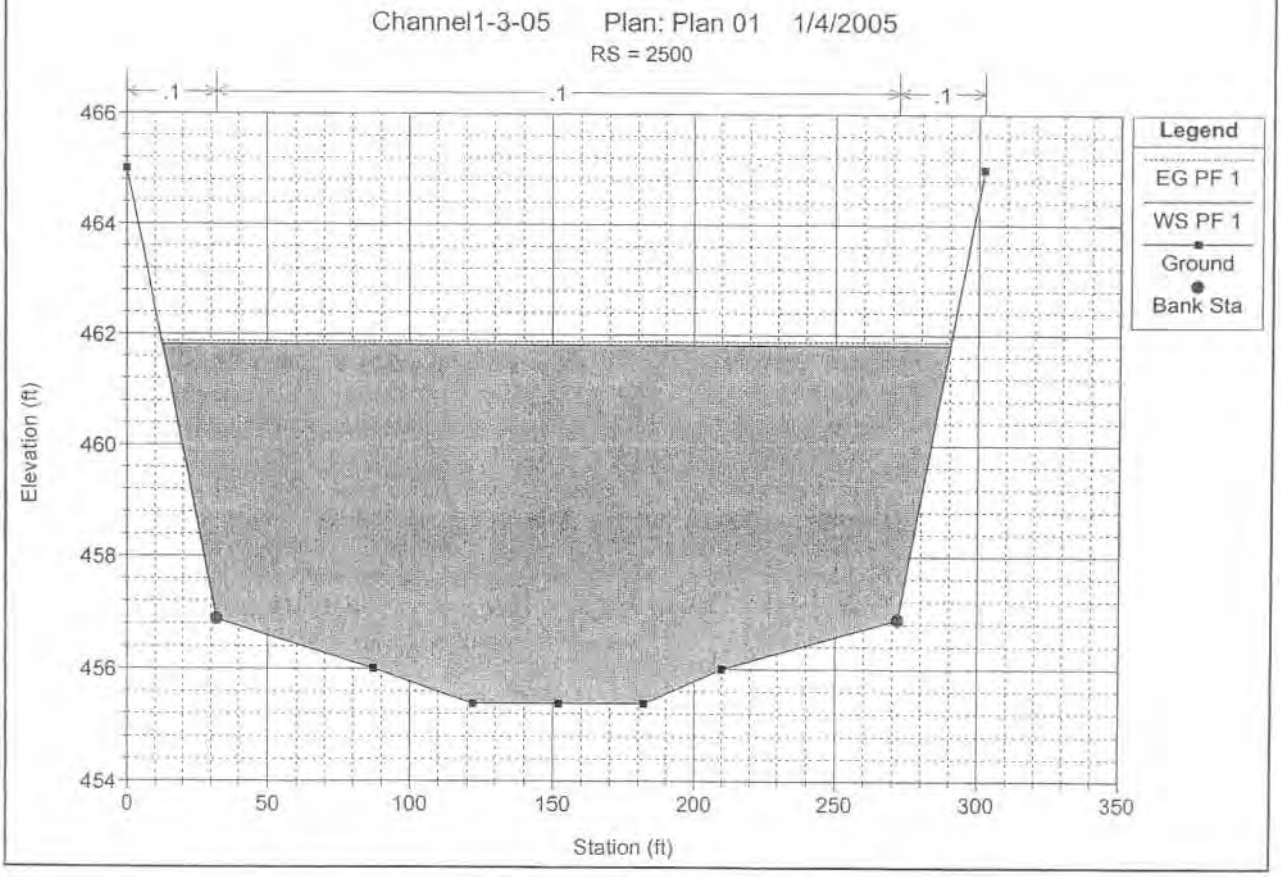

Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 2900
.1
.013
.1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

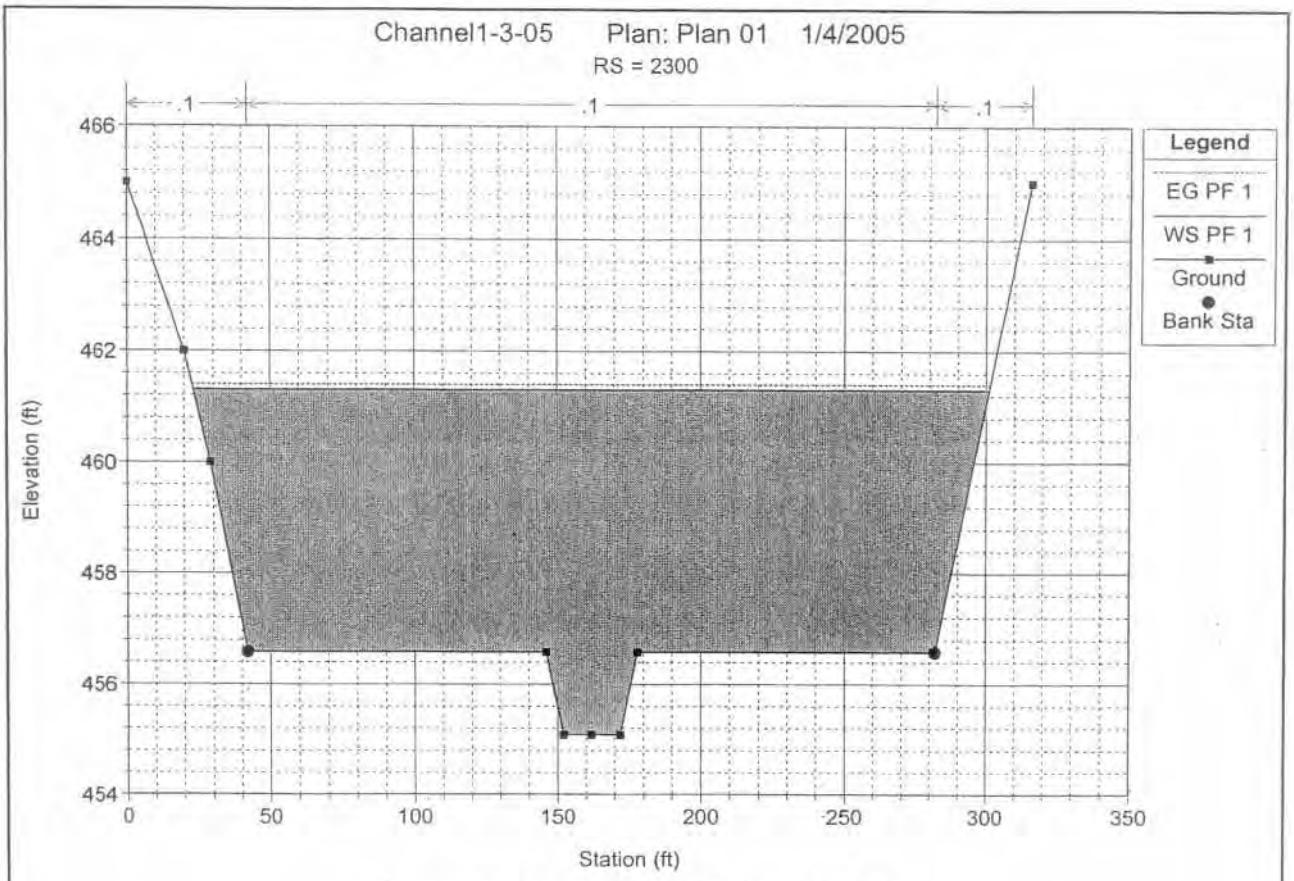

Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 2850
.013
.1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

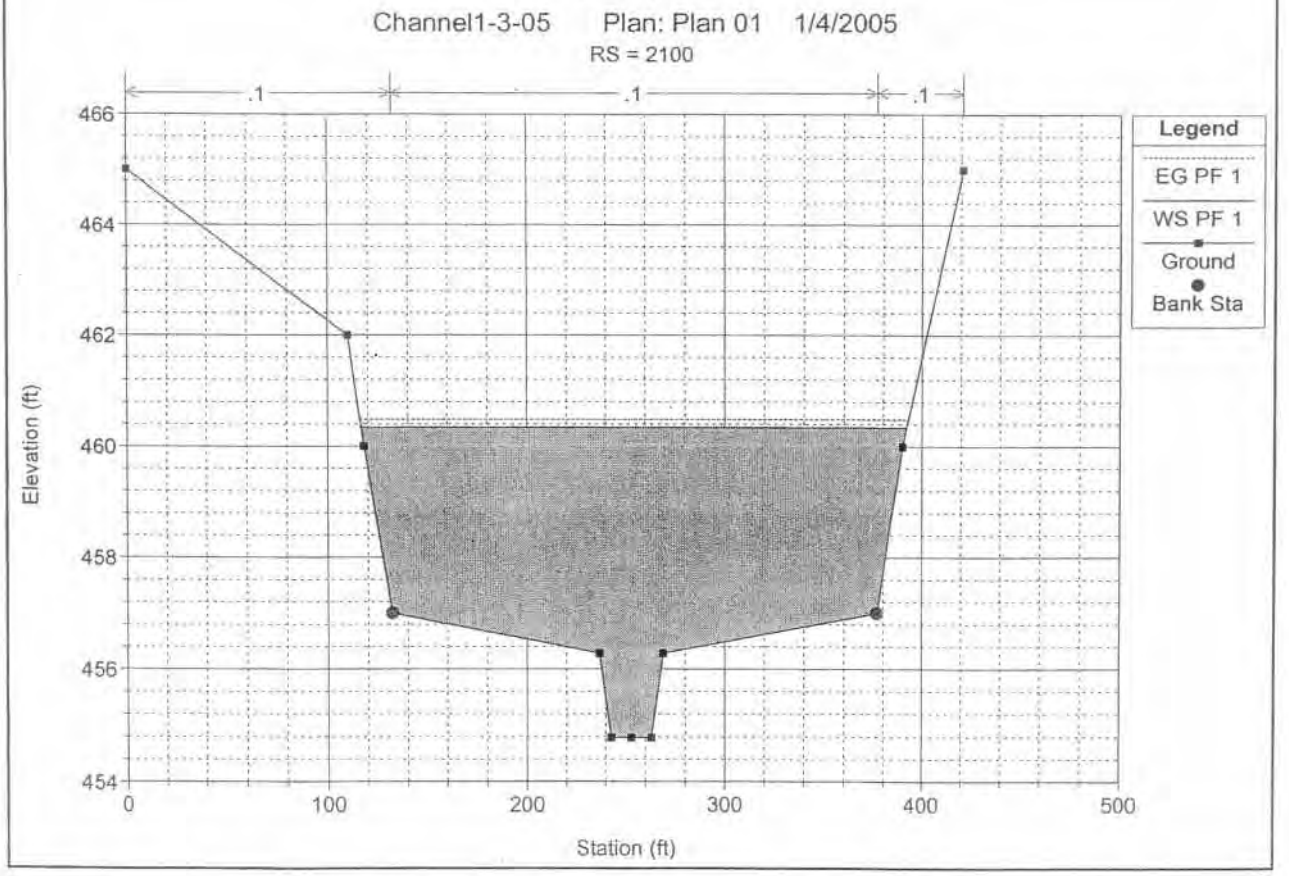

Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 2750 Culv
.013
.1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

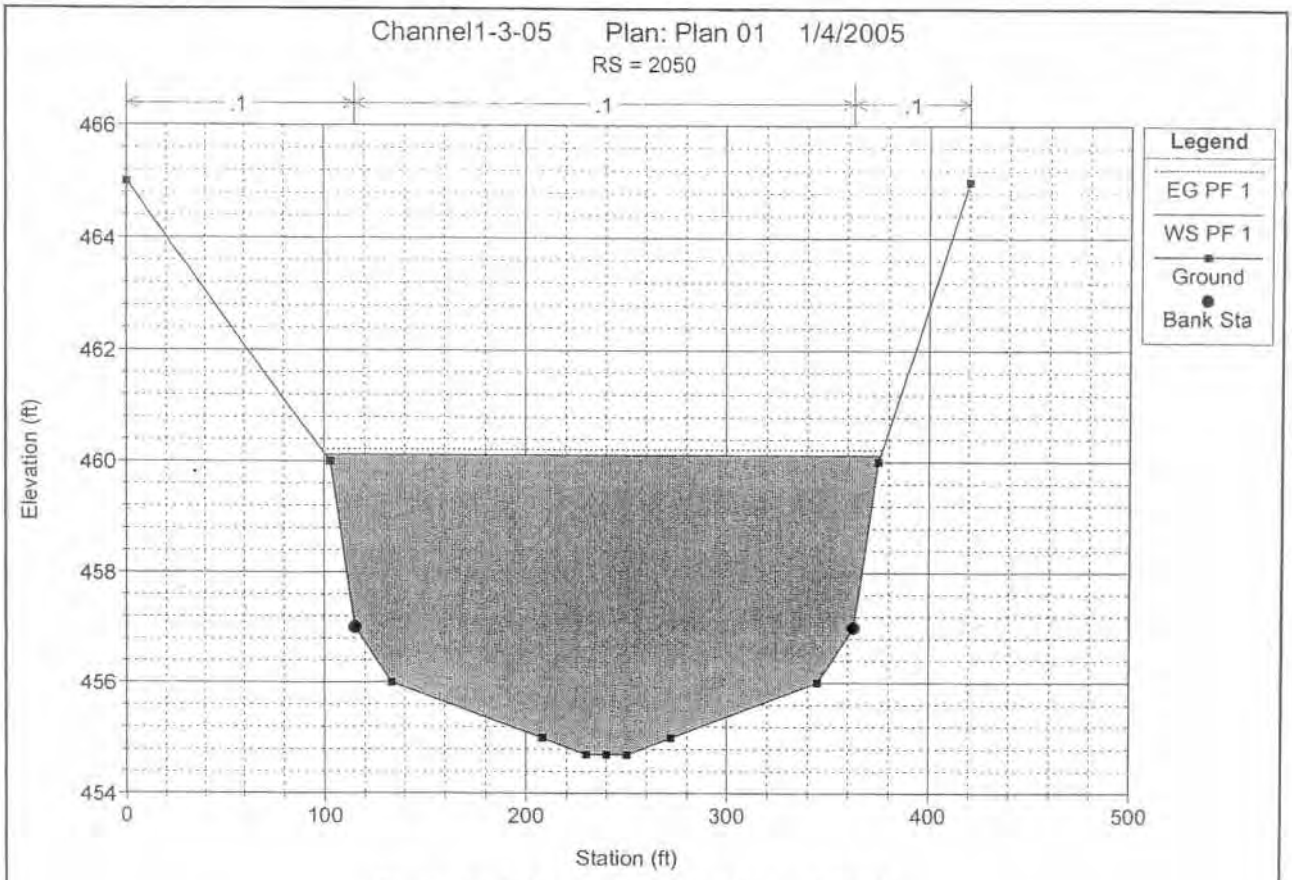

Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 2750 Culv
.1
.1
.1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

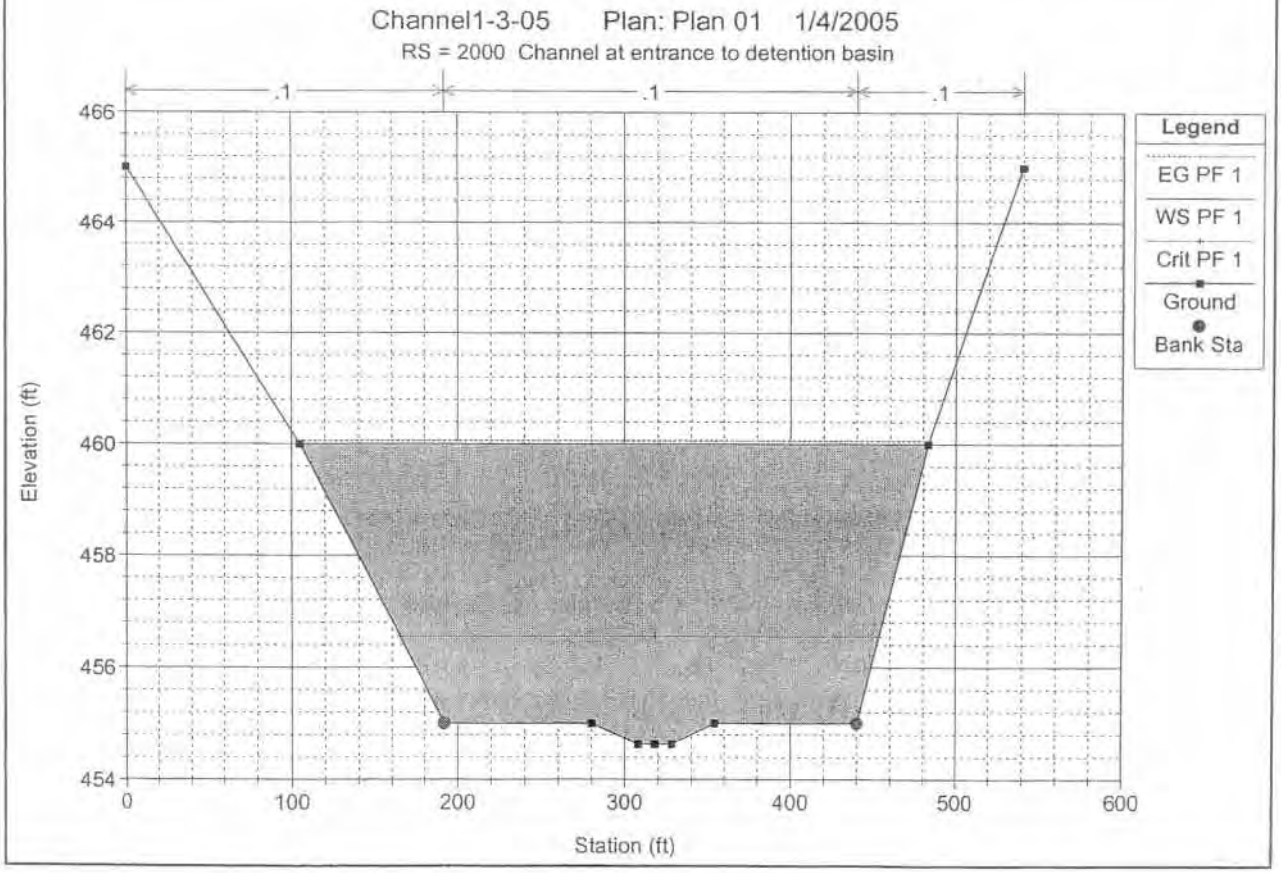

Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 2640
.1
.1
.1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
466
464
462
460
458
456
454
0
50
100
150
200
250
Station (ft)


Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 2500
.1
.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
466
464
462
460
458
456
454
0
50
100
150
200
250
300
350
Station (ft)


Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 2300
.1
.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
466
464
462
460
458
456
454
0
50
100
150
200
250
300
350


Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 2100
.1
.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
466
464
462
460
458
456
454
0
100
200
300
400
500


Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 2050
.1
.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
466
464
462
460
458
456
454
0
100
200
300
400
500
Station (ft)


Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 2000 Channel at entrance to detention basin
.1
.1
.1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
466
464
462
460
458
456
454
0
100
200
300
400
500
600
Station (ft)

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	Trapezoidal Channel - 1
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Discharge

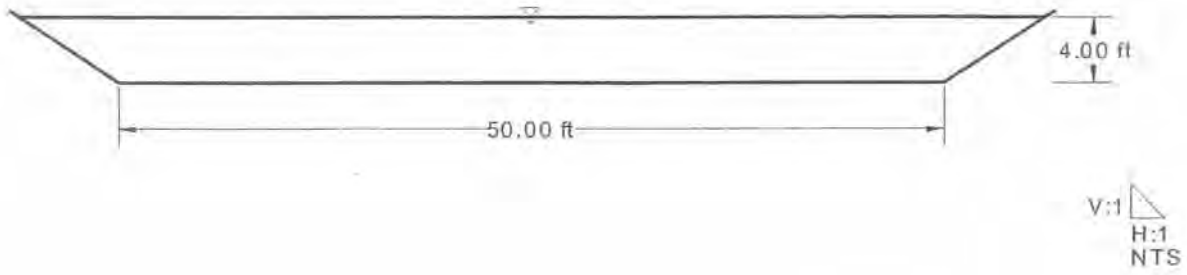
Input Data		
Mannings Coefficient	0.045	
Slope	0.006150	ft/ft
Depth	4.00	ft
Left Side Slope	1.50	H : V
Right Side Slope	1.50	H : V
Bottom Width	50.00	ft

Results		
Discharge	1,331.30	cfs
Flow Area	224.0	ft²
Wetted Perimeter	64.42	ft
Top Width	62.00	ft
Critical Depth	2.73	ft
Critical Slope	0.022466	ft/ft
Velocity	5.94	ft/s
Velocity Head	0.55	ft
Specific Energy	4.55	ft
Froude Number	0.55	
Flow Type	Subcritical	

Cross Section
Cross Section for Trapezoidal Channel

Project Description	
Worksheet	Trapezoidal Channel - 1
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Discharge

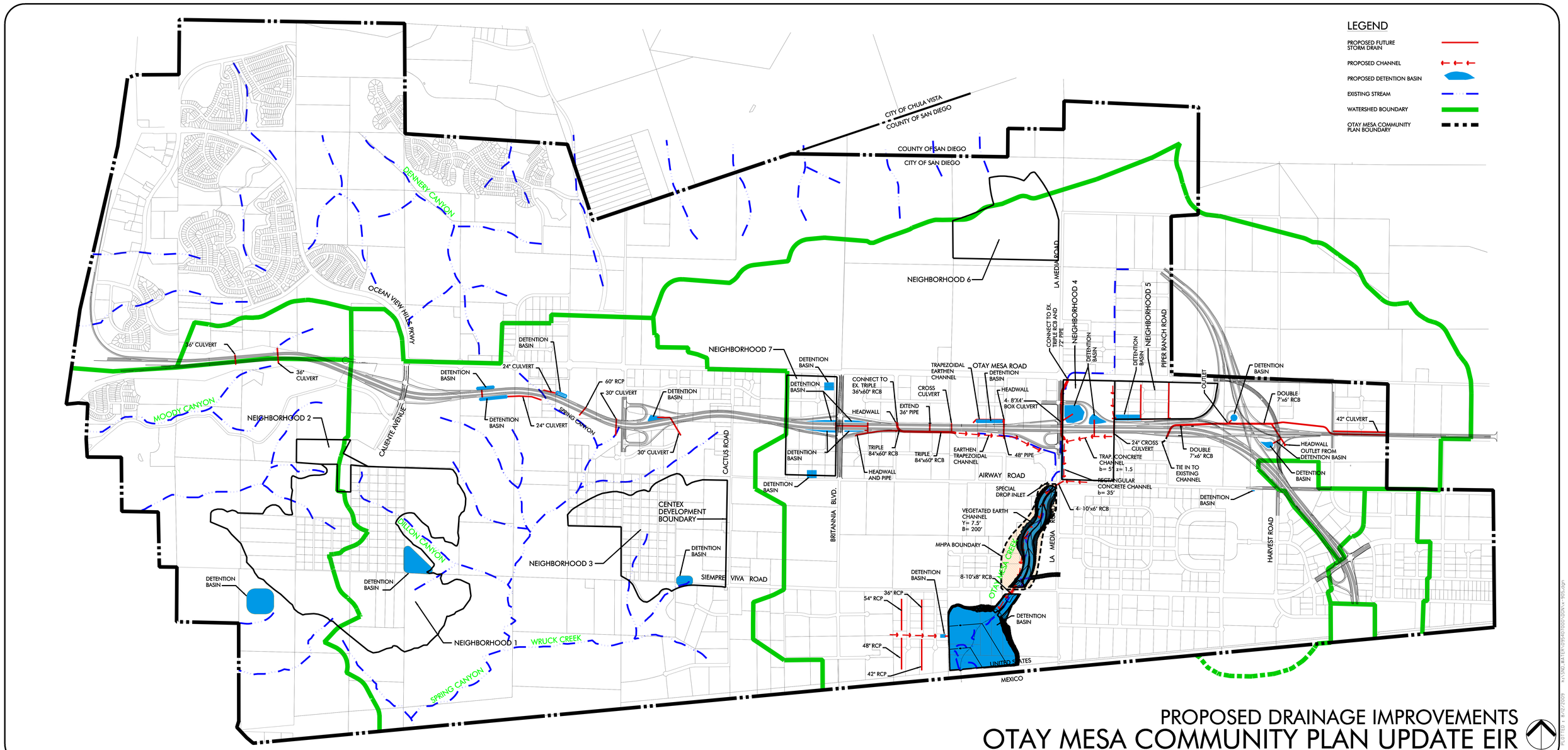
Section Data		
Mannings Coefficient	0.045	
Slope	0.006150	ft/ft
Depth	4.00	ft
Left Side Slope	1.50	H : V
Right Side Slope	1.50	H : V
Bottom Width	50.00	ft
Discharge	1,331.30	cfs



V. PROPOSED DRAINAGE FACILITIES

For most of the Mesa, drainage facilities are constructed as part of development or road projects, and include only facilities in the immediate vicinity of the projects. For the proposed future private development, no designs are available to show these future facilities. Caltrans has prepared plans for their SR-905 project, and those facilities are shown on the attached map.

The only Master Planned facility which needs to be constructed before development takes place is the Main Channel and Detention basin in the East Watershed. Details of this system are presented in Section VI.



PROPOSED DRAINAGE IMPROVEMENTS
OTAY MESA COMMUNITY PLAN UPDATE EIR

Scale: 1"=1000'
June 2006

KIMLEY-HORN AND ASSOCIATES

VI. PROPOSED DRAINAGE ALTERNATIVES

The historical drainage on the Mesa, with its flat terrain and shallow swales for drainage paths, did not become a problem until development started taking place in the 1960s. This development started concentrating flows in culverts under roads and redefined some of the historical drainage paths. Some of the development solved problems in some areas, but impacted other areas by moving the problem downstream. One of these areas is the existing creek that parallels La Media Road and eventually crosses the border into Mexico. The frequent flooding along portions of this channel is a constraint to future development for some of the areas along the creek.

1. NO PROJECT

The alternative of doing nothing to improve the drainage along the main creek channel would prevent future development from taking place along portions of La Media Road. The existing creek is not deep enough to allow the adjacent properties to drain effectively. To provide continued access along the truck route during storms, if the channel is not constructed, the roads will need to be raised or alternative routes identified. The existing intersection of Airway Road and La Media Road floods after any significant precipitation. The adjacent roads are too low to allow significant flows to pass under them, so they flood frequently. If the roads are raised to allow more flow to pass under them, they will impact the already-developed adjacent property, parts of which would now be lower than the roads, creating even more difficult drainage issues for the properties.

2. CONCRETE CHANNEL

The 1999 Otay Mesa Drainage Study recommended a concrete channel from Otay Mesa Road to the Border Detention Basin. The recommended plan was a concrete channel along the east side of La Media Road until reaching Siempre Viva Road, where it crossed under La Media and followed on the north side of Siempre Viva to box culverts under Siempre Viva that connected to the Border Detention Basin. All of the concrete channel alternatives assumed that the existing creek with its habitat would continue to carry low flows. The 1999 cost for this alternative was $10.6 million, which would be approximately $14.9 million in 2005 dollars without land acquisition.

3. LA MEDIA CHANNEL AND BORDER DETENTION BASIN

The largest watershed on the Mesa is the East Watershed, which covers an area at 6.78 square miles (4,340 Acres). All of the flow from this watershed collects at a concentration point at a large culvert where it crosses the border with Mexico and flows under the airport access road and airport runway before flowing into the Tijuana River.

This portion at the Mesa is extremely flat, and the adjacent properties can not effectively drain into the existing small creek channel without raising the elevations of the roads and developments near the creek. To allow for future development and to accommodate runoff from proposed future projects, a new channel is required with inverts from 3 to 5 feet below the existing creek channel.

The proposed channel has a bottom width that varies from 240 feet at the new border detention basin to 200 feet from north of Siempre Viva Road to the Airway Road/La Media Road intersection. The side slopes will vary between 4:1 to 10:1. Heavy riparian vegetation will be allowed to grow in the channel and no annual maintenance will be required. Once the vegetation has matured, maintenance of dead or fallen trees may be required every few years. There will be a 12 foot wide access road on each bank. The Channel will contain the 100 year flood flow with mature vegetation growth.

From the Airway Road/La Media Road intersection, a 35 foot wide concrete channel along the east side of La Media Road will connect with the proposed Caltrans culverts which will be constructed with SR 905. The RCB culverts under the intersection will need to accommodate existing utilities in both roads, which may impact the intersection and the utilities.

The Border Detention Basin will be designed to attenuate the peak post-development flows down to their pre-development levels for flows from 5 year through 100 year storms. The outlet structure will be less than six feet high, and will not be under the jurisdiction of the State of California DSOD. The design of the outlet structure will be prepared with final plans for the project. The Detention Basin will be approximately 1700' by 1500' and cover an area of approximately 58 acres.

Border Detention Basin

Area:	58 Acres
Max. Water Depth:	6.0 Feet
Max. Storage Volume:	308 AF

The basin will be graded to appear natural. Natural vegetation will be allowed to grow in the basin and no annual maintenance will be required. A low-flow stream will be created through the basin. A Maintenance Assessment District may be created for maintaining the channel and detention basin.

The basin and channel will require the removal of approximately 915,000 CY of soil. It is assumed that this export will be used on adjacent properties to raise the building pad grades thereby limiting the haul distance. A preliminary cost estimate was prepared which reflects both the construction costs and the land acquisition costs. A Property Ownership Map which shows the ownership within the East Watershed is attached.

La Media Channel and Border Detention Basin

Preliminary Opinion of Probable Construction Cost
2/8/2005
Kimley-Horn and Associates

Construction Items

Item No.	Description	Quantity	Units	Unit Price	Cost
1	Excavation	822,500	CY	$2	$1,645,000
2	Airway Road culvert (6~5'wx5'h)	300	CY	$1,500	$450,000
3	La Media/Airway Road intersection culvert (6~10'wx6'h)	1,500	CY	$1,500	$2,250,000
4	Siempre Viva Road culvert (8~10'wx8'h)	1,490	CY	$1,500	$2,235,000
5	Detention Basin Outlet Structure	1	LS	$100,000	$100,000
6	Traffic Control	1	LS	$100,000	$100,000
7	Utility Relocation	1	LS	$150,000	$150,000
8	Street Repair	1	LS	$50,000	$50,000
9	Erosion Control	1	LS	$50,000	$50,000
10	Revegetation	1	LS	$600,000	$600,000
		Subtotal			$7,630,000
		Contingency	20%		$1,526,000
		Total			$9,156,000

Land Acquisition

1	Land Acquisition (outside MHPA)*	2,610,000	SF	$4	$10,440,000
2	Land Acquisition (inside MHPA)**	1,820,000	SF	$1	$1,820,000
		Subtotal			$12,260,000
		Contingency	20%		$2,452,000
		Total			$14,712,000

Total Cost (Construction and Land Acquisition) $23,868,000

Notes: * Includes area of detention basin and channel south of Siempre Viva
** Includes entire area within MHPA boundary
*** Estimate does not include engineering, environmental, geotechnical, surveying, etc.

K:\095407000\Excel\[cost estimate.xls]Sheet1

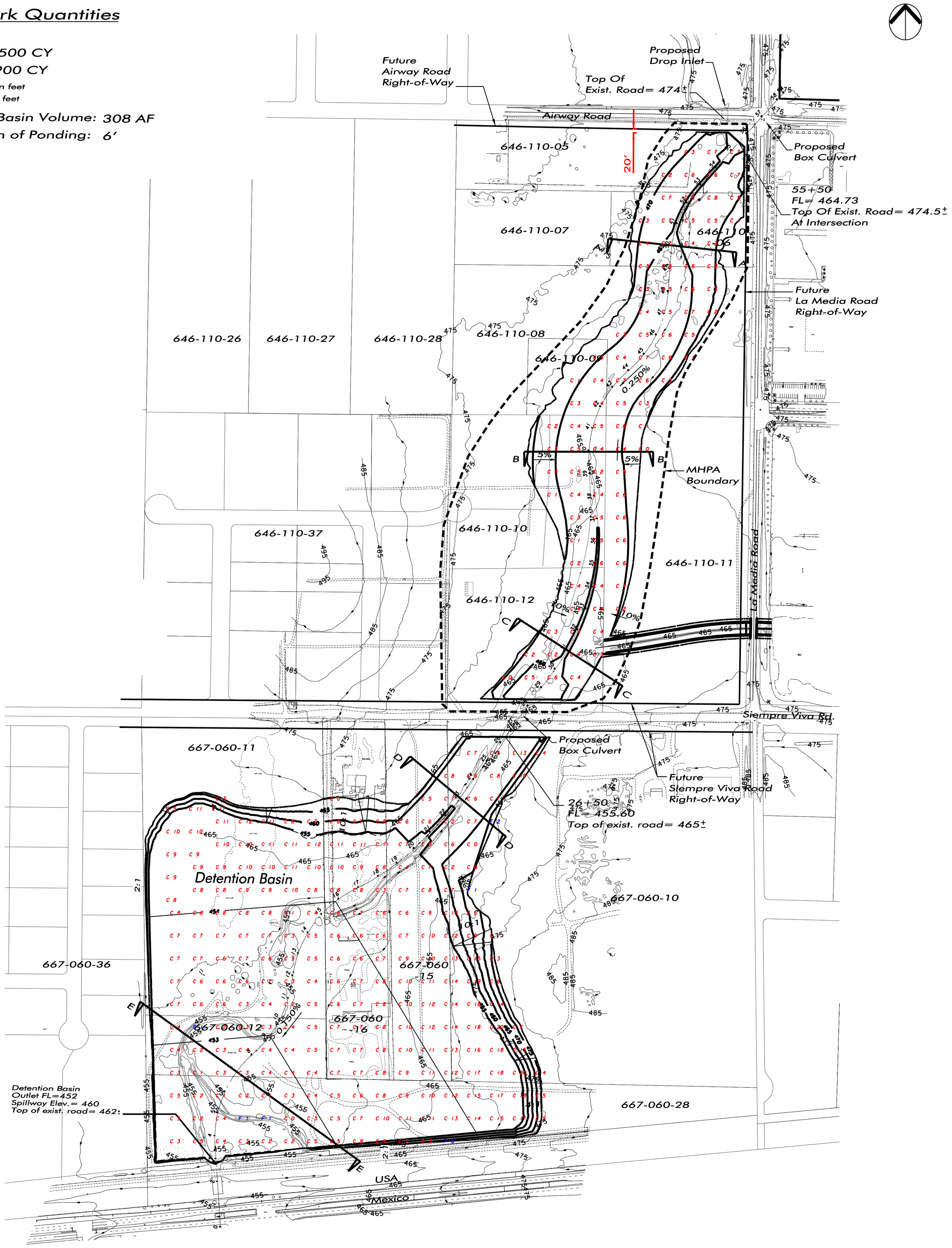
OTAY MESA CPU

Earthwork Quantities

Cut: 822,500 CY
Fill: 900 CY

C = Cut depth in feet
F = Fill depth in feet

Detention Basin Volume: 308 AF
Max. Depth of Ponding: 6'



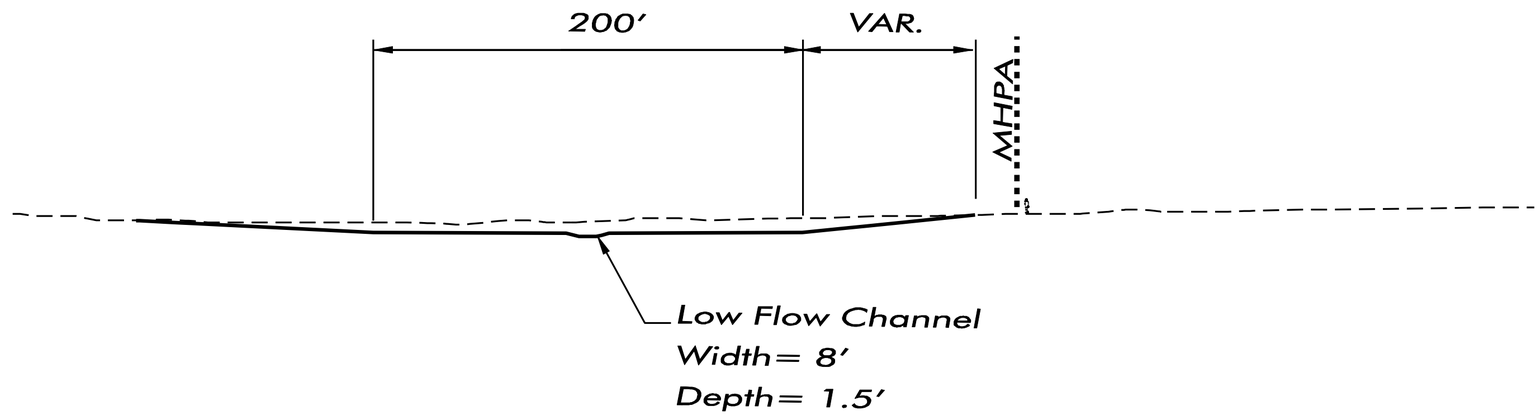
0 100 200 400
SCALE: 1" = 200'

KIMLEY-HORN and ASSOCIATES

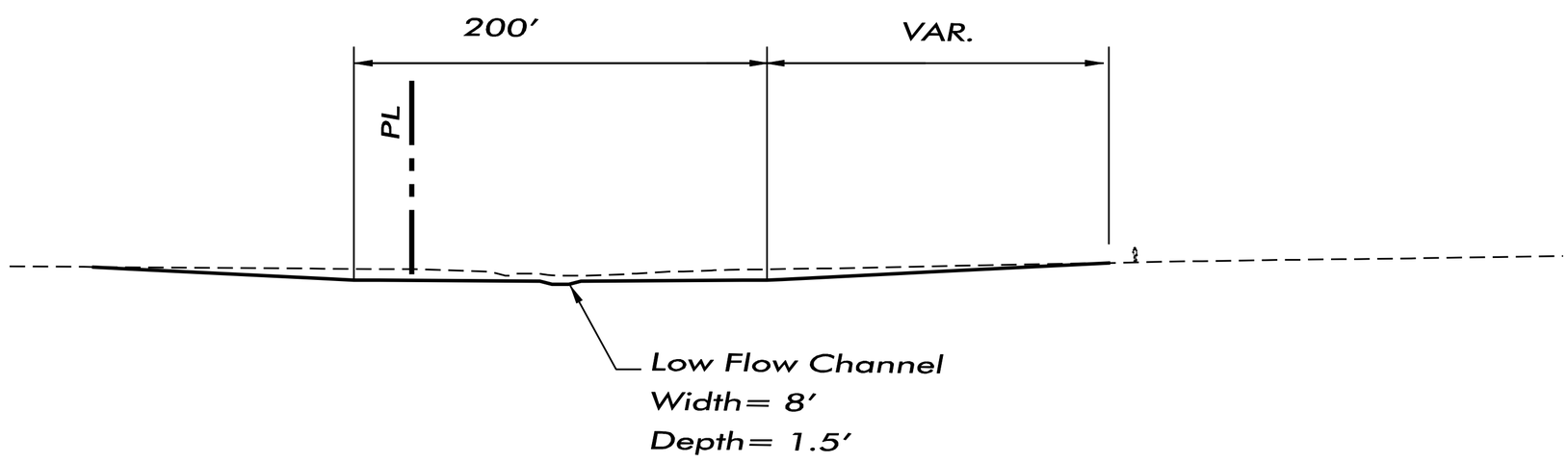
JUNE 2006

CONCEPTUAL CHANNEL/DETENTION BASIN GRADING

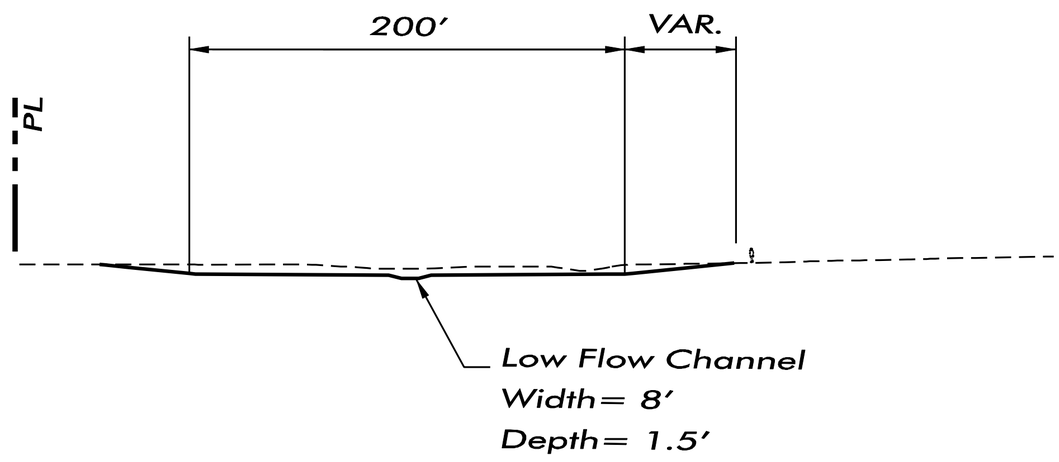
OTAY MESA CPU



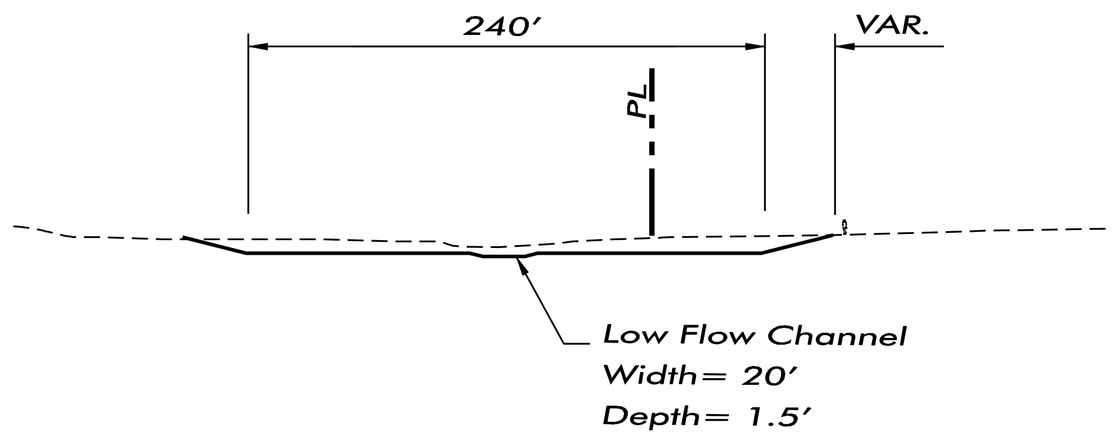
SECTION A-A



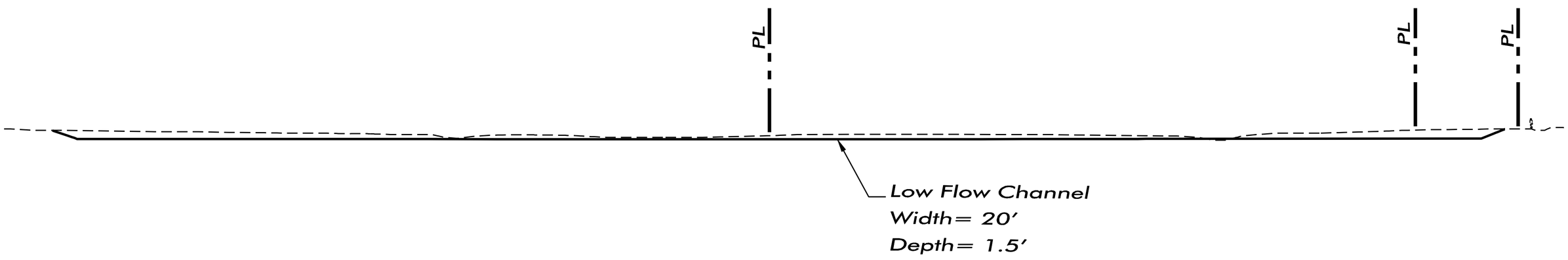
SECTION B-B



SECTION C-C



SECTION D-D



SECTION E-E

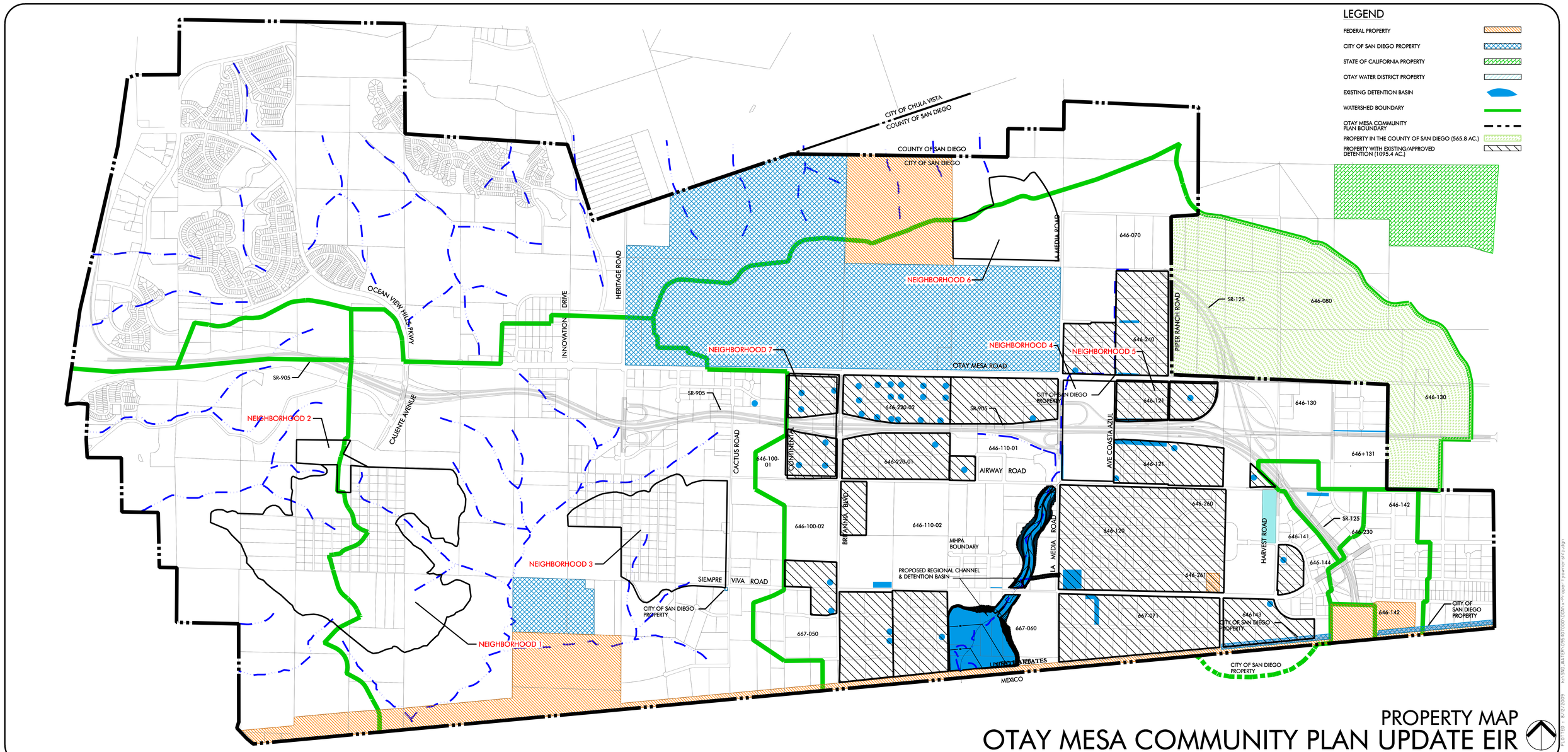
Note: No Vertical Exaggeration On Sections

0 25 50 100
SCALE: 1" = 50'

JUNE 2006

KIMLEY-HORN and ASSOCIATES

EARTHWORK CROSS SECTIONS



PROPERTY MAP
OTAY MESA COMMUNITY PLAN UPDATE EIR

Scale: 1"=1000'
JUNE 2006

KIMLEY-HORN AND ASSOCIATES

VII. RECOMMENDED DRAINAGE DESIGN CRITERIA

Since the five watershed areas on the Mesa flow in every direction except east, they flow into different watersheds with different constraints and impacts. The runoff from the five watersheds will have different criteria for design of drainage facilities.

West Perimeter Watershed

This watershed consists of smaller Mesa-top watersheds with a total area of approximately 254 acres that drain to the west to three separate creeks in canyons and gullies. These creeks are carried under the SD&AE and Trolley tracks and through San Ysidro in buried storm drain systems. The storm drains under the tracks have hydraulic capacities of 30 cfs (18" RCP) and 125 cfs (36" RCP) based on the San Ysidro Boulevard Area Master Drainage plan prepared by BSI Consultants, February 15, 1996. Sub-basins OT3-7 and OT3-8 combine downstream into a single creek that flows to the 36" RCP. The current study estimates 140 cfs (Q100) will flow off of the Mesa into this sub-basin. This study does not address the capacity of the downstream system or include the hydrologic analysis for areas to the west of the Mesa, but clearly the 125 cfs capacity of the existing system will be exceeded. This area will need to be addressed in more detail during design of the upstream tributary development. Detention Basins are recommended which will reduce peak flows in the sub-basin to minimize impacts on the downstream system. These detention basins will reduce the peak, 50-year, and 100-year flow to predevelopment levels. Because of the unstable soils in this area, care should be taken that the proposed detention basins and relocated drainage facilities do not contribute to an increase in the risk of slides through increased saturation of the soil.

West Watershed

The West Watershed consists of smaller Mesa-top watersheds that drain into the tributary canyons of Spring Canyon. All of the flow from the watershed flows into Mexico at the Spring Canyon concentration point. Detention basins will be required to reduce the post-development peak flows to predevelopment levels for the 50-year and 100-year storm. If the detention basins concentrate flows at the upper edge of canyons, care must be taken to ensure that erosion potential is not increased downstream.

East Watershed

The East Watershed flows to Mexico at a single concentration point between Britannia and La Media roads. Requirements for the control of peak runoff from development in this watershed already exist. The "Notice" dated August 7, 1987 (page 2), sets criteria for detention basins and for storm drain sizing. As part of the future storm drain project in this watershed, a single detention basin will be constructed at the border. The construction of this basin will eliminate the need for individual on-site detention basins for subsequent development.

North Perimeter Watershed

These small watersheds along the northern edge of the Mesa flow into small canyons that flow into the Otay River. There are no peak flow attenuation requirements for flows from these watersheds. There may be water quality issues with the Otay River, and there may be erosion issues from storm drains on the Mesa. Only approximately 14 acres of Neighborhood 6 are in this watershed.

VIII. STORM WATER QUALITY REQUIREMENTS

Because of problems related to the poor water quality of storm water runoff from urban conveyance systems, the City requires that storm water Best Management Practices (BMPs) be constructed for all new projects. The storm water discharge contains pollution such as chemicals, trash, sediment, bacteria, metals, oil and grease. Construction projects which add impervious areas and change drainage patterns increase the discharge of these pollutants.

The Municipal Storm Water National Pollutant Discharge Elimination System Permit (NPDES Municipal Permit), approved February 21, 2001 by the San Diego Regional Water Quality Control Board (RWQCB), requires the City to implement regulations for constructing storm water BMPs for development projects.

In 2003, as part of the San Diego Municipal Code, the City published "Storm Water Standards – A Manual for Construction & Permanent Storm Water Best Management Practices Requirements." This manual is the reference document for all of the storm water issues encountered in development, including BMPs. Included in this report are Appendix C – Example Permanent Storm Water Best Management Practices, and the Storm Water Requirements Applicability Checklist from the City's Manual. Before preparing a drainage study, the "Storm Water Requirements Applicability Checklist" is completed. This checklist is used to determine the priority level of the project. Most of the projects on the Mesa will require Priority Project Permanent Storm Water BMPs and High Priority Construction Storm Water BMPs.

All projects subject to the priority permanent BMP requirements must include a "Water Quality Technical Report." From the manual, the report will include:

1. A drainage study report prepared by a civil engineer, hydrologist, or hydrogeologist registered in the State of California, with experience in the science of stream and river generated surface features (i.e., fluvial geomorphology) and water resources management, satisfactory to the City Engineer. The report shall consider the project area's location (from the larger watershed perspective), topography, soil and vegetation conditions, percent impervious area, natural and infrastructure drainage features, and any other relevant hydrologic and environmental factors to be protected specific to the project area's watershed.
2. A field reconnaissance to observe and report on downstream conditions, including undercutting erosion, slope stability, vegetative stress (due to flooding, erosion, water quality degradation, or loss of water supplies) and the area's susceptibility to erosion or habitat alteration as a result of any future upstream development.
3. A hydrologic analysis to include rainfall runoff characteristics from the project area including at a minimum, peak runoff, time of concentration, and detention volume (if appropriate). These characteristics shall be developed for the two-year and ten-year frequency, six-hour or 24-hour, type B storm for the coastal areas of San Diego County. The largest peak flow should be included in the report. The report shall also report the project's conditions of concern based on the hydrologic and downstream conditions discussed above. Where downstream conditions of concern have been identified, the drainage study shall establish that pre-project hydrologic conditions that minimize impacts on those downstream conditions of concern would be either improved or maintained by the proposed project, satisfactory to the City Engineer, by incorporating the permanent BMP requirements.

Appendix D of the Manual includes detailed guidelines for the Water Quality Technical Report.

There are numerous alternative permanent BMPs that can be used for each project. The alternatives include Site Design BMPs, Source Control BMPs, and Treatment Control BMPs. The Site Design BMPs are primary ways to reduce storm water runoff through means such as increased pervious areas, increased infiltration, use of natural channels, and appropriate landscaping. All of these except dry wells are applicable to the Mesa. Source Control BMPs are meant to control pollutants at their source before they enter storm water, and are all applicable to the Mesa. Treatment Control BMPs treat the storm water before it leaves the property, and include natural methods such as biofilters, detention basins, wetlands, and porous pavement, and mechanical methods such as filters and separators. The one Treatment Control BMP that is not applicable to the Mesa is infiltration, which is not very effective on the Mesa because of the clay soils.

Most of Otay Mesa drains to the south across the border with Mexico and eventually into the Tijuana River. A small portion flows north into the Otay River, and the far western part of the Mesa flows to the west through San Ysidro and then into the Tijuana River. The Tijuana River has been identified by the 2002 Clean Water Act as a "Section 303(d) Water Quality Limited" river. The pollutants of concern which are included in the attached pages from the USEPA, need to be listed, and the new development project's potential impacts on these pollutants need to be included in the project's drainage report.

Recommended Storm Water Policies

1. **Apply water quality protection measures to land development projects during project design, permitting, construction, and operations in order to minimize the quantity of runoff generated on-site, the disruption of natural water flows and the contamination of storm water runoff.**

    a. Increase on-site infiltration, and preserve, restore or incorporate natural drainage systems into site design
    b. Reduce the amount of impervious surfaces through selection of materials, site planning, and narrowing street widths where possible.
    c. Increase the use of natural vegetation and landscaping in drainage design.
    d. Avoid conversion of areas particularly susceptible to erosion and sediment loss (e.g.: steep slopes), and where unavoidable, enforce regulations that minimize these impacts.
    e. Avoid land use, site development, and zoning regulations that limit impacts on, and protect the natural integrity of topography, drainage systems, and water bodies.
    f. Maintain landscape design standards that minimize the use of pesticides and herbicides.
    g. Enforce maintenance requirements in development permit conditions.

2. **Require construction contractors to comply with accepted storm water pollution prevention planning practices for all projects.**

    a. Minimize the amount of graded land surface exposed to erosion and enforce control ordinances
    b. Continue routine inspection practices to check for proper erosion control methods and housekeeping practices during construction.
    c. Ensure that contractors are aware of and implement urban runoff control programs.

3. **Encourage measures to promote the proper collection and disposal of pollutants at the source, rather than allowing them to enter the storm drain system.**

    a. Promote the provision of used oil recycling and/or hazardous waste recycling facilities and drop-off locations.
    b. Follow up on complaints of illegal discharges and accidental spills to storm drains, waterways, and canyons.

K:\095407000\Drainage\Otay Mesa Drainage Study June 2006.doc

APPENDIX C

EXAMPLE PERMANENT STORM WATER BEST MANAGEMENT PRACTICES

The following are a list of BMPs may be used to minimize the introduction of pollutants of concern that may result in significant impacts to receiving waters. Other BMPs approved by the Development Services Department as being equal or more effective in pollutant reduction than comparable BMPs identified below are acceptable. All BMPs must comply with local zoning and building codes and other applicable regulations.

Site Design BMPs

Minimizing Impervious Areas

- Reduce sidewalk widths
- Incorporate landscaped buffer areas between sidewalks and streets.
- Design residential streets for the minimum required pavement widths
- Minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover.
- Use open space development that incorporates smaller lot sizes
- Increase building density while decreasing the building footprint
- Reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together
- Reduce overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas

Increase Rainfall Infiltration

- Use permeable materials for private sidewalks, driveways, parking lots, and interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.)
- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the urban runoff conveyance system

Maximize Rainfall Interception

- Maximizing canopy interception and water conservation by preserving existing native trees and shrubs, and planting Additional native or drought tolerant trees and large shrubs.

Minimize Directly Connected Impervious Areas (DCIAs)

- Draining rooftops into adjacent landscaping prior to discharging to the storm water conveyance system

- Draining parking lots into landscape areas co-designed as biofiltration areas
- Draining roads, sidewalks, and impervious trails into adjacent landscaping

Slope and Channel Protection

Use of natural drainage systems to the maximum extent practicable

- Stabilized permanent channel crossings
- Planting native or drought tolerant vegetation on slopes
- Energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined Channels

Maximize Rainfall Interception

- Cisterns
- Foundation planting

Increase Rainfall Infiltration

- Dry wells

Source Control BMPs

- Storm water conveyance system stenciling and signage
- Outdoor material and trash storage area designed to reduce or control rainfall runoff
- Efficient irrigation system

Treatment Control BMPs

Biofilters

- Grass swale
- Grass strip
- Wetland vegetation swale
- Bioretention

Detention Basins

- Extended/dry detention basin with grass lining
- Extended/dry detention basin with impervious lining

Infiltration

- Infiltration basin
- Infiltration trench

Pervious Paving

- Porous asphalt
- Porous concrete
- Porous modular concrete block

Wet Ponds and Wetlands

- Wet pond (permanent pool)
- Constructed wetland

Drainage Inserts

- Catch basin/storm drain inserts
- Catch basin screens

Filtration Systems

- Media filtration
- Sand filtration

Hydrodynamic Separation Systems

- Swirl concentrator
- Cyclone separator
- Baffle boxes

City of San Diego
Development Services
1222 First Ave., MS-302
San Diego, CA 92101
(619) 446-5000 for information

THE CITY OF SAN DIEGO

Storm Water Requirements Applicability Checklist

Project Address:	Assessor Parcel Number(s):	Project Number *(for City Use Only)*

Complete Sections 1 and 2 of the following checklist to determine your project's permanent and construction storm water best management practices requirements. This form must be completed and submitted with your permit application.

Section 1 - Permanent Storm Water BMP Requirements:

If any answers to Part A are answered "Yes," your project is subject to the "Priority Project Permanent Storm Water BMP Requirements," and "Standard Permanent Storm Water BMP Requirements" of the Storm Water Standards Manual, Section III, "Permanent Storm Water BMP Selection Procedure." If all answers to Part A are "No," and any answers to Part B are "Yes," your project is only subject to the Standard Permanent Storm Water BMP Requirements. If every question in Part A and B is answered "No," your project is exempt from permanent storm water requirements.

Part A: Determine Priority Project Permanent Storm Water BMP Requirements.

Does the project meet the definition of one or more of the priority project categories?*

1. Detached residential development of 10 or more units ..... Yes No
2. Attached residential development of 10 or more units ..... Yes No
3. Commercial development greater than 100,000 square feet ..... Yes No
4. Automotive repair shop ..... Yes No
5. Restaurant ..... Yes No
6. Steep hillside development greater than 5,000 square feet ..... Yes No
7. Project discharging to receiving waters within Water Quality Sensitive Areas ..... Yes No
8. Parking lots greater than or equal to 5,000 square feet or with at least 15 parking spaces, and potentially exposed to urban runoff ..... Yes No
9. Streets, roads, highways, and freeways which would create a new paved surface that is 5,000 square feet or greater ..... Yes No
10. Significant redevelopment over 5,000 square feet ..... Yes No

** Refer to the definitions section in the* Storm Water Standards *for expanded definitions of the priority project categories.*

Limited Exclusion: *Trenching and resurfacing work associated with utility projects are not considered priority projects. Parking lots, buildings and other structures associated with utility projects are priority projects if one or more of the criteria in Part A is met. If all answers to Part A are "No", continue to Part B.*

Part B: Determine Standard Permanent Storm Water Requirements.

Does the project propose:

1. New impervious areas, such as rooftops, roads, parking lots, driveways, paths and sidewalks? ..... Yes No
2. New pervious landscape areas and irrigation systems? ..... Yes No
3. Permanent structures within 100 feet of any natural water body? ..... Yes No
4. Trash storage areas? ..... Yes No
5. Liquid or solid material loading and unloading areas? ..... Yes No
6. Vehicle or equipment fueling, washing, or maintenance areas? ..... Yes No
7. Require a General NPDES Permit for Storm Water Discharges Associated with Industrial Activities (Except construction)?* ..... Yes No
8. Commercial or industrial waste handling or storage, excluding typical office or household waste? ..... Yes No
9. Any grading or ground disturbance during construction? ..... Yes No
10. Any new storm drains, or alteration to existing storm drains? ..... Yes No

*To find out if your project is required to obtain an individual General NPDES Permit for Storm Water Discharges Associated with Industrial Activities, visit the State Water Resources Control Board web site at, www.swrcb.ca.gov/stormwtr/industrial.html

OVER

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To request this document in alternative format, call (619) 446-5446 or (800) 735-2929 (TT).
Be sure to see us on the WorldWide Web at www.sandiego.gov/development-services

Section 2. Construction Storm Water BMP Requirements:

If the answer to question 1 of Part C is answered "Yes," your project is subject to Section IV of the Storm Water Standards Manual, "Construction Storm Water BMP Performance Standards," and must prepare a Storm Water Pollution Prevention Plan (SWPPP). If the answer to question 1of Part C is "No," but the answer to any of the remaining questions is "Yes," your project is subject to Section IV of the Storm Water Standards Manual, "Construction Storm Water BMP Performance Standards," and must prepare a Water Pollution Control Plan (WPCP). If every question in Part C is answered "No," your project is exempt from any construction storm water BMP requirements. If any of the answers to the questions in Part C are "Yes," complete the construction site prioritization in Part D below.

Part C: Determine Construction Phase Storm Water Requirements.

Would the project meet any of these criteria during construction?

1. Is the project subject to California's statewide General NPDES Permit for Storm Water Discharges Associated With Construction Activities? ..... Yes No
2. Does the project propose grading or soil disturbance? ..... Yes No
3. Would storm water or urban runoff have the potential to contact any portion of the construction area, including washing and staging areas? ..... Yes No
4. Would the project use any construction materials that could negatively affect water quality if discharged from the site (such as, paints, solvents, concrete, and stucco)? ..... Yes No

Part D: Determine Construction Site Priority

In accordance with the Municipal Permit, each construction site with construction storm water BMP requirements must be designated with a priority: high, medium or low. This prioritization must be completed with this form, noted on the plans, and included in the SWPPP or WPCP. Indicate the project's priority in one of the check boxes using the criteria below, and existing and surrounding conditions of the project, the type of activities necessary to complete the construction and any other extenuating circumstances that may pose a threat to water quality. The City reserves the right to adjust the priority of the projects both before and during construction. [Note: The construction priority does NOT change construction BMP requirements that apply to projects; all construction BMP requirements must be identified on a case-by-case basis. The construction priority does affect the frequency of inspections that will be conducted by City staff. See Section IV.1 for more details on construction BMP requirements.]

☐ 1) High Priority

a) Projects where the site is 50 acres or more and grading will occur during the wet season

b) Projects 5 acres or more and tributary to an impaired water body for sediment (e.g., Peñasquitos watershed)

c) Projects 5 acres or more within or directly adjacent to or discharging directly to a coastal lagoon or other receiving water within an environmentally sensitive area

d) Projects, active or inactive, adjacent or tributary to sensitive water bodies

☐ 2) Medium Priority

a) Capital Improvement Projects where grading occurs, however a Storm Water Pollution Prevention Plan (SWPPP) is not required under the State General Construction Permit (i.e., water and sewer replacement projects, intersection and street re-alignments, widening, comfort stations, etc.)

b) Permit projects in the public right-of-way where grading occurs, however SWPPPs are not required, such as installation of sidewalk, substantial retaining walls, curb and gutter for an entire street frontage, etc.

c) Permit projects on private property where grading permits are required (i.e., cuts over 5 feet, fills over 3 feet), however, Notice Of Intents (NOIs) and SWPPPs are not required.

☐ 3) Low Priority

a) Capital Projects where minimal to no grading occurs, such as signal light and loop installations, street light installations, etc.

b) Permit projects in the public right-of-way where minimal to no grading occurs, such as pedestrian ramps, driveway additions, small retaining walls, etc.

c) Permit projects on private property where grading permits are not required, such as small retaining walls, single-family homes, small tenant improvements, etc.

Name of Owner or Agent *(Please Print)*:	Title:
Signature:	Date:

APPENDICES

Appendix A

- AES Hydrology Calculations

```
****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
         (c) Copyright 1982-2003 Advanced Engineering Software (aes)
             Ver. 1.5A Release Date: 01/01/2003  License ID 1499

                          Analysis prepared by:

                    Kimley-Horn and Associates San Diego
                          517 4th Avenue Suite 301
                        San Diego, California 92101
                     (619) 234-9411 Fax (619) 234-9433

 *************************** DESCRIPTION OF STUDY **************************
* Otay Mesa Watershed Analysis                                              *
* 50 Year Storm Event P=1.70                                                *
* 5/12/05 AMC                                                               *
 ***************************************************************************

  FILE NAME: C:\Drainage\407000\OT3-1.DAT
  TIME/DATE OF STUDY: 08:03 05/12/2005
---------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
---------------------------------------------------------------------------
  1985 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) =  50.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   1.700
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE   3100.00 TO NODE   3101.00 IS CODE =  21
---------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===========================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
```

```
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.86(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    106.00
  DOWNSTREAM ELEVATION(FEET) =    104.32
  ELEVATION DIFFERENCE(FEET) =      1.68
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.86
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.715
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   3101.00 TO NODE   3102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   180.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0240
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =   5.41   Tc(MIN.) =  16.27
  LONGEST FLOWPATH FROM NODE   3100.00 TO NODE   3102.00 =   250.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3102.00 TO NODE   3103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.092
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   19.30   SUBAREA RUNOFF(CFS) =   18.17
  TOTAL AREA(ACRES) =     19.40   TOTAL RUNOFF(CFS) =   18.29
  TC(MIN.) =  16.27

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3110.00 TO NODE   3111.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    110.00
```

```
  DOWNSTREAM ELEVATION(FEET) =     108.25
  ELEVATION DIFFERENCE(FEET) =       1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =       0.12
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.12

****************************************************************************
  FLOW PROCESS FROM NODE   3111.00 TO NODE   3112.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =   9.91   Tc(MIN.) =  20.76
  LONGEST FLOWPATH FROM NODE   3110.00 TO NODE   3112.00 =   400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3112.00 TO NODE   3113.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.788
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   14.70   SUBAREA RUNOFF(CFS) =   11.83
  TOTAL AREA(ACRES) =     14.80   TOTAL RUNOFF(CFS) =   11.95
  TC(MIN.) =  20.76

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3200.00 TO NODE   3201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.86(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    122.00
  DOWNSTREAM ELEVATION(FEET) =    120.29
  ELEVATION DIFFERENCE(FEET) =      1.71
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.86
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.716
```

```
  SUBAREA RUNOFF(CFS) =       0.12
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.12

****************************************************************************
  FLOW PROCESS FROM NODE   3201.00 TO NODE   3202.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   830.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0240
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  24.94   Tc(MIN.) =  35.80
  LONGEST FLOWPATH FROM NODE   3200.00 TO NODE   3202.00 =   900.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3202.00 TO NODE   3203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.258
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   47.00   SUBAREA RUNOFF(CFS) =   26.61
  TOTAL AREA(ACRES) =     47.10   TOTAL RUNOFF(CFS) =   26.74
  TC(MIN.) =  35.80

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3300.00 TO NODE   3301.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.83(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    108.00
  DOWNSTREAM ELEVATION(FEET) =    106.13
  ELEVATION DIFFERENCE(FEET) =      1.87
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.83
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.721
  SUBAREA RUNOFF(CFS) =       0.12
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.12

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   3201.00 TO NODE   3202.00 IS CODE =  51
----------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
======================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   230.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0267
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.56   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =   6.90   Tc(MIN.) =  17.73
  LONGEST FLOWPATH FROM NODE   3300.00 TO NODE   3202.00 =   300.00 FEET.

**********************************************************************
  FLOW PROCESS FROM NODE   3302.00 TO NODE   3303.00 IS CODE =  81
----------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
======================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.980
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   11.70   SUBAREA RUNOFF(CFS) =   10.42
  TOTAL AREA(ACRES) =     11.80   TOTAL RUNOFF(CFS) =   10.55
  TC(MIN.) =  17.73

**********************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
======================================================================

**********************************************************************
  FLOW PROCESS FROM NODE   3400.00 TO NODE   3401.00 IS CODE =  21
----------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
======================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.84(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    118.00
  DOWNSTREAM ELEVATION(FEET) =    116.20
  ELEVATION DIFFERENCE(FEET) =      1.80
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.84
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.719
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

**********************************************************************
  FLOW PROCESS FROM NODE   3401.00 TO NODE   3402.00 IS CODE =  51
----------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
==============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   630.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0257
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.56   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  18.91   Tc(MIN.) =  29.75
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3402.00 =   700.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3402.00 TO NODE   3403.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.418
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   34.90   SUBAREA RUNOFF(CFS) =   22.27
  TOTAL AREA(ACRES) =     35.00   TOTAL RUNOFF(CFS) =   22.39
  TC(MIN.) =  29.75

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
==============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3500.00 TO NODE   3501.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    110.00
  DOWNSTREAM ELEVATION(FEET) =    108.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   3501.00 TO NODE   3502.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
```

```
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =   9.91   Tc(MIN.) =  20.76
  LONGEST FLOWPATH FROM NODE   3500.00 TO NODE   3502.00 =   400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3502.00 TO NODE   3503.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.788
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   16.40   SUBAREA RUNOFF(CFS) =   13.20
  TOTAL AREA(ACRES) =     16.50   TOTAL RUNOFF(CFS) =   13.32
  TC(MIN.) =  20.76

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3600.00 TO NODE   3601.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.83(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    108.00
  DOWNSTREAM ELEVATION(FEET) =    106.13
  ELEVATION DIFFERENCE(FEET) =      1.87
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.83
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.721
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   3601.00 TO NODE   3602.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   230.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0267
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.12
  FLOW VELOCITY(FEET/SEC.) =   0.56   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =   6.90   Tc(MIN.) =  17.73
```

```
  LONGEST FLOWPATH FROM NODE   3600.00 TO NODE   3602.00 =   300.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3602.00 TO NODE   3603.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.980
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =    12.10   SUBAREA RUNOFF(CFS) =   10.78
  TOTAL AREA(ACRES) =      12.20   TOTAL RUNOFF(CFS) =   10.90
  TC(MIN.) =  17.73

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3700.00 TO NODE   3701.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    120.00
  DOWNSTREAM ELEVATION(FEET) =    118.25
  ELEVATION DIFFERENCE(FEET) =     1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   3701.00 TO NODE   3702.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   730.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  21.92   Tc(MIN.) =  32.77
  LONGEST FLOWPATH FROM NODE   3700.00 TO NODE   3702.00 =   800.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3702.00 TO NODE   3703.00 IS CODE =  81
```

```
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.332
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =    46.00   SUBAREA RUNOFF(CFS) =    27.57
  TOTAL AREA(ACRES) =      46.10   TOTAL RUNOFF(CFS) =    27.69
  TC(MIN.) =  32.77

****************************************************************************
  FLOW PROCESS FROM NODE       0.00 TO NODE       0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3800.00 TO NODE   3801.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =     70.00
  UPSTREAM ELEVATION(FEET) =     125.00
  DOWNSTREAM ELEVATION(FEET) =     123.25
  ELEVATION DIFFERENCE(FEET) =       1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =       0.12
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.12

****************************************************************************
  FLOW PROCESS FROM NODE   3801.00 TO NODE   3802.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    930.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =    10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =    2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.12
  FLOW VELOCITY(FEET/SEC.) =    0.55   FLOW DEPTH(FEET) =    0.02
  TRAVEL TIME(MIN.) =  27.93   Tc(MIN.) =  38.78
  LONGEST FLOWPATH FROM NODE   3800.00 TO NODE   3802.00 =  1000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3802.00 TO NODE   3803.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.195
```

```
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   51.30   SUBAREA RUNOFF(CFS) =   27.59
  TOTAL AREA(ACRES) =     51.40   TOTAL RUNOFF(CFS) =   27.71
  TC(MIN.) =  38.78

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2100.00 TO NODE   2101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    128.00
  DOWNSTREAM ELEVATION(FEET) =    126.22
  ELEVATION DIFFERENCE(FEET) =      1.78
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.718
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2101.00 TO NODE   2102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1030.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0255
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.56   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  30.92   Tc(MIN.) =  41.77
  LONGEST FLOWPATH FROM NODE   2100.00 TO NODE   2102.00 =  1100.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2102.00 TO NODE   2103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.139
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   33.20   SUBAREA RUNOFF(CFS) =   17.02
```

```
  TOTAL AREA(ACRES) =     33.30   TOTAL RUNOFF(CFS) =   17.14
  TC(MIN.) =  41.77

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2200.00 TO NODE   2201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    163.00
  DOWNSTREAM ELEVATION(FEET) =    161.24
  ELEVATION DIFFERENCE(FEET) =      1.76
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.718
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2201.00 TO NODE   2202.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2430.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0252
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.56   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  72.97   Tc(MIN.) =  83.82
  LONGEST FLOWPATH FROM NODE   2200.00 TO NODE   2202.00 =  2500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2202.00 TO NODE   2203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.727
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =  126.10   SUBAREA RUNOFF(CFS) =   41.25
  TOTAL AREA(ACRES) =    126.20   TOTAL RUNOFF(CFS) =   41.37
  TC(MIN.) =  83.82

****************************************************************************
```

```
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2180.00 TO NODE   2181.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED = 10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    130.00
  DOWNSTREAM ELEVATION(FEET) =    128.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =    0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2181.00 TO NODE   2182.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1130.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =  10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  33.94   Tc(MIN.) =  44.79
  LONGEST FLOWPATH FROM NODE   2180.00 TO NODE   2182.00 =  1200.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2182.00 TO NODE   2183.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.089
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =    97.00   SUBAREA RUNOFF(CFS) =   47.54
  TOTAL AREA(ACRES) =      97.10   TOTAL RUNOFF(CFS) =   47.66
  TC(MIN.) =  44.79

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.86(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    122.00
  DOWNSTREAM ELEVATION(FEET) =    120.29
  ELEVATION DIFFERENCE(FEET) =      1.71
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.86
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.716
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2401.00 TO NODE   2402.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   830.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0244
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  24.94   Tc(MIN.) =  35.80
  LONGEST FLOWPATH FROM NODE   2400.00 TO NODE   2402.00 =   900.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2402.00 TO NODE   2403.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.258
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   67.70   SUBAREA RUNOFF(CFS) =   38.34
  TOTAL AREA(ACRES) =     67.80   TOTAL RUNOFF(CFS) =   38.46
  TC(MIN.) =  35.80

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2500.00 TO NODE   2501.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
```

```
  UPSTREAM ELEVATION(FEET) =    130.00
  DOWNSTREAM ELEVATION(FEET) =    128.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2501.00 TO NODE   2502.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1130.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  33.94   Tc(MIN.) =  44.79
  LONGEST FLOWPATH FROM NODE   2500.00 TO NODE   2502.00 =  1200.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2502.00 TO NODE   2503.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.089
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   40.70   SUBAREA RUNOFF(CFS) =   19.95
  TOTAL AREA(ACRES) =     40.80   TOTAL RUNOFF(CFS) =   20.07
  TC(MIN.) =  44.79

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2600.00 TO NODE   2601.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    130.00
  DOWNSTREAM ELEVATION(FEET) =    128.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
```

```
  50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
 SUBAREA RUNOFF(CFS) =       0.12
 TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.12

****************************************************************************
 FLOW PROCESS FROM NODE   2601.00 TO NODE   2602.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1130.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =  33.94   Tc(MIN.) =  44.79
 LONGEST FLOWPATH FROM NODE   2600.00 TO NODE   2602.00 =  1200.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2602.00 TO NODE   2603.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.089
 GRASS FAIR COVER RUNOFF COEFFICIENT =  .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =   34.70   SUBAREA RUNOFF(CFS) =   17.00
 TOTAL AREA(ACRES) =     34.80   TOTAL RUNOFF(CFS) =   17.13
 TC(MIN.) =  44.79

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2700.00 TO NODE   2701.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT =  .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    105.00
 DOWNSTREAM ELEVATION(FEET) =    103.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.213
  50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.536
 SUBAREA RUNOFF(CFS) =       0.16
 TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.16

****************************************************************************
 FLOW PROCESS FROM NODE   2701.00 TO NODE   2702.00 IS CODE =  51
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   130.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.16
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.03
  TRAVEL TIME(MIN.) =   3.96   Tc(MIN.) =  11.17
  LONGEST FLOWPATH FROM NODE   2700.00 TO NODE   2702.00 =   200.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2702.00 TO NODE   2703.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.667
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   14.80   SUBAREA RUNOFF(CFS) =   17.76
  TOTAL AREA(ACRES) =     14.90   TOTAL RUNOFF(CFS) =   17.92
  TC(MIN.) =  11.17

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2800.00 TO NODE   2801.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.18(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    128.00
  DOWNSTREAM ELEVATION(FEET) =     26.22
  ELEVATION DIFFERENCE(FEET) =    101.78
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.18
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.832
  SUBAREA RUNOFF(CFS) =      0.13
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.13

****************************************************************************
  FLOW PROCESS FROM NODE   2801.00 TO NODE   2802.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1030.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.13
  FLOW VELOCITY(FEET/SEC.) =   0.58   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  29.68   Tc(MIN.) =  39.86
  LONGEST FLOWPATH FROM NODE   2800.00 TO NODE   2802.00 =  1100.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2802.00 TO NODE   2803.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.174
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   81.20   SUBAREA RUNOFF(CFS) =   42.90
  TOTAL AREA(ACRES) =     81.30   TOTAL RUNOFF(CFS) =   43.03
  TC(MIN.) =  39.86

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2900.00 TO NODE   2901.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.84(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    118.00
  DOWNSTREAM ELEVATION(FEET) =    116.20
  ELEVATION DIFFERENCE(FEET) =      1.80
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.84
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.719
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2901.00 TO NODE   2902.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   630.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
```

```
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.12
 FLOW VELOCITY(FEET/SEC.) =   0.56   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =  18.91   Tc(MIN.) =  29.75
 LONGEST FLOWPATH FROM NODE   2900.00 TO NODE   2902.00 =   700.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2902.00 TO NODE   2903.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.418
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =    36.80   SUBAREA RUNOFF(CFS) =   23.48
 TOTAL AREA(ACRES) =      36.90   TOTAL RUNOFF(CFS) =   23.60
 TC(MIN.) =  29.75

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2910.00 TO NODE   2911.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.85(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    108.00
 DOWNSTREAM ELEVATION(FEET) =    106.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
  50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   2911.00 TO NODE   2912.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   230.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =   6.91   Tc(MIN.) =  17.76
 LONGEST FLOWPATH FROM NODE   2910.00 TO NODE   2912.00 =   300.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2912.00 TO NODE   2913.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.978
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =    12.80   SUBAREA RUNOFF(CFS) =   11.39
  TOTAL AREA(ACRES) =      12.90   TOTAL RUNOFF(CFS) =   11.51
  TC(MIN.) =  17.76

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2100.00 TO NODE   2101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    160.00
  DOWNSTREAM ELEVATION(FEET) =    158.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2101.00 TO NODE   2102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2330.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  69.97   Tc(MIN.) =  80.82
  LONGEST FLOWPATH FROM NODE   2100.00 TO NODE   2102.00 =  2400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2102.00 TO NODE   2103.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.744
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =  128.30   SUBAREA RUNOFF(CFS) =   42.96
  TOTAL AREA(ACRES) =    128.40   TOTAL RUNOFF(CFS) =   43.09
  TC(MIN.) =  80.82

******************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
------------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE   2110.00 TO NODE   2111.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    143.00
  DOWNSTREAM ELEVATION(FEET) =    141.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

******************************************************************************
  FLOW PROCESS FROM NODE   2111.00 TO NODE   2112.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1630.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  48.95   Tc(MIN.) =  59.80
  LONGEST FLOWPATH FROM NODE   2110.00 TO NODE   2112.00 =  1700.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   2112.00 TO NODE   2113.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.904
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
```

```
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =  275.50   SUBAREA RUNOFF(CFS) =  112.04
  TOTAL AREA(ACRES) =    275.60   TOTAL RUNOFF(CFS) =  112.16
  TC(MIN.) =  59.80

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2120.00 TO NODE   2121.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    113.00
  DOWNSTREAM ELEVATION(FEET) =    111.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2121.00 TO NODE   2122.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   430.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  12.91   Tc(MIN.) =  23.76
  LONGEST FLOWPATH FROM NODE   2120.00 TO NODE   2122.00 =   500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2122.00 TO NODE   2123.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.639
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   23.50   SUBAREA RUNOFF(CFS) =   17.33
  TOTAL AREA(ACRES) =     23.60   TOTAL RUNOFF(CFS) =   17.45
```

```
  TC(MIN.) =  23.76

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2130.00 TO NODE   2131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    115.00
  DOWNSTREAM ELEVATION(FEET) =    113.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2131.00 TO NODE   2132.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   530.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  15.92   Tc(MIN.) =  26.77
  LONGEST FLOWPATH FROM NODE   2130.00 TO NODE   2132.00 =   600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2132.00 TO NODE   2133.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.518
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   61.40   SUBAREA RUNOFF(CFS) =   41.94
  TOTAL AREA(ACRES) =     61.50   TOTAL RUNOFF(CFS) =   42.06
  TC(MIN.) =  26.77

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
```

```
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2140.00 TO NODE   2141.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    125.00
  DOWNSTREAM ELEVATION(FEET) =    123.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2141.00 TO NODE   2142.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   930.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  27.93   Tc(MIN.) =  38.78
  LONGEST FLOWPATH FROM NODE   2140.00 TO NODE   2142.00 =  1000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2142.00 TO NODE   2143.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.195
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   48.30   SUBAREA RUNOFF(CFS) =   25.97
  TOTAL AREA(ACRES) =     48.40   TOTAL RUNOFF(CFS) =   26.10
  TC(MIN.) =  38.78

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2150.00 TO NODE   2151.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    150.00
  DOWNSTREAM ELEVATION(FEET) =    148.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2151.00 TO NODE   2152.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1930.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  57.96   Tc(MIN.) =  68.81
  LONGEST FLOWPATH FROM NODE   2150.00 TO NODE   2152.00 =  2000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2152.00 TO NODE   2153.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.826
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =  153.70   SUBAREA RUNOFF(CFS) =   57.10
  TOTAL AREA(ACRES) =    153.80   TOTAL RUNOFF(CFS) =   57.22
  TC(MIN.) =  68.81

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2160.00 TO NODE   2161.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    160.00
  DOWNSTREAM ELEVATION(FEET) =    158.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

******************************************************************************
  FLOW PROCESS FROM NODE   2161.00 TO NODE   2162.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2330.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  69.97   Tc(MIN.) =  80.82
  LONGEST FLOWPATH FROM NODE   2160.00 TO NODE   2162.00 =  2400.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   2162.00 TO NODE   2163.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.744
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =  121.60   SUBAREA RUNOFF(CFS) =   40.72
  TOTAL AREA(ACRES) =    121.70   TOTAL RUNOFF(CFS) =   40.84
  TC(MIN.) =  80.82

******************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
------------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE   2170.00 TO NODE   2171.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
```

```
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    175.00
  DOWNSTREAM ELEVATION(FEET) =    173.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2171.00 TO NODE   2172.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2930.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  87.99   Tc(MIN.) =  98.84
  LONGEST FLOWPATH FROM NODE   2170.00 TO NODE   2172.00 =  3000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2172.00 TO NODE   2173.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.654
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   60.20   SUBAREA RUNOFF(CFS) =   17.70
  TOTAL AREA(ACRES) =     60.30   TOTAL RUNOFF(CFS) =   17.83
  TC(MIN.) =  98.84

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   9990.00 TO NODE   9991.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =   1300.00
```

```
  DOWNSTREAM ELEVATION(FEET) =   1298.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   9991.00 TO NODE   9992.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  9930.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0300
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) = 298.21   Tc(MIN.) = 309.06
  LONGEST FLOWPATH FROM NODE   9990.00 TO NODE   9992.00 = 10000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   9992.00 TO NODE   9993.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.313
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =  774.70   SUBAREA RUNOFF(CFS) =  109.22
  TOTAL AREA(ACRES) =    774.80   TOTAL RUNOFF(CFS) =  109.34
  TC(MIN.) = 309.06
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =    774.80  TC(MIN.) =    309.06
  PEAK FLOW RATE(CFS)    =    109.34
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Q100

```
****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                        2003,1985,1981 HYDROLOGY MANUAL
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              Ver. 1.5A Release Date: 01/01/2003  License ID 1499

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 ************************** DESCRIPTION OF STUDY **************************
* Otay Mesa Watershed Analysis                                            *
* 100 Year Storm Event P=1.90                                             *
* 5/20/05 AMC                                                             *
 **************************************************************************

  FILE NAME: C:\Drainage\407000\CPU100yr.DAT
  TIME/DATE OF STUDY: 11:16 05/20/2005
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   1.900
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

****************************************************************************
  FLOW PROCESS FROM NODE   3100.00 TO NODE   3101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =     70.00
  UPSTREAM ELEVATION(FEET) =     106.00
  DOWNSTREAM ELEVATION(FEET) =     104.32
  ELEVATION DIFFERENCE(FEET) =       1.68
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =     4.387
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =       0.36
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.36

****************************************************************************
  FLOW PROCESS FROM NODE   3101.00 TO NODE   3102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   180.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0240
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =   3.50   Tc(MIN.) =   7.89
  LONGEST FLOWPATH FROM NODE   3100.00 TO NODE   3102.00 =  250.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3102.00 TO NODE   3103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.730
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   19.30   SUBAREA RUNOFF(CFS) =   51.11
  TOTAL AREA(ACRES) =     19.40   TOTAL RUNOFF(CFS) =   51.37
  TC(MIN.) =   7.89

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3110.00 TO NODE   3111.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =     70.00
  UPSTREAM ELEVATION(FEET) =     110.00
  DOWNSTREAM ELEVATION(FEET) =     108.25
  ELEVATION DIFFERENCE(FEET) =       1.75
```

```
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =     4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =       0.36
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.36

****************************************************************************
  FLOW PROCESS FROM NODE   3111.00 TO NODE   3112.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =   6.42   Tc(MIN.) =  10.75
  LONGEST FLOWPATH FROM NODE   3110.00 TO NODE   3112.00 =   400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3112.00 TO NODE   3113.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.055
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   14.70   SUBAREA RUNOFF(CFS) =   31.89
  TOTAL AREA(ACRES) =     14.80   TOTAL RUNOFF(CFS) =   32.10
  TC(MIN.) =  10.75

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3200.00 TO NODE   3201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    122.00
  DOWNSTREAM ELEVATION(FEET) =    120.29
  ELEVATION DIFFERENCE(FEET) =      1.71
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =     4.361
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =       0.36
```

```
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   3201.00 TO NODE   3202.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   830.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0240
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  16.16   Tc(MIN.) =  20.52
  LONGEST FLOWPATH FROM NODE   3200.00 TO NODE   3202.00 =   900.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3202.00 TO NODE   3203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.014
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   47.00   SUBAREA RUNOFF(CFS) =   67.20
  TOTAL AREA(ACRES) =     47.10   TOTAL RUNOFF(CFS) =   67.34
  TC(MIN.) =  20.52

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3300.00 TO NODE   3301.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    108.00
  DOWNSTREAM ELEVATION(FEET) =    106.13
  ELEVATION DIFFERENCE(FEET) =      1.87
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.233
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   3201.00 TO NODE   3202.00 IS CODE =  51
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   230.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0267
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  4.48   Tc(MIN.) =   8.71
  LONGEST FLOWPATH FROM NODE   3300.00 TO NODE   3202.00 =   300.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3302.00 TO NODE   3303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.500
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   11.70   SUBAREA RUNOFF(CFS) =   29.07
  TOTAL AREA(ACRES) =     11.80   TOTAL RUNOFF(CFS) =   29.32
  TC(MIN.) =   8.71

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3400.00 TO NODE   3401.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    118.00
  DOWNSTREAM ELEVATION(FEET) =    116.20
  ELEVATION DIFFERENCE(FEET) =      1.80
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.287
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   3401.00 TO NODE   3402.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =   630.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0257
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  12.26   Tc(MIN.) =  16.55
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3402.00 =   700.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3402.00 TO NODE   3403.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.313
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   34.90   SUBAREA RUNOFF(CFS) =   57.32
  TOTAL AREA(ACRES) =     35.00   TOTAL RUNOFF(CFS) =   57.48
  TC(MIN.) =  16.55

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3500.00 TO NODE   3501.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    110.00
  DOWNSTREAM ELEVATION(FEET) =    108.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   3501.00 TO NODE   3502.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
```

```
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =   6.42   Tc(MIN.) =  10.75
  LONGEST FLOWPATH FROM NODE   3500.00 TO NODE   3502.00 =   400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3502.00 TO NODE   3503.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.055
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   16.40   SUBAREA RUNOFF(CFS) =   35.57
  TOTAL AREA(ACRES) =     16.50   TOTAL RUNOFF(CFS) =   35.79
  TC(MIN.) =  10.75

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3600.00 TO NODE   3601.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    108.00
  DOWNSTREAM ELEVATION(FEET) =    106.13
  ELEVATION DIFFERENCE(FEET) =      1.87
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.233
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   3601.00 TO NODE   3602.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   230.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0267
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =   4.48   Tc(MIN.) =   8.71
  LONGEST FLOWPATH FROM NODE   3600.00 TO NODE   3602.00 =   300.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   3602.00 TO NODE   3603.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.500
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   12.10   SUBAREA RUNOFF(CFS) =   30.06
  TOTAL AREA(ACRES) =     12.20   TOTAL RUNOFF(CFS) =   30.31
  TC(MIN.) =   8.71

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3700.00 TO NODE   3701.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    120.00
  DOWNSTREAM ELEVATION(FEET) =    118.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   3701.00 TO NODE   3702.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   730.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  14.21   Tc(MIN.) =  18.54
  LONGEST FLOWPATH FROM NODE   3700.00 TO NODE   3702.00 =   800.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3702.00 TO NODE   3703.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.150
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =    46.00   SUBAREA RUNOFF(CFS) =    70.22
  TOTAL AREA(ACRES) =      46.10   TOTAL RUNOFF(CFS) =    70.37
  TC(MIN.) =  18.54

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3800.00 TO NODE   3801.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    125.00
  DOWNSTREAM ELEVATION(FEET) =    123.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   3801.00 TO NODE   3802.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   930.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  18.10   Tc(MIN.) =  22.43
  LONGEST FLOWPATH FROM NODE   3800.00 TO NODE   3802.00 =  1000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3802.00 TO NODE   3803.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.901
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
```

```
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =    51.30   SUBAREA RUNOFF(CFS) =    69.25
  TOTAL AREA(ACRES) =      51.40   TOTAL RUNOFF(CFS) =    69.38
  TC(MIN.) =  22.43

****************************************************************************
  FLOW PROCESS FROM NODE       0.00 TO NODE       0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2100.00 TO NODE   2101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =     128.00
  DOWNSTREAM ELEVATION(FEET) =     126.22
  ELEVATION DIFFERENCE(FEET) =       1.78
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =     4.303
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =       0.36
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2101.00 TO NODE   2102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1030.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0255
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  20.05   Tc(MIN.) =  24.35
  LONGEST FLOWPATH FROM NODE   2100.00 TO NODE   2102.00 =  1100.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2102.00 TO NODE   2103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.803
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   33.20   SUBAREA RUNOFF(CFS) =   42.50
```

```
  TOTAL AREA(ACRES) =      33.30   TOTAL RUNOFF(CFS) =   42.63
  TC(MIN.) =  24.35

****************************************************************************
  FLOW PROCESS FROM NODE       0.00 TO NODE       0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2200.00 TO NODE   2201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =     70.00
  UPSTREAM ELEVATION(FEET) =     163.00
  DOWNSTREAM ELEVATION(FEET) =    161.24
  ELEVATION DIFFERENCE(FEET) =      1.76
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =     4.319
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =       0.36
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2201.00 TO NODE   2202.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2430.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0252
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  47.30   Tc(MIN.) =  51.62
  LONGEST FLOWPATH FROM NODE   2200.00 TO NODE   2202.00 =  2500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2202.00 TO NODE   2203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.111
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =  126.10   SUBAREA RUNOFF(CFS) =   99.43
  TOTAL AREA(ACRES) =    126.20   TOTAL RUNOFF(CFS) =   99.51
  TC(MIN.) =  51.62

****************************************************************************
```

```
  FLOW PROCESS FROM NODE       0.00 TO NODE       0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2180.00 TO NODE   2181.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    130.00
  DOWNSTREAM ELEVATION(FEET) =    128.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2181.00 TO NODE   2182.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1130.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  22.00   Tc(MIN.) =  26.32
  LONGEST FLOWPATH FROM NODE   2180.00 TO NODE   2182.00 =  1200.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2182.00 TO NODE   2183.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.715
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   97.00   SUBAREA RUNOFF(CFS) =  118.10
  TOTAL AREA(ACRES) =     97.10   TOTAL RUNOFF(CFS) =  118.22
  TC(MIN.) =  26.32

****************************************************************************
  FLOW PROCESS FROM NODE       0.00 TO NODE       0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2190.00 TO NODE   2191.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    110.00
  DOWNSTREAM ELEVATION(FEET) =    108.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2191.00 TO NODE   2192.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =   6.42   Tc(MIN.) =  10.75
  LONGEST FLOWPATH FROM NODE   2190.00 TO NODE   2192.00 =   400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2192.00 TO NODE   2193.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.055
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   27.60   SUBAREA RUNOFF(CFS) =   59.87
  TOTAL AREA(ACRES) =     27.70   TOTAL RUNOFF(CFS) =   60.09
  TC(MIN.) =  10.75

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2300.00 TO NODE   2301.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    113.00
  DOWNSTREAM ELEVATION(FEET) =    111.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

******************************************************************************
  FLOW PROCESS FROM NODE   2301.00 TO NODE   2302.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   450.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =   8.76   Tc(MIN.) =  13.09
  LONGEST FLOWPATH FROM NODE   2300.00 TO NODE   2302.00 =   520.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   2302.00 TO NODE   2303.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.691
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   20.00   SUBAREA RUNOFF(CFS) =   38.22
  TOTAL AREA(ACRES) =     20.10   TOTAL RUNOFF(CFS) =   38.41
  TC(MIN.) =  13.09

******************************************************************************
  FLOW PROCESS FROM NODE    0.00 TO NODE      0.00 IS CODE =  13
------------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE   2400.00 TO NODE   2401.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
```

```
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    122.00
  DOWNSTREAM ELEVATION(FEET) =    120.29
  ELEVATION DIFFERENCE(FEET) =      1.71
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.361
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2401.00 TO NODE   2402.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   830.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0244
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  16.16   Tc(MIN.) =  20.52
  LONGEST FLOWPATH FROM NODE   2400.00 TO NODE   2402.00 =   900.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2402.00 TO NODE   2403.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.014
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   67.70   SUBAREA RUNOFF(CFS) =   96.79
  TOTAL AREA(ACRES) =     67.80   TOTAL RUNOFF(CFS) =   96.94
  TC(MIN.) =  20.52

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2500.00 TO NODE   2501.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    130.00
  DOWNSTREAM ELEVATION(FEET) =    128.25
```

```
  ELEVATION DIFFERENCE(FEET) =       1.75
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =     4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =       0.36
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2501.00 TO NODE   2502.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1130.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  22.00   Tc(MIN.) =  26.32
  LONGEST FLOWPATH FROM NODE   2500.00 TO NODE   2502.00 =  1200.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2502.00 TO NODE   2503.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.715
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   40.70   SUBAREA RUNOFF(CFS) =   49.55
  TOTAL AREA(ACRES) =     40.80   TOTAL RUNOFF(CFS) =   49.67
  TC(MIN.) =  26.32

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2600.00 TO NODE   2601.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    130.00
  DOWNSTREAM ELEVATION(FEET) =    128.25
  ELEVATION DIFFERENCE(FEET) =       1.75
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =     4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
```

```
  SUBAREA RUNOFF(CFS) =       0.36
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2601.00 TO NODE   2602.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1130.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  22.00   Tc(MIN.) =  26.32
  LONGEST FLOWPATH FROM NODE   2600.00 TO NODE   2602.00 =  1200.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2602.00 TO NODE   2603.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.715
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   34.70   SUBAREA RUNOFF(CFS) =   42.25
  TOTAL AREA(ACRES) =     34.80   TOTAL RUNOFF(CFS) =   42.37
  TC(MIN.) =  26.32

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2700.00 TO NODE   2701.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    105.00
  DOWNSTREAM ELEVATION(FEET) =    103.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =       0.36
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.36

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2701.00 TO NODE   2702.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   130.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =   2.53   Tc(MIN.) =   6.86
  LONGEST FLOWPATH FROM NODE   2700.00 TO NODE   2702.00 =   200.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2702.00 TO NODE   2703.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.083
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   14.80   SUBAREA RUNOFF(CFS) =   42.90
  TOTAL AREA(ACRES) =     14.90   TOTAL RUNOFF(CFS) =   43.19
  TC(MIN.) =   6.86

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2800.00 TO NODE   2801.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    128.00
  DOWNSTREAM ELEVATION(FEET) =     26.22
  ELEVATION DIFFERENCE(FEET) =    101.78
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.726
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2801.00 TO NODE   2802.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1030.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  20.05   Tc(MIN.) =  22.78
  LONGEST FLOWPATH FROM NODE   2800.00 TO NODE   2802.00 =  1100.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2802.00 TO NODE   2803.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.883
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   81.20   SUBAREA RUNOFF(CFS) =  108.53
  TOTAL AREA(ACRES) =     81.30   TOTAL RUNOFF(CFS) =  108.67
  TC(MIN.) =  22.78

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
==============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2900.00 TO NODE   2901.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    118.00
  DOWNSTREAM ELEVATION(FEET) =    116.20
  ELEVATION DIFFERENCE(FEET) =      1.80
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.287
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2901.00 TO NODE   2902.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   630.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
```

```
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  12.26   Tc(MIN.) =  16.55
  LONGEST FLOWPATH FROM NODE   2900.00 TO NODE   2902.00 =   700.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2902.00 TO NODE   2903.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.313
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   36.80   SUBAREA RUNOFF(CFS) =   60.44
  TOTAL AREA(ACRES) =     36.90   TOTAL RUNOFF(CFS) =   60.60
  TC(MIN.) =  16.55

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2910.00 TO NODE   2911.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    108.00
  DOWNSTREAM ELEVATION(FEET) =    106.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2911.00 TO NODE   2912.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   230.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
```

```
  TRAVEL TIME(MIN.) =   4.48   Tc(MIN.) =   8.80
  LONGEST FLOWPATH FROM NODE   2910.00 TO NODE   2912.00 =   300.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2912.00 TO NODE   2913.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.475
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   12.80   SUBAREA RUNOFF(CFS) =   31.58
  TOTAL AREA(ACRES) =     12.90   TOTAL RUNOFF(CFS) =   31.83
  TC(MIN.) =   8.80

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2100.00 TO NODE   2101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    160.00
  DOWNSTREAM ELEVATION(FEET) =    158.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2101.00 TO NODE   2102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2330.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  45.35   Tc(MIN.) =  49.68
  LONGEST FLOWPATH FROM NODE   2100.00 TO NODE   2102.00 =  2400.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2102.00 TO NODE   2103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.138
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =  128.30   SUBAREA RUNOFF(CFS) =  103.70
  TOTAL AREA(ACRES) =    128.40   TOTAL RUNOFF(CFS) =  103.78
  TC(MIN.) =  49.68

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2110.00 TO NODE   2111.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    143.00
  DOWNSTREAM ELEVATION(FEET) =    141.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2111.00 TO NODE   2112.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1630.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  31.73   Tc(MIN.) =  36.06
  LONGEST FLOWPATH FROM NODE   2110.00 TO NODE   2112.00 =  1700.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2112.00 TO NODE   2113.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.400
STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
SOIL CLASSIFICATION IS "D"
S.C.S. CURVE NUMBER (AMC II) =  93
AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
SUBAREA AREA(ACRES) =  275.50   SUBAREA RUNOFF(CFS) =  273.81
TOTAL AREA(ACRES) =    275.60   TOTAL RUNOFF(CFS) =  273.91
TC(MIN.) =  36.06

****************************************************************************
FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
>>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
FLOW PROCESS FROM NODE   2120.00 TO NODE   2121.00 IS CODE =  21
----------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
SOIL CLASSIFICATION IS "D"
S.C.S. CURVE NUMBER (AMC II) =  93
INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
UPSTREAM ELEVATION(FEET) =    113.00
DOWNSTREAM ELEVATION(FEET) =  111.25
ELEVATION DIFFERENCE(FEET) =    1.75
SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      0.36
TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
FLOW PROCESS FROM NODE   2121.00 TO NODE   2122.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
CHANNEL LENGTH THRU SUBAREA(FEET) =   430.00
REPRESENTATIVE CHANNEL SLOPE =  0.0250
CHANNEL BASE(FEET) =   10.00  "Z" FACTOR =  50.000
MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
TRAVEL TIME(MIN.) =   8.37   Tc(MIN.) =  12.70
LONGEST FLOWPATH FROM NODE   2120.00 TO NODE   2122.00 =   500.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2122.00 TO NODE   2123.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.744
STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
SOIL CLASSIFICATION IS "D"
S.C.S. CURVE NUMBER (AMC II) =  93
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =    23.50   SUBAREA RUNOFF(CFS) =    45.79
  TOTAL AREA(ACRES) =      23.60   TOTAL RUNOFF(CFS) =    45.98
  TC(MIN.) =  12.70

****************************************************************************
  FLOW PROCESS FROM NODE       0.00 TO NODE       0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2130.00 TO NODE   2131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =     70.00
  UPSTREAM ELEVATION(FEET) =    115.00
  DOWNSTREAM ELEVATION(FEET) =    113.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =       0.36
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2131.00 TO NODE   2132.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   530.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  10.32   Tc(MIN.) =  14.64
  LONGEST FLOWPATH FROM NODE   2130.00 TO NODE   2132.00 =   600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2132.00 TO NODE   2133.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.503
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =    61.40   SUBAREA RUNOFF(CFS) =  109.12
  TOTAL AREA(ACRES) =      61.50   TOTAL RUNOFF(CFS) =  109.30
  TC(MIN.) =  14.64
```

```
****************************************************************************
  FLOW PROCESS FROM NODE       0.00 TO NODE       0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2140.00 TO NODE   2141.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =     70.00
  UPSTREAM ELEVATION(FEET) =     125.00
  DOWNSTREAM ELEVATION(FEET) =     123.25
  ELEVATION DIFFERENCE(FEET) =       1.75
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =     4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =       0.36
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2141.00 TO NODE   2142.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   930.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  18.10   Tc(MIN.) =  22.43
  LONGEST FLOWPATH FROM NODE   2140.00 TO NODE   2142.00 =  1000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2142.00 TO NODE   2143.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.901
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   48.30   SUBAREA RUNOFF(CFS) =   65.20
  TOTAL AREA(ACRES) =     48.40   TOTAL RUNOFF(CFS) =   65.33
  TC(MIN.) =  22.43

****************************************************************************
  FLOW PROCESS FROM NODE       0.00 TO NODE       0.00 IS CODE =  13
----------------------------------------------------------------------------
```

```
  FLOW PROCESS FROM NODE   2160.00 TO NODE   2161.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    160.00
  DOWNSTREAM ELEVATION(FEET) =    158.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2161.00 TO NODE   2162.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2330.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET):=   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR =0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  45.35   Tc(MIN.) =  49.68
  LONGEST FLOWPATH FROM NODE   2160.00 TO NODE   2162.00 =  2400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2162.00 TO NODE   2163.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.138
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =  121.60   SUBAREA RUNOFF(CFS) =   98.28
  TOTAL AREA(ACRES) =    121.70   TOTAL RUNOFF(CFS) =   98.36
  TC(MIN.) =  49.68

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2170.00 TO NODE   2171.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    175.00
  DOWNSTREAM ELEVATION(FEET) =    173.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   2171.00 TO NODE   2172.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2930.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  57.03   Tc(MIN.) =  61.36
  LONGEST FLOWPATH FROM NODE   2170.00 TO NODE   2172.00 =  3000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2172.00 TO NODE   2173.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.993
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   60.20   SUBAREA RUNOFF(CFS) =   42.46
  TOTAL AREA(ACRES) =     60.30   TOTAL RUNOFF(CFS) =   42.53
  TC(MIN.) =  61.36

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   9990.00 TO NODE   9991.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
```

```
UPSTREAM ELEVATION(FEET) =   1300.00
DOWNSTREAM ELEVATION(FEET) =   1298.25
ELEVATION DIFFERENCE(FEET) =      1.75
SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      0.36
TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
FLOW PROCESS FROM NODE   9991.00 TO NODE   9992.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
CHANNEL LENGTH THRU SUBAREA(FEET) =  9930.00
REPRESENTATIVE CHANNEL SLOPE =  0.0300
CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
TRAVEL TIME(MIN.) = 193.29   Tc(MIN.) = 197.62
LONGEST FLOWPATH FROM NODE   9990.00 TO NODE   9992.00 = 10000.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   9992.00 TO NODE   9993.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.467
STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
SOIL CLASSIFICATION IS "D"
S.C.S. CURVE NUMBER (AMC II) =  93
AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
SUBAREA AREA(ACRES) =  774.70   SUBAREA RUNOFF(CFS) =  256.98
TOTAL AREA(ACRES) =    774.80   TOTAL RUNOFF(CFS) =  257.02
TC(MIN.) = 197.62
============================================================================
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)      =    774.80  TC(MIN.) =    197.62
PEAK FLOW RATE(CFS)    =    257.02
============================================================================
============================================================================
END OF RATIONAL METHOD ANALYSIS
```

Appendix B

- HEC-1 Model

OTAY CPU HEC-1 12-21-04

```
1*****************************************
*****************************************
*                                       *
*
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
ENGINEERS    *
*              JUN   1998               *
CENTER    *
*            VERSION 4.1                *
STREET          *
*                                       *
95616       *
*  RUN DATE   21DEC04  TIME  07:23:00   *
*
*                                       *
*
*****************************************
*****************************************
```

```
*
*   U.S. ARMY CORPS OF
*   HYDROLOGIC ENGINEERING
*        609 SECOND
*      DAVIS, CALIFORNIA
*          (916) 756-1104
*
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X               X
XXXXXXX  XXXX     X       XXXXX   X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.

THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION

NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY, DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
1                                                HEC-1 INPUT                                                    PAGE  1

 LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

               *DIAGRAM
   1           ID  .....1.......2.......3.......4.......5.......6.......7.......8.......9......10
   2           ID
   3           ID       ***************************************************************
   4           ID       OTAY MESA HYDROLOGY
   5           ID       ***************************************************************
   6           ID
   7           ID       KIMLEY-HORN AND ASSOCIATES, INC.
   8           ID       100 YEAR, 6 HOUR STORM EVENT
   9           ID       FILE: IN"9300WDB-SD-IN2.TXT OUT 9300WDB-015
  10           ID       LSM 8-31-98, MODIFIED 7-27-99 BY SLM
  11           ID
  12           IT       2                    300
  13           IO       0

  14           KK      A1  RUNOFF HYDROGRAPH
  15           BA   0.075
  16           PB    2.95
  17           PI  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024
  18           PI  0.0024  0.0024  0.0024  0.0024  0.0024  0.0031  0.0031  0.0031  0.0031  0.0031
  19           PI  0.0031  0.0031  0.0031  0.0031  0.0031  0.0031  0.0031  0.0031  0.0031  0.0031
  20           PI  0.0037  0.0037  0.0037  0.0037  0.0037  0.0037  0.0037  0.0037  0.0037  0.0037
  21           PI  0.0037  0.0037  0.0037  0.0037  0.0037  0.0047  0.0047  0.0047  0.0053  0.0053
  22           PI  0.0053  0.0057  0.0057  0.0057  0.0067  0.0067  0.0067  0.0083  0.0083  0.0083
  23           PI  0.0150  0.0180  0.0270  0.0380  0.0440  0.0420  0.0360  0.0280  0.0220  0.0220
  24           PI  0.0200  0.0180  0.0160  0.0140  0.0110  0.0083  0.0083  0.0083  0.0077  0.0077
  25           PI  0.0077  0.0073  0.0073  0.0073  0.0067  0.0067  0.0067  0.0053  0.0053  0.0053
  26           PI  0.0048  0.0048  0.0048  0.0048  0.0048  0.0048  0.0048  0.0048  0.0048  0.0048
  27           PI  0.0048  0.0048  0.0048  0.0048  0.0048  0.0038  0.0038  0.0038  0.0038  0.0038
  28           PI  0.0038  0.0038  0.0038  0.0038  0.0038  0.0038  0.0038  0.0038  0.0038  0.0038
  29           PI  0.0032  0.0032  0.0032  0.0032  0.0032  0.0032  0.0032  0.0032  0.0032  0.0032
  30           PI  0.0032  0.0032  0.0032  0.0032  0.0032  0.0028  0.0028  0.0028  0.0028  0.0028
  31           PI  0.0028  0.0028  0.0028  0.0028  0.0028  0.0028  0.0028  0.0028  0.0028  0.0028
  32           PI  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025
  33           PI  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025
  34           PI  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024
  35           LS            83.9
  36           UD   0.140

  37           KK      A7  RUNOFF HYDROGRAPH
  38           BA   0.033
  39           PB    2.90
  40           LS            88.8
  41           UD   0.062

  42           KK      01  RUNOFF HYDROPGRAPH
  43           BA   0.228
  44           PB    2.90
  45           LS            83.5
  46           UD   0.262
1                                                HEC-1 INPUT                                                    PAGE  2
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 47           KK   CP-01  COMBINE HYDROPGRAPHS FROM A1, A7, AND 01
 48           HC       3

 49           KK  CP-A15  ROUTE FROM CP 01
 50           RK    1800   0.009    0.20            TRAP     100      20

 51           KK      A5  RUNOFF HYDROGRAPH
 52           BA   0.062
 53           PB    3.00
 54           LS            83.9
 55           UD   0.062

 56           KK  CP-A10  ROUTE FROM A5
 57           RK    1320   0.003   0.013            TRAP      35       0

 58           KK     A10  RUNOFF HYDROGRAPH
 59           BA   0.082
 60           PB    2.90
 61           LS            88.8
 62           UD   0.042

 63           KK  CP-A10  COMBINE HYDROGRAPHS FROM A5 AND A10
 64           HC       2

 65           KK  CP-A15  ROUTE FROM CP A10
 66           RK    1320   0.011   0.017            TRAP      50      20

 67           KK     A15  RUNOFF HYDROGRAPH
 68           BA   0.098
 69           PB    2.80
 70           LS            89.9
 71           UD   0.087

 72           KK  CP-A15  COMBINE HYDROGRAPHS FROM CP-01, CP-A10, AND A15
 73           HC       3

 74           KK  CP-A20  ROUTE FROM CP-A15
 75           RK    3400   0.006   0.020            TRAP     200      20

 76           KK      05  RUNOFF HYDROGRAPH FROM 05
 77           BA   0.097
 78           PB    2.75
 79           LS            83.9
 80           UD   0.080

 81           KK  CP-A20  ROUTE FROM 05
 82           RK    3500  0.006    0.020            TRAP     200      20

 83           KK     A20  RUNOFF HYDROGRAPH
 84           BA   0.254
 85           PB    2.75
 86           LS            88.4
 87           UD   0.184
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 88           KK     A25  RUNOFF FROM A25
 89           BA   0.030
 90           PB    2.60
 91           LS            88.4
 92           UD   0.076

 93           KK     A27  RUNOFF HYDROGRAPH
 94           BA   0.021
 95           PB    2.60
 96           LS            93.8
 97           UD   0.041

 98           KK  CP-A20  COMBINE HYDROGRAPHS FROM CP-A15, 05, A25, A27, AND A20
 99           HC       5

100           KK  CP-A25 ROUTE FROM CP-A20
101           RK    1200   0.005    0.02            TRAP      20       2

102           KK     A23  RUNOFF HYDROGRAPH FROM A23
103           BA   0.051
104           PB    2.60
105           LS            93.8
106           UD   0.058

107           KK  CP-A25  ROUTE FROM A23
108           RK     525   0.005   0.013            CIRC     3.5

109           KK  CP-A25 COMBINE HYDROGRAPHS FROM A23, CP-A20
110           HC       2

111           KK  CP-A30 ROUTE FROM CP-A25
112           RK    1100   0.005   0.020            TRAP      20       3

113           KK     O25  RUNOFF HYDROGRAPH
114           BA   0.134
115           PB    2.60
116           LS            83.9
117           UD   0.228

118           KK     O20  RUNOFF HYDROGRAPH
```

```
119          BA   0.263
120          PB    2.70
121          LS            83.9
122          UD   0.294

123          KK  CP-030  ROUTE FROM 020
124          RK     900   0.001   0.020            TRAP     200      20

125          KK     030  RUNOFF HYDROGRAPH
126          BA   0.129
127          PB    2.50
128          LS            83.9
129          UD   0.258
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

130          KK  CP-030  COMBINE HYDROGRAPHS FROM 025, 020 AND 030
131          HC       3

132          KK  CP-045 ROUTE FROM 030
133          RK     600   0.007   0.030            TRAP      70       0

134          KK     045  RUNOFF HYDROGRAPH
135          BA   0.079
136          PB    2.50
137          LS            93.8
138          UD   0.137

139          KK  CP-045  COMBINE HYDROGRAPHS FROM 045, CP-030
140          HC       2

141          KK  CP-050 ROUTE FROM CP-045
142          RK    2100   0.007   0.015            TRAP      70       0

143          KK     057  RUNOFF HYDROGRAPH
144          BA   0.527
145          PB    2.45
146          LS            93.8
147          UD   0.171

148          KK  CP-050
149          RK    5900   0.007   0.015            TRAP      70       0

150          KK     050  RUNOFF HYDROGRAPH
151          BA   0.463
152          PB    2.45
153          LS            93.8
154          UD   0.185

155          KK  CP-050  COMBINE HYDROGRAPHS FROM  CP-045, 057, 050
156          HC       3

157          KK  CP-010  ROUTE FROM CP-050
158          RK    1000   0.007   0.015

159          KK     010  RUNOFF HYDROGRAPH
160          BA   0.081
161          PB    2.75
162          LS            83.9
163          UD   0.087

164          KK  CP-010  COMBINE HYDROGRAPHS FROM 010,CP-050
165          HC            83.9

166          KK  CP-036  ROUTE FROM CP-010
167          RK    2100   0.007   0.015            TRAP      70       0
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

168          KK     036  RUNOFF HYDROGRAPH
169          BA   0.116
170          PB    2.60
171          LS            93.8
172          UD   0.088

173          KK     060
174          BA   0.146
175          PB    2.40
176          LS            84.2
177          UD   0.086

178          KK  CP-036 ROUTE FROM CP-060
179          RK     500   0.007   0.015            TRAP      30       0

180          KK  CP-036  COMBINE HYDROGRAPHS FROM 060, 036, CP-010
181          HC       3

182          KK  CP-A30  ROUTE FROM CP-036
183          RK    1700   0.002   0.002   0.040    TRAP      30       0

184          KK     A30  RUNOFF HYDROGRAPH
185          BA   0.070
186          PB    2.50
187          LS            90.5
188          UD   0.083

189          KK  CP-A30  COMBINE HYDROGRAPHS FROM A30, CP-036, CP-A25
```

```
190          HC       3

191          KK  CP-A31  ROUTE FROM CP-A30
192          RK    1000   0.002   0.040            TRAP      30       0

193          KK     A28  RUNOFF HYDROGRAPH
194          BA   0.021
195          PB    2.60
196          LS            93.8
197          UD   0.041

198          KK  CP-A31  RUNOFF HYDROGRAPH
199          RK    1200   0.005    0.02            TRAP      10       2

200          KK     A31  RUNOFF HYDROGRAPH
201          BA   0.047
202          PB    2.60
203          LS            93.8
204          UD   0.063

205          KK  CP-A31  COMBINE HYDROGRAPHS FROM CP-A30, A28, A31
206          HC       3
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

207          KK  CP-S1A  ROUTE FROM CP-A31
208          RK    2600   0.002   0.040            TRAP      30       2

209          KK     B10
210          KM            BASIN 10
211          BA   .0067
212          PB     2.0
213          LS       0      91      61
214          UD    .004

215          KK     B20
216          KM            BASIN 20
217          BA   .0055
218          LS       0      89      52
219          UD    .007

220          KK     C12        COMBINE B10 & B20
221          HC       2

222          KK      C2        ROUTE CHANNEL NUMBER 2
223          UK     150    .020     .08     100
224          RK     620    .005    .035            TRAP      30       4

225          KK     B30
226          KM            BASIN 30
227          BA   .0052
228          LS       0      89      43
229          UD    .005

230          KK     C23        COMBINE B20 OUT & B30
231          HC       2

232          KK      C3        ROUTE CHANNEL NUMBER 3
233          RK    1100    .005    .035            TRAP      30       4

234          KK     B40
235          KP       1
236          KM            BASIN 40
237          BA   .0942
238          LS       0      91      60
239          UD    .024

240          KK    SD43         ROUTE B40 THROUGH B30: STORM DRAIN
241          UK    1050    .020     .08     100
242          RK     800    .015    .015            CIRC     5.5

243          KK     B50
244          KP       1
245          KM            BASIN 50
246          BA   .0781
247          LS       0      90      60
248          UD    .019
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

249          KK     C45         COMBINE B40 & B50 @ B30
250          HC       2

251          KK     CP4
252          BA    .032
253          UK     250    .012     .08     100
254          RK    1320    .015    .015            CIRC       6            YES

255          KK    CCP4
256          KM        COMBINE AT  CONC. PT. 4
257          HC       2

258          KK     CP3
259          KM        ROUTE TO CONC. PT. 3
260          BA    .040
261          UK     650    .011     .08     100
262          RK    1320    .015    .015            CIRC       6            YES
```

```
263          KK    CCP3
264          KM        COMBINE AT CONC. PT. 3
265          HC       2

266          KK     MX1
267          KM        MEXICO BASIN 1
268          BA   .0316
269          LS       0       90       60
270          UD    .007

271          KK     MX2
272          KM        MEXICO BASIN 2
273          BA   .0781
274          LS       0       89       50
275          UD    .019

276          KK    MX12
277          KM        COMBINE MEXICO AND BORDER AREA
278          HC       2

279          KK   MX123
280          KM        ROUTE TO CP3A
281          RK     600    .015    .015            CIRC       5

282          KK     MX3
283          KM        BORDER CORRIDOR
284          BA   .0215
285          LS       0       88       30
286          UD    .005

287          KK    CP3A
288          KM        COMBINE AT CONC. PT. 3A
289          HC       2
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

290          KK    RCP3
291          KM        ROUTE TO CONC. PT. 3A
292          RK     750    .015    .015            CIRC       5

293          KK    CCP3
294          KM        COMBINE AT CONC. PT. 3
295          HC       2

296          KK    RCP2
297          KM        ROUTE TO CONC. PT. 2
298          RK     400    .015    .015            CIRC       7

299          KK     RP2
300          KM        RUNOFF TO CONC. PT. 2
301          BA   .0473
302          UK     550    .012     .08     100
303          RK    1200    .015    .015            CIRC       4

304          KK    CCP2
305          KM        COMBINEAT CONC. PT. 2
306          HC       2

307          KK    SVRW
308          KM        SIEMPRE VIVA RD WATESHED
309          BA   .0646
310          UK     450    .015     .08     100
311          RK    3000    .015    .015            CIRC       5

312          KK      EB
313          KM        WATESHED EAST OF PREVIOUS DET. BASIN
314          BA   .0102
315          UK     250    .010     .08     100
316          RK     100    .015    .015            CIRC       2

317          KK      WB
318          KM        WATERSHED WEST OF PREVIOUS DET. BASIN
319          BA   .0158
320          UK     400    .010     .08     100
321          RK     100    .015    .015            CIRC       2

322          KK    WSVR
323          KM        WEST SIEMPRE VIVA RD.
324          BA   .0108
325          UK     350    .012     .08     100
326          RK     600    .015    .015            CIRC       4

327          KK     CP1
328          HC       5
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

329          KK      S1  RUNOFF HYDROGRAPH
330          BA   0.516
331          PB    2.70
332          LS            93.8
333          UD   0.143

334          KK   CP-S1  COMBINE HYDROGRAPHS FROM B10, CP1 AND S1
335          HC       3
```

```
336          KK  CP-S1A  COMBINE HYDROGRAPHS FROM CP-S1, CP-A31
337          HC       2

338          KK  CP-S10  ROUTE FROM CP-S1A
339          RK    1300   0.004   0.004            TRAP      30       0

340          KK     A60  RUNOFF HYDROGRAPH
341          BA   0.033
342          PB    2.30
343          LS             93.8
344          UD   0.039

345          KK  CP-A50  ROUTE FROM A60
346          RK    3000   0.005   0.013            CIRC       2

347          KK     055  RUNOFF HYDROGRAPH
348          BA   0.482
349          PB    2.35
350          LS             91.7
351          UD   0.140

352          KK  CP-A50  ROUTE FROM 055
353          RK    2900   0.004   0.013            TRAP      15       0

354          KK     A50  RUNOFF HYDROGRAPH
355          BA   0.250
356          PB    2.35
357          LS             93.8
358          UD   0.121

359          KK  CP-A50  COMBINE HYDROGRAPHS FROM A60, 055, AND A50
360          HC       3

361          KK     A50
362          DT     A50
363          DI       0     615    1000
364          DQ       0    0.01     385

365          KK     A42  RUNOFF HYDROGRAPH
366          BA   0.032
367          PB    2.40
368          LS             93.8
369          UD   0.046
```



```
LINE         ID.......1.........2.......3.......4.......5.......6.......7.......8.......9.......10

370          KK  CP-A50  COMBINE HYDROGRAPHS FROM A50 AND A42
371          HC       2

372          KK  CP-A45  ROUTE FROM CP-A50
373          RK    3000   0.002   0.040            TRAP      40       1

374          KK     A40  RUNOFF HYDROGRAPH
375          BA   0.032
376          PB    2.40
377          LS             93.8
378          UD   0.057

379          KK  CP-A45  ROUTE FROM A40
380          RK    2380   0.006   0.040            TRAP      40       1

381          KK     A35  RUNOFF HYDROGRAPH
382          BA   0.065
383          PB    2.50
384          LS             93.8
385          UD   0.076

386          KK  CP-A45  ROUTE FROM A35
387          RK    2000   0.001   0.040            TRAP       5       1

388          KK     A45  RUNOFF HYDROGRAPH
389          BA   0.122
390          PB    2.45
391          LS             94.0
392          UD   0.112

393          KK  CP-A45  COMBINE HYDROGRAPHS FROM CP-A50, A40 AND A45
394          HC       4

395          KK     A45
396          DT     A45
397          DI       0      60    1000
398          DQ       0    0.01     940

399          KK  CP-S10  ROUTE FROM CP-A45
400          RK    2900   0.003   0.040            TRAP      25     0.8

401          KK     S10  RUNOFF FROM HYDROGRAPH
402          BA   0.263
403          PB    2.50
404          LS             94.4
405          UD   0.235

406          KK  CP-S10  COMBINE HYDROGRAPHS FROM S1-DET, CP-A45, AND S10
407          HC       3
```



```
LINE         ID.......1.........2.......3.......4.......5.......6.......7.......8.......9.......10
```

```
408          KK  CP-B30  ROUTE FROM CP-S10
409          RD    2400   0.004   0.040            TRAP      50      0.8

410          KK     A65  RUNOFF HYDROGRAPH FROM A65
411          BA   0.055
412          PB    2.30
413          LS              93.8
414          UD   0.037

415          KK  CP-S25 ROUTE FROM A65
416          RK    2910   0.010   0.040            TRAP     200       20

417          KK     S25  RUNOFF HYDROGRAPH
418          BA   0.082
419          PB    2.30
420          LS              83.9
421          UD   0.202

422          KK  CP-S25  COMBINE HYDROGRAPHS FROM A65 AND S25
423          HC       2

424          KK  CP-S20  ROUTE FROM CP-S25
425          RK    1460   0.004   0.020            TRAP      15       1

426          KK     S20  RUNOFF HYDROGRAPH
427          BA   0.136
428          PB    2.30
429          LS              83.9
430          UD   0.176

431          KK  CP-S20  COMBINE HYDROGRAPHS FROM CP-S25, AND S20
432          HC       2

433          KK  CP-B30  ROUTE FROM CP-S20
434          RK    3500   0.004   0.040            TRAP      15       1

435          KK     S15  RUNOFF HYDROGRAPH
436          BA   0.128
437          PB    2.40
438          LS              93.8
439          UD   0.083

440          KK  CP-B30  ROUTE FROM S15
441          RK    2800   0.004   0.040            TRAP      15       1

442          KK     B20  RUNOFF HYDROGRAPH
443          BA   0.040
444          PB    2.30
445          LS              93.8
446          UD   0.051
```



```
LINE         ID.......1.........2.........3.........4.........5.........6.........7.........8.........9.........10

447          KK  CP-B25  ROUTE FROM B20
448          RK    1320   0.002   0.020            TRAP       8       2
449          KK     B25  RUNOFF HYDROGRAPH
450          BA   0.127
451          PB    2.30
452          LS              93.8
453          UD   0.070

454          KK  CP-B25  COMBINE HYDROGRAPHS FROM B20 AND B25
455          HC       2

456          KK  CP-B25  ROUTE FROM CP-B25
457          RK    2700   0.001   0.040            TRAP      15       1

458          KK     B15  RUNOFF HYDROGRAPH
459          BA   0.074
460          PB    2.50
461          LS              94.5
462          UD   0.078

463          KK  CP-B30
464          RK    1000   0.015   0.040            TRAP      15       1

465          KK     B30  RUNOFF HYDROGRAPH
466          BA   0.228
467          PB    2.45
468          LS              84.8
469          UD   0.465

470          KK  CP-B30  COMBINE HYDROGRAPHS FROM CP-S10, CP-S20, S15, CP-B25, B15 AND B30
471          KO       1
472          HC       6

473          KK  DB-030  DETENTION BASIN AT BORDER
474          RS       1    STOR
475          SV       0     11     71    166    268    319
476          SE       0      2      4      6      8      9
477          SQ       0     20    150    350   1000   2200
478          ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

```
INPUT
 LINE      (V) ROUTING          |--->| DIVERSION OR PUMP FLOW
```

```
NO.     (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

 14         A1
             .
 37          .          A7
             .           .
             .           .
 42          .           .          01
             .           .           .
             .           .           .
 47      CP-01.......................
            V
            V
 49     CP-A15
             .
             .
 51          .          A5
             .           V
             .           V
 56          .      CP-A10
             .           .
             .           .
 58          .           .        A10
             .           .         .
             .           .         .
 63          .      CP-A10............
             .           V
             .           V
 65          .      CP-A15
             .           .
             .           .
 67          .           .        A15
             .           .         .
             .           .         .
 72     CP-A15.......................
            V
            V
 74     CP-A20
             .
             .
 76          .          05
             .           V
             .           V
 81          .      CP-A20
             .           .
             .           .
 83          .           .        A20
             .           .         .
             .           .         .
 88          .           .         .        A25
             .           .         .         .
             .           .         .         .
 93          .           .         .         .        A27
             .           .         .         .         .
             .           .         .         .         .
 98     CP-A20.............................................
            V
            V
100     CP-A25
             .
             .
102          .         A23
             .           V
             .           V
107          .      CP-A25
             .           .
             .           .
109     CP-A25............
            V
            V
111     CP-A30
             .
             .
113          .         O25
             .           .
             .           .
118          .           .        O20
             .           .         V
             .           .         V
123          .           .      CP-O30
             .           .         .
             .           .         .
125          .           .         .        O30
             .           .         .         .
             .           .         .         .
130          .      CP-O30........................
             .           V
             .           V
132          .      CP-O45
             .           .
             .           .
134          .           .        045
             .           .         .
             .           .         .
139          .      CP-045............
             .           V
             .           V
141          .      CP-050
             .           .
             .           .
```

```
143          .          .        057  OT1-2
             .          .          V
             .          .          V
148          .          .     CP-050
             .          .          .
             .          .          .
150          .          .          .        050
             .          .          .          .
             .          .          .          .
155          .     CP-050.......................
             .          V
             .          V
157          .     CP-010
             .          .
             .          .
159          .          .        010
             .          .          .
             .          .          .
164          .     CP-010............
             .          V
             .          V
166          .     CP-036
             .          .
             .          .
168          .          .        036
             .          .          .
             .          .          .
173          .          .          .        060  OT1-4
             .          .          .          V
             .          .          .          V
178          .          .          .     CP-036
             .          .          .          .
             .          .          .          .
180          .     CP-038.......................  OT1-5
             .          V
             .          V
182          .     CP-A30
             .          .
             .          .
184          .          .        A30
             .          .          .
             .          .          .
189     CP-A30.......................
             V
             V
191     CP-A31
             .
             .
193          .        A28
             .          V
             .          V
198          .     CP-A31
             .          .
             .          .
200          .          .        A31
             .          .          .
             .          .          .
205     CP-A31.......................  OT1-(8+9)
             V
             V
207     CP-S1A
             .
             .
209          .        B10
             .          .
             .          .
215          .          .        B20
             .          .          .
             .          .          .
220          .        C12............
             .          .
             .          .
222          .          .         C2
             .          .          .
             .          .          .
225          .          .          .        B30
             .          .          .          .
             .          .          .          .
230          .          .        C23............
             .          .          V
             .          .          V
232          .          .         C3
             .          .          .
             .          .          .
234          .          .          .        B40
             .          .          .          .
             .          .          .          .
240          .          .          .          .       SD43
             .          .          .          .          .
             .          .          .          .          .
243          .          .          .          .          .        B50
             .          .          .          .          .          .
             .          .          .          .          .          .
249          .          .          .          .        C45............
             .          .          .          .          V
             .          .          .          .          V
251          .          .          .          .        CP4 ***
             .          .          .          .          .
             .          .          .          .          .
255          .          .          .       CCP4............
             .          .          .          V
```

```
                                                  V
258                                              CP3 ***
                                                  .
                                                  .
263                                        CCP3............
                                                  .
                                                  .
266                                              MX1
                                                  .
                                                  .
271                                                .          MX2
                                                  .
                                                  .
276                                              MX12............
                                                  V
                                                  V
279                                              MX123
                                                  .
                                                  .
282                                                .          MX3
                                                  .
                                                  .
287                                              CP3A............
                                                  V
                                                  V
290                                              RCP3
                                                  .
                                                  .
293                                        CCP3............
                                                  V
                                                  V
296                                        RCP2
                                                  .
                                                  .
299                                              RP2
                                                  .
                                                  .
304                                        CCP2............
                                                  .
                                                  .
307                                              SVRW
                                                  .
                                                  .
312                                                .          EB
                                                  .
                                                  .
317                                                .          .          WB
                                                  .
                                                  .
322                                                .          .          .          WSVR
                                                  .
                                                  .
327                                        CP1.........................................
                                                  .
                                                  .
329                                              S1
                                                  .
                                                  .
334                                CP-S1........................
                                                  .
                                                  .
336                CP-S1A............
                        V
                        V
338                CP-S10
                        .
                        .
340                        A60
                        .
                        .
345                        CP-A50
                        .
                        .
347                                        055
                                                  V
                                                  V
352                                        CP-A50
                                                  .
                                                  .
354                                              A50
                                                  .
                                                  .
359                        CP-A50........................
                        .
                        .
362                        .-------->     A50
361                        A50
                        .
                        .
365                                        A42
                        .
                        .
370                        CP-A50............
                        .
                        .
372                        CP-A45
                        .
                        .
374                                        A40
                                                  V
                                                  V
```

Siempre Viva BP

OT1-3

```
379                 .           .       CP-A45
                    .           .
                    .           .
381                 .           .           A35
                    .           .            V
                    .           .            V
386                 .           .       CP-A45
                    .           .
                    .           .
388                 .           .                    A45
                    .           .
                    .           .
393                 .       CP-A45.......................................
                    .           .
                    .           .                    ↓
396                 .           .-------->     A45
395                 .       A45
                    .        V
                    .        V                       ↓
399                 .       CP-S10 - ..
                    .           \                    ↓
                    .           .
401                 .           .       S10
                    .           .                    ↓
                    .           .
406            CP-S10.......................          ↓
                    V
                    V
408            CP-B30
                    .
                    .
410                 .       A65
                    .        V
                    .        V
415                 .       CP-S25                    .
                    .           .
                    .           .
417                 .           .       S25
                    .           .                    ↓
                    .           .
422                 .       CP-S25............        ↓
                    .        V                       ↓
                    .        V                       .
424                 .       CP-S20
                    .           .                    ↓
                    .           .
426                 .           .       S20          ↓
                    .           .
                    .           .
431                 .       CP-S20............        .
                    .        V
                    .        V
433                 .       CP-B30
                    .           .
                    .           .
435                 .           .       S15
                    .           .        V           ↓
                    .           .        V           ↓
440                 .           .   CP-B30           ↓
                    .           .
                    .           .
442                 .           .           B20
                    .           .            V       ↓
                    .           .            V
447                 .           .       CP-B25
                    .           .
                    .           .
449                 .           .                    B25
                    .           .
                    .           .
454                 .           .       CP-B25
                    .           .            V
                    .           .            V
456                 .           .       CP-B25
                    .           .
                    .           .
458                 .           .                    B15
                    .           .                     V
                    .           .                     V
463                 .           .                CP-B30
                    .           .
                    .           .
465                 .           .                                 B30
                    .           .
                    .           .
470            CP-B30.......................................................
                    V
                    V
473            DB-030
(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*****************************************
 *                                    *                                    *
*
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                    *   U.S. ARMY CORPS OF
ENGINEERS      *
 *             JUN   1998             *                                    *   HYDROLOGIC ENGINEERING
CENTER     *
 *          VERSION 4.1               *                                    *          609 SECOND
STREET          *
```

OTI-12

OTI-11

OTI-14

```
*                                                                                                    *        DAVIS, CALIFORNIA
95616        *
 *  RUN DATE   21DEC04  TIME  07:23:00   *                                                           *            (916) 756-1104
*
 *                                       *                                                           *
*
 ****************************************
*************************************


                          .....1.......2.......3.......4.......5.......6.......7.......8.......9......10
                                 ************************************************************
                                 OTAY MESA HYDROLOGY
                                 ************************************************************

                                 KIMLEY-HORN AND ASSOCIATES, INC.
                                 100 YEAR, 6 HOUR STORM EVENT
                                 FILE: IN*9300WDB-SD-IN2.TXT OUT 9300WDB-015
                                 LSM 8-31-98, MODIFIED 7-27-99 BY SLM

  13 IO          OUTPUT CONTROL VARIABLES
                       IPRNT           0  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                        NMIN           2  MINUTES IN COMPUTATION INTERVAL
                       IDATE       1   0  STARTING DATE
                       ITIME        0000  STARTING TIME
                          NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE       1   0  ENDING DATE
                     NDTIME        0958  ENDING TIME
                      ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL      .03 HOURS
                      TOTAL TIME BASE     9.97 HOURS

          ENGLISH UNITS
               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***
*** *** ***

            **************
            *            *
  473 KK    *   DB-030   *        DETENTION BASIN AT BORDER
            *            *
            **************

               HYDROGRAPH ROUTING DATA

  474 RS          STORAGE ROUTING
                       NSTPS           1  NUMBER OF SUBREACHES
                        ITYP        STOR  TYPE OF INITIAL CONDITION
                      RSVRIC         .00  INITIAL CONDITION
                           X         .00 WORKING R AND D COEFFICIENT

  475 SV            STORAGE          .0      11.0      71.0     166.0     268.0     319.0

  476 SE          ELEVATION         .00      2.00      4.00      6.00      8.00      9.00

  477 SQ          DISCHARGE          0.       20.      150.      350.     1000.     2200.
                                                                ***
*****************************************************************************************************
***********

                                                HYDROGRAPH AT STATION   DB-030

*****************************************************************************************************
***********
                                        *                                        *
  DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE * DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE * DA MON HRMN ORD  OUTFLOW
STORAGE   STAGE
                                        *                                        *
   1     0000   1       0.       .0      .0 *  1     0320 101     667.    215.7     7.0 *  1     0640 201     695.
220.1     7.1
   1     0002   2       0.       .0      .0 *  1     0322 102     682.    218.1     7.0 *  1     0642 202     688.
219.0     7.0
   1     0004   3       0.       .0      .0 *  1     0324 103     696.    220.2     7.1 *  1     0644 203     681.
217.9     7.0
   1     0006   4       0.       .0      .0 *  1     0326 104     708.    222.2     7.1 *  1     0646 204     674.
216.8     7.0
   1     0008   5       0.       .0      .0 *  1     0328 105     720.    224.1     7.1 *  1     0648 205     666.
```

215.7	7.0													
1	0010	6	0.	.0	.0 *	1	0330	106	732.	225.9	7.2 *	1	0650	206	659.
214.5	7.0													
1	0012	7	0.	.0	.0 *	1	0332	107	742.	227.5	7.2 *	1	0652	207	652.
213.3	6.9													
1	0014	8	0.	.0	.0 *	1	0334	108	752.	229.1	7.2 *	1	0654	208	644.
212.1	6.9													
1	0016	9	0.	.0	.0 *	1	0336	109	761.	230.5	7.3 *	1	0656	209	636.
210.9	6.9													
1	0018	10	0.	.1	.0 *	1	0338	110	770.	231.9	7.3 *	1	0658	210	628.
209.7	6.9													
1	0020	11	0.	.1	.0 *	1	0340	111	778.	233.2	7.3 *	1	0700	211	620.
208.4	6.8													
1	0022	12	0.	.1	.0 *	1	0342	112	786.	234.4	7.3 *	1	0702	212	612.
207.2	6.8													
1	0024	13	0.	.2	.0 *	1	0344	113	793.	235.5	7.4 *	1	0704	213	604.
205.9	6.8													
1	0026	14	0.	.2	.0 *	1	0346	114	799.	236.5	7.4 *	1	0706	214	596.
204.7	6.8													
1	0028	15	0.	.3	.0 *	1	0348	115	805.	237.5	7.4 *	1	0708	215	588.
203.4	6.7													
1	0030	16	1.	.3	.1 *	1	0350	116	811.	238.4	7.4 *	1	0710	216	580.
202.1	6.7													
1	0032	17	1.	.4	.1 *	1	0352	117	816.	239.2	7.4 *	1	0712	217	572.
200.9	6.7													
1	0034	18	1.	.4	.1 *	1	0354	118	821.	239.9	7.4 *	1	0714	218	564.
199.6	6.7													
1	0036	19	1.	.4	.1 *	1	0356	119	826.	240.6	7.5 *	1	0716	219	557.
198.4	6.6													
1	0038	20	1.	.5	.1 *	1	0358	120	830.	241.3	7.5 *	1	0718	220	549.
197.2	6.6													
1	0040	21	1.	.5	.1 *	1	0400	121	834.	241.9	7.5 *	1	0720	221	541.
195.9	6.6													
1	0042	22	1.	.6	.1 *	1	0402	122	837.	242.4	7.5 *	1	0722	222	533.
194.7	6.6													
1	0044	23	1.	.6	.1 *	1	0404	123	840.	242.9	7.5 *	1	0724	223	525.
193.5	6.5													
1	0046	24	1.	.7	.1 *	1	0406	124	843.	243.4	7.5 *	1	0726	224	518.
192.3	6.5													
1	0048	25	1.	.8	.1 *	1	0408	125	846.	243.8	7.5 *	1	0728	225	510.
191.1	6.5													
1	0050	26	1.	.8	.1 *	1	0410	126	848.	244.2	7.5 *	1	0730	226	503.
190.0	6.5													
1	0052	27	2.	.9	.2 *	1	0412	127	850.	244.5	7.5 *	1	0732	227	495.
188.8	6.4													
1	0054	28	2.	.9	.2 *	1	0414	128	852.	244.8	7.5 *	1	0734	228	488.
187.7	6.4													
1	0056	29	2.	1.0	.2 *	1	0416	129	854.	245.0	7.5 *	1	0736	229	481.
186.5	6.4													
1	0058	30	2.	1.1	.2 *	1	0418	130	855.	245.2	7.6 *	1	0738	230	474.
185.4	6.4													
1	0100	31	2.	1.2	.2 *	1	0420	131	856.	245.4	7.6 *	1	0740	231	466.
184.3	6.4													
1	0102	32	2.	1.2	.2 *	1	0422	132	857.	245.5	7.6 *	1	0742	232	459.
183.2	6.3													
1	0104	33	2.	1.3	.2 *	1	0424	133	858.	245.7	7.6 *	1	0744	233	452.
182.1	6.3													
1	0106	34	3.	1.4	.3 *	1	0426	134	858.	245.7	7.6 *	1	0746	234	446.
181.0	6.3													
1	0108	35	3.	1.5	.3 *	1	0428	135	859.	245.8	7.6 *	1	0748	235	439.
179.9	6.3													
1	0110	36	3.	1.6	.3 *	1	0430	136	859.	245.8	7.6 *	1	0750	236	432.
178.9	6.3													
1	0112	37	3.	1.8	.3 *	1	0432	137	859.	245.9	7.6 *	1	0752	237	425.
177.8	6.2													
1	0114	38	3.	1.9	.3 *	1	0434	138	859.	245.8	7.6 *	1	0754	238	419.
176.8	6.2													
1	0116	39	4.	2.0	.4 *	1	0436	139	859.	245.8	7.6 *	1	0756	239	412.
175.8	6.2													
1	0118	40	4.	2.2	.4 *	1	0438	140	858.	245.8	7.6 *	1	0758	240	406.
174.7	6.2													
1	0120	41	4.	2.4	.4 *	1	0440	141	858.	245.7	7.6 *	1	0800	241	399.
173.7	6.2													
1	0122	42	5.	2.5	.5 *	1	0442	142	857.	245.6	7.6 *	1	0802	242	393.
172.8	6.1													
1	0124	43	5.	2.7	.5 *	1	0444	143	857.	245.5	7.6 *	1	0804	243	387.
171.8	6.1													
1	0126	44	5.	2.9	.5 *	1	0446	144	856.	245.4	7.6 *	1	0806	244	381.
170.8	6.1													
1	0128	45	6.	3.1	.6 *	1	0448	145	855.	245.2	7.6 *	1	0808	245	375.
169.9	6.1													
1	0130	46	6.	3.4	.6 *	1	0450	146	854.	245.1	7.6 *	1	0810	246	369.
169.0	6.1													
1	0132	47	7.	3.6	.7 *	1	0452	147	853.	244.9	7.5 *	1	0812	247	363.
168.0	6.0													
1	0134	48	7.	3.8	.7 *	1	0454	148	851.	244.7	7.5 *	1	0814	248	357.
167.1	6.0													
1	0136	49	7.	4.1	.7 *	1	0456	149	850.	244.5	7.5 *	1	0816	249	351.
166.2	6.0													
1	0138	50	8.	4.4	.8 *	1	0458	150	849.	244.2	7.5 *	1	0818	250	349.
165.3	6.0													
1	0140	51	8.	4.6	.8 *	1	0500	151	847.	244.0	7.5 *	1	0820	251	347.
164.5	6.0													
1	0142	52	9.	4.9	.9 *	1	0502	152	846.	243.8	7.5 *	1	0822	252	345.
163.6	5.9													
1	0144	53	10.	5.2	1.0 *	1	0504	153	844.	243.5	7.5 *	1	0824	253	343.
162.7	5.9													
1	0146	54	10.	5.6	1.0 *	1	0506	154	842.	243.2	7.5 *	1	0826	254	341.
161.8	5.9													
1	0148	55	11.	6.0	1.1 *	1	0508	155	840.	243.0	7.5 *	1	0828	255	339.
161.0	5.9													

1	0150	56	12.	6.4	1.2	*	1	0510	156	839.	242.7	7.5	*	1	0830	256	338.
160.1	5.9																
1	0152	57	12.	6.8	1.2	*	1	0512	157	837.	242.4	7.5	*	1	0832	257	336.
159.2	5.9																
1	0154	58	13.	7.3	1.3	*	1	0514	158	835.	242.1	7.5	*	1	0834	258	334.
158.3	5.8																
1	0156	59	14.	7.8	1.4	*	1	0516	159	833.	241.8	7.5	*	1	0836	259	332.
157.5	5.8																
1	0158	60	15.	8.4	1.5	*	1	0518	160	831.	241.4	7.5	*	1	0838	260	330.
156.6	5.8																
1	0200	61	17.	9.1	1.7	*	1	0520	161	829.	241.1	7.5	*	1	0840	261	328.
155.8	5.8																
1	0202	62	18.	9.9	1.8	*	1	0522	162	826.	240.8	7.5	*	1	0842	262	327.
154.9	5.8																
1	0204	63	19.	10.7	1.9	*	1	0524	163	824.	240.4	7.5	*	1	0844	263	325.
154.1	5.7																
1	0206	64	21.	11.7	2.0	*	1	0526	164	822.	240.1	7.5	*	1	0846	264	323.
153.2	5.7																
1	0208	65	24.	12.8	2.1	*	1	0528	165	820.	239.7	7.4	*	1	0848	265	321.
152.4	5.7																
1	0210	66	27.	14.2	2.1	*	1	0530	166	817.	239.3	7.4	*	1	0850	266	320.
151.5	5.7																
1	0212	67	31.	16.0	2.2	*	1	0532	167	815.	238.9	7.4	*	1	0852	267	318.
150.7	5.7																
1	0214	68	36.	18.5	2.2	*	1	0534	168	812.	238.6	7.4	*	1	0854	268	316.
149.9	5.7																
1	0216	69	43.	21.7	2.4	*	1	0536	169	810.	238.2	7.4	*	1	0856	269	314.
149.0	5.6																
1	0218	70	52.	25.8	2.5	*	1	0538	170	808.	237.8	7.4	*	1	0858	270	313.
148.2	5.6																
1	0220	71	63.	30.8	2.7	*	1	0540	171	805.	237.4	7.4	*	1	0900	271	311.
147.4	5.6																
1	0222	72	76.	36.8	2.9	*	1	0542	172	803.	237.0	7.4	*	1	0902	272	309.
146.6	5.6																
1	0224	73	91.	43.7	3.1	*	1	0544	173	800.	236.7	7.4	*	1	0904	273	307.
145.8	5.6																
1	0226	74	108.	51.5	3.3	*	1	0546	174	798.	236.3	7.4	*	1	0906	274	306.
145.0	5.6																
1	0228	75	126.	59.9	3.6	*	1	0548	175	795.	235.9	7.4	*	1	0908	275	304.
144.1	5.5																
1	0230	76	145.	68.7	3.9	*	1	0550	176	793.	235.5	7.4	*	1	0910	276	302.
143.3	5.5																
1	0232	77	165.	77.9	4.1	*	1	0552	177	790.	235.1	7.4	*	1	0912	277	301.
142.5	5.5																
1	0234	78	185.	87.4	4.3	*	1	0554	178	788.	234.7	7.3	*	1	0914	278	299.
141.7	5.5																
1	0236	79	205.	97.0	4.5	*	1	0556	179	786.	234.3	7.3	*	1	0916	279	297.
141.0	5.5																
1	0238	80	225.	106.4	4.7	*	1	0558	180	783.	234.0	7.3	*	1	0918	280	296.
140.2	5.5																
1	0240	81	244.	115.6	4.9	*	1	0600	181	781.	233.6	7.3	*	1	0920	281	294.
139.4	5.4																
1	0242	82	262.	124.3	5.1	*	1	0602	182	778.	233.2	7.3	*	1	0922	282	292.
138.6	5.4																
1	0244	83	280.	132.7	5.3	*	1	0604	183	776.	232.8	7.3	*	1	0924	283	291.
137.8	5.4																
1	0246	84	296.	140.5	5.5	*	1	0606	184	773.	232.4	7.3	*	1	0926	284	289.
137.0	5.4																
1	0248	85	312.	147.8	5.6	*	1	0608	185	771.	232.1	7.3	*	1	0928	285	287.
136.3	5.4																
1	0250	86	326.	154.5	5.8	*	1	0610	186	768.	231.6	7.3	*	1	0930	286	286.
135.5	5.4																
1	0252	87	339.	160.9	5.9	*	1	0612	187	765.	231.2	7.3	*	1	0932	287	284.
134.8	5.3																
1	0254	88	355.	166.7	6.0	*	1	0614	188	762.	230.7	7.3	*	1	0934	288	283.
134.0	5.3																
1	0256	89	389.	172.2	6.1	*	1	0616	189	759.	230.1	7.3	*	1	0936	289	281.
133.2	5.3																
1	0258	90	421.	177.2	6.2	*	1	0618	190	755.	229.6	7.2	*	1	0938	290	279.
132.5	5.3																
1	0300	91	451.	181.8	6.3	*	1	0620	191	751.	228.9	7.2	*	1	0940	291	278.
131.7	5.3																
1	0302	92	478.	186.1	6.4	*	1	0622	192	747.	228.2	7.2	*	1	0942	292	276.
131.0	5.3																
1	0304	93	504.	190.2	6.5	*	1	0624	193	742.	227.5	7.2	*	1	0944	293	275.
130.3	5.2																
1	0306	94	529.	194.1	6.6	*	1	0626	194	737.	226.7	7.2	*	1	0946	294	273.
129.5	5.2																
1	0308	95	552.	197.8	6.6	*	1	0628	195	732.	225.9	7.2	*	1	0948	295	272.
128.8	5.2																
1	0310	96	575.	201.3	6.7	*	1	0630	196	726.	225.0	7.2	*	1	0950	296	270.
128.1	5.2																
1	0312	97	596.	204.6	6.8	*	1	0632	197	720.	224.1	7.1	*	1	0952	297	269.
127.3	5.2																
1	0314	98	615.	207.7	6.8	*	1	0634	198	714.	223.1	7.1	*	1	0954	298	267.
126.6	5.2																
1	0316	99	634.	210.5	6.9	*	1	0636	199	708.	222.1	7.1	*	1	0956	299	266.
125.9	5.2																
1	0318	100	651.	213.2	6.9	*	1	0638	200	701.	221.1	7.1	*	1	0958	300	264.
125.2	5.1																

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	9.97-HR
(CFS)	(HR)					
		(CFS)				
859.	4.53		658.	441.	441.	441.
		(INCHES)	.954	1.061	1.061	1.061

		(AC-FT)	326.	363.	363.	363.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE			
			6-HR	24-HR	72-HR	9.97-HR
* (AC-FT)	(HR)					
246.	4.53		214.	150.	150.	150.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
			6-HR	24-HR	72-HR	9.97-HR
* (FEET)	(HR)					
7.57	4.53		6.94	5.16	5.16	5.16

CUMULATIVE AREA = 6.41 SQ MI

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

TIME OF STAGE	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	MAX
+	HYDROGRAPH AT	A1	64.	2.37	12.	7.	7.	.08		
+	HYDROGRAPH AT	A7	44.	2.27	6.	4.	4.	.03		
+	HYDROGRAPH AT	01	153.	2.53	35.	21.	21.	.23		
+	3 COMBINED AT	CP-01	229.	2.47	53.	32.	32.	.34		
+	ROUTED TO	CP-A15	227.	2.83	54.	33.	33.	.34		
+	HYDROGRAPH AT	A5	66.	2.27	10.	6.	6.	.06		
+	ROUTED TO	CP-A10	65.	2.30	10.	6.	6.	.06		
+	HYDROGRAPH AT	A10	117.	2.23	16.	10.	10.	.08		
+	2 COMBINED AT	CP-A10	170.	2.27	26.	16.	16.	.14		
+	ROUTED TO	CP-A15	170.	2.30	26.	16.	16.	.14		
+	HYDROGRAPH AT	A15	124.	2.30	19.	11.	11.	.10		
+	3 COMBINED AT	CP-A15	307.	2.83	98.	60.	60.	.58		
+	ROUTED TO	CP-A20	306.	3.00	99.	60.	60.	.58		
+	HYDROGRAPH AT	05	82.	2.30	14.	8.	8.	.10		
+	ROUTED TO	CP-A20	81.	2.57	14.	9.	9.	.10		
+	HYDROGRAPH AT	A20	232.	2.40	44.	27.	27.	.25		
+	HYDROGRAPH AT	A25	32.	2.27	5.	3.	3.	.03		
+	HYDROGRAPH AT	A27	34.	2.23	4.	3.	3.	.02		
+	5 COMBINED AT	CP-A20	569.	2.50	165.	101.	101.	.98		
+	ROUTED TO	CP-A25	567.	2.53	165.	101.	101.	.98		
+	HYDROGRAPH AT	A23	79.	2.23	11.	6.	6.	.05		
+	ROUTED TO	CP-A25	78.	2.27	11.	6.	6.	.05		
+	2 COMBINED AT	CP-A25	599.	2.53	176.	107.	107.	1.03		
+	ROUTED TO	CP-A30	598.	2.53	176.	107.	107.	1.03		
+	HYDROGRAPH AT	O25	77.	2.50	17.	10.	10.	.13		
	HYDROGRAPH AT									

+		020	147.	2.57	36.	22.	22.	.26
+	ROUTED TO	CP-030	146.	2.67	36.	22.	22.	.26
+	HYDROGRAPH AT	030	65.	2.53	15.	9.	9.	.13
+	3 COMBINED AT	CP-030	276.	2.60	68.	41.	41.	.53
+	ROUTED TO	CP-045	275.	2.60	68.	41.	41.	.53
+	HYDROGRAPH AT	045	95.	2.33	16.	9.	9.	.08
+	2 COMBINED AT	CP-045	329.	2.57	84.	51.	51.	.61
+	ROUTED TO	CP-050	328.	2.60	84.	51.	51.	.61
+	HYDROGRAPH AT	057	575.	2.37	102.	62.	62.	.53
+	ROUTED TO	CP-050	570.	2.47	102.	62.	62.	.53
+	HYDROGRAPH AT	050	493.	2.40	90.	54.	54.	.46
+	3 COMBINED AT	CP-050	1301.	2.47	275.	166.	166.	1.60
+	ROUTED TO	CP-010	1299.	2.50	275.	166.	166.	1.60
+	HYDROGRAPH AT	010	68.	2.30	11.	7.	7.	.08
+	2 COMBINED AT	CP-010	1346.	2.50	286.	173.	173.	1.68
+	ROUTED TO	CP-036	1345.	2.50	287.	173.	173.	1.68
+	HYDROGRAPH AT	036	166.	2.27	24.	15.	15.	.12
+	HYDROGRAPH AT	060	95.	2.30	17.	10.	10.	.15
+	ROUTED TO	CP-036	94.	2.30	17.	10.	10.	.15
+	3 COMBINED AT	CP-036	1508.	2.50	327.	198.	198.	1.94
+	ROUTED TO	CP-A30	1507.	2.50	327.	198.	198.	1.94
+	HYDROGRAPH AT	A30	78.	2.27	12.	7.	7.	.07
+	3 COMBINED AT	CP-A30	2150.	2.50	514.	312.	312.	3.04
+	ROUTED TO	CP-A31	2145.	2.50	514.	312.	312.	3.04
+	HYDROGRAPH AT	A28	34.	2.23	4.	3.	3.	.02
+	ROUTED TO	CP-A31	33.	2.27	4.	3.	3.	.02
+	HYDROGRAPH AT	A31	71.	2.27	10.	6.	6.	.05
+	3 COMBINED AT	CP-A31	2196.	2.50	528.	321.	321.	3.11
+	ROUTED TO	CP-S1A	2184.	2.57	527.	320.	320.	3.11
+	HYDROGRAPH AT	B10	9.	2.20	1.	1.	1.	.01
+	HYDROGRAPH AT	B20	7.	2.20	1.	1.	1.	.01
+	2 COMBINED AT	C12	16.	2.20	2.	1.	1.	.01
+	HYDROGRAPH AT	C2	5.	2.33	1.	1.	1.	.01
+	HYDROGRAPH AT	B30	6.	2.20	1	0.	0.	.01

+	2 COMBINED AT	C23	9.	2.27	2.	1.	1.	.01
+	ROUTED TO	C3	9.	2.40	2.	1.	1.	.01
+	HYDROGRAPH AT	B40	127.	2.20	17.	10.	10.	.09
+	HYDROGRAPH AT	SD43	64.	2.47	16.	10.	10.	.09
+	HYDROGRAPH AT	B50	104.	2.20	14.	8.	8.	.08
+	2 COMBINED AT	C45	139.	2.20	29.	18.	18.	.17
+	HYDROGRAPH AT	CP4	163.	2.23	35.	22.	22.	.20
+	2 COMBINED AT	CCP4	283.	2.20	52.	32.	32.	.30
+	HYDROGRAPH AT	CP3	302.	2.23	58.	36.	36.	.34
+	2 COMBINED AT	CCP3	304.	2.23	60.	37.	37.	.35
+	HYDROGRAPH AT	MX1	42.	2.20	6.	3.	3.	.03
+	HYDROGRAPH AT	MX2	95.	2.20	13.	8.	8.	.08
+	2 COMBINED AT	MX12	137.	2.20	18.	11.	11.	.11
+	ROUTED TO	MX123	136.	2.20	18.	11.	11.	.11
+	HYDROGRAPH AT	MX3	22.	2.20	3.	2.	2.	.02
+	2 COMBINED AT	CP3A	158.	2.20	21.	13.	13.	.13
+	ROUTED TO	RCP3	155.	2.20	21.	13.	13.	.13
+	2 COMBINED AT	CCP3	455.	2.23	81.	50.	50.	.48
+	ROUTED TO	RCP2	454.	2.23	81.	50.	50.	.48
+	HYDROGRAPH AT	RP2	26.	2.50	6.	4.	4.	.05
+	2 COMBINED AT	CCP2	468.	2.23	87.	54.	54.	.53
+	HYDROGRAPH AT	SVRW	40.	2.47	9.	5.	5.	.06
+	HYDROGRAPH AT	EB	7.	2.37	1.	1.	1.	.01
+	HYDROGRAPH AT	WB	10.	2.47	2.	1.	1.	.02
+	HYDROGRAPH AT	WSVR	7.	2.40	1.	1.	1.	.01
+	5 COMBINED AT	CP1	503.	2.23	100.	62.	62.	.63
+	HYDROGRAPH AT	S1	679.	2.33	113.	68.	68.	.52
+	3 COMBINED AT	CP-S1	1116.	2.33	216.	132.	132.	1.16 @ La Media
+	2 COMBINED AT	CP-S1A	2955.	2.53	736.	452.	452.	4.26
+	ROUTED TO	CP-S10	2950.	2.53	736.	452.	452.	4.26
+	HYDROGRAPH AT	A60	45.	2.23	6.	4.	4.	.03
+	ROUTED TO	CP-A50	44.	2.30	6.	4.	4.	.03
+	HYDROGRAPH AT	055	463.	2.33	79.	48.	48.	.48
+	ROUTED TO	CP-A50	462.	2.37	79.	48.	48.	.48

+	HYDROGRAPH AT	A50	287.	2.33	46.	28.	28.	.25
+	3 COMBINED AT	CP-A50	771.	2.33	131.	79.	79.	.76
+	DIVERSION TO	A50	156.	2.33	4.	2.	2.	.76
+	HYDROGRAPH AT	A50	615.	2.33	127.	77.	77.	.76
+	HYDROGRAPH AT	A42	46.	2.23	6.	4.	4.	.03
+	2 COMBINED AT	CP-A50	658.	2.27	133.	80.	80.	.80
+	ROUTED TO	CP-A45	653.	2.40	133.	80.	80.	.80
+	HYDROGRAPH AT	A40	45.	2.23	6.	4.	4.	.03
+	ROUTED TO	CP-A45	44.	2.43	6.	4.	4.	.03
+	HYDROGRAPH AT	A35	92.	2.27	13.	8.	8.	.06
+	ROUTED TO	CP-A45	90.	2.43	13.	8.	8.	.06
+	HYDROGRAPH AT	A45	154.	2.30	24.	14.	14.	.12
+	4 COMBINED AT	CP-A45	915.	2.40	176.	106.	106.	1.02
+	DIVERSION TO	A45	855.	2.37	126.	76.	76.	1.02
+	HYDROGRAPH AT	A45	60.	2.37	50.	31.	31.	1.02
+	ROUTED TO	CP-S10	60.	2.60	50.	30.	30.	1.02
+	HYDROGRAPH AT	S10	273.	2.47	54.	32.	32.	.26
+	3 COMBINED AT	CP-S10	3270.	2.53	839.	515.	515.	5.54
+	ROUTED TO	CP-B30	3217.	2.60	838.	514.	514.	5.54
+	HYDROGRAPH AT	A65	76.	2.23	10.	6.	6.	.05
+	ROUTED TO	CP-S25	74.	2.53	10.	6.	6.	.05
+	HYDROGRAPH AT	S25	38.	2.47	8.	5.	5.	.08
+	2 COMBINED AT	CP-S25	111.	2.53	19.	11.	11.	.14
+	ROUTED TO	CP-S20	108.	2.57	19.	11.	11.	.14
+	HYDROGRAPH AT	S20	66.	2.43	14.	8.	8.	.14
+	2 COMBINED AT	CP-S20	166.	2.57	33.	20.	20.	.27
+	ROUTED TO	CP-B30	162.	2.73	32.	20.	20.	.27
+	HYDROGRAPH AT	S15	167.	2.27	24.	15.	15.	.13
+	ROUTED TO	CP-B30	163.	2.37	24.	15.	15.	.13
+	HYDROGRAPH AT	B30	54.	2.23	7.	4.	4.	.04
+	ROUTED TO	CP-B25	52.	2.30	7.	4.	4.	.04
+	HYDROGRAPH AT	B25	162.	2.27	23.	14.	14.	.13
+	2 COMBINED AT	CP-B25	212.	2.27	30.	18.	18.	.17
	ROUTED TO							

		Pk Flow	Tpk	6	24	72	Area
	CP-B25	209.	2.43	30.	18.	18.	.17
HYDROGRAPH AT	B15	108.	2.27	15.	9.	9.	.07
ROUTED TO	CP-B30	107.	2.30	15.	9.	9.	.07
HYDROGRAPH AT	B30	90.	2.80	28.	17.	17.	.23
6 COMBINED AT	CP-B30	3673.	2.60	967.	593.	593.	6.41
ROUTED TO	DB-030	859.	4.53	658.	441.	441.	6.41

4.53 1 7.57

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING

6.78 mi²

APPENDIX G-2

Review of Otay Mesa Drainage Studies

TETRA TECH

Review of Otay Mesa Drainage Studies

Contract H084445

Task Order No. 16

think BLUE SM

SAN DIEGO

Review of Otay Mesa Drainage Studies

Contract H084445

Task Order No. 16

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I. Introduction

Otay Mesa is a community located within the City of San Diego. Originally developed as an industrial area in 1985 in response to the creation of a U.S./Mexico border crossing, Otay Mesa now includes residential areas, an airport, and more than 1200 companies which sell and ship directly to Mexico or utilize the labor pool that commutes from Tijuana. Current development projects in the area include a major transportation project, State Route 905, to improve traffic in the region, with completion anticipated by 2013. With this, continued industrial and residential growth is anticipated. See Figure 1 for a map of Otay Mesa's location.

Figure 1. Location of Otay Mesa

Prior to development, the region was primarily an agricultural community. Effects of increased development were identified soon after it began. Because most of the Mesa drains south towards Mexico, concern arose over increased stormwater runoff crossing the border. In 1987, the City Council approved a contract to prepare the Otay Mesa Master Drainage Plan and published a Notice to "All Private Engineers" that established drainage requirements for development in Otay Mesa. The Notice required no increase in the rate of stormwater runoff from the property after development than it was before development, by the construction of stormwater detention basins on-site. The Notice also

indicated the plans of the City's Engineer Office, Flood Control Section, to prepare a plan for a main north–south channel from Otay Mesa Road to the Mexican border. The *Otay Mesa Drainage Master Plan- Preliminary Channel Design* was published in January 1988, and was updated in August 1999 (*Otay Mesa Drainage Study*), May 2005 (*Otay Mesa Community Plan Update*), and April 2007 (*Drainage Study for the Otay Mesa Community Plan Update*.)

Most existing drainage facilities were constructed as part of private development. These facilities are discontinuous because of the nature of individual development projects, which creates difficulties for subsequent developers that need to connect to private drainage facilities. Most development has occurred in the East Watershed of the Mesa, where most existing drainage facilities are located. These facilities consist of a system of storm drains, improved channels, and detention basins. Many of the detention basins discharge to natural drainages, which do not have adequate hydraulic capacity. Flooding therefore occurs occasionally in the area.

Because of continuing development in the area, recommendations and guidance provided in the previous drainage reports quickly become outdated. This document provides a review of the previous reports and summarizes report recommendations. Current land use and drainage patterns, as well as regulations regarding stormwater are also reviewed to provide up-to-date considerations and recommendations for the placement of storm water management facilities and to shed light on potential restoration projects that may be required to mitigate impacts to sensitive areas (e.g., vernal pools).

II. Review of Completed and Draft Planning and Engineering Reports

A. Introduction

The purpose of this report is to provide a summary of the engineering reports to gain a better understanding on the motivation behind the reports and to highlight considerations that may require additional thought weighed if progress were to be made in implementing the projects contained within the engineering reports.

B. Review of Pertinent Notices and Planning Reports

The following sections are a summary of four engineering reports for the Otay Mesa that were supplied to Tetra Tech by the City of San Diego.

August 7, 1987. Notice to All Private Engineers

The notice required all property in Otay Mesa that is within the watershed that drains to Mexico to be developed with the following requirements:

- Each property owner shall provide stormwater detention facilities so that there will be no increase in the rate of runoff due to development of the property.
- The detention facility shall be designed so that the rate of runoff from the property will be no greater after development than it was before development for a 5-year, 10-year, 25-year, and 50-year storm.
- All drainage facilities crossing four-lane major or higher classification streets shall be designed for a Q100 (existing). Other facilities, except the major channel described below, may be designed for Q50 (existing).

- The Drainage Design Manual shall be used as guidelines for design of drainage facilities, and computing design discharges.
- The City's Engineer Office, Flood Control Section, is preparing a preliminary plan for the main north-south channel from Otay Mesa Road near La Media to the Mexican border. The preliminary design will include the design Q (Q100 existing), the invert grade and the water surface elevation at the major road crossings.

January 1988. Otay Mesa Drainage Master Plan – Preliminary Channel Design

This document provided the initial preliminary design for the main channel indicated in the Notice, above.

Introduction: To prevent flooding problems, the City has required individual developments to regulated runoff from their property. The Mesa is zoned for industrial and commercial use. To allow for the planning and development of the area, an area-wide drainage collection and conveyance system is needed to serve the many individual properties. The report presented a preliminary channel design for a main channel to give Otay Mesa developers a basis for the design of the individual property storm drains.

Hydrologic Analyses: The hydrologic analysis was conducted using the US Army Corp of Engineers (US ACE) HEC-1 flood hydrograph computer model. The watershed was divided into 53 subareas, and the design storm was a 100-year, 6-hour event. The precipitation for the design event was estimated for the 53 subareas from the NOAA isopluvial map for San Diego. Other inputs for the program included the percent of impervious area in the subarea, the Soil Conservation Service (SCS) curve number, which was estimated from SCS soil maps and existing land uses, and the basin lag time. The HEC-1 model calculated peak discharges at 5 flow concentration points along the proposed channel route.

Hydraulic Analyses: The hydraulic analysis was conducted using the US ACE HEC-2 water surface profile computer program. The design discharges for various segments of the channel were those calculated using the HEC-1 model. A minimum of 1 foot of free board was assumed, and the top of road, top of bank, and channel invert elevations needed to develop cross-sectional input data was determined from maps, surveying notes, and road grading plans for the area. Other input parameters for the HEC-2 program were estimated, using the guidelines in the HEC-2 user's manual and independent hydraulic calculations, and included the Manning's "n" roughness coefficient and flow expansion and contraction coefficients. The analysis also assumed that there would be reinforced concrete box culverts placed at the road crossings and that the design would include a spreading basin at the terminus of the proposed channel. The purpose of the proposed spreading basin in the design was to reduce flow velocities, to spread flows such that the discharge to Mexico would occur in approximately the same area, to provide area for potential wetland mitigation, and to lessen the adverse aesthetic of a concrete channel. The results of the hydraulic analysis provided the optimal design of the main channel. The channel was designed as a concrete trapezoidal channel with a 2:1 slope.

Conclusions: The proposed channel would start at the south end of reinforced box concrete culverts under Otay Mesa Road just east of La Media Road, and then end with the spreading basin prior to discharge to Mexico. The proposed channel is approximately 7,570 feet (ft) long, with a width of 56 –

150 ft. The final 515 ft length of the channel would encompass the spreading basin, which would be approximately 600 ft wide. The spreading basin would be planted with natural riparian vegetation and would have a low-flow channel connecting the upstream concrete channel to the existing channel in Mexico.

August 9, 1999. Otay Mesa Drainage Study

This document provided an update to the 1988 Master Plan and identified a project that was compatible with new development plans for Otay Mesa and considered environmental constraints and alternative analyses.

Introduction: The goal of the document was to provide a primary drainage channel from Otay Mesa Road to the border with Mexico to accommodate runoff from existing and future development. Since the 1988 study, new channels, roads, development and detention basins had been constructed. The original project predicted construction of the channel described by 2005. The funding for the project was proposed to be collected from fees collected at the Final Map/ Building Permit approval for new developments.

Hydrologic Analysis: The new hydrologic analysis using the United States Army Corps of Engineers (US ACE) Hydraulic Engineering Center – HEC-1 model reflected runoff expected with new developments. The US ACE HEC-1 model was used, and the SCS method of analysis was used to estimate the rainfall on subareas with the study area. Guidance from the San Diego County Hydrology manual was used in providing required input for the program. The analysis derived subareas and flow concentration points based on existing drainage facilities, and where available, improvement plans for proposed facilities. If no improvement plan was available, the hydrologic criteria and drainage paths were based on assumptions of further development from master plans for the Mesa. The analysis included the proposed SR 905 and SR 125 freeways, and the proposed San Diego Air Commerce Center.

Hydraulic Analysis: Water surface profiles for the proposed channel were generated using the US ACE Hydraulic Engineering Center – River Analysis System (HECRAS), Version 1.2, a US ACE computer program. The HECRAS program determined steady state flow conditions based on user supplied cross section geometry and flow rates.

The slope of the proposed channel would be controlled by the gradual slope of the Mesa, the existing drainage facility located under Otay Mesa Road, and the channel elevation at the border. To convey the 100-year flood flow, the proposed channel would have to be very wide. A rectangular channel was recommended, as the rectangular shape carries the most flow per unit of area. The proposed rectangular channel would have a width of 40 ft across the inside bottom, plus wall width and channel access, such that the total width would be 55 ft. Any channel narrower and deeper than that proposed would possibly affect the ability of adjacent properties to properly drain. Existing sewer lines also constrained the depth of the proposed channel.

Environmental Constraints

Hydrologic: The future design of the Otay Mesa Master Drainage Plan would need to include future projects, including SR 905, SR 125, the Otay Mesa Road future realignment, and the Brown Field Airport. The project must meet the purpose and interest of the San Diego Environmentally Sensitive

Lands Ordinance. The channel design must also consider the effects of other planned projects in the vicinity and the concerns of the International Boundary and Water Commission (IBWC) regarding stormwater runoff rates. Permit requirements for the project would also likely include the use of soft bottom for the channel and incorporation of natural vegetation as much as possible, and demonstration that the project minimizes impacts to regional wildlife habitat.

Biological Resources: The Empire Center Mitigation Site, constructed in 1997 as part of a City, State and federal permitting action for an earlier project, included 5 acres of land in an area north of Airway Road and west of La Media Road and included over 12 created and naturally occurring vernal pools and habitat for San Diego button celery, a federally listed species. At least 14 vernal pools, encompassing approximately 25,756 ft^2, are located outside of the mitigation area. A patch of freshwater marsh was identified in the vernal pool restoration area. Mitigation at a probable ratio of 2:1 would be required to ameliorate any impacts to vernal pools and the freshwater marsh. Indirect effects to wetlands through changes in drainage patterns that could significantly affect their functionality would also possibly require mitigation.

Recommended actions for the Master Drainage Plan in reference to biological resources constraints included:

- Avoiding impacts to the Empire Centre Mitigation Site;
- Accurately mapping vernal pools with a survey crew in the spring;
- Avoiding impact to the vernal pools or concurrently mitigating impacts to the pools outside of the project site;
- Avoiding impacts to federally listed and narrow endemic plant species (i.e., San Diego celery-button, Otay tarplant, and variegated dudleya;
- Avoiding impacts to the San Diego Multi-Habitat Planning Area (MHPA);
- Including plans in the Master Drainage Plan to maintain low flow drainage patterns to avoid indirect effects on wetland habitats;
- Conduct surveys for burrowing owl burrows prior to development and impacts should be avoided or mitigated;
- Conduct protocol surveys for other potential federally listed species on the site;
- Mitigation of nonnative grassland at a ratio of 0.5:1.

Cultural Resources: Completion of a literature review and record searches at San Diego University and the San Diego Museum of Man was recommended for previously conducted archeological surveys.

Alternative Analyses

The objective of the alternatives analysis was to identify an alignment for the drainage channel that will efficiently convey the flows from an existing rectangular concrete box culvert under Otay Mesa Road to the U.S.-Mexico Border while minimizing impacts on environmentally sensitive areas and adjacent properties. The preferred alternative placed the channel along the east side of La Media to a box culvert crossing from the northeast corner to the northwest corner of the intersection of La Media with Siempre Viva Road. The channel continued along the north side of Siempre Viva from the box culvert outlet at La Media to a box culvert crossing to the south side of Siempre Viva to connect to the existing stream channel. This alternative was chosen as the preferred alternative because an existing drainage ditch is on the east side of La Media Road; the channel would intercept flows from

the east without potential conflicts from utilities in La Media Road; and flows from the west would continue to flow in the old drainage path. Additionally, the alternative minimizes impact on properties by following the property line and minimizes potential utilities conflicts in Siempre Viva Road by crossing under it through a box culvert at the existing stream location.

Possible funding mechanisms identified for funding the project included general obligation bonds, Mello-Roos Community Facilities Districts tax, special assessment bonds, and certificates of participation.

May 2005. Drainage Study for Otay Mesa Community Plan Update

The report was prepared as an appendix to the Otay Mesa Community Plan update EIR to provide a summary of existing drainage facilities and to provide alternatives for draining the Mesa. Most existing drainage facilities are located within East Watershed. The system existing at the time of the report was a combination of storm drains, improved channels, and detention basins, which discharge in many areas to natural drainage paths that do not have adequate hydraulic capacity. As many of the projects have been developed, portions of the properties have been dedicated to the city as drainage easements or flood water storage easements. These were presumably recorded as easements, however, this part of the Study was not verified.

Hydrologic Analysis: The Otay Mesa Drainage Study area included all of the Mesa area within the City of San Diego, divided into 5 watersheds (West Perimeter, West, North Perimeter, East, and Border Crossing), excluding the far northwest arm of the Mesa which had been fully developed. Most of Otay Mesa slopes from north to south with flow entering Mexico at several points. The perimeter of the Mesa drains into the adjacent canyons. The watershed boundaries on the Mesa are not well defined because the Mesa is flat, with stormwater run-off mostly sheet-flowing across the Mesa. Previous drainage study reports (1988, 1999) prepared hydrologic analyses for the East watershed. In the current report, new hydrologic models were developed using the HEC-1 model for the East watershed, since that was the hydrologic model previously used in analysis of the watershed. For the other main watersheds, West Perimeter and West, the AES-developed standard City of San Diego Modified Rational Method was used. The hydrologic analyses calculated that the total flow from these watersheds at the concentration point at the border for the 100-year flow was 5,793 cubic feet per second (cfs). The Spring Canyon open space in the West Watershed was calculated to contribute an additional 257 cfs.

Hydraulic Analysis: The HEC-RAS model was used to size the 100-year floodplain of Otay Mesa Creek based on current conditions. The model was also used to size the proposed new channel to contain the 100-year flow which would reduce or eliminate flooding impacts to nearby facilities. An existing channel that is tributary to the proposed main channel and located just upstream of the Siempre Viva Road Crossing is approximately 15 ft wide and 4 ft deep, with a hydraulic capacity of approximately 120 cfs. The 100-year flow in this channel however would be 1116 cfs. A new channel proposed for this tributary by this report is sized 50 ft wide with 1.5:1 side slopes to convey the 100 year flow. The cost estimate proposed by this report does not include this tributary channel.

Proposed Drainage Facilities: Caltrans had completed their plans for the SR-905 project. For proposed private development, the only Master Planned facility which would need to be constructed prior to

continued development is the Main Channel and the Detention Basin in the East Watershed. The Main Channel proposed by this report would have a bottom width of 240 ft at the Detention Basin to 200 ft from just north of Siempre Viva Road to the intersection of Airway Road and La Media Road. The side slopes would be 4:1 to 10:1 and heavy riparian vegetation would be allowed to grow in the channel. Hiking trails and access roads with a width of 12 feet would line each bank of the channel. At the Airway Road and La Media intersection, a 35 ft wide concrete channel would connect the channel with the proposed Caltrans culverts which would be constructed concurrently with SR 905.

The proposed Detention Basin was designed to attenuate peak flows from 5 year to 100 year storms, with dimensions of approximately 1700 ft by 1500 ft. The basin would encompass 58 acres with a maximum storage depth of 6.0 ft and a maximum storage volume of 308 acre-ft. The basin would be graded and vegetated to appear natural and to create a low flow stream. The basin and channel would require removal of 915,000 cubic yards of soil. It was assumed this soil would be used on adjacent properties to raise building pad grades.

A preliminary cost estimate was $23,868,000 to complete the proposed project.

Recommended Drainage Design Criteria: The current study estimated that approximately 140 cfs will flow off of Otay Mesa into the West Perimeter Watershed. Detention basins were recommended for this watershed to reduce peak flows to predevelopment levels. Because of unstable soils in the area, placement of these detention basins and relocation of drainage facilities should be planned carefully to avoid an increase in soil instability and slope failure.

The West Watershed consists of smaller mesa-top watersheds that drain into the tributary canyons of Spring Canyon, which then flow into Mexico via the Spring Canyon concentration point. Detention basins were recommended in this watershed to reduce post-development peak flows to predevelopment levels. Care must be taken if detention basins concentrate flows at the upper edge of canyons so that erosion potential is not increased downstream.

Requirements have already been implemented in the East Watershed for control of peak runoff from development. The August 7, 1987 Notice provided requirements for individual developments to regulate stormwater such that runoff from developed properties did not increase above the runoff rate prior to development. The proposed single Detention Basin at the border would eliminate the need for individual on-site detention basins for subsequent development.

In the North Perimeter watershed, there were no identified peak flow attenuation requirements for the small watersheds that flow into small canyons that flow into the Otay River.

Stormwater Quality Requirements: The City requires Best Management Practices (BMPs) be constructed for all new projects. In 2003, the City published “Storm Water Standards – A Manual for Construction & Permanent Storm Water Best Management Practices Requirements”, a reference document for all stormwater issues encountered in development. Most projects on Otay Mesa will require Priority Project Permanent Storm Water BMPs and High Priority Construction Storm Water BMPs. The manual requires the submission of a “Water Quality Technical Report” for all projects subject to priority permanent BMP requirements.

Most of Otay Mesa drains to the south across the U.S./Mexico border to the Tijuana River, which has been identified as an impaired water body pursuant to section 303(d) of the Clean Water Act. A small portion of the drainage flows north into the Otay River and the far western part of the Mesa flows to the west through San Ysidiro and then into the Tijuana River.

April 2007. Drainage Study for the Otay Mesa Community Plan Update

The 2007 report was identical to the 2005 report, except for the addition of a section regarding the proposed drainage alternatives. This additional section is summarized below.

No Project Alternative: The alternative of doing nothing to improve drainage along the main creek channel would prevent future development from taking place along portions of La Media Road. The intersection of Airway Road and La Media Road floods during significant precipitation. The existing creek would not be deep enough to allow adjacent properties to drain effectively. To provide continued access along the truck route during storms the roads would need to be raised to allow flow to pass under them, or an alternative route would need to be identified.

Concrete Channel: The 1999 Otay Mesa Drainage Study identified a concrete channel as a recommended plan from Otay Mesa Road to the Border Detention Basin. The concrete channel would follow the east side of La Media Road until intersecting at Siempre Viva Road, where it crossed under La Media and followed on the north side of Siempre Viva to box culverts under Siempre Viva that connected to the Border Detention Basin. The concrete channel plan assumed that the existing creek with its habitat would continue to carry low flows. The 1999 cost for this project was $10.6 million dollars, without including land acquisition costs, which corresponds to a 2005 cost of $14.9 million.

La Media Channel and Border Detention Basin: The East Watershed is the largest watershed on the Mesa. All flows from the watershed collect at a concentration point at a large culvert where flows cross the U.S./Mexico border. The surrounding area is very flat and adjacent properties cannot drain effectively into the existing creek. To allow for future development, and to accommodate runoff from proposed future projects, a new channel would be required that has an invert of 3 to 5 feet below that of the existing creek channel. The proposed La Media Channel and Border Detention Basin would be built as described in the 2005 report.

C. Impetus of Drainage Studies

Tetra Tech was asked to provide as much detail as possible into the funding and motivation behind the drainage studies completed for Otay Mesa. It is well understood that the first report in 1988 was intended to provide drainage opportunities in the developing Otay Mesa area. The 1999, 2005, and 2007 reports all indicate the need for drainage planning in the rapidly developing Mesa area but also point to the need for water quality considerations and regulations, as well. Meeting regulatory requirements for flood and drainage control (1988) as well as water quality and environmental considerations (1999, 2005, and 2007) seem to be the initial motivation behind the reports.

The drainage reports provided little insight into the funding mechanisms supporting these studies. There were suggestions in several of the studies for funding mechanisms to implement the recommendations

within the studies including general obligation bonds, Mello-Roos Community Facilities Districts tax, special assessment bonds, and certificates of participation. Based on the direction of recommendations, the development community might have initiated the request for drainage control and improved drainage within the public right of way to accommodate drainage from developing areas. However, it is also quite possible that the motivation was also a part of a plan to design the public portion of the drainage system to fully accommodate a built out Otay Mesa that would provide the necessary public safety and flood control needs that a future fully developed scenario might require.

III. Data Compilation and Review

Plans and data including GIS data relevant to Otay Mesa study have been compiled for this report. Relevant drainage requirements and existing drainage plans for Otay Mesa area are summarized in the previous section. Using GIS data, drainage areas for the project site were defined and relevant spatial analyses have been conducted for each drainage area. Potential areas for restoring or improving vernal pools were identified using soil suitability, land uses, and site availability.

A. Data Compilation

The following data were compiled for this Otay Mesa study. Most of the data were downloaded from two websites, SanGIS (http://files.sangis.org/) and SANDAG (http://www.sandag.org/). Vernal pools data were supplied directly from the City.

- Otay Mesa community boundary (SanGIS)
- Zoning (SanGIS)
- Land use (SANDAG)
- Soils (SanGIS)
- Topography: 20-m DEM and 2-ft contours (SanGIS)
- Streams (SanGIS)
- Roads / Streets (SanGIS)
- Parcel boundaries (SanGIS)
- Watershed / Subwatershed boundaries (SanGIS)
- Vegetation (SanGIS)
- Existing vernal pools (City)

B. Drainage Areas

From the existing watershed/subwatershed data, three drainage areas were found in the Otay Mesa study area, which are Otay Valley, San Ysidro, and Water Tanks. Otay Valley covers north of Otay Mesa around the Otay River, San Ysidro covers west, and Water Tanks covers south of Otay Mesa. Otay Valley and Water Tanks were sub-divided into east and west areas respectively. As a result, the Otay Mesa area was divided into five drainages as shown in Figure 2. The sizes of drainage areas are presented in Table 1.

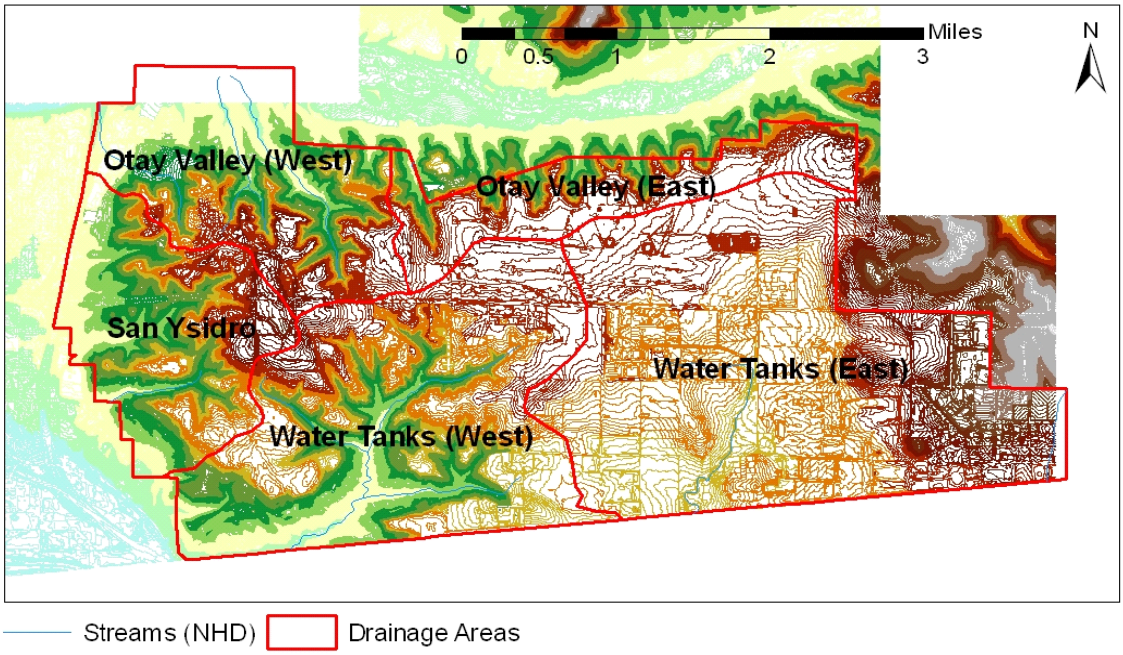

Figure 2. Defined Drainage Areas

Table 1. Drainage Area Sizes

Drainage Areas	Acres
Otay Valley (East)	827.5
Otay Valley (West)	1,378.4
San Ysidro	1,226.1
Water Tanks (East)	3,380.2
Water Tanks (West)	2,488.0
Total	9,300.2

C. Zoning Status

Existing zoning for the Otay Mesa is presented in Figure 3. Otay Mesa zoning consists of Industrial (41.2%), Agricultural (25.4%), Residential (12.2%), Commercial (4.8%), Open Space (0.2%), Other (4.8%), and Unzoned (11.4%) areas. The individual drainage area of each zone and total area is summarized in Table 2.

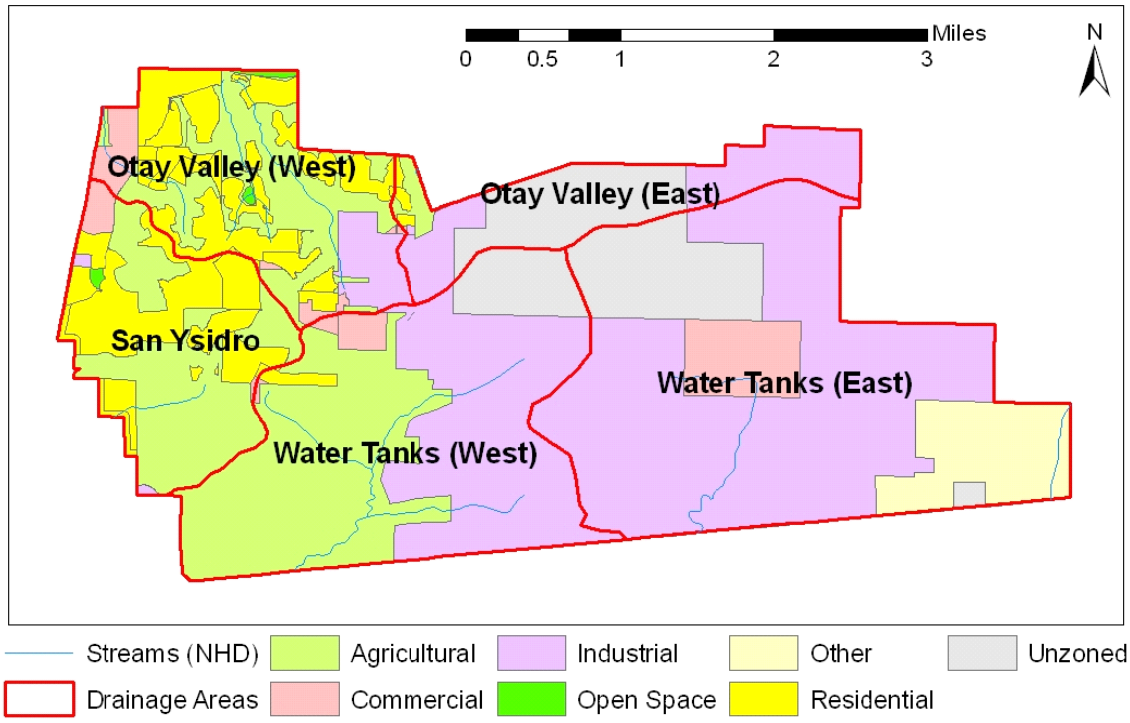

Figure 3. Zoning Status

Table 2. Zoning Status for Drainage Areas

Zoning	Drainage Areas					
	Otay Valley (East)	Otay Valley (West)	San Ysidro	Water Tanks (East)	Water Tanks (West)	Total
Agricultural	46.3	543.2	643.0	0.0	1,127.3	2,359.8
Commercial	0.7	100.2	43.2	241.5	61.5	447.0
Industrial	378.4	149.3	10.6	2,227.9	1,062.6	3,828.7
Open Space	0.0	15.1	5.9	0.0	0.0	21.0
Other	0.0	0.0	0.0	445.3	0.0	445.3
Residential	18.8	570.7	523.3	0.0	25.8	1,138.6
Unzoned	383.3	0.0	0.0	465.7	210.8	1,059.8
Total	827.5	1,378.4	1,226.1	3,380.3	2,488.0	9,300.2

D. Land Uses

Land use status for Otay Mesa is presented in Figure 4 using the 2009 SANDAG land use data set. The detailed land use status for each drainage area is summarized in Table 3. The Otay Mesa land uses consist of Open Space (28.8%), Undeveloped (25.4%), Transportation (21.5%), Industrial (12.1%), Residential (5.6%), Agricultural (3.3%), Commercial (2.1%), Education (1.0%), and Park (0.1%). Land use status appears quite different from the Otay Mesa zoning status. This might be because some areas within a particular zone are not fully developed or because the land use data have more detailed spatial descriptions, which consider topography that can impact land use, than the zoning data.

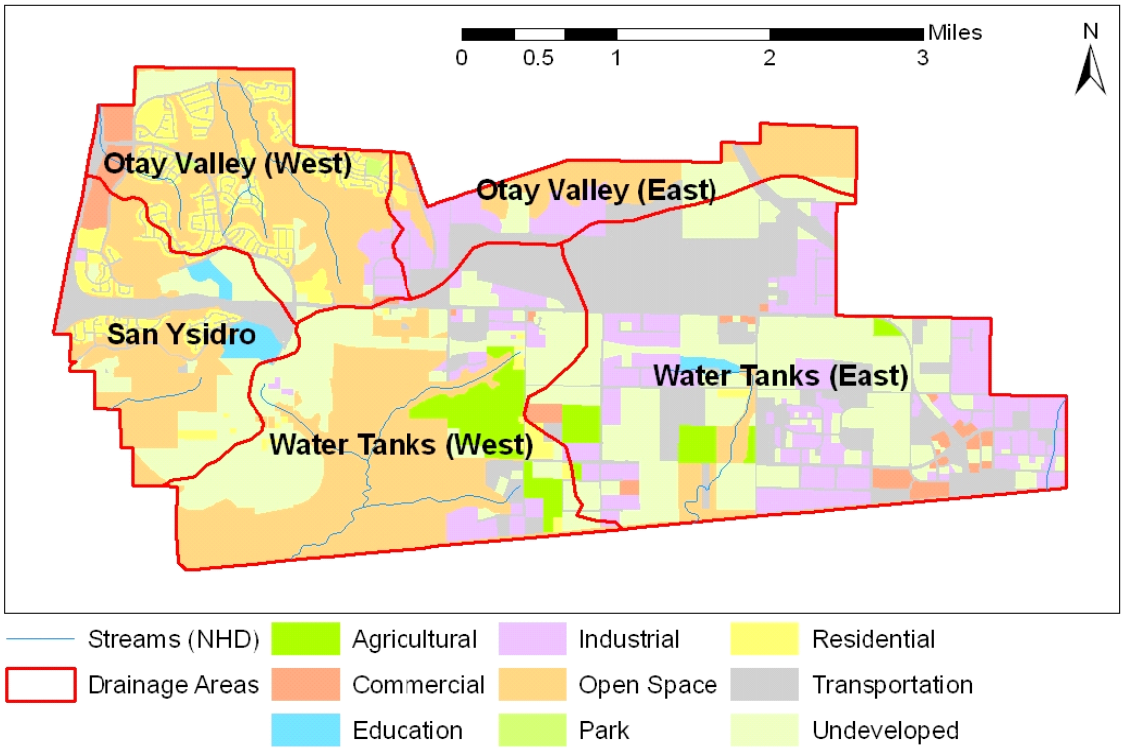

Figure 4. Land Uses

Table 3. Land uses for Drainage Areas

Land Use	Drainage Areas					
	Otay Valley (East)	Otay Valley (West)	San Ysidro	Water Tanks (East)	Water Tanks (West)	Total
Agricultural	0.0	0.0	0.0	101.6	204.3	305.9
Commercial	0.0	60.7	30.6	101.3	5.4	197.9
Education	0.0	0.0	70.1	17.6	0.7	88.4
Industrial	181.6	59.8	2.9	740.5	137.6	1,122.6
Open Space	377.3	629.0	461.2	133.1	1,081.3	2,681.9
Park	0.0	12.9	0.0	0.0	0.0	12.9
Residential	10.7	316.8	136.0	9.9	49.7	523.1
Transportation	146.5	190.0	227.0	1,148.0	290.1	2,001.7
Undeveloped	111.4	109.2	298.1	1,128.2	719.0	2,366.0
Total	827.5	1,378.4	1,226.1	3,380.2	2,488.0	9,300.2

E. Soils

Soil properties for the Otay Mesa are presented in Figure 5. Soil coverage for each drainage area is summarized in Table 4. Otay Mesa is covered mainly by loam (81.2%) and clay (18.0%) type soils.

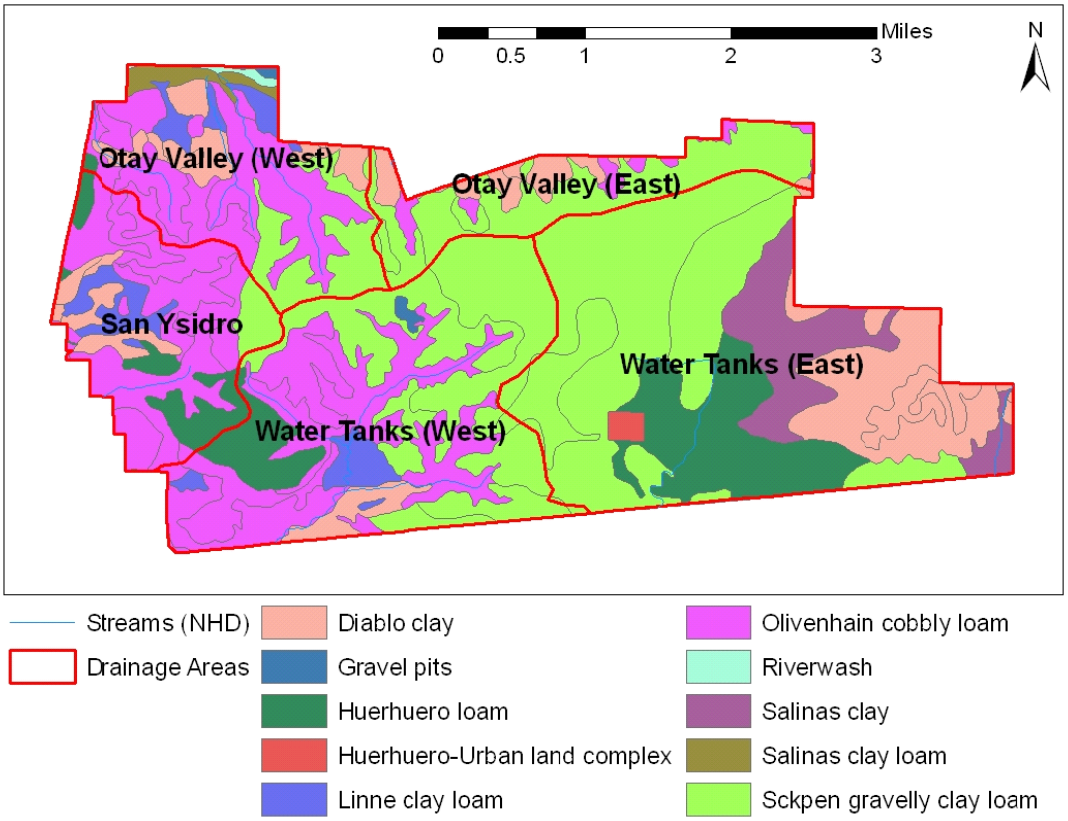

Figure 5. Soils

Table 4. Soils for Drainage Areas

Soils	Drainage Areas					
	Otay Valley (East)	Otay Valley (West)	San Ysidro	Water Tanks (East)	Water Tanks (West)	Total
Diablo clay	149.8	196.0	121.3	635.1	98.0	1,200.1
Gravel pits	0.0	8.6	0.0	0.0	15.7	24.3
Huerhuero loam	0.0	6.9	174.7	606.4	182.4	970.4
Huerhuero-Urban land complex	0.0	0.0	0.0	31.4	0.0	31.4
Linne clay loam	1.5	93.2	111.1	0.0	105.9	311.7
Olivenhain cobbly loam	83.0	714.0	742.3	0.0	989.7	2,529.1
Riverwash	0.0	17.8	0.0	0.0	0.0	17.8
Salinas clay	0.0	0.0	0.0	474.1	0.0	474.1
Salinas clay loam	0.0	71.3	0.0	0.0	0.0	71.3
Stockpen gravelly clay loam	593.1	270.7	76.7	1,633.2	1,096.2	3,670.1
Total	827.5	1,378.4	1,226.1	3,380.2	2,488.0	9,300.2

F. Vegetation

Vegetation coverage for Otay Mesa is presented in Figure 6. The size of vegetation coverage for each drainage area is summarized in Table 5. Otay Mesa vegetation consists mostly of non-native vegetation or developed/unvegetated areas (70.6%), scrub and chaparral (18.9%), grasslands and meadows (10.2%), and other areas (0.4%).

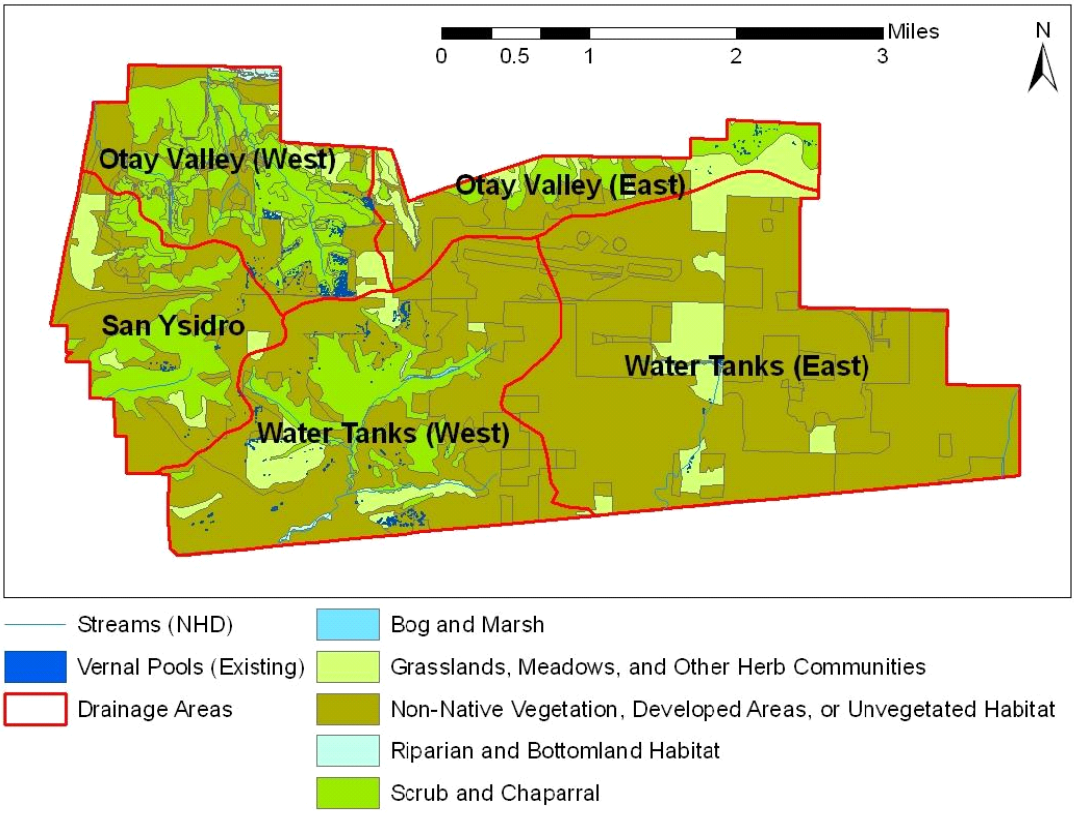

Figure 6. Vegetation of Otay Mesa

Table 5. Vegetation Coverage for Drainage Areas

Vegetation	Drainage Areas					
	Otay Valley (East)	Otay Valley (West)	San Ysidro	Water Tanks (East)	Water Tanks (West)	Total
Bog and Marsh	0.0	0.8	0.0	0.0	4.0	4.8
Grasslands, Meadows, and Other Herb Communities	205.1	88.6	112.0	341.0	201.8	948.5
Non-Native Vegetation, Developed Areas, or Unvegetated Habitat	394.2	528.9	720.2	3,039.2	1,883.4	6,565.9
Riparian and Bottomland Habitat	0.0	17.6	0.2	0.0	8.6	26.4
Scrub and Chaparral	228.2	742.5	393.7	0.0	390.2	1,754.7
Total	827.5	1,378.4	1,226.1	3,380.2	2,488.0	9,300.2

IV. Environmentally Sensitive Lands

A. Vernal Pool Background

Vernal pools are unique seasonal and ephemeral wetlands that result from specific depression-type geomorphic regions. (City of San Diego Vernal Pool Inventory, 2004) Vernal pools form when small, shallow depressions collect precipitation, and by nature are dry basins in the dry months followed by variable lengths of saturation and inundation. [Draft City of San Diego Multiple Species Conservation Program (MSCP) Vernal Pool Management Plan, 2008] The variability in moisture conditions separates these pools from other wetland ecosystems, which is a characteristic of the Mediterranean –type climate that exists in southern California.

Within the City of San Diego, groups or series of vernal pools are found in Del Mar Mesa, Mire Mesa, Carmel Mountain, Kearny Mesa, Mission Trails Regional Park, Otay Mesa, Otay Lakes, and Marron Valley. The pools are often associated with small hills known as Mima mounds, and form in the inter-mound swales. The vernal pools located in these areas have been found to be associated with the particular soil types in these areas. (Bauder and McMillan, 1998) In Otay Mesa, Stockpen, a gravelly clay, is the dominant type of pool-supporting soil, as identified from the county's 1973 Soil Survey maps, with the type of vernal pools associated with this soil called Coastal Mesa pools. Coastal mesa pools are found almost exclusively on the mesas but sustain different flora and fauna depending on the dominant soil series.

Vernal pools support a specific biological ecosystem. Research has found that 47 plant species from 20 families are restricted to vernal pool habitat. (Draft San Diego MSCP Vernal Pool Management Plan, 2008) Vernal pool habitat also supports animals from insect larvae to amphibians, birds, and mammals. San Diego vernal pools provide habitat for two federally listed endangered invertebrates, San Diego and Riverside fairy shrimp; five federally listed endangered plants, spreading navarretia, San Diego and Otay mesa mint, San Diego button celery, and California Orcutt grass; and an unprotected, although rare, plant, little mousetail. *Pogogyne nudiuscula* is a mesa mint species endemic to the coastal mesa pool type of Otay Mesa.

Ecological processes that occur within vernal pools are complex, and not fully understood. Local processes are affected by the relatively short period of wet conditions and relatively small affected area (Leidy and White, 1998). The ecology of the vernal pool is also influenced by larger-scale effects of the watershed including landscape processes of stormwater run-off and native and invasive vegetation. Vernal pools and their associated wetland functions may be indirectly impacted by changes in the watershed, especially changes in hydrologic conditions which need to be considered when development or other landscape changes occur.

B. Otay Mesa Vernal Pools

Within Otay Mesa, the number and quality of vernal pools has been impacted historically by farming and grazing, and more recently, by rapid development in the area. Vernal pool surveys in the San Diego area have been conducted since the late 1970s. In 1988, the California Department of Parks and Recreation estimated that approximately 905 of the Otay Mesa vernal pools had been lost to urban development, agriculture and mining (Leidy and White, 1998). The most recent survey was conducted by the City of San Diego in 2002 – 2003 (City of San Diego Vernal Pool Inventory 2002 – 2003, 2004). This survey identified 29 series, or clusters, of vernal pool basins within the Otay Mesa area, and a total of 983

basins. The survey also identified a total of 12.89 acres of pools that were under creation, enhancement or restoration activities.

The Draft San Diego MSCP Vernal Pool Management Plan identified several factors that should be considered in management and preservation of vernal pools, with urban development identified as the primary threat to these ecosystems. Border Patrol activities along the U.S./Mexico border have caused impacts to Otay Mesa vernal pools because of foot traffic of illegal immigrants and Border Patrol agents. Recreational off-road vehicle users, illegal dumping and littering have also lead to vernal pool impacts. Disturbance and fragmentation of native habitat have resulted in vernal pool ecosystem impacts.

Recommendations for management of vernal pool resources have been implemented at the City and federal level. The 2008 draft San Diego MSCP Vernal Pool Management Plan includes site-specific management requirements and general recommendations for multiple vernal pool complex locations in Otay Mesa. These recommendations include conservation, enhancement or restoration of degraded basins through government implementation, project mitigation requirements, and/or interested non-governmental organizations. The document also recommended research on vernal pool plant genetics, native pollination and dispersal mechanisms to better understanding of vernal pool functions. Also, public education efforts are recommended to increase awareness of vernal pools. The City prioritized the following recommendations:

1. Conservation of land comprising the vernal pool site(s) through government or private land trust acquisition, dedication in fee title, conservation easement, or covenant of easement.
2. Adequate protection of conserved vernal pools from illegal and inadvertent impacts by fencing the site, placing signs, and providing education and/or law enforcement patrol of the sites.
3. Enhancement or restoration of vernal pools to reinstate historic ecosystem functions and values.
4. Solicit and fund, if possible, research on vernal pool ecosystems.

The recommendations provided by the Vernal Pool Management Plan may be enforceable by regulatory agencies through permit conditions, approved mitigation, monitoring and reporting programs, a Biological Opinion resulting from a Section 7 consultation with the U.S. Fish and Wildlife Service (FWS), and development agreement(s).

The U.S. FWS first provided a vernal pool recovery plan for southern California in 1998, and again in 2005. The more recent plan addressed 33 species of plants and animals that occur exclusively or primarily within a vernal pool ecosystem in California, with the ultimate goal of achieving and protecting self-sustaining populations of each species, through stabilizing and protecting populations to prevent further decline. (U.S. FWS, 2005) The key elements included in the plan for achieving these goals were habitat protection; adaptive management, restoration and monitoring; status surveys; and research.

U.S. EPA has also provided recommendations for vernal pool compensation and conservation (Leidy and White, 1998). In light of the complex system of processes that occur within vernal pool ecosystems, and the relationship of these niches to the larger watershed, U.S. EPA recommended using an ecosystem approach in assessing vernal pool compensation. The ecosystem approach would base compensation on preservation of vernal pool complexes within *an ecosystem* rather than the current approach of creating or restoring isolated pools. A hydrogeomorphic approach to assessing wetland function was

recommended to provide the most efficient method to determine mitigation requirements for impacted vernal pools (Leidy and White, 1998).

V. Review of Stormwater Regulations

A. Federal Regulations and Permits

CWA Section 404 Permits

Most projects conducted in or adjacent to streams or wetlands will require a U.S. Army Corp of Engineers (US ACE) Clean Water Act (CWA) Section 404 Permit. A Section 404 Permit is required if materials, including dirt, rocks, geotextiles, concrete, or culverts, are moved or placed into or within US ACE jurisdictional areas. Permit coverage may be granted if the following are performed: (1) actions are taken to avoid wetland impacts, (2) potential impacts are minimized, and (3) compensation for any unavoidable impacts is provided.

Proposed activities are regulated through a permit review process. An individual permit is required for potentially significant impacts. Individual permits are reviewed by the US ACE and evaluated under a public interest review, as well as the environmental criteria set forth in the CWA Section 404(b)(1) Guidelines. However, for most discharges that will have only minimal adverse effects, a general permit may be suitable. The Section 404 general permit process is more streamlined than the individual permit process due to the elimination of the individual review, provided that the general or specific conditions for general permit coverage are met. General permits are issued on a nationwide, state, or regional basis for particular categories of activities.

- Regional General Permits (RGPs) are issued for common maintenance-type activities with minimal impact to the environment and often include pre-approval from the RWQCB Section 401 Certification and/or from the U.S. Fish and Wildlife Service (FWS) and NOAA Fisheries Service for Endangered Species Act consultations. Permit coverage takes approximately one to six months for existing activity categories or six months to one year for new and unique activity categories.
- Nationwide Permits (NWPs) are written for categories of projects that occur nationwide, such as road crossings, bank stabilization, repairs to existing structures, flood control maintenance, and wetland restoration for wildlife habitat. Permit coverage takes from three to nine months.
- An Individual Permit (IP) may be required if over one-half acre of permanent impacts may occur. Public review is required for an IP, which lengthens the amount of time between permit application and permit coverage (six months to a year under the best circumstances, but can be multiple years).

The 404 Permit process should begin with a consultation with US ACE. Prior to application for a Section 404 Permit, a wetland delineation and estimation of US ACE jurisdictional area should be performed. RWQCB 401 Water Quality Certification must also be obtained when applying for a NWP or IP. After any pre-application steps are completed, the US ACE “Application for Department of the Army Permit” should be prepared and submitted.

The US ACE Section 404 permit also requires that a Section 106 Review be conducted as part of the permit application. Section 106 is a document review of the project site for historical significance. Based on the results, additional studies may be required, such as an additional Historical/Archaeological Report or mitigation to protect the historical significance of the site. The review search and approval duration varies on the project scope.

Endangered Species Act

Impacts to endangered or threatened species are regulated under both the California Endangered Species Act (CESA) administered by CA Department of Fish and Game (DFG) and the federal Endangered Species Act (ESA) administered by US Fish and Wildlife Service (FWS). Species that are protected under these laws are designated on the state and federal endangered and threatened species lists. The term "take" is used to describe the impact to a species. Under Section 2081 of the DFG code, a development project that coincides with the occurrence of a listed species must have an incidental take permit. To obtain this permit, the applicant must meet the following criteria (California Department of Fish and Game, 2009):

1. The authorized take is incidental to an otherwise lawful activity
2. The impacts of the authorized take are minimized and fully mitigated
3. The measures required to minimize and fully mitigate the impacts of the authorized take are roughly proportional in extent to the impact of the taking on the species, maintain the applicant's objectives to the greatest extent possible, and are capable of successful implementation.
4. Adequate funding is provided to implement the required minimization and mitigation measures and to monitor compliance with and the effectiveness of the measures
5. Issuance of the permit will not jeopardize the continued existence of a State-listed species.

A mitigation plan is attached to a permit that outlines how these criteria will be met. Measures for meeting the criteria vary and may include avoidance measures or acquisition and transfer of habitat management lands (including funds for protecting and maintaining land in perpetuity). Applicants must avoid all take for "fully protected" species and "specified birds" as defined in Fish and Game Code Sections 3505, 3511, 4700, 5050, 5515, and 5517 (http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection=fgc&codebody=&hits=20). All take of bird species protected under the Migratory Bird Treaty Act must also be avoided, as stated in Section 3515 of the DFG code.

An applicant determines whether an incidental take permit and a Habitat Conservation Plan (HCP) are required by contacting the nearest DFG. The potential need for a permit can be assessed by using the DFG's online mapping resources. If a listed species is present on the property and the project will result in a take of that species, then a permit is required. Permit processing is likely to take between 3 and 12 months or longer depending on the project circumstances and whether a federal permit is required.

To meet federal ESA requirements for a take of federally listed species, an incidental take permit (http://www.dfg.ca.gov/habcon/cesa/incidental/CodeRegT14_783.pdf) must also be obtained by developing a HCP that outlines plans to offset impacts to the species listed as threatened or endangered (http://www.fws.gov/Endangered/wildlife.html). HCP must meet the following criteria:

1. Taking will be incidental
2. The applicant will, to the maximum extent practicable, minimize and mitigate the impacts of the taking
3. The applicant will ensure that adequate funding for the plan will be provided
4. Taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild
5. Other measures, as required by the Secretary, will be met.

Mitigation measures for ESA, like measures for CESA, vary by the project and may include the following:

- Payment into an established conservation fund or bank
- Preservation (via acquisition or conservation easement) of existing habitat
- Enhancement or restoration of degraded or a former habitat
- Establishment of buffer areas around existing habitats
- Modifications of land use practices and restrictions on access.

An applicant determines whether an incidental take permit and HCP are required by contacting the nearest DFG or FWS office. If a listed species is present on the property and the project will result in a take of that species, then a permit is required.

Under ESA, an incidental take permit is not required for plant species. However, if a permit is required for other endangered or threatened species and an HCP must be prepared, then the HCP must analyze the effects of the action on any endangered or threatened plant species. Accordingly, if a plant is on the California threatened or endangered list, then a permit must be obtained through DFG.

The timeline for federal incidental permit processing varies by project complexity and whether FWS must require National Environmental Policy Act (NEPA) documentation. Minor, or “Low Effect,” HCPs do not require FWS to prepare NEPA documentation, and the target processing time for these HCPs is three months. HCPs that require an Environmental Assessment (EA) under NEPA have a target processing time of four to six months, and for HCPs requiring an Environmental Impact Statement (EIS), processing may take up to 12 months or longer (U.S. Fish and Wildlife Service, 2005).

A Section 7 Consultation may also be required under the ESA if the project has a “federal nexus,” usually in the form of another federal permit or federal funding, at some stage of the project and with any federal agency. The type of consultation will be either informal or formal, depending on whether the project affects listed or protected species. If the project has a federal nexus, it will also require NEPA documentation, which is described under the federal requirements section of this report.

Data on endangered and threatened species observations are available from the California Natural Diversity Database, which is developed by the Biogeographic Data Branch of DFG, and these data estimate the approximate spatial range of the species.

B. State Regulations and Permits

California Endangered Species Act (CESA)

CESA states that all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats, threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation, will be protected or preserved (California Department of Fish and Game, no date). Sections 2081(b) and (c) of CESA allow the California DFG to issue an incidental take permit for a State listed threatened and endangered species only if specific criteria are met. These criteria are as follows:

- The authorized take is incidental to an otherwise lawful activity;
- The impacts of the authorized take are minimized and fully mitigated;
- The measures required to minimize and fully mitigate the impacts of the authorized take are roughly proportional in extent to the impact of the taking on the species, maintain the applicant's objectives to the greatest extent possible, and are capable of successful implementation;
- Adequate funding is provided to implement the required minimization and mitigation measures and to monitor compliance with and the effectiveness of the measures; and
- Issuance of the permit will not jeopardize the continued existence of a State-listed species.

Measures to minimize the take of species covered by the permit and to mitigate the impacts caused by the take will be set forth in one or more attachments to the permit. Incidental Take Permit Applications include the following (California Department of Fish and Game, 2008):

1. Applicant's full name, mailing address, and telephone number(s).
2. The common and scientific names of the species to be covered by the permit and the species' status under CESA, including whether the species is the subject of rules and guidelines pursuant to Section 2112 and Section 2114 of the Fish and Game Code.
3. A complete description of the project or activity for which the permit is sought.
4. The location where the project or activity is to occur or to be conducted.
5. An analysis of whether and to what extent the project or activity for which the permit is sought could result in the taking of species to be covered by the permit.
6. An analysis of the impacts of the proposed taking on the species.
7. An analysis of whether issuance of the Incidental Take Permit would jeopardize the continued existence of a species. This analysis includes consideration of the species' capability to survive and reproduce, and any adverse impacts of the taking on those abilities in light of (a) known population trends; (b) known threats to the species; and (c) reasonably foreseeable impacts on the species from other related projects and activities.
8. Proposed measures to minimize and fully mitigate the impacts of the proposed taking.
9. A proposed plan to monitor compliance with the minimization and mitigation measures and the effectiveness of the measures.
10. A description of the funding source and the level of funding available for implementation of the minimization and mitigation measures.
11. Certification of accuracy.

California Environmental Quality Act (CEQA)

CEQA requires environmental impact assessment and mitigation for non-exempt projects occurring within the State of California. As unique ecosystems associated with endangered and threatened species, vernal pools are considered rare biological resources in CEQA review. CEQA applies to projects proposed to be undertaken or requiring approval by State and local government agencies. The lead agency is responsible for completing an environmental review process defined by CEQA. The review process includes

1. Determining if the activity is a project subject to CEQA,
2. Determining if the project is exempt from CEQA, and
3. Performing an Initial Study to identify the environmental impacts of the project and determine whether the identified impacts are "significant." Based on the findings of significance, one of the following documents must be prepared:

    - Negative Declaration if the review finds no "significant" impacts;
    - Mitigated Negative Declaration if the review finds "significant" impacts but the project can be altered to avoid or mitigate those significant impacts;
    - Environmental Impact Report (EIR) if the review finds "significant" impacts.

Some projects may be determined to be exempt from CEQA by law because the project may fall under a category of projects that have already been determined to generally not have significant environmental impacts. Examples include resource and environmental protection actions by regulatory agencies, wildlife habitat acquisition, habitat restoration on five acres of less, maintenance activities, or emergencies. Retrofits to existing structures may be considered an exception. Articles 18 (http://ceres.ca.gov/ceqa/guidelines/art18.html) and Article 19 (http://ceres.ca.gov/ceqa/guidelines/art19.html) of the Act contain details on exemptions and exceptions to CEQA.

This project may require consideration of cultural resources as part of CEQA documentation. The purpose of a cultural resources study is to identify significant impacts and potentially significant impacts of a proposed project to cultural resources, and to provide mitigation measures to reduce impacts to a level less than significant.

401 Certification

Under CWA Section 401, every applicant for a federal permit or license for any activity which may result in a discharge to a water body must obtain State Water Quality Certification (401 Certification) to ensure the proposed activity will comply with state water quality standards. In general, a 401 Certification is required for all projects in which a US ACE CWA Section 404 Permit (described above) is obtained or that will discharge dredged or fill material to waters of the U.S., including removing vegetation or channel materials for flood control, constructing levees, and filling wetlands. If the Regional Water Quality Control Board (RWQCB) deems a project exempt from the provisions of Section 401, it may regulate the dredge and fill activity under State authority in the form of Waste Discharge Requirements or Certification of Waste Discharge Requirements.

To initiate the 401 Certification process, a Biological Assessment is typically performed in which any potential impact to waters of the U.S., adjacent wetlands, and receiving waters is determined. Coordination between the City and the RWQCB is recommended before the application is submitted. A *Section 401 Water Quality Certification Application Form* should then be prepared and submitted to the RWQCB. On average, the 401 Certification application process takes three to four months to complete from the time of application to the time of approval.

C. Local Regulations and Permits

Post-Construction Stormwater Management

For typical development projects, the City requires project proponents to use a checklist to determine whether standard stormwater requirements (low impact development and source controls) or priority stormwater requirements (for development that meets certain size or land use thresholds or that might impact sensitive areas) are applicable. The Stormwater Standards Manual describes the steps that then need to be taken (i.e., Best Management Practices, or BMPs) to meet the applicable requirements. These stormwater requirements are not likely to apply to a drainage project.

Project proponents are required to submit Urban Stormwater Mitigation Plans consistent with the region's Standard Urban Stormwater Mitigation Plan (http://www.sdcounty.ca.gov/dpw/watersheds/susmp/susmp.html) to meet the following objectives:

- Reduce Priority Development Project discharges of pollutants from the MS4 to the maximum extent practicable
- Prevent Priority Development Project runoff discharges from the MS4 from causing or contributing to a violation of water quality standards
- Manage increases in runoff discharge rates and durations from Priority Development Projects that are likely to cause increased erosion of stream beds and banks, silt pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

Some areas within Otay Mesa could be considered a Priority Development Project Areas if they were to discharge runoff from any development or redevelopment directly into or directly adjacent to receiving waters within an Environmentally Sensitive Area (ESA; includes vernal pools). Other conditions that would trigger the application of a priority development project area include either the creation of 2,500 square feet of impervious surface on a proposed project site or an increase in the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition (San Diego Regional Water Board Order R9-2007-0001 (Section D.1.d.(2)(g)). Within these definitions, "directly adjacent" is defined as project sites situated within 200 feet of the ESA. "Discharging directly to" is defined as outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.

Provision D.1.g of San Diego Regional Water Board Order R9-2007-0001 requires the San Diego Stormwater Copermittees to implement a Hydromodification Management Plan (HMP) "…to manage increases in runoff discharge rates and durations from all Priority Development Projects, where such increased rates and durations are likely to cause increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to

increased erosive force." To comply with this requirement, the San Diego Copermittees developed an HMP (http://www.projectcleanwater.org/pdf/susmp/hmp_final_12-29-09_clean.pdf, December 29, 2009), which is subject to Regional Water Quality Control Board approval. The HMP specifies that Priority Development Projects are required to implement hydromodification mitigation measures so that post-project runoff flow rates and durations do not exceed pre-project flow rates and durations where such increases would result in an increased potential for erosion or significant impacts to beneficial uses. Hydromodification mitigation can be provided as follows:

- Demonstrate no post-project increase in impervious area and resultant peak flow rates as compared to pre-project conditions
- Installation of LID BMPs, such as bioretention facilities, to control runoff flows and durations from new impervious areas
- Mitigation of flow and durations through implementation of extended detention flow duration control basins
- Preparation of continuous simulation hydrologic models and comparison of the pre-project and mitigated post-project runoff peaks and durations (with hydromodification flow controls) until compliance is achieved
- Implementation of in-stream rehabilitation controls to demonstrate that projected increases in runoff peaks and/or durations would not accelerate erosion to the rehabilitated receiving stream reach.

Chapter 6 of the HMP Guidance provides guidance on applicability, hydromodification mitigation criteria and implementation options, and a framework for in-stream rehabilitation options.

Construction Stormwater Management

In California, discharges from construction sites one acre or larger are regulated under the State-wide General Permit for Waste Discharge Requirements for Discharges of Storm Water Associated with Construction Activity (NPDES General Permit CAS000002) Water Quality Order 98-08-DWQ (General Permit). The General Permit requires a Storm Water Pollution Prevention Plan (SWPPP) that describes BMPs to prevent pollutant and sediment discharges from the construction site, as well as an inspection and monitoring program. A Notice of Intent (Attachment 2 of the General Permit) is to be submitted to the State Water Resources Control Board (SWRCB) along with a project site map and fee at least two weeks prior to construction initiation.

The SWPPP must remain onsite at all times and regular self-inspections must be performed to assess the effectiveness of the BMPs. Stormwater samples must be collected if there is reason to suspect that non-visible pollutants have come into contact with stormwater or the site discharges to a water body listed on the 2006 CWA Section 303(d) List of Water Quality Limited Segments Requiring TMDLs. If permit coverage is not terminated within a year, an annual report must be completed and submitted to the LARWQCB. To terminate permit coverage, a Notice of Termination is to be completed and submitted to the SWRCB. The Construction Storm Water General Permit is currently under revision and is available online at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml.

Biological Resources

Multi-Species Conservation Program

The Multi-Species Conservation Program (MSCP) applies to the Otay Mesa area. The MSCP is designed to preserve native habitat for multiple species by identifying areas for directed development and areas to be conserved in perpetuity (referred to as Multi-Habitat Planning Area or MHPA) to achieve a workable balance between smart growth and species protection. The project area falls within portions of the City's MHPA and includes areas directly adjacent to the MHPA. These two categories have different requirements as follows:

- For **premises that are located within or adjacent the City's MHPA**, the project must demonstrate compliance with the MHPA land use adjacency guidelines (see the City's MSCP Subarea Plan, March 1997, http://www.sandiego.gov/planning/mscp/pdf/subarea.pdf) to address potential indirect effects to the MHPA through features incorporated into the project and/or permit conditions. The following issue areas are addressed:

    1. Drainage;
    2. Toxics;
    3. Lighting;
    4. Noise;
    5. Barriers;
    6. Invasive species;
    7. Brush management; and,
    8. Grading/land development.

- For **sites partially within the MHPA**, the allowable development area under the MSCP includes all the land outside the MHPA. If less than 25 percent is outside the MHPA, the project would be allowed the required area to achieve a 25 percent development area. In defining the 25 percent developable area, the least sensitive portion of the site must be used and would include avoidance/minimization of wetlands and MSCP narrow endemics.

The MHPA can be altered on a site to accommodate a project, subject to approval by the City and wildlife agencies in accordance with meeting the six MHPA boundary line adjustment functional criteria (see Section 5.4.2 of the Regional MSCP Plan, August 1998, http://www.co.san-diego.ca.us/dplu/mscp/docs/SCMSCP/FinalMSCPProgramPlan.pdf). These criteria include:

- Effects on significantly and sufficiently conserved habitats;
- Effects to covered species;
- Effects on habitat linkages and function of preserve areas;
- Effects on preserve configuration and management;
- Effects on ecotones of other conditions affecting species diversity; and
- Effects to species of concern not on the covered species list.

The analysis for any proposed MHPA adjustment should be included in the project biology report[1] (if required, see below), and include:

1. An exhibit clearly showing the proposed removal and addition areas with the proposed grading;
2. A table showing, by habitat type, area within the existing MHPA, area to be removed, area to be added, and the proposed net change to the preserve; and
3. A written analysis of how the proposed MHPA adjustment meets the six required functional equivalency criteria.

Environmentally Sensitive Lands (ESL) Regulations
The City oversees development that may impact listed species through the ESL Regulations (San Diego Municipal Code, Land Development Code, and Biology Guidelines, currently pending amendment). City public projects do not need a grading permit, however these projects will still be required to obtain all necessary City, State, and Federal permits prior to the preconstruction meeting or any clearing or grading of the project site.

Land Development Code Biology Guidelines (City of San Diego, 2001) lists *Eryngium aristulatum* var. *parishii* (Parish's eryngo, San Diego button celery), *Navarretia fossalis* (spreading navarretia, vernal pool pincushionplant), *Orcuttia californica* (California Orcutt grass), *Pogogyne abramsii* (San Diego mesa mint), and *P. nudiuscula* (Otay Mesa mint) as narrow endemic species. Narrow endemics are included in the definition of Environmentally Sensitive Lands, which requires a discretionary review of the project permit including biological surveys and species specific mitigation requirements. These species are associated with vernal pool habitats, which are found within the project area (see Section Vernal Pool Management Plan, below, for more information about vernal pool management).

A biological survey report is required for all proposed development projects that are subject to the ESL Regulations, and/or where CEQA review has determined that there may be a significant impact on other biological resources considered sensitive under CEQA. Table 6 summarizes survey requirements for various biological resources inside and outside the MHPA. Note that the proposed project site includes areas that are inside, adjacent to, and outside of the MHPA area.

The Biological Survey Report must identify all potential impacts from the development (both on-site impacts and off-site impacts such as roads, water and sewer lines) to sensitive biological resources and to other significant biological resources as determined by the CEQA process. The report should evaluate the significance of these impacts. Impact assessments need to include analysis of direct impacts (e.g. grading, Zone 1 brush management), indirect impacts (e.g. lighting, noise) and cumulative impacts. The City of San Diego (1994) Significance Determination Guidelines under the CEQA should be used as a reference.

The ESL regulations require that impacts to wetlands be avoided, and all unavoidable wetlands impacts (both temporary and permanent) will need to be analyzed and mitigated via wetland creation, restoration, enhancement, and/or acquisition. Acquisition and/or enhancement of existing wetlands

[1] Three full sets of the MHPA adjustment materials will be required for any proposed MHPA adjustment.

may be considered as partial mitigation only. The mitigation ratio for vernal pools ranges from 2:1 when no endangered species are present, up to 4:1 when endangered species with very limited distributions (e.g., *P. abramsii*) are present.

Table 6. Summary of biological survey requirements

Resource	Survey Requirements	
	Inside MHPA	Outside MHPA
Vegetation		
Uplands	Confirm/Revise MSCP mapping	Confirm/Revise MSCP mapping
Wetlands	Delineate wetlands per City definition	Delineate wetlands per City definition
Covered species[1]		
Listed species	Focused survey per protocol	Per MSCP conditions of coverage[2]
Narrow endemic	Focused survey per protocol	Focused survey per protocol
Other	Survey as necessary to comply with requirements as outlined in Section II.A.2 of Biology Guidelines	Per MSCP conditions of coverage[2]
Non-covered species		
Listed species	Focused survey per protocol	Focused survey per protocol
"Other sensitive species" [3]	Case-by-case determination depending on the species	Case-by-case determination depending on the species

1. Based upon the MSCP mapping, site specific surveys, the NDDB records, previous EIRs and biological surveys and/or discussion with the Wildlife Agencies, the potential for listed species, narrow endemic and CEQA sensitive species will be determined. Where there is a reasonable likelihood that one of these species exists, surveys will follow the above requirements.
2. Survey as necessary to conform with to Appendix A of the City of San Diego MSCP Subarea Plan (March 1997).
3. "Other Sensitive Species". Those other species that are not listed by federal and/or state agencies and/or not covered by the MSCP and to which any impacts may be considered significant under CEQA.

Vernal Pool Management Plan

To protect vernal pools, site-specific management recommendations were developed for ten Otay Mesa locations (http://www.sandiego.gov/planning/mscp/vpmp/index.shtml), two of which occur in the project area: "J28 East" and "J21." J 28 East is a 20-acre site located southwest of the intersection of La Media Road and Avenida de la Fuente with five mapped vernal pools that are located within the MHPA. J21 is a 49-acre site located southwest of Siempre Viva Road and La Media Road with seven vernal pools that are located outside of the MHPA. Both sites' vernal pools were identified by the adopted Recovery Plan for Vernal Pools of Southern California (USFWS, 1998) as necessary to stabilize populations of the following endangered and threatened species: *E. aristulatum*, *P. nudiuscula*, *N. fossalis*, *O. californica*, *B. sandiegonensis* and *S. woottoni*.

Both sites are subject to the same threats: development (both sites are privately owned and not conserved); invasive species (particularly grasses); trespass from foot traffic and off-road vehicles; litter, wind-blown debris, and illegal dumping; and fire and fire suppression activities. Both sites are recommended for conservation through public acquisition or private mitigation, and restoration or

enhancement of the vernal pools is appropriate given the high species diversity recorded historically at those sites. Restoration at J28 East should focus on creating stable populations of the aforementioned species, particularly on *E. aristulatum*, *M. minimus*, and *P. nudiuscula*, and restoration at J21 should focus particularly on *E. aristulatum*, *N. fossalis*, *O. californica*, and *P. nudiuscula*.

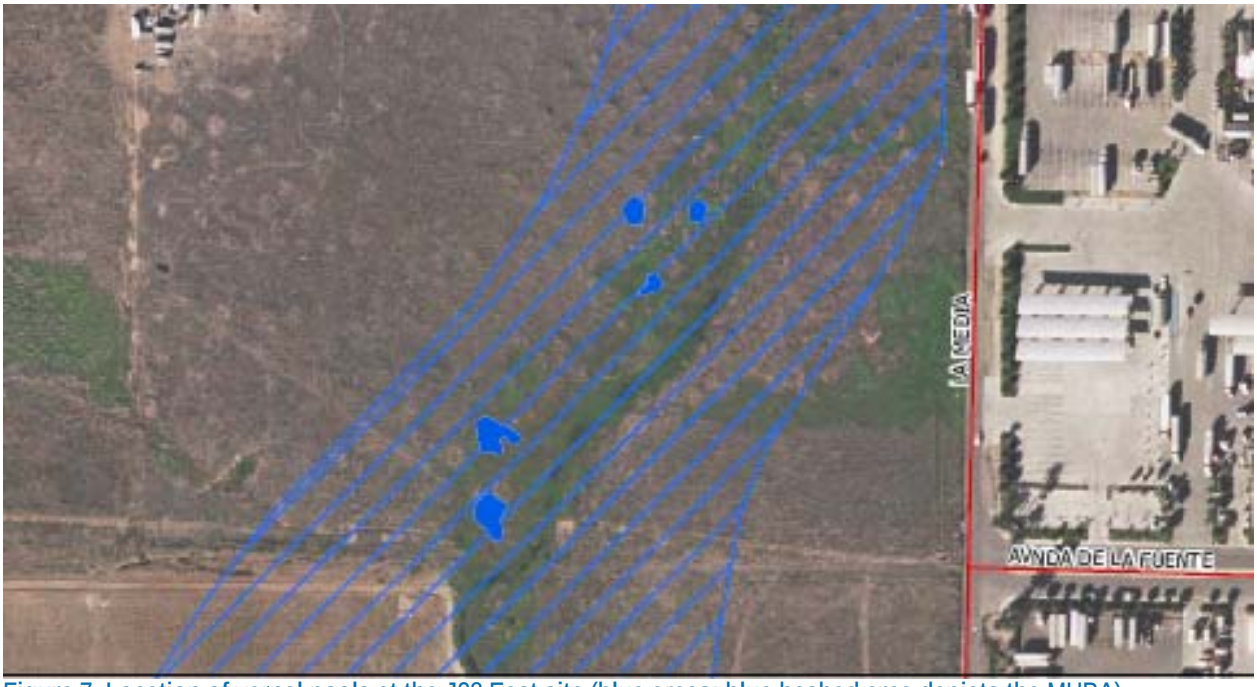

Figure 7. Location of vernal pools at the J28 East site (blue areas; blue hashed area depicts the MHPA).

Figure 8. Location of vernal pools at the J21 site (blue areas; blue hashed area depicts the MHPA).

Geologic Hazards

Unstable slopes, slide-prone geologic formations, faults and liquefaction-prone soils occur in many parts of the City. The relative risk of these geologic hazards has been mapped as part of the City of San Diego Seismic Safety Study (SSS) (City of San Diego Development Services, 2009). The maps indicate where potentially adverse geological conditions may exist, as defined by Geologic Hazard Category (http://www.sandiego.gov/development-services/hazards/hazardsmaps.shtml).

Evaluation of the SSS maps for the project area show the presence of Geologic Hazard Category 53, defined as level or sloping terrain with unfavorable geologic structure, which presents a low to moderate geologic risk.

The proposed project can be categorized as a minor public structure, which can be considered Building Type/Land Use Category IV, defined as "residential (single-family residences, apartments, etc.) and most commercial and *minor public structures*" (emphasis added). Group III, the next more stringent group, specifies places normally attracting large concentrations of people, and this project should not fall into that category.

Based on the presence of Geologic Hazard Category 53 and a Category IV project, a soil investigation and geologic investigation are anticipated. The City of San Diego (2008) *Guidelines for Geotechnical Reports* (http://www.sandiego.gov/development-services/industry/pdf/geoguidelines.pdf) describes these investigations in greater detail.

Grading

Not applicable; public works projects do not require a grading permit.

D. County Regulations and Permits

Because the areas in question are located within the City limits, county permits are not anticipated to be needed unless drainage or other infrastructure will connect to or otherwise affect county-owned infrastructure.

E. International Regulations and Permits

The International Boundary and Water Commission (IBWC) issues licenses and permits for activities in the IBWC right-of-way at the border or on IBWC maintained floodways. The *Criteria for Construction Activities within the Limits of USIBWAC Floodways* specifies that a license or permit is required for any proposed activities crossing or encroaching upon the floodplains of the IBWC flood control projects and right-of-way. This project does not affect the floodplains or right-of-way of any IBWC flood control project. Water quality considerations under IBWC jurisdiction focus on Texas rivers only and do not apply to the Otay Mesa area.

VI. Drainage Requirements, Considerations, and Opportunities

This report provides information primarily on the East and West Water Tanks drainage areas as these are the areas covered by the engineering reports. The West Watershed consists of smaller mesa-top watersheds that drain into the tributary canyons of Spring Canyon, which then flow into Mexico via the

Spring Canyon concentration point. While there is a need for some runoff management in these areas to reduce post-development peak flows to predevelopment levels, this area is of fairly low priority.

The engineering reports completed in the Otay Mesa area and summarized above focus primarily on the industrialized areas of the East Water Tanks drainage areas. This East Watershed is the largest watershed on the Mesa. All flows from the watershed collect at a concentration point at a large culvert where flows cross the U.S./Mexico border. The surrounding area is fairly flat and adjacent properties have difficulty draining effectively into the existing creek during larger storm events. The existing drainage is a combination of storm drains, improved channels, and detention basins, which discharge in many areas to natural drainage paths that do not have adequate hydraulic capacity. As projects have been developed in this area, portions of the private properties have been dedicated to the city as drainage easements or flood water storage easements (not verified as a part of this report).

Collectively, the engineering reports have recommended in one way or another that for this area to accommodate future development, the construction of a drainage channel along the east side of La Media crossing from the northeast corner to the northwest corner of the intersection of La Media with Siempre Viva Road would be required. The proposed channel would continue along the north side of Siempre Viva at La Media to the current culvert crossing along Siempre Viva to connect to the existing stream channel. This plan was selected because an existing drainage ditch located on the east side of La Media Road could be expanded to intercept flows from the east without creating potential conflicts from utilities in La Media Road; and flows from the west would continue to flow in the old drainage path. Additionally, this plan may reduce impacts to properties by following the property boundaries and could minimize potential utilities conflicts along Siempre Viva Road.

In this area, drainage alternatives should be given substantial thought by the City of San Diego. The next section presents several considerations that highlight key practical issues that might impinge on future drainage and development decisions.

A. Consideration 1: Drainage and Runoff Management Responsibilities

One of the first considerations is who has the responsibility to provide drainage the East Water tanks Drainage Area. The City of San Diego is responsible for public land including runoff from public roads and right of ways. However, as has been pointed out several times in this document, private property owners or developers are required to provide adequate storage and conveyance for 50-year flows in areas in the watershed that are above major (four lane) road crossings (City of San Diego Development Services, 2004). This is typical for most developments in the East Water Tanks drainage area. However, below major roadways, the drainage infrastructure must be designed to accommodate 100-year flows. The 100-year floodplain is also significant in that it is a standard used by the National Flood Insurance Program (NFIP) for floodplain management and to determine the need for flood insurance.

Figure 9 shows 100-year floodplain in the Water Tanks (East) drainage area (Kimley-Horn and Associate, 2007).

The interpretation of drainage language is that all public or private properties are required to provide adequate storage and conveyance for up to the 50-year flows, except for those in the natural drainage channel which are exempt. “Major roadways”, that is, those that are four lane or greater and major roadway crossings would require designs that consider conveyance of the 100-year storm either beneath,

along and/or on the roadway as long as not more than one lane of the four is used for conveyance and the conveyance does not encroach onto private property outside of the road right-of-way. None of the areas shown in Figure 9 are considered to be below major roadways.

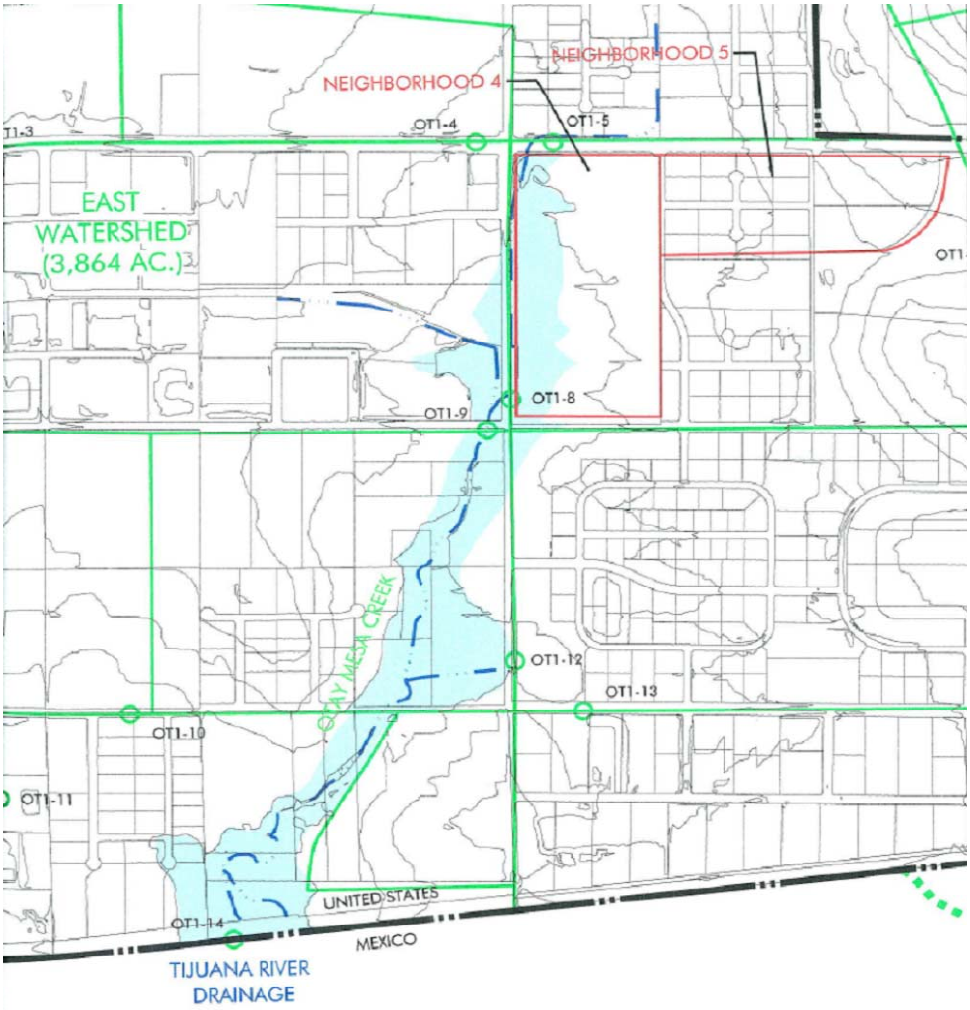

Figure 9. 100-year Floodplain in the Water Tanks (East) drainage area (Kimley-Horn and Associate, 2007).

B. Consideration 2: Potential for BMPs

The potential for stormwater BMPs is another consideration in the decision making process. If, in the future, conveyance along with water quality systems like BMPs are required in the Water Tanks East Drainage, current policies state that all BMPs be constructed for Priority Project Permanent Storm Water BMPs and High Priority Construction Storm Water BMPs. Most projects in the East Water Tanks watershed then would require the submission of a “Water Quality Technical Report” which follows the guidance “Storm Water Standards – A Manual for Construction & Permanent Storm Water Best Management Practices Requirements.”

Several factors must be considered when including BMPs in this area. The suitability and types of BMPs that may be selected are highly dependent on the existing conditions, including slope, soils, adequate area, and other natural resource considerations such as destruction of natural vernal pools. However,

this may potentially be an opportunity as well. As has previously been noted, this area is endemic to vernal pools. Projects within this area may provide a very good opportunity to include vernal pool restoration or creation and habitat improvements to support this unique ecosystem natural to Otay Mesa.

Potential Areas for Vernal Pools

Potential areas for restoring and/or improving vernal pools were identified using soil suitability, land use, and site availability. Bauder and McMillan (1998) describe suitable areas for vernal pools with slopes 9% or less and a substance layer with permeability of 0.06 inches/hour or less. Suitable areas using the criteria are shown in Figure 10.

The downstream areas of the Water Tanks (East) drainage area are mainly covered by two types of soils as shown in Figure 5. Major characteristics of the soils are summarized below (Bauder and McMillan 1998).

Huerhuero loam:

- Slopes: 2 to 9 percent
- Impervious sub-surface layer: 12 to 55 inches of clay and clay loam
- Permeability of sub-surface layer: <0.06 inches/hour
- pH: 5.3- for surface and 8.2 for sub-surface

Sckpen (Stockpen) gravelly clay loam:

- Slopes: 0 to 2 percent
- Impervious sub-surface layer: 21 to 60 inches of gravelly clay or clay
- Permeability of sub-surface layer: <0.06 inches/hour
- pH: 6.5 for surface and 8.0 for sub-surface

The characteristics of these soils make them ideal for creating vernal pools.

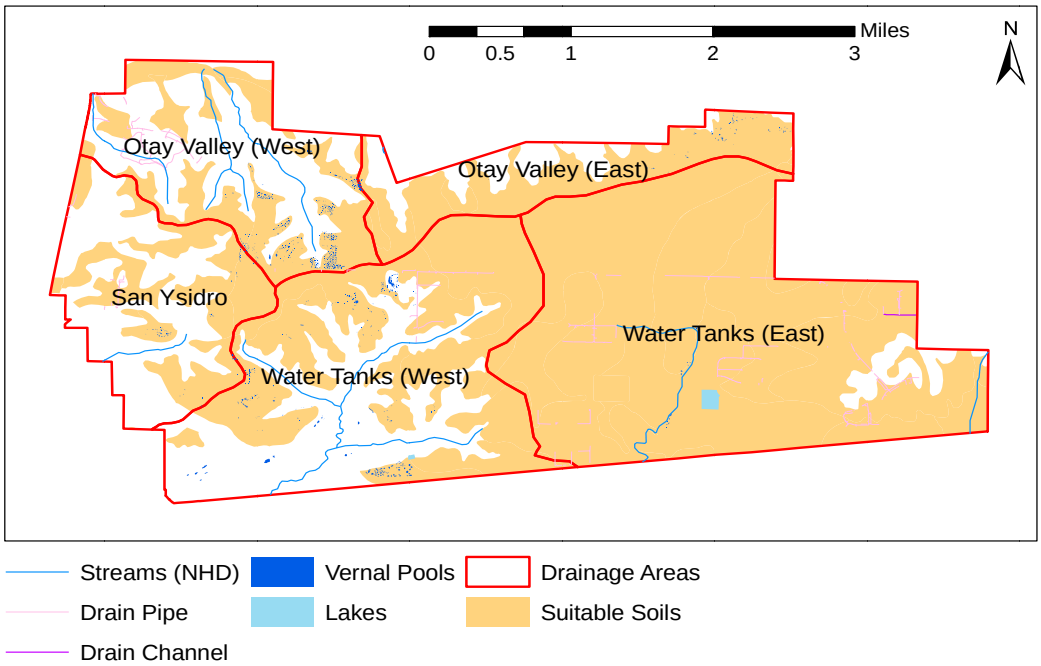

Figure 10. Suitable Areas for Vernal Pools with 9% or less Slope and 0.06 inches/hour or less Permeability

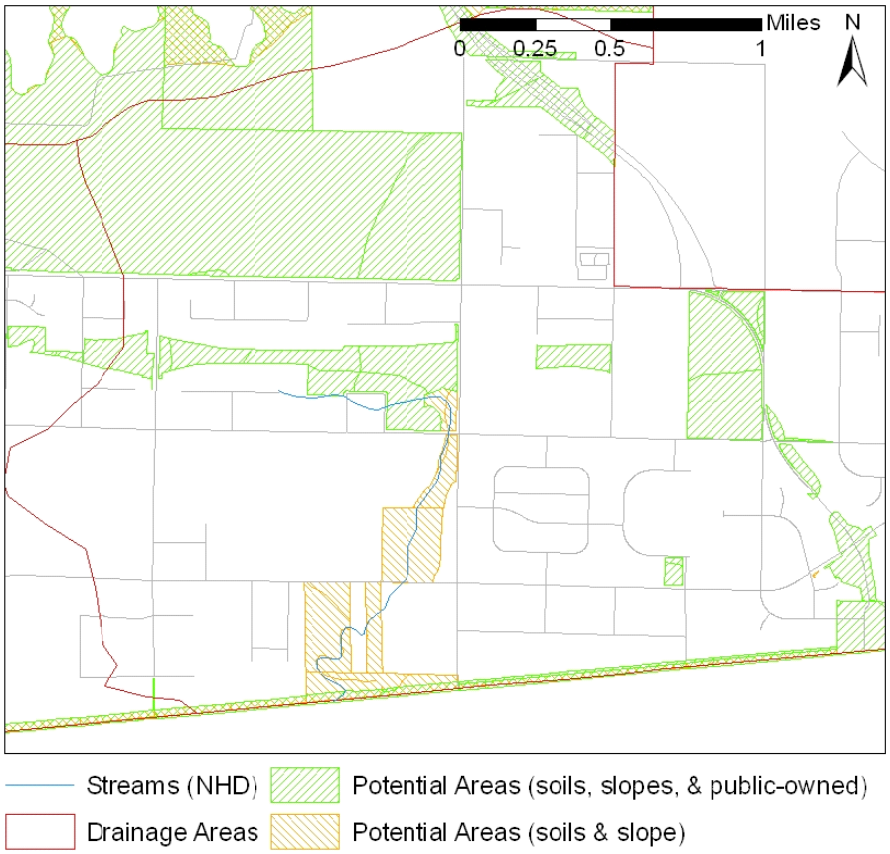

Figure 11. Potential Areas for Vernal Pools within the Water Tanks (East) drainage area

There are a number of parcels that could serve as potential areas for vernal pool creation as supplemental stormwater BMPs beyond the canal and detention system highlighted in the engineering reports.

C. Consideration 3: Estimated Annualized Costs for Planning, Permitting, Land Acquisition, Design, Construction, and Maintenance of Stormwater and Drainage Infrastructure

Another consideration is the cost of future maintenance of stormwater and drainage facilities if these were to be put in place.

Planning

Costs for planning include the effort required to further develop the project concept which, depending on the complexity of the project, could result in preparing a Project Concept Report. Additional administrative costs could be required to administer, manage and coordinate the project's implementation and are included with the planning costs. Administrative costs can vary widely with the complexity of the project, but for purposes of comparison, a value of 5 percent of the capital costs is assumed for planning.

Permitting

Regulatory requirements have to be met and environmental permits are required to implement most BMPs. The applicability of many regulations for a specific project depends on its site or design characteristics. Because the requirements imposed by regulatory agencies often have an effect on the project cost, the associated costs were included in the analysis for centralized BMPs: Because the opportunities identified for distributed structural BMPs are for areas of impervious cover and not applied to vacant or open spaces, the permitting effort anticipated for such projects is minimal, if any. Therefore, no separate costs are identified in the analysis for permitting. It is assumed that any permitting costs associated with the construction phase, such as erosion and sedimentation control, are included in the construction costs.

Land Acquisition

Cost estimates for any acquisition of private lands in Otay Mesa would be generated at the time when the City has determined to move forward with a public drainage facility. The cost estimates would be based on market value at that time, and would include BMP's as necessary.

Design

Designing structural BMPs requires collecting data, analyzing it, and preparing documents that can be used for constructing a project. Data collection could include geotechnical investigations, field investigation of existing utilities (potholing), and a topographic survey for mapping. The design deliverables are project plans and specifications that can be bid by a contractor for construction. Engineering costs can vary widely depending on the complexity of the project. For the purposes of the cost estimates, fixed rates of 5 and 10 percent were applied to the distributed and centralized BMP construction costs, respectively, to estimate the design/engineering cost. A lower percent was used for distributed BMP design costs because these BMPs are expected to have less time-intensive designs compared to centralized BMPs.

Construction

The typical levels of construction cost estimates are:

- Preliminary/Order of Magnitude—provide a range of costs at the planning level for a conceptually defined project
- Budget—cost estimates based on layouts and specific quantities
- Final/Definitive—prepared after the design documents are complete

The estimates for centralized BMPs on public and private property are not site-specific and are in the preliminary/order of magnitude category. To the extent possible, construction costs are based on approximate quantifications of the major components of the BMP.

Mobilization: Mobilization costs are highly variable depending on the magnitude of the project. A mobilization factor of 5% was included.

Excavation and removal: Excavation and removal costs include the cost of excavating the volume of soil required to provide the required storage, hauling the removed dirt offsite, and disposal to an appropriate facility.

Reinforced Concrete Pipe: Costs were derived from R.S. Means (2007) and are included to estimate the costs for constructing a storm drain extension of or to bypass an existing storm drain system.
Landscaping: One of the benefits of distributed BMPs is that they can be integrated into the site plan and often incorporated into the landscaping. Landscaping costs were estimated based on regional data.

Native Landscaping: Native landscaping should be used for any BMP because native landscaping is more adapted to the natural conditions which increase plant survivability.

Contingency: Because some of the project components have not been fully defined at this preliminary stage, a contingency factor of 25 percent should be applied to the construction costs to estimate the total construction costs and capture expected but as yet unidentified additional costs. The costs could arise from site-specific field conditions such as those associated with utility relocations, dewatering, and erosion and sedimentation control. At this stage of project development, the contingency also includes an allowance for such items as field facilities and construction scheduling, which might be required but are not specifically itemized. The contingency factor has **not** been applied to any of the cost functions or component cost estimates itemized in Table 7.

Table 7: Per Unit Cost Estimates for Construction Components

Construction Component	Cost
Mobilization	5% of construction total
Excavation and Removal	$25.00/yd^3
Asphalt/Base Removal	$8.00/yd^3
Site Preparation	$20.00/ft^2
Reinforced Concrete Pipe	$8.00 per diameter (inch) per length (ft)
Landscaping (includes mulch/sod and vegetation)	$5.00/ft^2
Native Landscaping	$25.00/ft^2
Planning	5% of total

Construction Component	Cost
	construction costs
Permits/Studies	Included in design
Design (Centralized)	10% of total construction costs
Design (Distributed)	5% of total construction costs
Contingency for Planning Estimate (Centralized)	25% of total construction costs
Contingency for Planning Estimate (Distributed)	15% of total construction costs

This costing information can be used by the City of San Diego to evaluate costs of planning, permitting, operating and maintaining the proposed drainage facilities and BMPs.

D. Consideration 4: Risk-Based Analyses

On method of assessing the level of service to provide to some drainage areas is to evaluate the risk to private citizens and the economic losses due to flooding. Risk costs are those cost items incurred due to the unexpected failure in the drainage system due to flooding and can broadly be categorized as tangible and intangible costs. Tangible costs are those measured as direct monetary losses including damage to properties and structures, loss of business, cost of repair, etc. Intangible costs include psychological trauma, damage to the environment, and other costs that do not have a direct, agreed upon, or known value.

Economic risks and flood loss costs were considered began to take hold in the early 1960's. One of the early applications was risk based concept to hydraulic design of highway culverts. Pritchett used four actual locations, calculating the investment costs with the expected flood damage costs on an annual basis for several design alternatives. The results indicated that a more economical solution would be reached by selecting smaller culvert sizes compared to the traditional return method typically used.

The basic concept of risk based design is shown schematically in Figure 13. The risk function can account for the potential undesirable consequence associated with the failure of hydraulic structures on the damage and costs related to flooding costs. However, it must be recognized that the risk costs associated with the failure of hydraulic structures cannot be precisely predicted from year to year

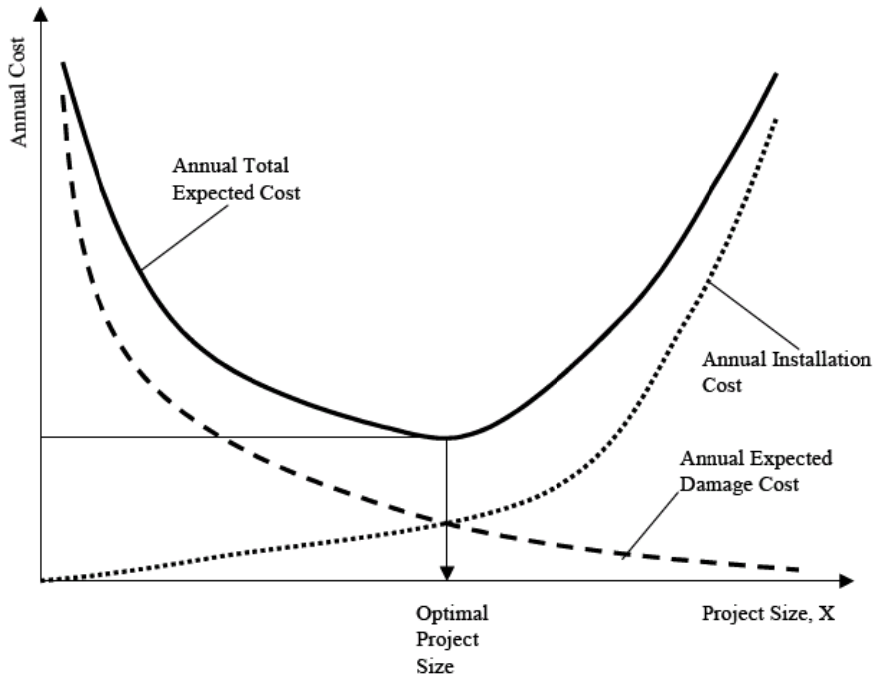

Figure 12. Risk-Based Design Costs Analyses Concepts

The Annual Total Expected Cost is the sum of the annual expected installation and maintenance costs and the annual expected damage and flooding costs. The sum of cost that makes up the intersection between the individual cost curves is the estimated optimal project size. Using this risk-based approach projects can more efficiently determine the estimated costs to inform project design.

For Otay Mesa, the engineering reports summarized potential drainage designs but do not consider the design based on a risk-based approach. These reports use the 100-year return interval for their recommended designs. It should be noted that the land uses where the drainage upgrades are suggested are primarily industrial in nature. This may impact tangible economic costs (e.g., transportation/delivery, vehicle and employee access, etc.), but other intangible costs such as loss of life and threat to personal safety are likely to be minimal because of very little if any residential land uses in this area.

A risk-based approach may be well suited for decision making in the Otay Mesa area. To adequately determine the size of a project to be designed, the annual total expected costs should be evaluated to assist in determining the optimal project size most appropriate for the drainage area. While risk based analyses is not as commonly used by engineers and planners, it is recommended that this task include economists from the City to consider risk-based costs when evaluating engineering designs such as those planned for the Otay Mesa drainage areas.

E. Consideration 5: Border Issues

There are some transboundary considerations beyond what was covered in the regulatory section of this report. The International Boundary and Water Commission (IBWC) is the lead agency for transboundary water management and settlement of bilateral disputes relating to managing shared water resources. An

international pollution abatement board makes recommendations to the EPA administrator for the abatement of international water pollution.

In August 1983, the U.S.-Mexico Border Environment Cooperation Agreement, better known as the La Paz Agreement, initiated a new era of formal multinational consultation and heightened attention to environmental issues within the border region. The La Paz process was strengthened by the 1992-1994 Integrated Border Environmental Program, the 1995-2000 Border XXI Program, and most recently by EPA's Border 2012 Program. These programs broadened the scope of border water management to include pollution prevention, water quality management, a concern for ecological processes, and a concern for advancing sustainable development of water resources along the border. Although these programs acknowledge IBWC's historic treaty role in binational water planning, they favor more regionalized and local workgroups and task forces to de-centralize decision making and to mobilize local resources for local solutions to water issues.

Even with these layers of bureaucracy, it is understood that Governments may be liable when mismanagement of reservoirs or other storage systems result in major flooding of downstream areas. For example, The U.S. Court of Claims [Gasser v United States, 14 Cl. Ct 476 (1988)] has held that the U.S. may be liable for flood damages in Mexico caused by operation of an upstream government reservoir. However, catastrophic natural events do not seem to apply to flood control requirements. Similarly, there is no standard set for the control of flows from the U.S. into Mexico, especially for intermittent or ephemeral streams such as the drainage of the Water Tanks (East) catchment. If a canal and detention system were built in this area, consideration of this area as a "hydrocommons", hydraulically linked basins connected through man-made engineered systems, may be necessary (Michel, 2000). The changing of current drainage patterns and timing of flow across the border in the Water Tanks (East) watershed of Otay Mesa could significantly alter downstream (Mexico) hydrologic functions such as water quality, aquatic habitat, riparian ecosystems, and land use. These issues are weakly addresses with federal, state, and international laws with the implications of constructing the proposed drainage and flood control systems unclear. Further investigation into the legal responsibilities and ramifications should be further reviewed if the drainage and detention projects proceed.

VII. Conclusions

This report has provided a review of previously developed engineering drainage reports with the report recommendations summarized. An inventory of current land use and drainage patterns, as well as regulations regarding storm water were provided as background to support up-to-date considerations for the placement of stormwater management facilities including the possibility of vernal pool restoration. This type of restoration may be required to mitigate impacts to sensitive areas (e.g.,vernal pools) associated with the implementation of the previously recommended drainage reports. The five considerations that were forwarded in this report are:

- Drainage and Runoff Management Responsibilities
- Potential for BMPs
- Estimated Annualized Costs for Planning, Permitting, Land Acquisition, Design, Construction, and Maintenance of Stormwater and Drainage Infrastructure
- Risk-Based Analyses
- Border issues

Through the consideration of these issues, the many regulatory layers, background on environmental sensitive areas of Otay Mesa, data compilation and description, and the summary and evaluation of the engineering reports the City of San Diego will have the necessary information for decision analysis for the Otay Mesa drainage area.

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APPENDIX G-3

Water Quality Technical Report

Water Quality Technical Report

Otay Mesa Community Plan Update

January, 2007

Prepared for:
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WATER QUALITY TECHNICAL REPORT

Otay Mesa Community Plan

January, 2007

Prepared for:
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San Diego, CA 92101

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1. Introduction

The Otay Mesa Community is quickly developing in the City of San Diego. This area consists of approximately 7,000 acres bounded by the City of Chula Vista and the Otay River Valley on the north, the International Border on the south, Interstate 805 on the west, and the County of San Diego on the east. The far northwest arm of the Mesa is fully developed and all other areas are envisioned for residential, industrial, and commercial development in the Otay Mesa Community Plan.

The Mesa consists of flat terrain and shallow swales for drainage paths. Most of the Mesa slopes north to south resulting in runoff entering Mexico at several points. Increased development has caused concentrated flows in culverts under roads, redefined some of the historical drainage paths, and increased runoff into Mexico. For the most part, the existing drainage facilities have been constructed by private development causing non-continuous facilities and difficulty for subsequent developers to tie into the existing facilities. The Otay Mesa Creek is the only significant creek on the Mesa which lies in the East Watershed (see **Appendix A** for watersheds). The Drainage Study prepared for the Otay Mesa Community Plan Update proposes improvements to the Otay Mesa Creek with the La Media Channel and Border Detention Basin in the East Watershed to be constructed to convey flow and prevent downstream flooding. From the hydraulic analysis in the Drainage Study, Otay Mesa Creek crosses the border into Mexico just north of the Tijuana Airport and eventually to the Tijuana River. The West Perimeter Watershed and West Watershed also flow into the Tijuana River. The Tijuana River Watershed is a water quality impacted watershed; therefore, the water quality must be addressed for additional development. The Tijuana River is included in the 2002 Clean Water Act Section 303(d) List of Water Quality Limited Segments approved by the U.S. Environmental Protection Agency (EPA) and by the State Water Resources Control Board (SWRCB) on February 4, 2003.

The proposed detention basins in the West Perimeter Watershed and West Watershed will be constructed as part of development in the immediate vicinity of future projects. These detention basins are recommended to also function as treatment BMPs for runoff caused by new development. The La Media Channel and Border Detention Basin will be constructed before new development along the creek takes place (see **Appendix A** for locations). These BMPs target sediment, nutrients, trash, metals, oil & grease, and organics from existing and future development prior to crossing the border and into the Tijuana River.

This document complies with the City of San Diego's Standard Urban Storm Water Mitigation Plan and Storm Water Standards Manual.

2. Pollutants that May Affect Storm Water Quality

Future use of the undeveloped land may consist of residential, industrial, and commercial projects. From Table 2 of the City of San Diego's Storm Water Standards Manual, the anticipated and potential pollutants can be identified based on project category. For a residential development, the anticipated pollutants of concern are sediments, nutrients, trash and debris, and pesticides. The potential pollutants of concern include oxygen demanding substances, oil & grease, and bacteria & viruses. The anticipated pollutants for commercial developments include trash & debris and oil & grease. Potential pollutants are sediments, nutrients, organic compounds, oxygen demanding substances, bacteria &

viruses, and pesticides.

The Tijuana River is listed on the 303(d) list for impaired water bodies for bacteria, nutrients, oxygen demanding substances, low dissolved oxygen, pesticides, synthetic organics, and trash. This project proposes the La Media Channel and Border Detention Basin to improve existing drainage. Since residential, industrial, and commercial developments are planned uses of the site, this water quality technical report will not address additional pollutants (associated with the planned uses). Permanent storm water BMPs must be incorporated into future project where necessary to mitigate the impacts of urban runoff as a result of the development. For this project, the proposed channel and detention basin will contribute to filtering of pollutants prior to crossing the border. Heavy riparian vegetation will be allowed to grow in the channel, which traps pollutants. The channel slowly conveys runoff into a detention basin where runoff will be held for some minimum time allowing pollutants to settle prior to discharge.

3. Proposed Control Measures

The Water Quality Technical Report or the Storm Water Management Plan for future projects in the Otay Mesa Community rely on implementation of site design BMPs, source control BMPs, and treatment control BMPs. This project, Otay Mesa Community Plan Update, will only implement treatment control BMPs for the region. Future developers must address site design BMPs, source control BMPs, and additional treatment control BMPs based on anticipated and potential pollutants for the corresponding planned use. The main objective is to ensure that pollutants do not come in contact with storm water by reducing or eliminating the pollutants. These objectives are achieved by implementing the required source, site, priority project and treatment BMPs set forth in the City of San Diego Storm Water Standards.

Site Design

The following Site design BMPs are identified for future development (City Storm Water Standards – Section III.2.A and Appendix C):

1. Minimize impervious footprint. (1) Increase building density (number of stories above or below ground); (2) construct walkways, trails, patios, overflow parking lots and alleys and other low-traffic area with permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials; (3) construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised; and (4) minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.
2. Conserve natural areas and provide buffer zones between natural water bodies and the project footprint. (1) Concentrate or cluster development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition; and (2) use natural drainage systems to the maximum extent practicable (natural drainages and vegetated swales are preferred over using lined channels or underground storm drains.
3. Minimize directly connect impervious areas. (1) Where landscaping is proposed, drain rooftops into adjacent landscaping prior to discharging to the storm water conveyance system; and (2) where landscaping is proposed, drain impervious parking lots, sidewalks, walkways, trails, and patios into adjacent landscaping.

4. Maximize canopy interception and water conservation. (1) Preserve existing native trees and shrubs; and (2) plant additional native or drought tolerant trees and large shrubs in place of non-drought tolerant exotics.
5. Convey runoff safely from the tops of slopes.
6. Vegetate slopes with native or drought tolerant vegetation
7. Stabilize permanent channel crossings.
8. Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.

Source Control

The following source control BMPs are identified for future development (City Storm Water Standards – Section III.2.B and Appendix C):

1. Outdoor material storage areas will be designed to reduce pollution introduction. Any hazardous materials with the potential to contaminate urban runoff shall be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with rain, runoff or spillage to the storm water conveyance system; and (2) protected by secondary containment structures such as berms, dikes or curbs. The storage area shall be pave and sufficiently impervious to contain leaks and spills and have a roof or awning to minimize direct precipitation within the secondary containment area.
2. Trash storage areas shall be: (1) paved with an impervious surface, designed not to allow run-on from adjoining areas, and screened or walled to prevent off-site transport of trash; and, (2) contain attached lids on all trash containers that exclude rain; or (3) contain a roof or awning to minimize direct precipitation.
3. Integrated pest management principles shall be employed including planting pest-resistant or well-adapted varieties such as native plants and using pesticides as a last line of defense. These principles shall be extended through the distribution of IPM educational materials to future site tenants.
4. Efficient irrigation systems and landscape design should employ rain shutoff devices to prevent irrigation during and after precipitation, irrigation design according to specific water requirements, and flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
5. All inlets should contain prohibitive illegal dumping language.

Priority Project

The following Priority Project design BMPs are identified for applicable future developments (City Storm Water Standards – Section III.2.C):

1. The design of private roadways shall use at least one of the following: (1) rural swale system; (2) urban curb/swale system; or (3) dual drainage system.
2. Residential driveways shall have one of the following: (1) shared access; (2) flared entrance; (3) wheelstrips (paving under tires); (4) porous paving; or (5) designed to drain into landscaping prior to discharging to the storm water conveyance system. Uncovered temporary

or guest parking on private residential lots shall be: (1) paved with permeable surface; or (2) designed to drain into landscaping prior to discharging to the storm water conveyance system.

3. Loading/unloading dock areas shall include the following: (1) cover loading dock areas, or design drainage to preclude urban run-on and runoff; and (2) an acceptable method of containment and pollutant removal, such as a shut-ff valve and containment area.
4. Maintenance bays shall include at least one of the following: (1) repair/maintenance bays shall be indoors; or, (2) designed to preclude urban run-on and runoff. Maintenance bays shall include a repair/maintenance bay drainage system to capture all wash water, leaks, and spills.
5. Outdoor areas for vehicle & equipment washing shall be: (1) self-contained to preclude run-on and run-off, covered with a roof or overhang, and equipped with a clarifier or other pre-treatment facility; and (2) properly connected to a sanitary sewer.
6. Outdoor processing areas shall: (1) cover or enclose areas that would be the most significant source of pollutants; or, (2) slope the area toward a dead-end sump; or, (3) discharge to the sanitary sewer system. Grade or berm processing area to prevent run-on from surrounding areas.
7. Where landscaping is proposed in surface parking areas, incorporate landscape areas into the drainage system. Overflow parking may be constructed with permeable paving.
8. Non-Retail fueling areas should be designed with the following: (1) paved with Portland cement concrete or equivalent; (2) designed to extend 6.5 feet from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot, whichever is less; (3) sloped to prevent ponding; (4) separated from the rest of the site by a grade break; and (5) designed to drain to the project's treatment control BMP. Must have overhanging roof structure or canopy that is equal to or greater than the area within the fuel dispensing area's grade break and designed not to drain onto or across the fuel dispensing area.
9. Steep hillside areas shall be landscaped with deep-rooted, drought tolerant plant species.

Treatment Control

Treatment control BMPs are designed to filter or treat runoff prior to discharging into an on-site or off-site storm drain system. The largest watershed of the Mesa is the East Watershed encompassing approximately 4,000 acres. This watershed flows into Mexico at a single point between Britannia and La Media roads. The La Media Channel and Border Detention Basin will function as a treatment design BMP (See Exhibit A for locations). Runoff drains to the La Media Channel where runoff is slowly conveyed through heavy riparian vegetation. The channel slopes at 0.25% for approximately 3,500 feet and behaves similar to a vegetated swale. Runoff is then discharged into the Border Detention Basin where storm water flow is slowed in order for pollutants to settle. The basin is approximately 58 acres with a maximum water depth of 6ft. These BMPs were chosen on the basis of site design feasibility and the City Storm Water Standards- Section III.2.D. Additional site treatment control BMPs may be necessary and addressed for future developments.

4. Operation and Maintenance Procedures

Grass Lined Channel

1) Inspect swales at least twice annually for erosion, damage to vegetation, and sediment and debris. See BMP detail TC-30 in **Appendix B** for preferred schedule.
2) Regularly inspect swales for pools of standing water to prevent mosquito breeding.
3) Every few years maintenance of dead or fallen trees may be required.

Detention Basin

An effective maintenance program should include the following key components:

1. Weather-triggered inspections – Inspect after several storm events for bank stability and to determine if the desired residence time has been achieved.
2. Regular inspections – Inspect semi-annually and after significant storm events. Inspect for the issues as described in BMP detail TC-22 in **Appendix B**.
3. Sediment Removal – Remove accumulated sediment when accumulated sediment volume exceeds 10-20% of the basin volume or when accumulation reaches 6 inches or if re-suspension is observed. Significant sediment deposition is not expected after development on The Mesa is completed.
4. Water Removal – Basin will be designed with a "low-flow" outlet; however, if water remains remove standing water by cleaning drainage path within 72 hours after accumulation.
5. General Maintenance Activities – see BMP detail TC-22 in **Appendix B** for maintenance activities and suggested frequency.

5. Operation and Maintenance Responsibility

A Maintenance District will be created for maintaining the channel and regional detention basin. Project detention/water quality basins and BMPs will be maintained by the project owners.

6. Installation Costs

La Media Channel and Border Detention Basin

Preliminary Opinion of Probable Construction Cost
2/8/2005
Kimley-Horn and Associates
Construction Items

Item No.	Description	Quantity	Units	Unit Price	Cost
1	Excavation	822,500	CY	$2	$1,645,000
2	Airway Road culvert (6~5'wx5'h)	300	CY	$1,500	$450,000
3	La Media/Airway Road culvert (6~10'wx6'h)	1,500	CY	$1,500	$2,250,000
4	Siempre Viva Road culvert (8~10'wx8'h)	1,490	CY	$1,500	$2,235,000
5	Detention Basin Outlet Structure	1	LS	$100,000	$100,000
6	Traffic Control	1	LS	$100,000	$100,000
7	Utility Relocation	1	LS	$150,000	$150,000
8	Street Repair	1	LS	$50,000	$50,000
9	Erosion Control	1	LS	$50,000	$50,000
10	Revegetation	1	LS	$600,000	$600,000
		Subtotal			$7,630,000
		Contingency	20%		$1,526,000
		Total			$9,156,000

Land Acquisition

1	Land Acquisition (outside MHPA)*	2,610,000	SF	$4	$10,440,000
2	Land Acquisition (inside MHPA)**	1,820,000	SF	$1	$1,820,000
		Subtotal			$12,260,000
		Contingency	20%		$2,452,000
		Total			$14,712,000

Total Cost (Construction and Land Acquisition) $23,868,000

Notes: * Includes area of detention basin and channel south of Siempre Viva
** Includes entire area within MHPA boundary
*** Estimate does not include engineering, environmental, geotechnical, surveying, etc.

8. Conclusion

The future developments on the Mesa will include source, site, priority project, and treatment control BMPs consistent with the City of San Diego Storm Water Standards. This project consists of treatment control which will be in place before adjacent development is completed. The treatment control consist of a detention basin and a grass lined channel for the watershed to minimize downstream flooding and to treat and filter runoff prior to discharge across border. Use of these control measures complies with the Municipal Storm Water National Pollutant Discharge Elimination System (NPDES) Permit and the City of San Diego's Storm Water Standards.

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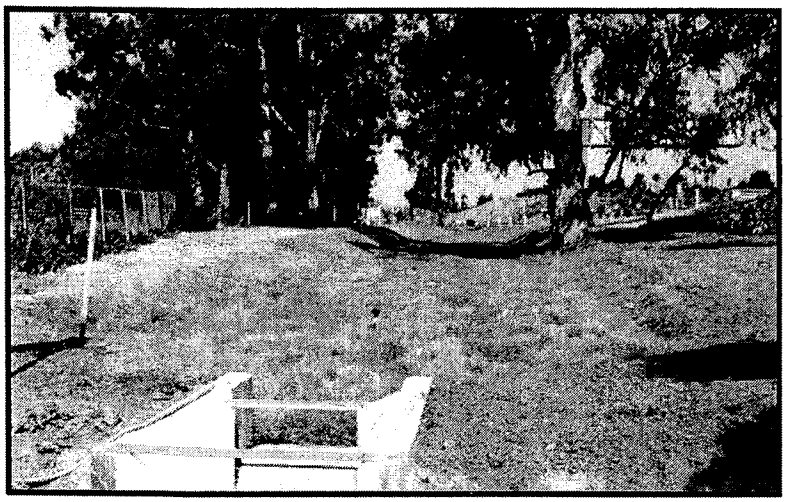
Vegetated Swale TC-30



Design Considerations

- Tributary Area
- Area Required
- Slope
- Water Availability

Description

Vegetated swales are open, shallow channels with vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. They are designed to treat runoff through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Swales can be natural or manmade. They trap particulate pollutants (suspended solids and trace metals), promote infiltration, and reduce the flow velocity of stormwater runoff. Vegetated swales can serve as part of a stormwater drainage system and can replace curbs, gutters and storm sewer systems.

Targeted Constituents

☑	Sediment	▲
☑	Nutrients	●
☑	Trash	●
☑	Metals	▲
☑	Bacteria	●
☑	Oil and Grease	▲
☑	Organics	▲

Legend *(Removal Effectiveness)*

● Low ■ High

▲ Medium

California Experience

Caltrans constructed and monitored six vegetated swales in southern California. These swales were generally effective in reducing the volume and mass of pollutants in runoff. Even in the areas where the annual rainfall was only about 10 inches/yr, the vegetation did not require additional irrigation. One factor that strongly affected performance was the presence of large numbers of gophers at most of the sites. The gophers created earthen mounds, destroyed vegetation, and generally reduced the effectiveness of the controls for TSS reduction.

Advantages

- If properly designed, vegetated, and operated, swales can serve as an aesthetic, potentially inexpensive urban development or roadway drainage conveyance measure with significant collateral water quality benefits.

- Roadside ditches should be regarded as significant potential swale/buffer strip sites and should be utilized for this purpose whenever possible.

Limitations

- Can be difficult to avoid channelization.
- May not be appropriate for industrial sites or locations where spills may occur
- Grassed swales cannot treat a very large drainage area. Large areas may be divided and treated using multiple swales.
- A thick vegetative cover is needed for these practices to function properly.
- They are impractical in areas with steep topography.
- They are not effective and may even erode when flow velocities are high, if the grass cover is not properly maintained.
- In some places, their use is restricted by law: many local municipalities require curb and gutter systems in residential areas.
- Swales are mores susceptible to failure if not properly maintained than other treatment BMPs.

Design and Sizing Guidelines

- Flow rate based design determined by local requirements or sized so that 85% of the annual runoff volume is discharged at less than the design rainfall intensity.
- Swale should be designed so that the water level does not exceed 2/3rds the height of the grass or 4 inches, which ever is less, at the design treatment rate.
- Longitudinal slopes should not exceed 2.5%
- Trapezoidal channels are normally recommended but other configurations, such as parabolic, can also provide substantial water quality improvement and may be easier to mow than designs with sharp breaks in slope.
- Swales constructed in cut are preferred, or in fill areas that are far enough from an adjacent slope to minimize the potential for gopher damage. Do not use side slopes constructed of fill, which are prone to structural damage by gophers and other burrowing animals.
- A diverse selection of low growing, plants that thrive under the specific site, climatic, and watering conditions should be specified. Vegetation whose growing season corresponds to the wet season are preferred. Drought tolerant vegetation should be considered especially for swales that are not part of a regularly irrigated landscaped area.
- The width of the swale should be determined using Manning's Equation using a value of 0.25 for Manning's n.

Construction/Inspection Considerations

- Include directions in the specifications for use of appropriate fertilizer and soil amendments based on soil properties determined through testing and compared to the needs of the vegetation requirements.
- Install swales at the time of the year when there is a reasonable chance of successful establishment without irrigation; however, it is recognized that rainfall in a given year may not be sufficient and temporary irrigation may be used.
- If sod tiles must be used, they should be placed so that there are no gaps between the tiles; stagger the ends of the tiles to prevent the formation of channels along the swale or strip.
- Use a roller on the sod to ensure that no air pockets form between the sod and the soil.
- Where seeds are used, erosion controls will be necessary to protect seeds for at least 75 days after the first rainfall of the season.

Performance

The literature suggests that vegetated swales represent a practical and potentially effective technique for controlling urban runoff quality. While limited quantitative performance data exists for vegetated swales, it is known that check dams, slight slopes, permeable soils, dense grass cover, increased contact time, and small storm events all contribute to successful pollutant removal by the swale system. Factors decreasing the effectiveness of swales include compacted soils, short runoff contact time, large storm events, frozen ground, short grass heights, steep slopes, and high runoff velocities and discharge rates.

Conventional vegetated swale designs have achieved mixed results in removing particulate pollutants. A study performed by the Nationwide Urban Runoff Program (NURP) monitored three grass swales in the Washington, D.C., area and found no significant improvement in urban runoff quality for the pollutants analyzed. However, the weak performance of these swales was attributed to the high flow velocities in the swales, soil compaction, steep slopes, and short grass height.

Another project in Durham, NC, monitored the performance of a carefully designed artificial swale that received runoff from a commercial parking lot. The project tracked 11 storms and concluded that particulate concentrations of heavy metals (Cu, Pb, Zn, and Cd) were reduced by approximately 50 percent. However, the swale proved largely ineffective for removing soluble nutrients.

The effectiveness of vegetated swales can be enhanced by adding check dams at approximately 17 meter (50 foot) increments along their length (See Figure 1). These dams maximize the retention time within the swale, decrease flow velocities, and promote particulate settling. Finally, the incorporation of vegetated filter strips parallel to the top of the channel banks can help to treat sheet flows entering the swale.

Only 9 studies have been conducted on all grassed channels designed for water quality (Table 1). The data suggest relatively high removal rates for some pollutants, but negative removals for some bacteria, and fair performance for phosphorus.

Table 1 Grassed swale pollutant removal efficiency data

Removal Efficiencies (% Removal)							
Study	TSS	TP	TN	NO_3	Metals	Bacteria	Type
Caltrans 2002	77	8	67	66	83-90	-33	dry swales
Goldberg 1993	67.8	4.5	-	31.4	42–62	-100	grassed channel
Seattle Metro and Washington Department of Ecology 1992	60	45	-	-25	2–16	-25	grassed channel
Seattle Metro and Washington Department of Ecology, 1992	83	29	-	-25	46–73	-25	grassed channel
Wang et al., 1981	80	-	-	-	70–80	-	dry swale
Dorman et al., 1989	98	18	-	45	37–81	-	dry swale
Harper, 1988	87	83	84	80	88–90	-	dry swale
Kercher et al., 1983	99	99	99	99	99	-	dry swale
Harper, 1988.	81	17	40	52	37–69	-	wet swale
Koon, 1995	67	39	-	9	-35 to 6	-	wet swale

While it is difficult to distinguish between different designs based on the small amount of available data, grassed channels generally have poorer removal rates than wet and dry swales, although some swales appear to export soluble phosphorus (Harper, 1988; Koon, 1995). It is not clear why swales export bacteria. One explanation is that bacteria thrive in the warm swale soils.

Siting Criteria

The suitability of a swale at a site will depend on land use, size of the area serviced, soil type, slope, imperviousness of the contributing watershed, and dimensions and slope of the swale system (Schueler et al., 1992). In general, swales can be used to serve areas of less than 10 acres, with slopes no greater than 5 %. Use of natural topographic lows is encouraged and natural drainage courses should be regarded as significant local resources to be kept in use (Young et al., 1996).

Selection Criteria (NCTCOG, 1993)

- Comparable performance to wet basins
- Limited to treating a few acres
- Availability of water during dry periods to maintain vegetation
- Sufficient available land area

Research in the Austin area indicates that vegetated controls are effective at removing pollutants even when dormant. Therefore, irrigation is not required to maintain growth during dry periods, but may be necessary only to prevent the vegetation from dying.

The topography of the site should permit the design of a channel with appropriate slope and cross-sectional area. Site topography may also dictate a need for additional structural controls. Recommendations for longitudinal slopes range between 2 and 6 percent. Flatter slopes can be used, if sufficient to provide adequate conveyance. Steep slopes increase flow velocity, decrease detention time, and may require energy dissipating and grade check. Steep slopes also can be managed using a series of check dams to terrace the swale and reduce the slope to within acceptable limits. The use of check dams with swales also promotes infiltration.

Additional Design Guidelines

Most of the design guidelines adopted for swale design specify a minimum hydraulic residence time of 9 minutes. This criterion is based on the results of a single study conducted in Seattle, Washington (Seattle Metro and Washington Department of Ecology, 1992), and is not well supported. Analysis of the data collected in that study indicates that pollutant removal at a residence time of 5 minutes was not significantly different, although there is more variability in that data. Therefore, additional research in the design criteria for swales is needed. Substantial pollutant removal has also been observed for vegetated controls designed solely for conveyance (Barrett et al, 1998); consequently, some flexibility in the design is warranted.

Many design guidelines recommend that grass be frequently mowed to maintain dense coverage near the ground surface. Recent research (Colwell et al., 2000) has shown mowing frequency or grass height has little or no effect on pollutant removal.

Summary of Design Recommendations

1) The swale should have a length that provides a minimum hydraulic residence time of at least 10 minutes. The maximum bottom width should not exceed 10 feet unless a dividing berm is provided. The depth of flow should not exceed 2/3rds the height of the grass at the peak of the water quality design storm intensity. The channel slope should not exceed 2.5%.

2) A design grass height of 6 inches is recommended.

3) Regardless of the recommended detention time, the swale should be not less than 100 feet in length.

4) The width of the swale should be determined using Manning's Equation, at the peak of the design storm, using a Manning's n of 0.25.

5) The swale can be sized as both a treatment facility for the design storm and as a conveyance system to pass the peak hydraulic flows of the 100-year storm if it is located "on-line." The side slopes should be no steeper than 3:1 (H:V).

6) Roadside ditches should be regarded as significant potential swale/buffer strip sites and should be utilized for this purpose whenever possible. If flow is to be introduced through curb cuts, place pavement slightly above the elevation of the vegetated areas. Curb cuts should be at least 12 inches wide to prevent clogging.

7) Swales must be vegetated in order to provide adequate treatment of runoff. It is important to maximize water contact with vegetation and the soil surface. For general purposes, select fine, close-growing, water-resistant grasses. If possible, divert runoff (other than necessary irrigation) during the period of vegetation

establishment. Where runoff diversion is not possible, cover graded and seeded areas with suitable erosion control materials.

Maintenance

The useful life of a vegetated swale system is directly proportional to its maintenance frequency. If properly designed and regularly maintained, vegetated swales can last indefinitely. The maintenance objectives for vegetated swale systems include keeping up the hydraulic and removal efficiency of the channel and maintaining a dense, healthy grass cover.

Maintenance activities should include periodic mowing (with grass never cut shorter than the design flow depth), weed control, watering during drought conditions, reseeding of bare areas, and clearing of debris and blockages. Cuttings should be removed from the channel and disposed in a local composting facility. Accumulated sediment should also be removed manually to avoid concentrated flows in the swale. The application of fertilizers and pesticides should be minimal.

Another aspect of a good maintenance plan is repairing damaged areas within a channel. For example, if the channel develops ruts or holes, it should be repaired utilizing a suitable soil that is properly tamped and seeded. The grass cover should be thick; if it is not, reseed as necessary. Any standing water removed during the maintenance operation must be disposed to a sanitary sewer at an approved discharge location. Residuals (e.g., silt, grass cuttings) must be disposed in accordance with local or State requirements. Maintenance of grassed swales mostly involves maintenance of the grass or wetland plant cover. Typical maintenance activities are summarized below:

- Inspect swales at least twice annually for erosion, damage to vegetation, and sediment and debris accumulation preferably at the end of the wet season to schedule summer maintenance and before major fall runoff to be sure the swale is ready for winter. However, additional inspection after periods of heavy runoff is desirable. The swale should be checked for debris and litter, and areas of sediment accumulation.

- Grass height and mowing frequency may not have a large impact on pollutant removal. Consequently, mowing may only be necessary once or twice a year for safety or aesthetics or to suppress weeds and woody vegetation.

- Trash tends to accumulate in swale areas, particularly along highways. The need for litter removal is determined through periodic inspection, but litter should always be removed prior to mowing.

- Sediment accumulating near culverts and in channels should be removed when it builds up to 75 mm (3 in.) at any spot, or covers vegetation.

- Regularly inspect swales for pools of standing water. Swales can become a nuisance due to mosquito breeding in standing water if obstructions develop (e.g. debris accumulation, invasive vegetation) and/or if proper drainage slopes are not implemented and maintained.

Cost

Construction Cost

Little data is available to estimate the difference in cost between various swale designs. One study (SWRPC, 1991) estimated the construction cost of grassed channels at approximately \$0.25 per ft^2. This price does not include design costs or contingencies. Brown and Schueler (1997) estimate these costs at approximately 32 percent of construction costs for most stormwater management practices. For swales, however, these costs would probably be significantly higher since the construction costs are so low compared with other practices. A more realistic estimate would be a total cost of approximately \$0.50 per ft^2, which compares favorably with other stormwater management practices.

Table 2 Swale Cost Estimate (SEWRPC, 1991)

Component	Unit	Extent	Unit Cost			Total Cost		
			Low	Moderate	High	Low	Moderate	High
Mobilization / Demobilization-Light	Swale	1	$107	$274	$441	$107	$274	$441
Site Preparation								
Clearing[b]	Acre	0.5	$2,200	$3,800	$5,400	$1,100	$1,900	$2,700
Grubbing[c]	Acre	0.25	$3,800	$5,200	$6,600	$950	$1,300	$1,650
General Excavation[d]	Yd^3	372	$2.10	$3.70	$5.30	$781	$1,376	$1,972
Level and Till[e]	Yd^2	1,210	$0.20	$0.35	$0.50	$242	$424	$605
Sites Development								
Salvaged Topsoil Seed, and Mulch[f]	Yd^2	1,210	$0.40	$1.00	$1.60	$484	$1,210	$1,936
Sod[g]	Yd^2	1,210	$1.20	$2.40	$3.60	$1,452	$2,904	$4,356
Subtotal	--	--	--	--	--	$5,116	$9,388	$13,660
Contingencies	Swale	1	25%	25%	25%	$1,279	$2,347	$3,415
Total	--	--	--	--	--	$6,395	$11,735	$17,075

Source: (SEWRPC, 1991)

Note: Mobilization/demobilization refers to the organization and planning involved in establishing a vegetative swale.

[a] Swale has a bottom width of 1.0 foot, a top width of 10 feet with 1:3 side slopes, and a 1,000-foot length.

[b] Area cleared = (top width + 10 feet) x swale length.

[c] Area grubbed = (top width x swale length).

[d] Volume excavated = (0.67 x top width x swale depth) x swale length (parabolic cross-section).

[e] Area tilled = $\left(\text{top width} + \frac{8(\text{swale depth}^2)}{3(\text{top width})}\right) \times$ swale length (parabolic cross-section).

[f] Area seeded = area cleared x 0.5.

[g] Area sodded = area cleared x 0.5.

Table 3 Estimated Maintenance Costs (SEWRPC, 1991)

Component	Unit Cost	Swale Size (Depth and Top Width)		Comment
		1.5-Foot Depth, One-Foot Bottom Width, 10-Foot Top Width	3-Foot Depth, 3-Foot Bottom Width, 21-Foot Top Width	
Lawn Mowing	$0.85 / 1,000 ft^2 / mowing	$0.14 / linear foot	$0.21 / linear foot	Lawn maintenance area=(top width + 10 feet) x length. Mow eight times per year
General Lawn Care	$9.00 / 1,000 ft^2 / year	$0.18 / linear foot	$0.28 / linear foot	Lawn maintenance area = (top width + 10 feet) x length
Swale Debris and Litter Removal	$0.10 / linear foot / year	$0.10 / linear foot	$0.10 / linear foot	--
Grass Reseeding with Mulch and Fertilizer	$0.30 / yd^2	$0.01 / linear foot	$0.01 / linear foot	Area revegetated equals 1% of lawn maintenance area per year
Program Administration and Swale Inspection	$0.15 / linear foot / year, plus $25 / inspection	$0.15 / linear foot	$0.15 / linear foot	Inspect four times per year
Total	--	$0.58 / linear foot	$ 0.75 / linear foot	--

Maintenance Cost

Caltrans (2002) estimated the expected annual maintenance cost for a swale with a tributary area of approximately 2 ha at approximately $2,700. Since almost all maintenance consists of mowing, the cost is fundamentally a function of the mowing frequency. Unit costs developed by SEWRPC are shown in Table 3. In many cases vegetated channels would be used to convey runoff and would require periodic mowing as well, so there may be little additional cost for the water quality component. Since essentially all the activities are related to vegetation management, no special training is required for maintenance personnel.

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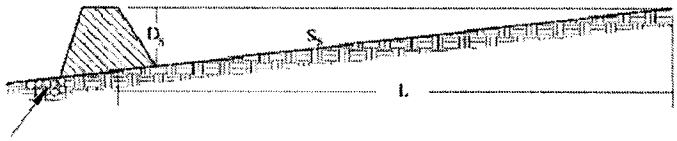
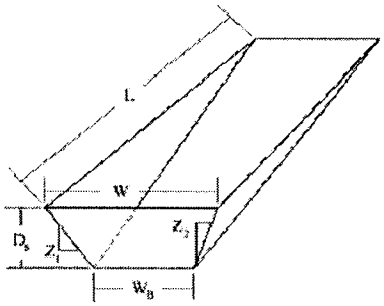


Provide for scour protection.

(a) Cross section of swale with check dam.

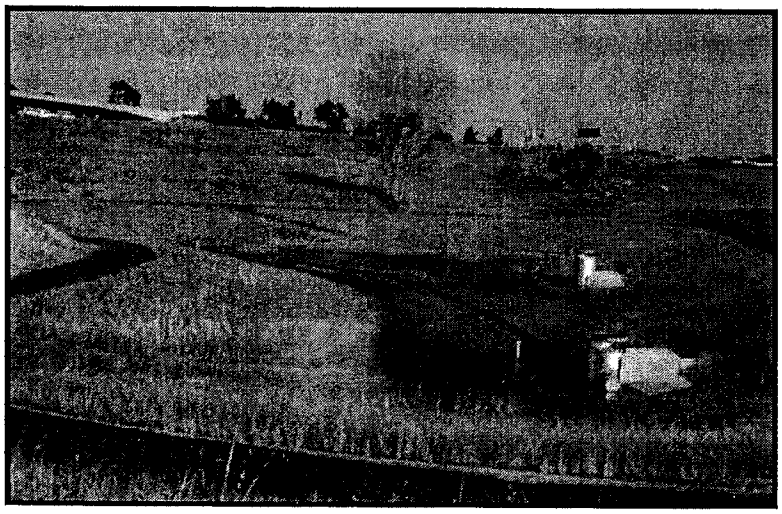


(b) Dimensional view of swale impoundment area.

Notation:

L = Length of swale impoundment area per check dam (ft)
D_s = Depth of check dam (ft)
S_s = Bottom slpe of swale (ft/ft)
W = Top width of check dam (ft)
W_B = Bottom width of check dam (ft)
$Z_{1&2}$ = Ratio of horizontal to vertical change in swale side slope (ft/ft)

Extended Detention Basin TC-22



Design Considerations

- Tributary Area
- Area Required
- Hydraulic Head

Description

Dry extended detention ponds (a.k.a. dry ponds, extended detention basins, detention ponds, extended detention ponds) are basins whose outlets have been designed to detain the stormwater runoff from a water quality design storm for some minimum time (e.g., 48 hours) to allow particles and associated pollutants to settle. Unlike wet ponds, these facilities do not have a large permanent pool. They can also be used to provide flood control by including additional flood detention storage.

Targeted Constituents

☑	Sediment	▲
☑	Nutrients	●
☑	Trash	■
☑	Metals	▲
☑	Bacteria	▲
☑	Oil and Grease	▲
☑	Organics	▲

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

California Experience

Caltrans constructed and monitored 5 extended detention basins in southern California with design drain times of 72 hours. Four of the basins were earthen, less costly and had substantially better load reduction because of infiltration that occurred, than the concrete basin. The Caltrans study reaffirmed the flexibility and performance of this conventional technology. The small headloss and few siting constraints suggest that these devices are one of the most applicable technologies for stormwater treatment.

Advantages

- Due to the simplicity of design, extended detention basins are relatively easy and inexpensive to construct and operate.
- Extended detention basins can provide substantial capture of sediment and the toxics fraction associated with particulates.
- Widespread application with sufficient capture volume can provide significant control of channel erosion and enlargement caused by changes to flow frequency

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relationships resulting from the increase of impervious cover in a watershed.

Limitations

- Limitation of the diameter of the orifice may not allow use of extended detention in watersheds of less than 5 acres (would require an orifice with a diameter of less than 0.5 inches that would be prone to clogging).
- Dry extended detention ponds have only moderate pollutant removal when compared to some other structural stormwater practices, and they are relatively ineffective at removing soluble pollutants.
- Although wet ponds can increase property values, dry ponds can actually detract from the value of a home due to the adverse aesthetics of dry, bare areas and inlet and outlet structures.

Design and Sizing Guidelines

- Capture volume determined by local requirements or sized to treat 85% of the annual runoff volume.
- Outlet designed to discharge the capture volume over a period of hours.
- Length to width ratio of at least 1.5:1 where feasible.
- Basin depths optimally range from 2 to 5 feet.
- Include energy dissipation in the inlet design to reduce resuspension of accumulated sediment.
- A maintenance ramp and perimeter access should be included in the design to facilitate access to the basin for maintenance activities and for vector surveillance and control.
- Use a draw down time of 48 hours in most areas of California. Draw down times in excess of 48 hours may result in vector breeding, and should be used only after coordination with local vector control authorities. Draw down times of less than 48 hours should be limited to BMP drainage areas with coarse soils that readily settle and to watersheds where warming may be determined to downstream fisheries.

Construction/Inspection Considerations

- Inspect facility after first large to storm to determine whether the desired residence time has been achieved.
- When constructed with small tributary area, orifice sizing is critical and inspection should verify that flow through additional openings such as bolt holes does not occur.

Performance

One objective of stormwater management practices can be to reduce the flood hazard associated with large storm events by reducing the peak flow associated with these storms. Dry extended detention basins can easily be designed for flood control, and this is actually the primary purpose of most detention ponds.

Dry extended detention basins provide moderate pollutant removal, provided that the recommended design features are incorporated. Although they can be effective at removing some pollutants through settling, they are less effective at removing soluble pollutants because of the absence of a permanent pool. Several studies are available on the effectiveness of dry extended detention ponds including one recently concluded by Caltrans (2002).

The load reduction is greater than the concentration reduction because of the substantial infiltration that occurs. Although the infiltration of stormwater is clearly beneficial to surface receiving waters, there is the potential for groundwater contamination. Previous research on the effects of incidental infiltration on groundwater quality indicated that the risk of contamination is minimal.

There were substantial differences in the amount of infiltration that were observed in the earthen basins during the Caltrans study. On average, approximately 40 percent of the runoff entering the unlined basins infiltrated and was not discharged. The percentage ranged from a high of about 60 percent to a low of only about 8 percent for the different facilities. Climatic conditions and local water table elevation are likely the principal causes of this difference. The least infiltration occurred at a site located on the coast where humidity is higher and the basin invert is within a few meters of sea level. Conversely, the most infiltration occurred at a facility located well inland in Los Angeles County where the climate is much warmer and the humidity is less, resulting in lower soil moisture content in the basin floor at the beginning of storms.

Vegetated detention basins appear to have greater pollutant removal than concrete basins. In the Caltrans study, the concrete basin exported sediment and associated pollutants during a number of storms. Export was not as common in the earthen basins, where the vegetation appeared to help stabilize the retained sediment.

Siting Criteria

Dry extended detention ponds are among the most widely applicable stormwater management practices and are especially useful in retrofit situations where their low hydraulic head requirements allow them to be sited within the constraints of the existing storm drain system. In addition, many communities have detention basins designed for flood control. It is possible to modify these facilities to incorporate features that provide water quality treatment and/or channel protection. Although dry extended detention ponds can be applied rather broadly, designers need to ensure that they are feasible at the site in question. This section provides basic guidelines for siting dry extended detention ponds.

In general, dry extended detention ponds should be used on sites with a minimum area of 5 acres. With this size catchment area, the orifice size can be on the order of 0.5 inches. On smaller sites, it can be challenging to provide channel or water quality control because the orifice diameter at the outlet needed to control relatively small storms becomes very small and thus prone to clogging. In addition, it is generally more cost-effective to control larger drainage areas due to the economies of scale.

Extended detention basins can be used with almost all soils and geology, with minor design adjustments for regions of rapidly percolating soils such as sand. In these areas, extended detention ponds may need an impermeable liner to prevent ground water contamination.

The base of the extended detention facility should not intersect the water table. A permanently wet bottom may become a mosquito breeding ground. Research in Southwest Florida (Santana et al., 1994) demonstrated that intermittently flooded systems, such as dry extended detention ponds, produce more mosquitoes than other pond systems, particularly when the facilities remained wet for more than 3 days following heavy rainfall.

A study in Prince George's County, Maryland, found that stormwater management practices can increase stream temperatures (Galli, 1990). Overall, dry extended detention ponds increased temperature by about 5°F. In cold water streams, dry ponds should be designed to detain stormwater for a relatively short time (i.e., 24 hours) to minimize the amount of warming that occurs in the basin.

Additional Design Guidelines

In order to enhance the effectiveness of extended detention basins, the dimensions of the basin must be sized appropriately. Merely providing the required storage volume will not ensure maximum constituent removal. By effectively configuring the basin, the designer will create a long flow path, promote the establishment of low velocities, and avoid having stagnant areas of the basin. To promote settling and to attain an appealing environment, the design of the basin should consider the length to width ratio, cross-sectional areas, basin slopes and pond configuration, and aesthetics (Young et al., 1996).

Energy dissipation structures should be included for the basin inlet to prevent resuspension of accumulated sediment. The use of stilling basins for this purpose should be avoided because the standing water provides a breeding area for mosquitoes.

Extended detention facilities should be sized to completely capture the water quality volume. A micropool is often recommended for inclusion in the design and one is shown in the schematic diagram. These small permanent pools greatly increase the potential for mosquito breeding and complicate maintenance activities; consequently, they are not recommended for use in California.

A large aspect ratio may improve the performance of detention basins; consequently, the outlets should be placed to maximize the flowpath through the facility. The ratio of flowpath length to width from the inlet to the outlet should be at least 1.5:1 (L:W) where feasible. Basin depths optimally range from 2 to 5 feet.

The facility's drawdown time should be regulated by an orifice or weir. In general, the outflow structure should have a trash rack or other acceptable means of preventing clogging at the entrance to the outflow pipes. The outlet design implemented by Caltrans in the facilities constructed in San Diego County used an outlet riser with orifices

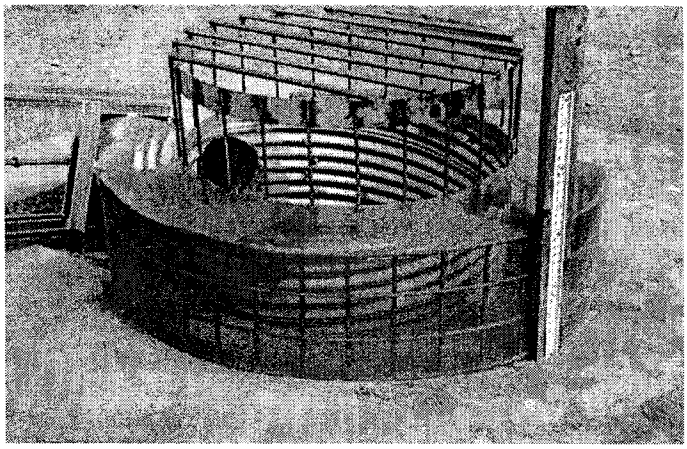

Figure 1
Example of Extended Detention Outlet Structure

sized to discharge the water quality volume, and the riser overflow height was set to the design storm elevation. A stainless steel screen was placed around the outlet riser to ensure that the orifices would not become clogged with debris. Sites either used a separate riser or broad crested weir for overflow of runoff for the 25 and greater year storms. A picture of a typical outlet is presented in Figure 1.

The outflow structure should be sized to allow for complete drawdown of the water quality volume in 72 hours. No more than 50% of the water quality volume should drain from the facility within the first 24 hours. The outflow structure can be fitted with a valve so that discharge from the basin can be halted in case of an accidental spill in the watershed.

Summary of Design Recommendations

(1) Facility Sizing - The required water quality volume is determined by local regulations or the basin should be sized to capture and treat 85% of the annual runoff volume. See Section 5.5.1 of the handbook for a discussion of volume-based design.

Basin Configuration – A high aspect ratio may improve the performance of detention basins; consequently, the outlets should be placed to maximize the flowpath through the facility. The ratio of flowpath length to width from the inlet to the outlet should be at least 1.5:1 (L:W). The flowpath length is defined as the distance from the inlet to the outlet as measured at the surface. The width is defined as the mean width of the basin. Basin depths optimally range from 2 to 5 feet. The basin may include a sediment forebay to provide the opportunity for larger particles to settle out.

A micropool should not be incorporated in the design because of vector concerns. For online facilities, the principal and emergency spillways must be sized to provide 1.0 foot of freeboard during the 25-year event and to safely pass the flow from 100-year storm.

(2) Pond Side Slopes - Side slopes of the pond should be 3:1 (H:V) or flatter for grass stabilized slopes. Slopes steeper than 3:1 (H:V) must be stabilized with an appropriate slope stabilization practice.

(3) Basin Lining – Basins must be constructed to prevent possible contamination of groundwater below the facility.

(4) Basin Inlet – Energy dissipation is required at the basin inlet to reduce resuspension of accumulated sediment and to reduce the tendency for short-circuiting.

(5) Outflow Structure - The facility's drawdown time should be regulated by a gate valve or orifice plate. In general, the outflow structure should have a trash rack or other acceptable means of preventing clogging at the entrance to the outflow pipes.

The outflow structure should be sized to allow for complete drawdown of the water quality volume in 72 hours. No more than 50% of the water quality volume should drain from the facility within the first 24 hours. The outflow structure should be fitted with a valve so that discharge from the basin can be halted in case of an accidental spill in the watershed. This same valve also can be used to regulate the rate of discharge from the basin.

The discharge through a control orifice is calculated from:

$$Q = CA(2g(H-H_0))^{0.5}$$

where:
- Q = discharge (ft^3/s)
- C = orifice coefficient
- A = area of the orifice (ft^2)
- g = gravitational constant (32.2)
- H = water surface elevation (ft)
- H_0= orifice elevation (ft)

Recommended values for C are 0.66 for thin materials and 0.80 when the material is thicker than the orifice diameter. This equation can be implemented in spreadsheet form with the pond stage/volume relationship to calculate drain time. To do this, use the initial height of the water above the orifice for the water quality volume. Calculate the discharge and assume that it remains constant for approximately 10 minutes. Based on that discharge, estimate the total discharge during that interval and the new elevation based on the stage volume relationship. Continue to iterate until H is approximately equal to H_0. When using multiple orifices the discharge from each is summed.

(6) Splitter Box - When the pond is designed as an offline facility, a splitter structure is used to isolate the water quality volume. The splitter box, or other flow diverting approach, should be designed to convey the 25-year storm event while providing at least 1.0 foot of freeboard along pond side slopes.

(7) Erosion Protection at the Outfall - For online facilities, special consideration should be given to the facility's outfall location. Flared pipe end sections that discharge at or near the stream invert are preferred. The channel immediately below the pond outfall should be modified to conform to natural dimensions, and lined with large stone riprap placed over filter cloth. Energy dissipation may be required to reduce flow velocities from the primary spillway to non-erosive velocities.

(8) Safety Considerations - Safety is provided either by fencing of the facility or by managing the contours of the pond to eliminate dropoffs and other hazards. Earthen side slopes should not exceed 3:1 (H:V) and should terminate on a flat safety bench area. Landscaping can be used to impede access to the facility. The primary spillway opening must not permit access by small children. Outfall pipes above 48 inches in diameter should be fenced.

Maintenance

Routine maintenance activity is often thought to consist mostly of sediment and trash and debris removal; however, these activities often constitute only a small fraction of the maintenance hours. During a recent study by Caltrans, 72 hours of maintenance was performed annually, but only a little over 7 hours was spent on sediment and trash removal. The largest recurring activity was vegetation management, routine mowing. The largest absolute number of hours was associated with vector control because of mosquito breeding that occurred in the stilling basins (example of standing water to be avoided) installed as energy dissipaters. In most cases, basic housekeeping practices such as removal of debris accumulations and vegetation

management to ensure that the basin dewaters completely in 48-72 hours is sufficient to prevent creating mosquito and other vector habitats.

Consequently, maintenance costs should be estimated based primarily on the mowing frequency and the time required. Mowing should be done at least annually to avoid establishment of woody vegetation, but may need to be performed much more frequently if aesthetics are an important consideration.

Typical activities and frequencies include:

- Schedule semiannual inspection for the beginning and end of the wet season for standing water, slope stability, sediment accumulation, trash and debris, and presence of burrows.
- Remove accumulated trash and debris in the basin and around the riser pipe during the semiannual inspections. The frequency of this activity may be altered to meet specific site conditions.
- Trim vegetation at the beginning and end of the wet season and inspect monthly to prevent establishment of woody vegetation and for aesthetic and vector reasons.
- Remove accumulated sediment and re-grade about every 10 years or when the accumulated sediment volume exceeds 10 percent of the basin volume. Inspect the basin each year for accumulated sediment volume.

Cost

Construction Cost

The construction costs associated with extended detention basins vary considerably. One recent study evaluated the cost of all pond systems (Brown and Schueler, 1997). Adjusting for inflation, the cost of dry extended detention ponds can be estimated with the equation:

$$C = 12.4V^{0.760}$$

where: C = Construction, design, and permitting cost, and
V = Volume (ft^3).

Using this equation, typical construction costs are:

$ 41,600 for a 1 acre-foot pond

$ 239,000 for a 10 acre-foot pond

$ 1,380,000 for a 100 acre-foot pond

Interestingly, these costs are generally slightly higher than the predicted cost of wet ponds (according to Brown and Schueler, 1997) on a cost per total volume basis, which highlights the difficulty of developing reasonably accurate construction estimates. In addition, a typical facility constructed by Caltrans cost about $160,000 with a capture volume of only 0.3 ac-ft.

An economic concern associated with dry ponds is that they might detract slightly from the value of adjacent properties. One study found that dry ponds can actually detract from the

perceived value of homes adjacent to a dry pond by between 3 and 10 percent (Emmerling-Dinovo, 1995).

Maintenance Cost

For ponds, the annual cost of routine maintenance is typically estimated at about 3 to 5 percent of the construction cost (EPA website). Alternatively, a community can estimate the cost of the maintenance activities outlined in the maintenance section. Table 1 presents the maintenance costs estimated by Caltrans based on their experience with five basins located in southern California. Again, it should be emphasized that the vast majority of hours are related to vegetation management (mowing).

Table 1 Estimated Average Annual Maintenance Effort

Activity	Labor Hours	Equipment & Material ($)	Cost
Inspections	4	7	183
Maintenance	49	126	2282
Vector Control	0	0	0
Administration	3	0	132
Materials	-	535	535
Total	**56**	**$668**	**$3,132**

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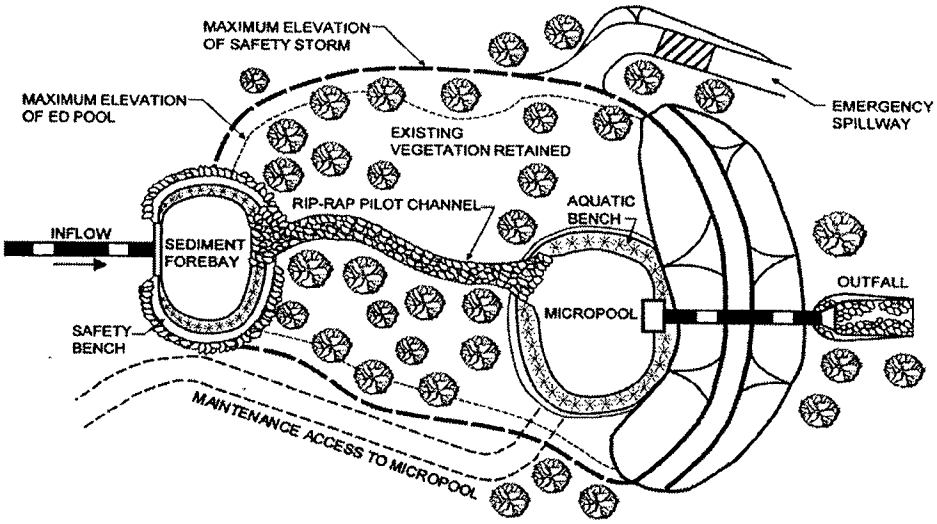
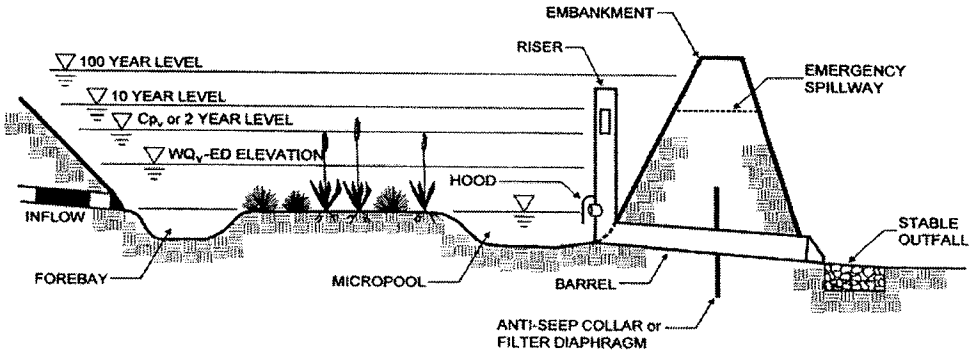


PLAN VIEW



PROFILE

Schematic of an Extended Detention Basin (MDE, 2000)

Drainage Study for the Otay Mesa Community Plan Update

June, 2006

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I. BACKGROUND

This report has been prepared as an appendix to the Otay Mesa Community Plan update EIR. Its purpose is to provide a summary of the existing drainage situation and facilities and proposed future facilities, including alternatives for draining the large central watershed. In addition, this report presents recommendations for drainage design criteria and storm water quality requirements for each of the watersheds on the Mesa.

For most of its early history, Otay Mesa was used for agriculture and farming was the primary land use. As industrial and commercial development started taking place in the 1960s, the City of San Diego recognized the need for a comprehensive drainage Master Plan for the Mesa. Because most of the Mesa drains to the South into Mexico, there was concern that the new development would increase the runoff crossing the border. The City needed to establish criteria for the new development such that there was no increase in runoff as a result of the new construction.

In May of 1987, the City Council approved a contract to prepare the Otay Mesa Drainage Master Plan. In August of 1987, the City published a Notice to "All Private Engineers" that established "Drainage Requirements for Development in Otay Mesa" (attached). The Master Plan was published in January, 1988, and included a proposed concrete Channel from Airway Road to Siempre Viva Road that followed the existing drainage channel.

The Master plan was updated with the "Otay Mesa Drainage Study" published in August, 1999. The most significant recommendation change was moving the proposed new channel from the creek alignment to a new location directly adjacent to La Media Road and Siempre Viva Road.

Reproduction of 1987 NOTICE from Engineering and Development Department

NOTICE

Date: August 7, 1987

To: All Private Engineers

From: Subdivision Engineer

Subject: Drainage requirements for development in Otay Mesa

In order to minimize the effects of increased storm water runoff in Mexico, due to development of property in Otay Mesa, all property in Otay Mesa that is within the water shed that drains into Mexico, shall be developed with the following requirements:

1. Each property owner shall provide storm water detention facilities so that there will be no increase in the rate of runoff due to development of the property.

2. The detention facilities shall be designed so that the rate of runoff from the property will not be greater after development than it was before development for a 5 year, 10 year, 25 year and 50 year storm.

3. All drainage facilities crossing four-lane major or higher classification streets shall be designed for a Q100 (existing). Other facilities, except the major channel referred to in paragraph 5, may be designed for Q50 (existing).

4. The Drainage Design Manual shall be used as guidelines for design of drainage facilities and computing design discharges.

5. The City Engineer's Office, Flood Control Section, is preparing a preliminary plan for the main north-south channel from Otay Mesa Road near La Media to the Mexican Border. The preliminary design will include the design "Q" (Q100 existing), the invert grade, and the water surface elevation at the major road crossings.

C.R. Lockhead
Subdivision Engineer

II. EXISTING DRAINAGE FACILITIES

Information was collected for existing drainage and flood control facilities on Otay Mesa through as-built plans, SanGIS maps, and site visits. Most of the existing drainage facilities were constructed as part of the private development that is taking place on the Mesa. Many of these facilities are not continuous because of the piecemeal nature of the development. This creates challenges for the subsequent developers that need to tie into the existing facilities. Many of the existing facilities are temporary.

Most of the development to-date has occurred in the East Watershed, which therefore includes most of the existing drainage facilities on the Mesa. The existing system is a combination of storm drains, improved channels, and detention basins, which in many areas discharge to natural drainage paths that do not have adequate hydraulic capacity.

The "Existing Drainage Facilities" drawing shows the facilities as-of the date of this report. The area is developing rapidly, and therefore new facilities are continuously being constructed. There are currently no dedicated drainage rights-of-way on the Mesa. Many of the projects, as they were mapped and constructed, dedicated portions of the properties to the city as drainage easements or flood water storage easements. Eventually, the systems and their easements will be continuous.

III. HYDROLOGIC ANALYSIS

The Otay Mesa Study area is shown on the Watershed Map, and includes all of the Mesa area within the City of San Diego divided into five watersheds (with the exception of the far northwest arm of the Mesa, which is fully developed).

Watersheds	Acres	mi^2
West Perimeter Watershed	258	0.40
West Watershed	2,190	3.42
North Perimeter Watershed	590	0.92
East Watershed	3,864	6.04
Border Crossing Watershed	223	0.35
TOTAL	7,125	11.13

Most of the Mesa slopes from North to South, with the flow entering Mexico at several points. The northern and western perimeters of the Mesa flow into the adjacent Canyons. These perimeter watersheds are divided into several independent smaller watersheds. The watershed boundaries on the Mesa are not well defined because the Mesa is so flat. There are very few defined natural drainage paths, with much of the runoff sheet-flowing across the Mesa. The watershed boundaries shown are based on field investigations and best available mapping, but the actual drainage boundaries may be very different.

The only watershed that has been studied significantly from a drainage perspective is the East Watershed. Hydrologic models have been prepared for both of the previous drainage studies. The peak flows calculated in the two studies are different, primarily because of different assumptions relative to developed area, proposed drainage facilities, and watershed areas. The East Watershed includes a large area of unincorporated County property. The hydrologic model assumed the same industrial development for the unincorporated area. If land uses change in the County area, it may change the runoff rates. The differences for the concentration point at the border are shown below.

Q100 at Border East Watershed		
	Area (mi^2)	Q100(cfs)
1988 Study	5.72	5,050
1999 Study	6.63	3,529
2004 CPU	6.78	3,673

As part of this study, new hydrologic models have been prepared for the main watersheds which flow into the Tijuana River. For the East Watershed, HEC-1 has been used, since both previous studies used this model. For the other watersheds, the standard City of San Diego Modified Rational Method (AES) has been used. The results of these analyses are shown in the table below.

Hydrologic Analysis Summary			
	Area (mi^2)	Q50(cfs)	Q100(cfs)
West Perimeter Watershed	0.40	170	444
West Watershed	3.42	672	1,676
East Watershed	6.78	1,280	3,673
	10.60	2,122	5,793

In addition to the above flows, the Spring Canyon open space area contributes 109 cfs (Q50) and 257 cfs (Q100) from 1.2 mi^2. Since the Tijuana River Watershed is a water-quality impacted watershed, the quality and quantity of flow will need to be addressed before additional development takes place.

IV. HYDRAULIC ANALYSIS

Most of the Mesa is very flat, resulting in local flooding during storms at the low points and along some drainage ditches. The only significant creek on the Mesa is the main channel in the East Watershed, Otay Mesa Creek, which flows from North to South along La Media Road and crosses the border into Mexico just north of the Tijuana Airport.

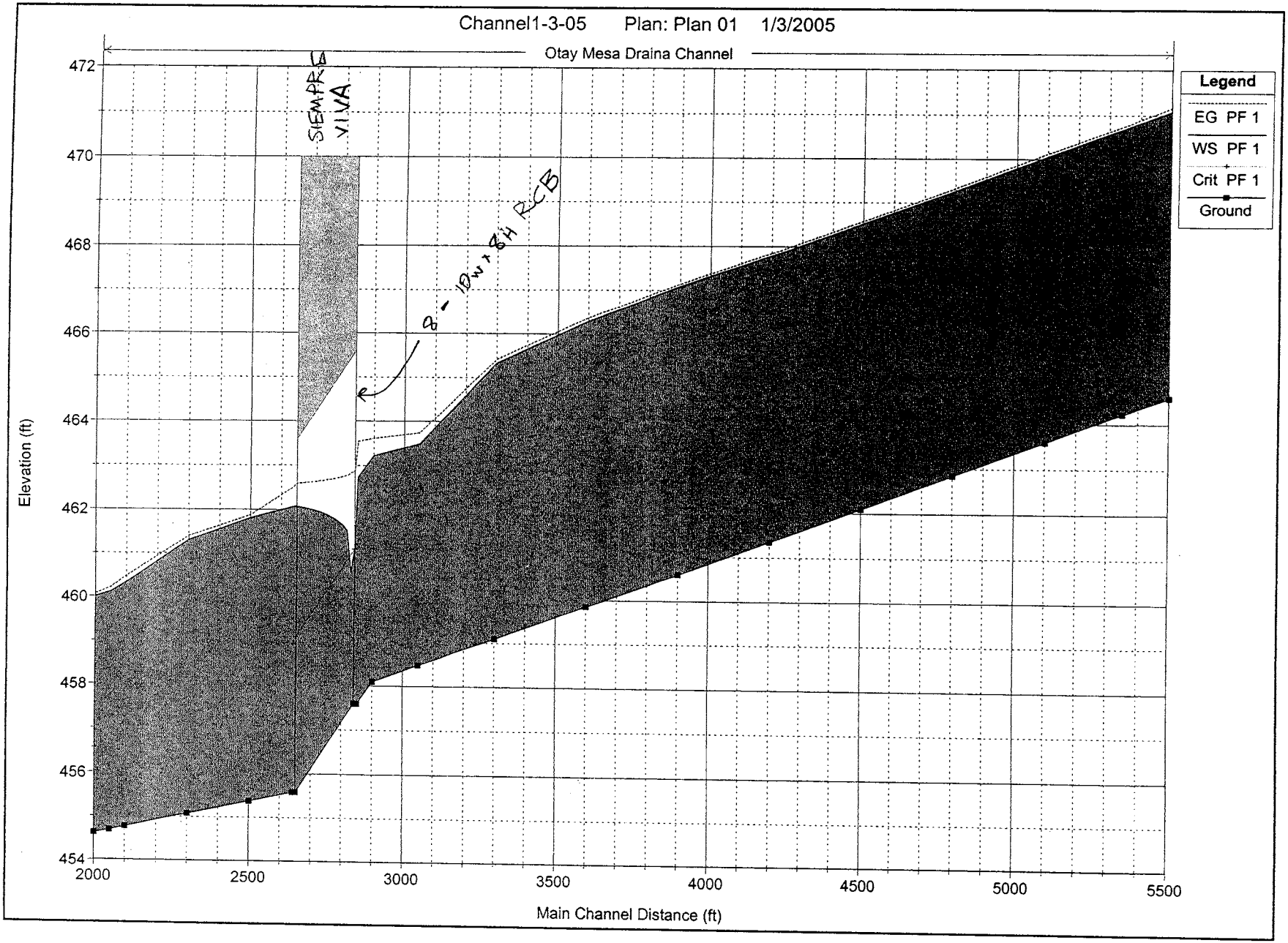
A HEC-RAS hydraulic model was prepared for this channel from the border north to Otay Mesa Road. The purpose of this model was to identify the 100-year floodplain for this reach for present conditions. The proposed future drainage project along this alignment will be designed to contain the 100-year flow, reducing or eliminating flooding impacts to adjacent properties.

The HEC-RAS model was also used to size the proposed new channel from Airway Road to just south of Siempre Viva Road. Several alternative cross-sections were modeled to reflect input on the environmental aspects of the channel.

A significant tributary to the main channel enters just upstream of the Siempre Viva Road crossing. This tributary conveys flow from the De La Fuente Business Park and the Siempre Viva Business Park. The existing channel from La Media Road to the proposed main channel is approximately 15 feet wide and 4 feet deep, with a hydraulic capacity of approximately 120 cfs. The 100 year flow in this channel is 1116 cfs. A proposed new channel has a 50 ft bottom width with 1.5:1.0 side slopes and will convey the 100 year flow. A double 10' x 4.5' RCB will also be required for the flow under La Media Road. The cost estimate does not include these facilities.

HEC-RAS Plan: Plan 01 River: Otay Mesa Draina Reach: Channel Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Channel	5500	PF 1	2500.00	464.60	471.08		471.16	0.002743	2.33	1073.59	200.00	0.18
Channel	5350	PF 1	2500.00	464.23	470.69		470.76	0.002572	2.16	1279.19	335.44	0.17
Channel	5100	PF 1	2500.00	463.60	470.06		470.12	0.002591	2.17	1275.99	335.16	0.17
Channel	4800	PF 1	2500.00	462.85	469.27		469.33	0.002666	2.19	1263.56	334.04	0.18
Channel	4500	PF 1	2500.00	462.10	468.51		468.56	0.002430	2.08	1358.84	378.24	0.17
Channel	4200	PF 1	2500.00	461.35	467.79		467.85	0.002365	2.07	1371.79	379.61	0.17
Channel	3900	PF 1	2500.00	460.60	467.09		467.15	0.002266	2.04	1392.50	381.79	0.16
Channel	3600	PF 1	2500.00	459.85	466.30		466.37	0.002969	2.32	1153.04	281.59	0.19
Channel	3300	PF 1	2500.00	459.10	465.33		465.42	0.003423	2.41	1109.99	285.62	0.20
Channel	3050	PF 1	3000.00	458.48	463.50		463.74	0.014532	4.06	777.90	261.33	0.39
Channel	2900	PF 1	3000.00	458.10	463.23	461.14	463.61	0.000245	4.97	603.31	222.92	0.41
Channel	2850	PF 1	3000.00	457.60	462.74	461.24	463.55	0.000521	7.22	415.32	168.05	0.58
Channel	2750		Culvert									
Channel	2640	PF 1	3000.00	455.59	462.07	458.95	462.52	0.011957	5.38	557.46	183.64	0.37
Channel	2500	PF 1	3000.00	455.38	461.81		461.87	0.001846	2.07	1492.22	277.64	0.15
Channel	2300	PF 1	3000.00	455.08	461.31		461.40	0.003272	2.45	1261.91	277.98	0.19
Channel	2100	PF 1	3000.00	454.78	460.34		460.48	0.006864	3.05	1006.36	275.43	0.27
Channel	2050	PF 1	3000.00	454.70	460.11		460.21	0.003838	2.56	1191.75	275.37	0.21
Channel	2000	PF 1	3000.00	454.63	460.00	456.55	460.06	0.002196	2.06	1582.39	378.00	0.16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Otay Mesa Draina Channel
SIEMPRE VIVA
a - 10W x 8H RCB
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Elevation (ft)
472
470
468
466
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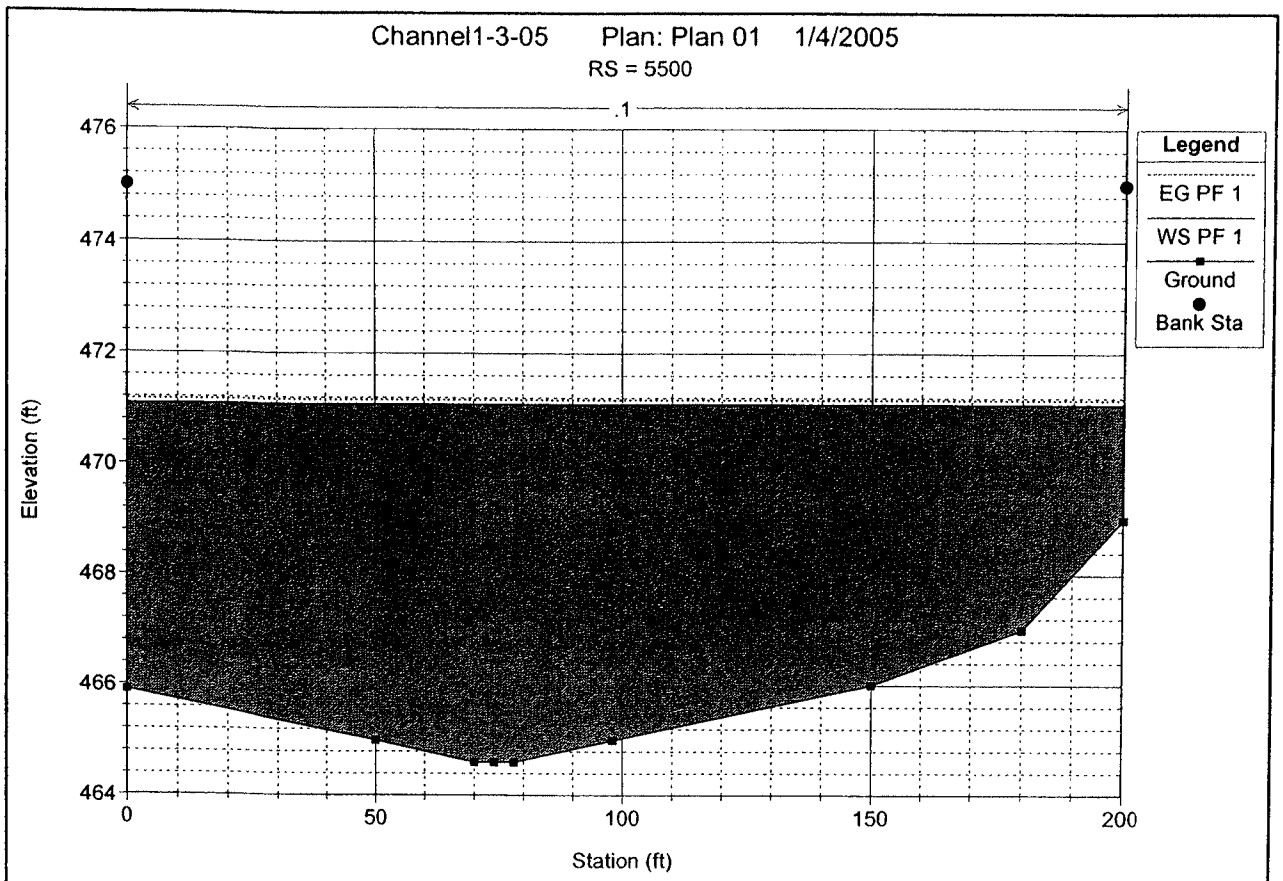
462
460
458
456
454
2000
2500
3000
3500
4000
4500
5000
5500
Main Channel Distance (ft)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WS PF 1
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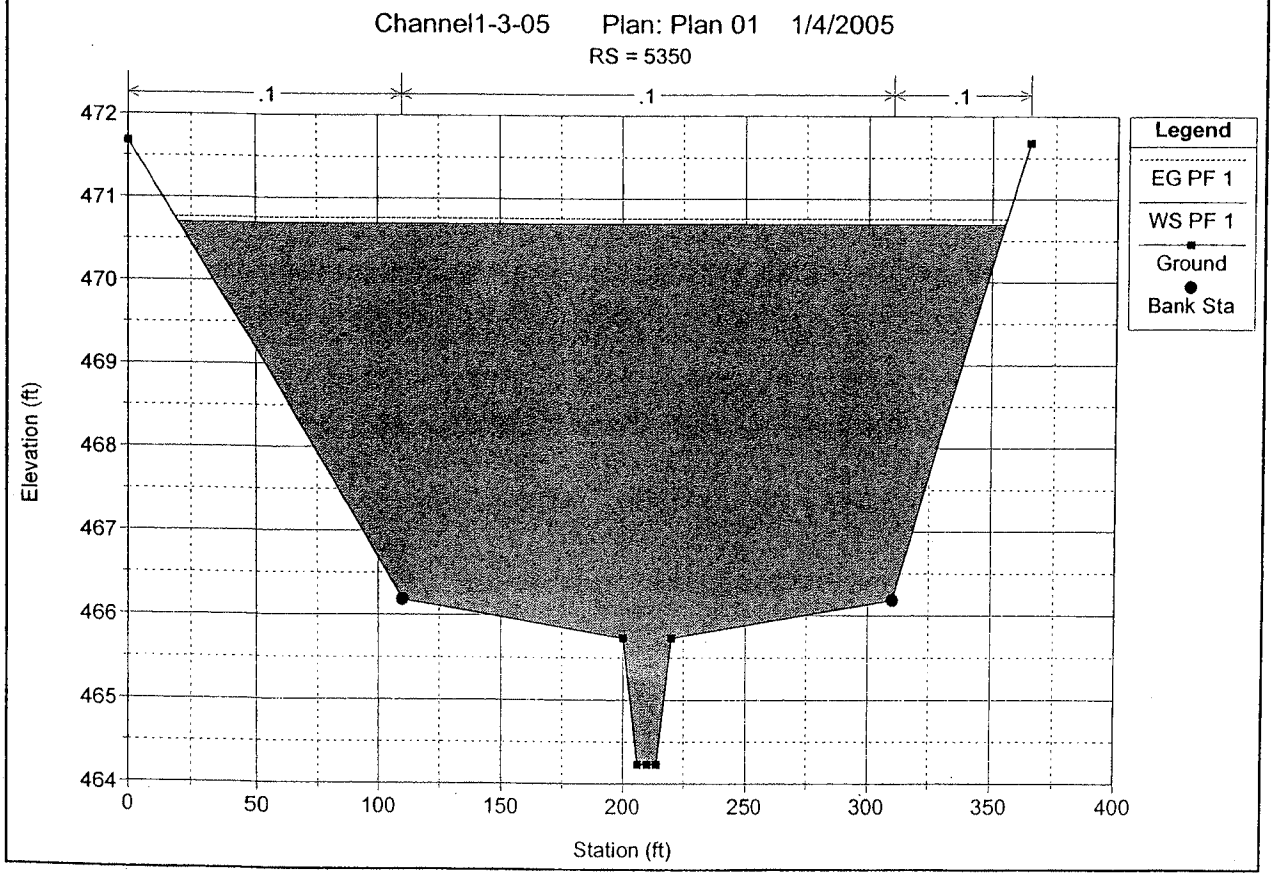
150
200
Station (ft)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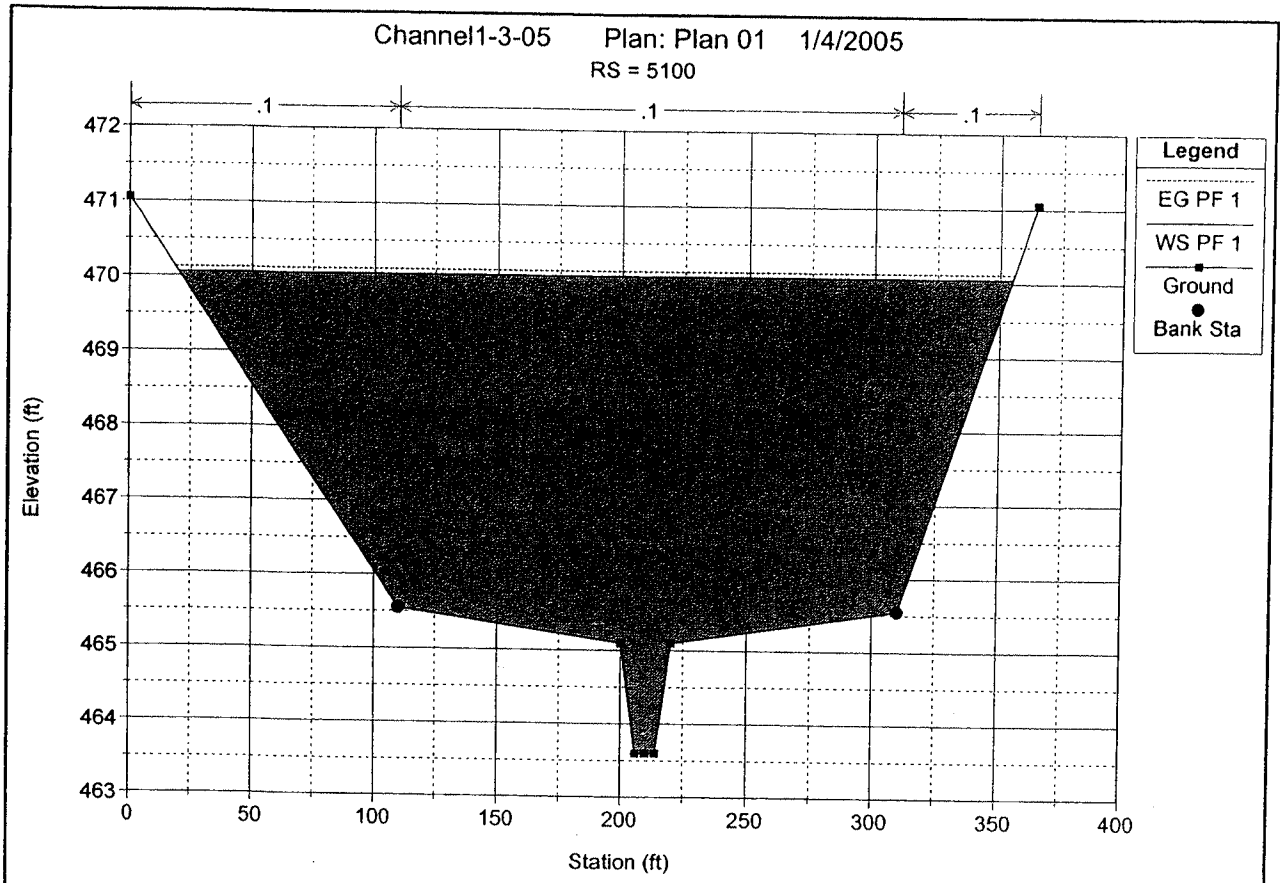
Station (ft)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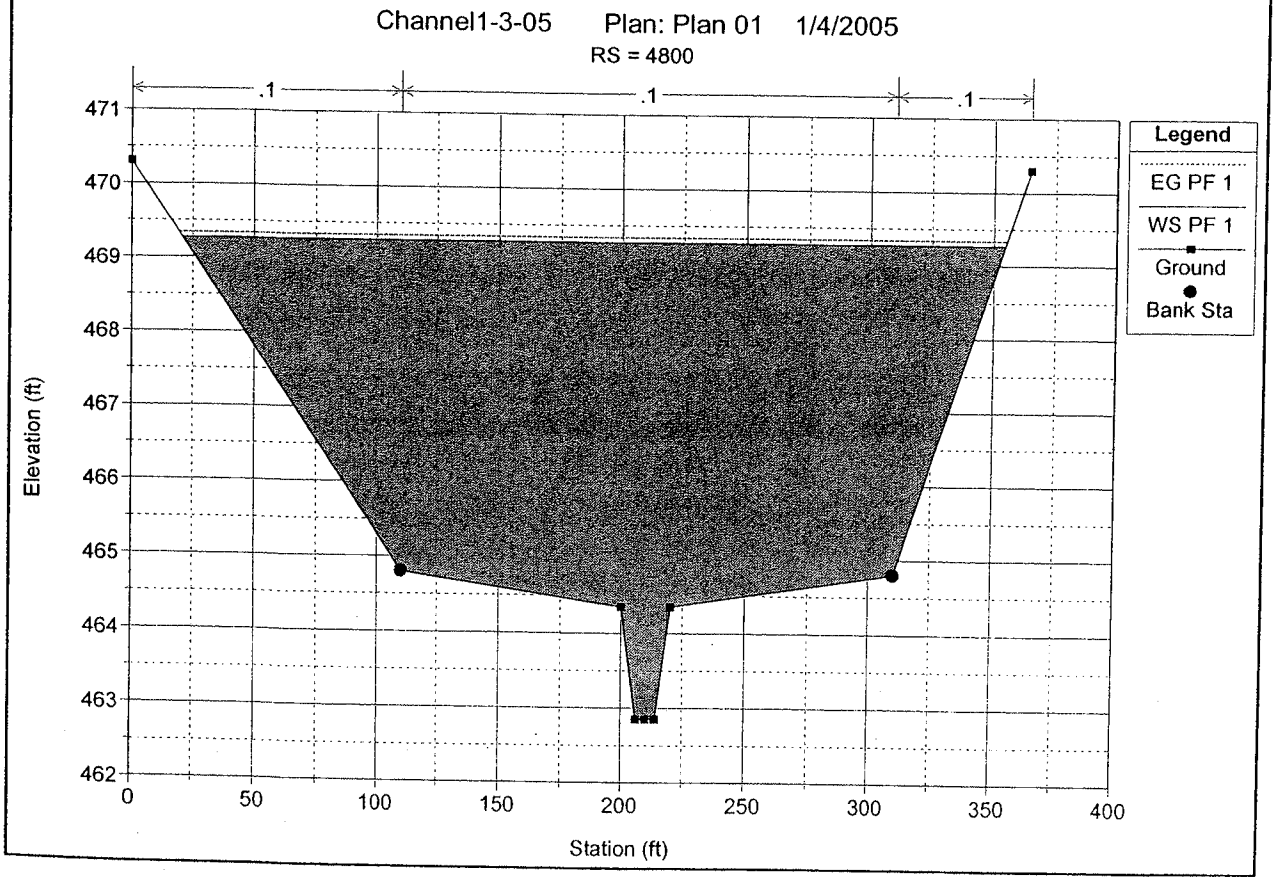
Station (ft)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WS PF 1
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Bank Sta
Elevation (ft)
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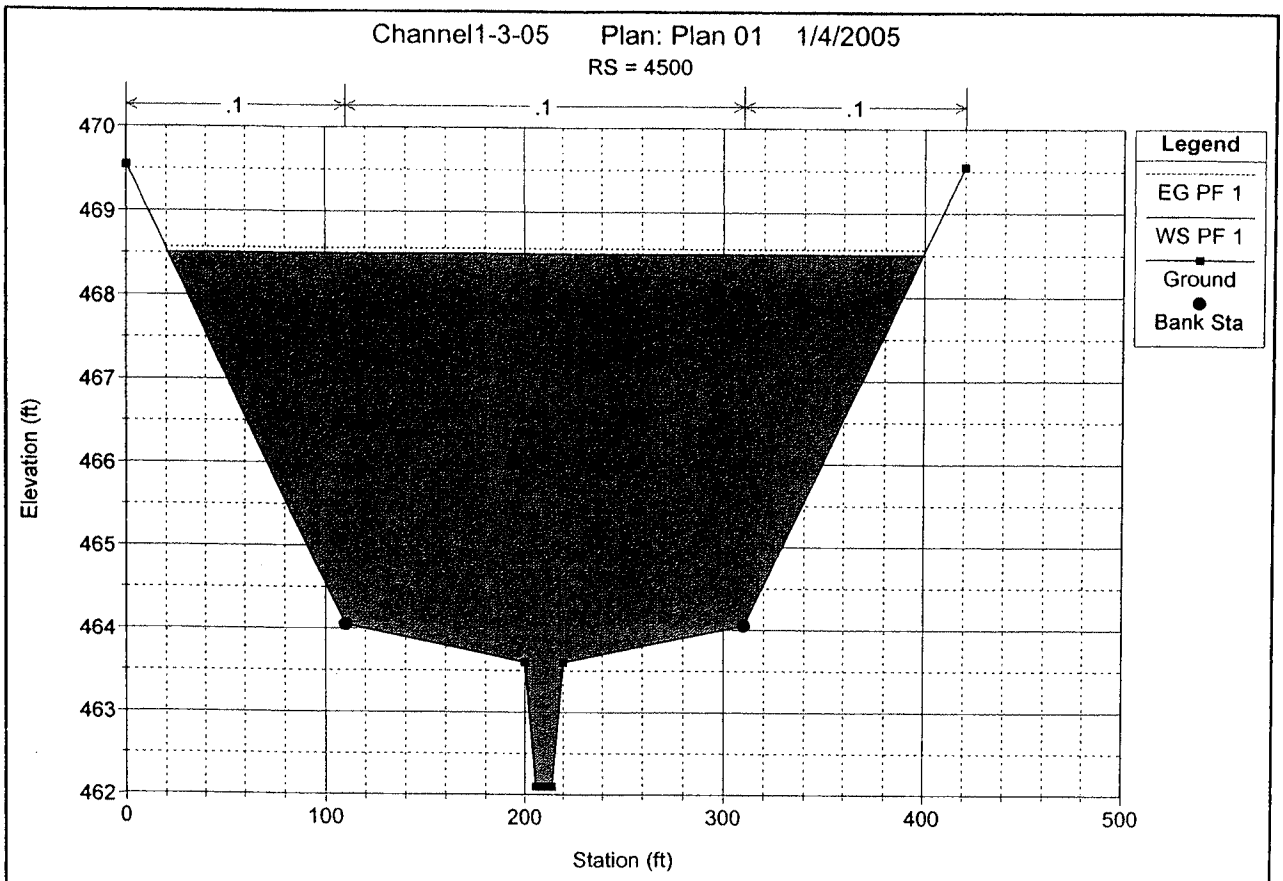
Station (ft)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500
Station (ft)
Legend
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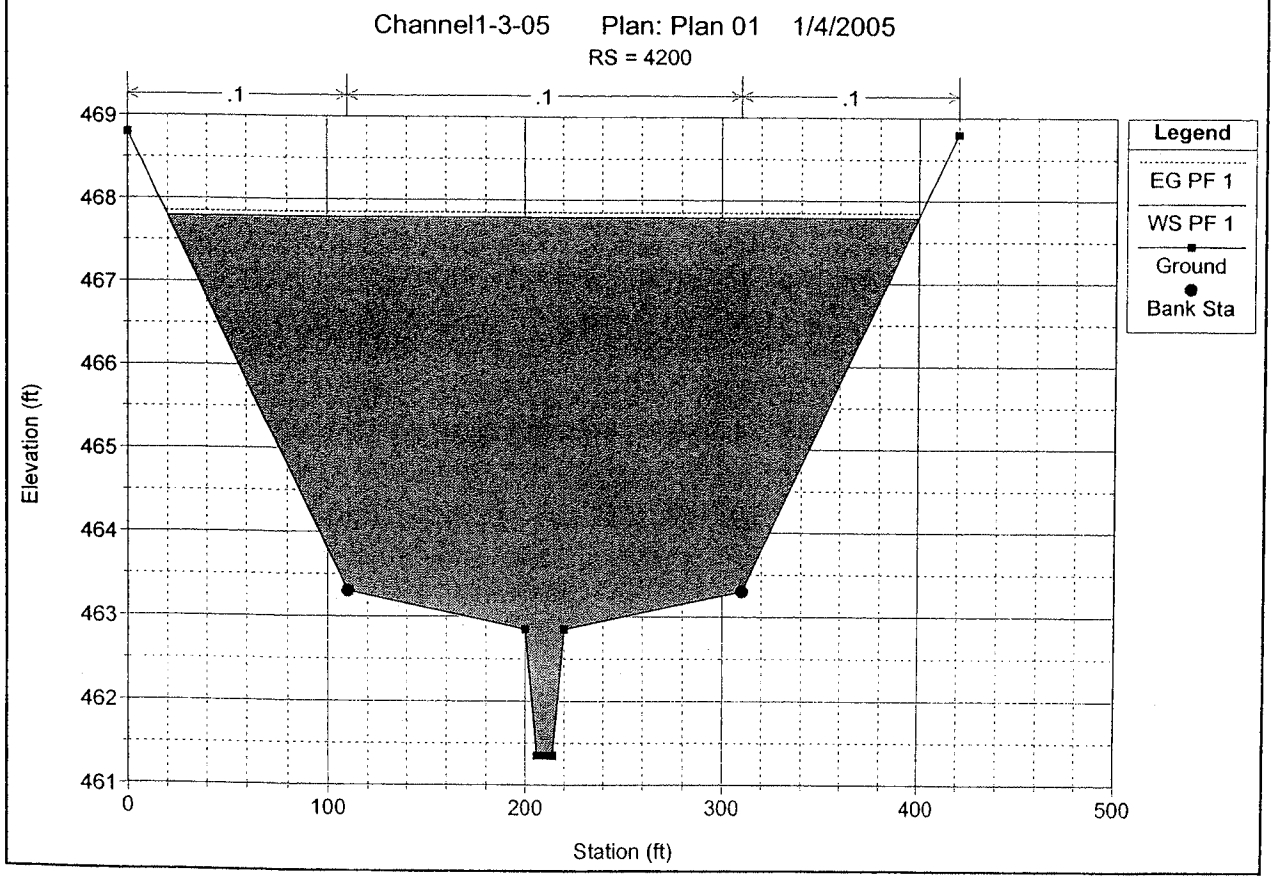
WS PF 1
Ground
Bank Sta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500
Station (ft)
Legend
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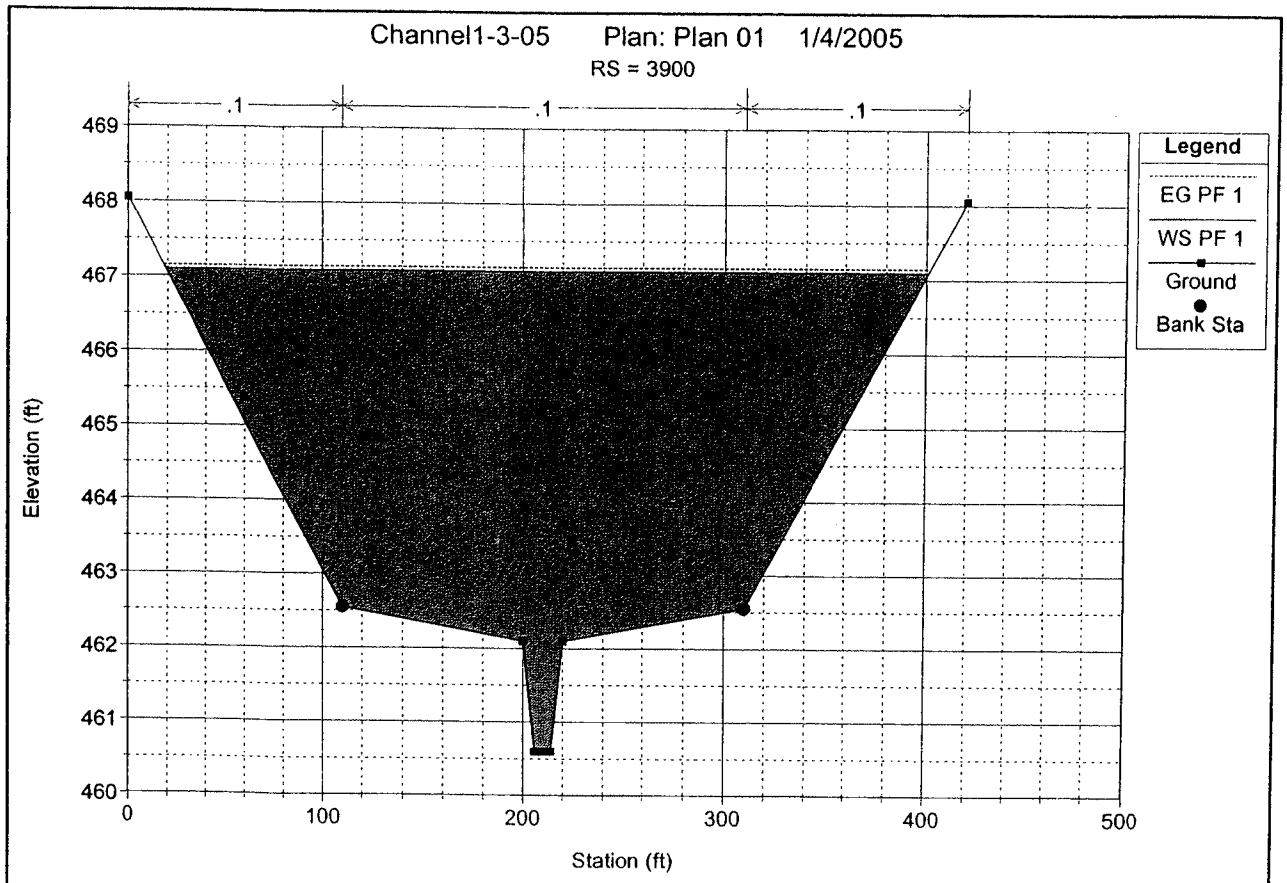
WS PF 1
Ground
Bank Sta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WS PF 1
Ground
Bank Sta
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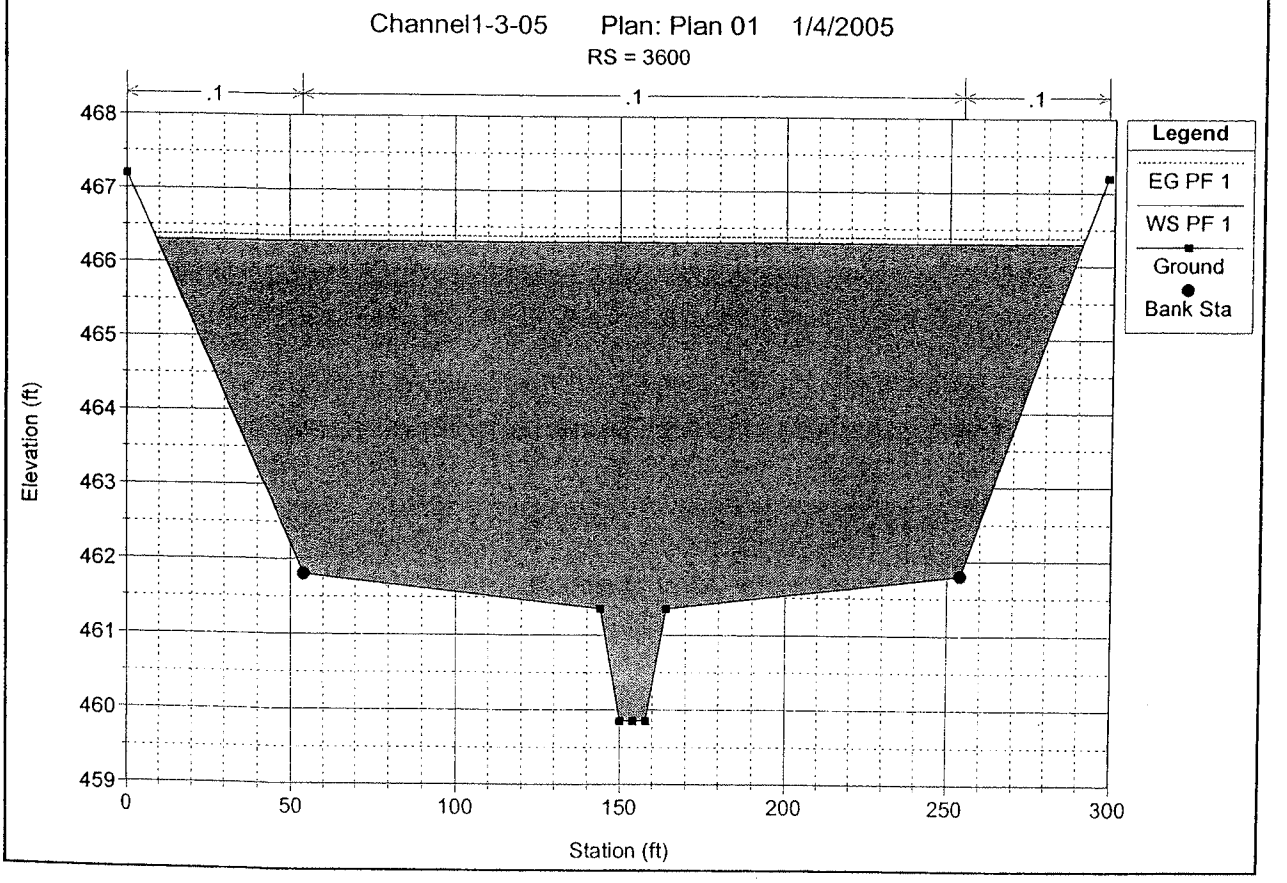
500
Station (ft)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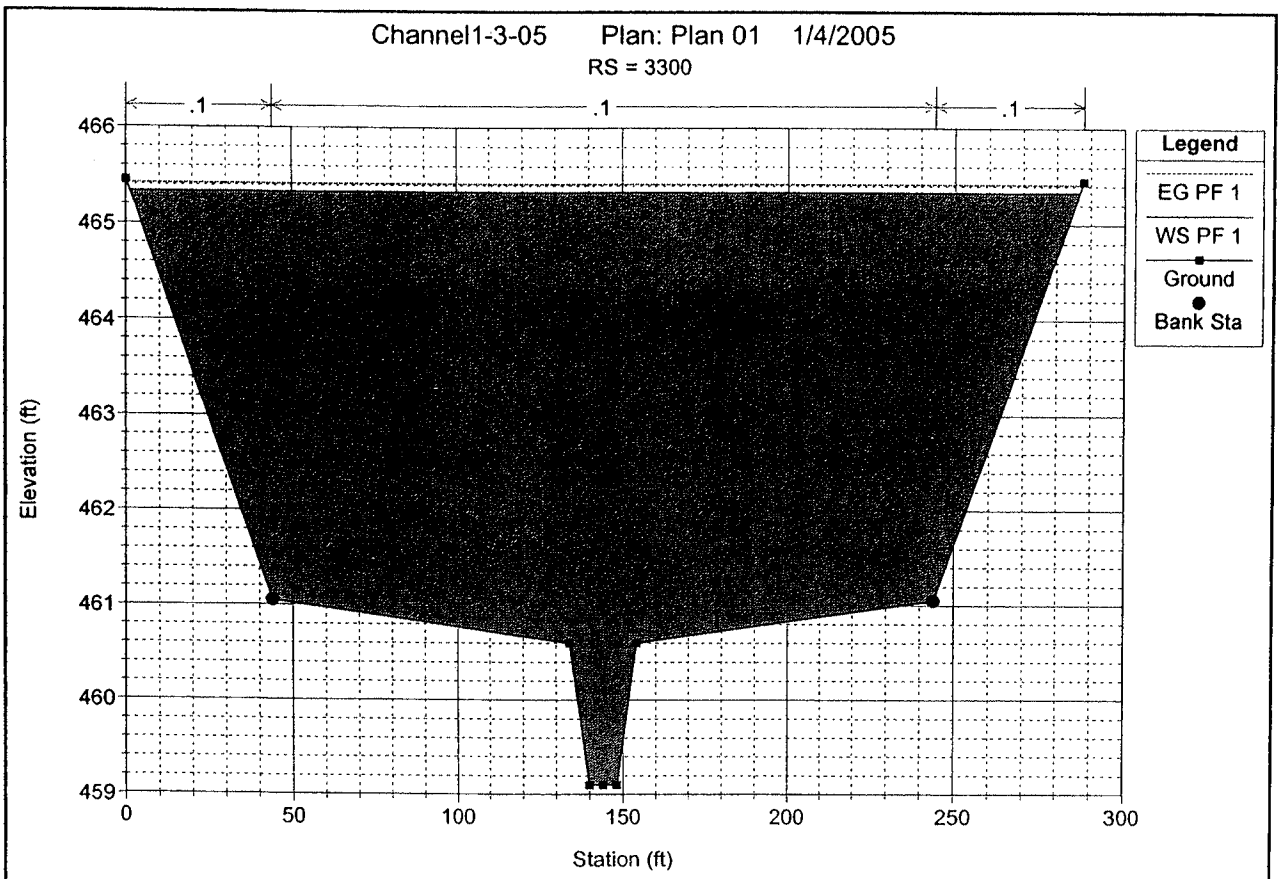
Station (ft)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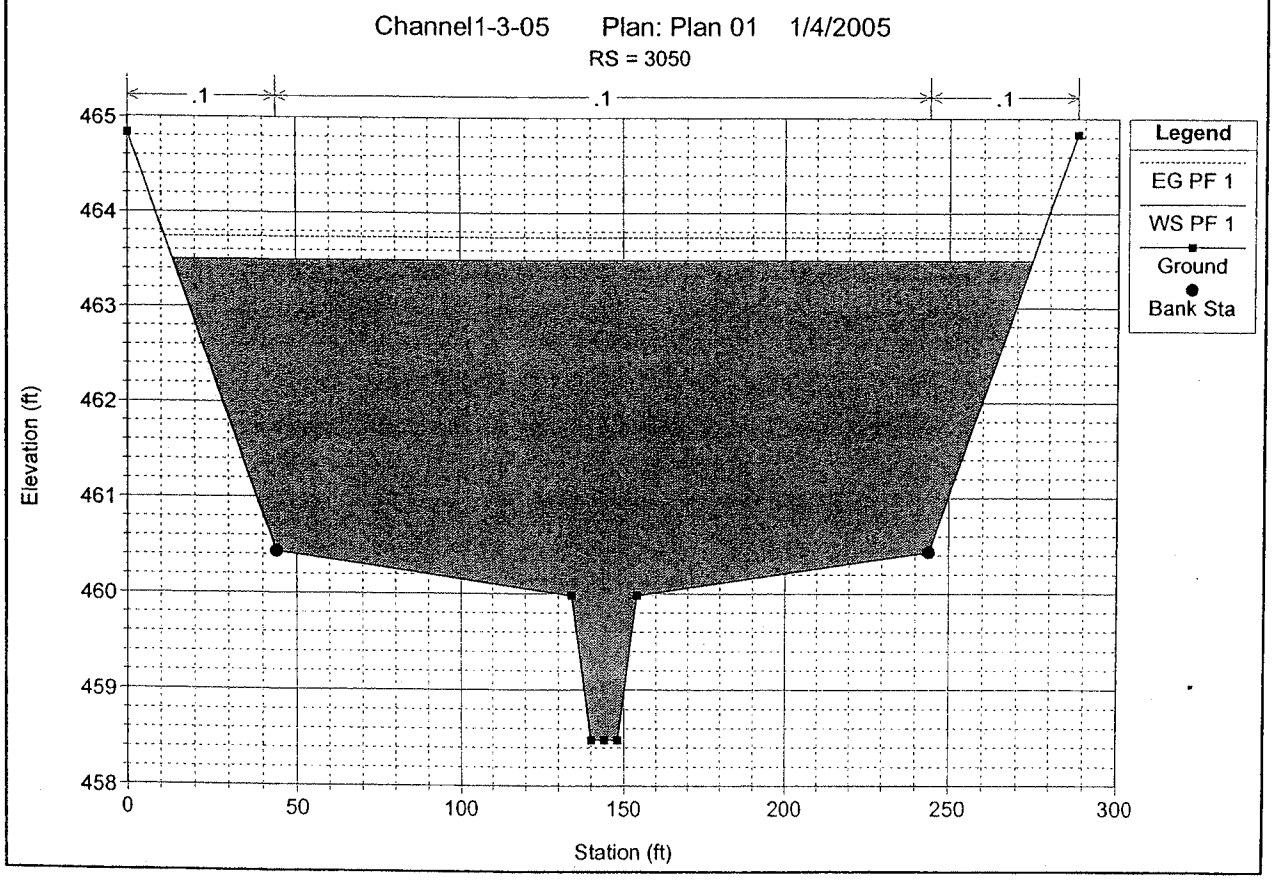
Station (ft)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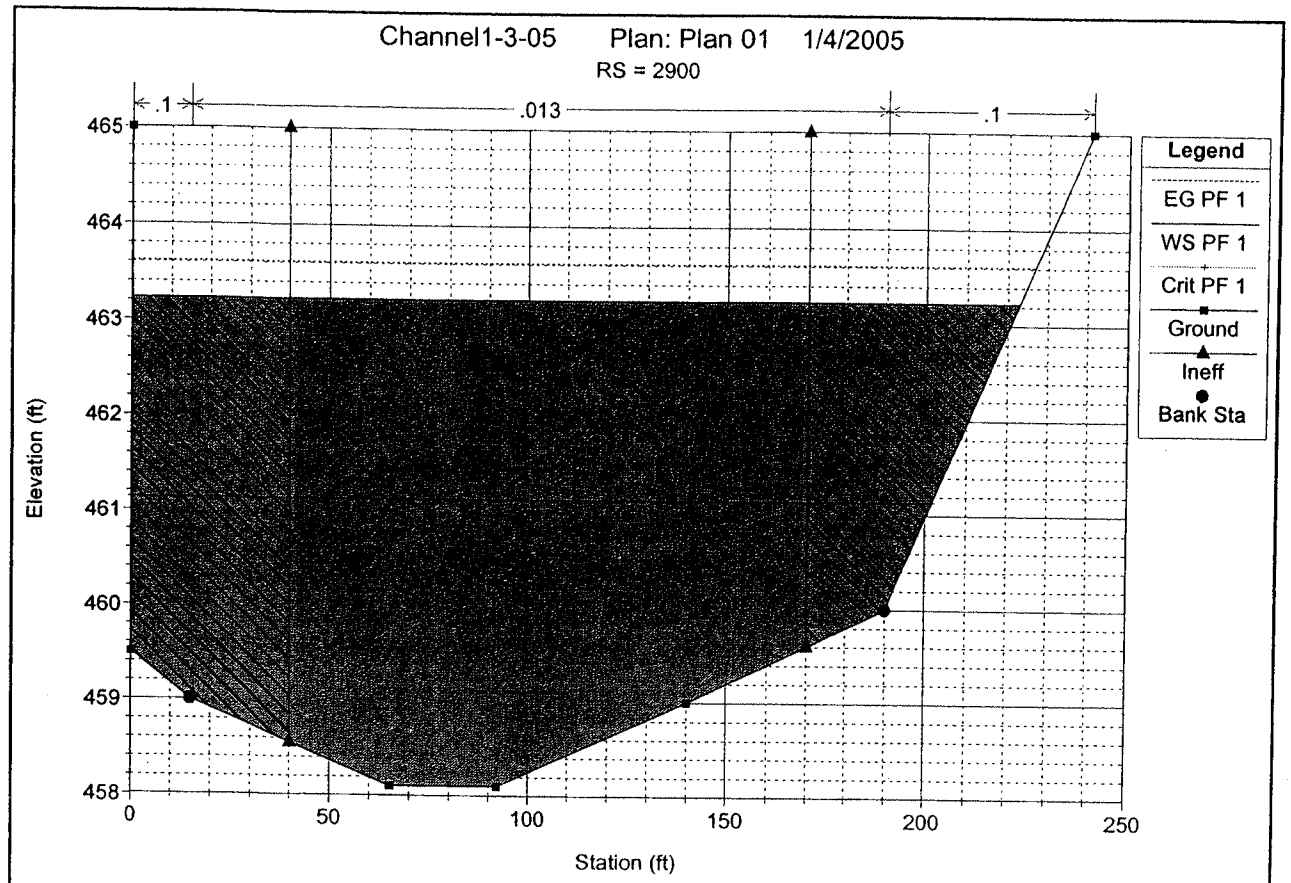
Station (ft)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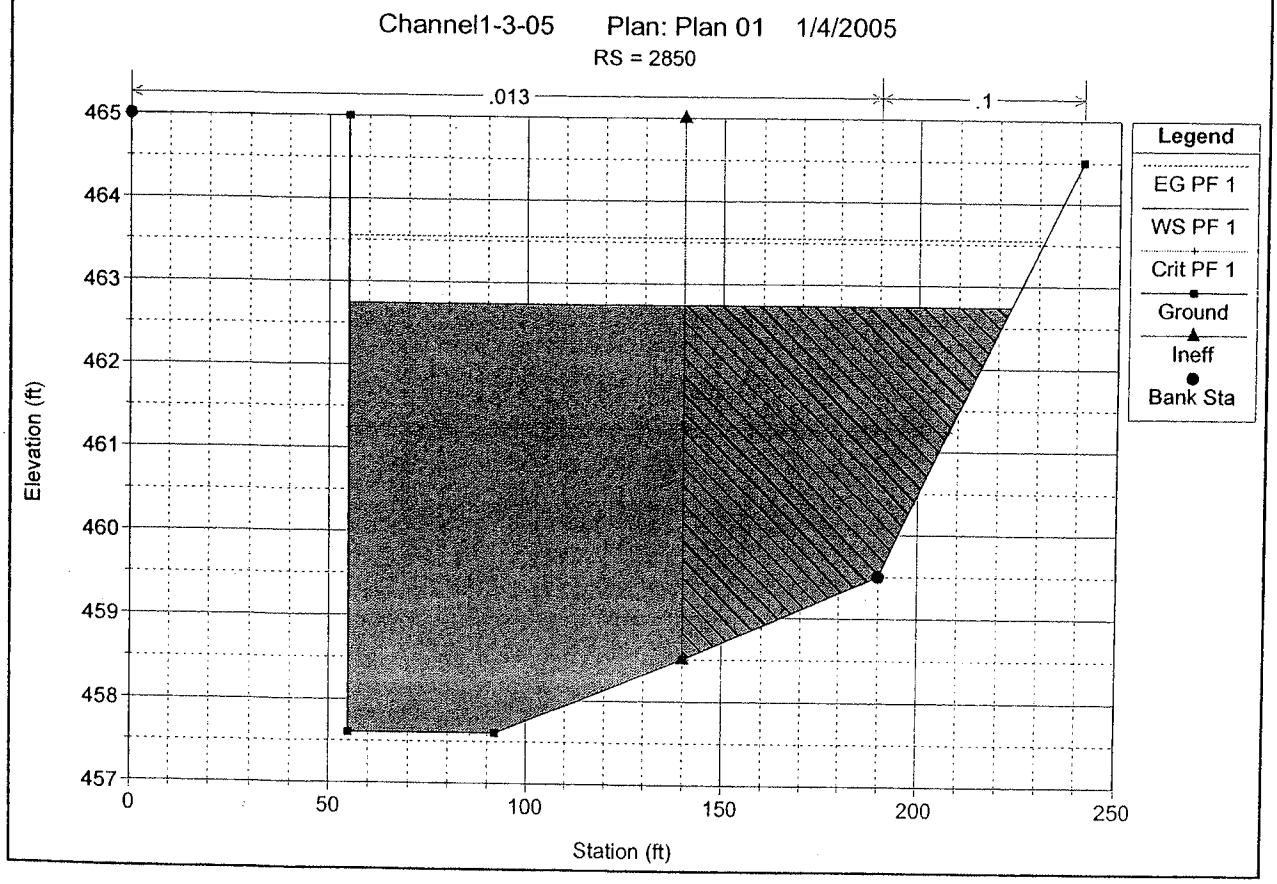
Station (ft)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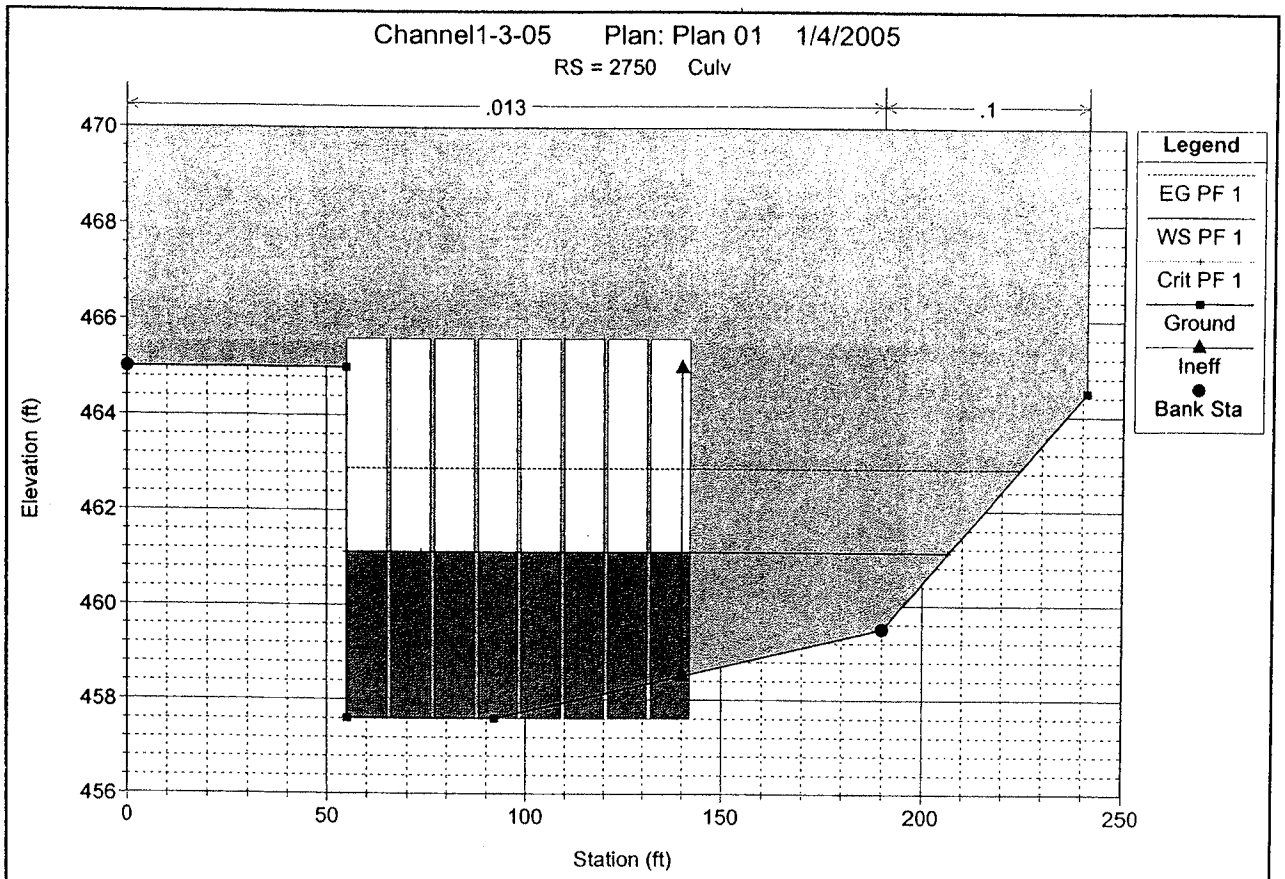
Station (ft)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Station (ft)
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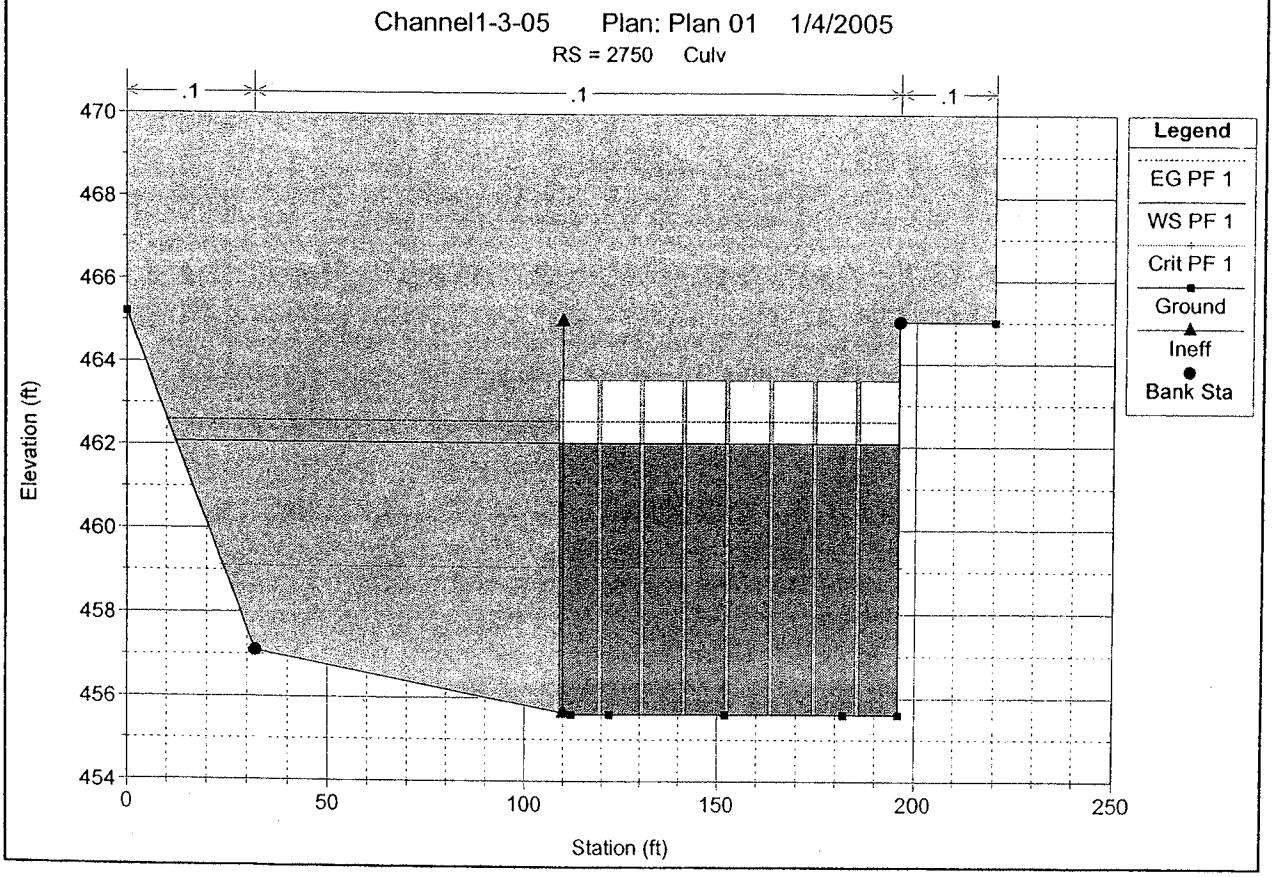
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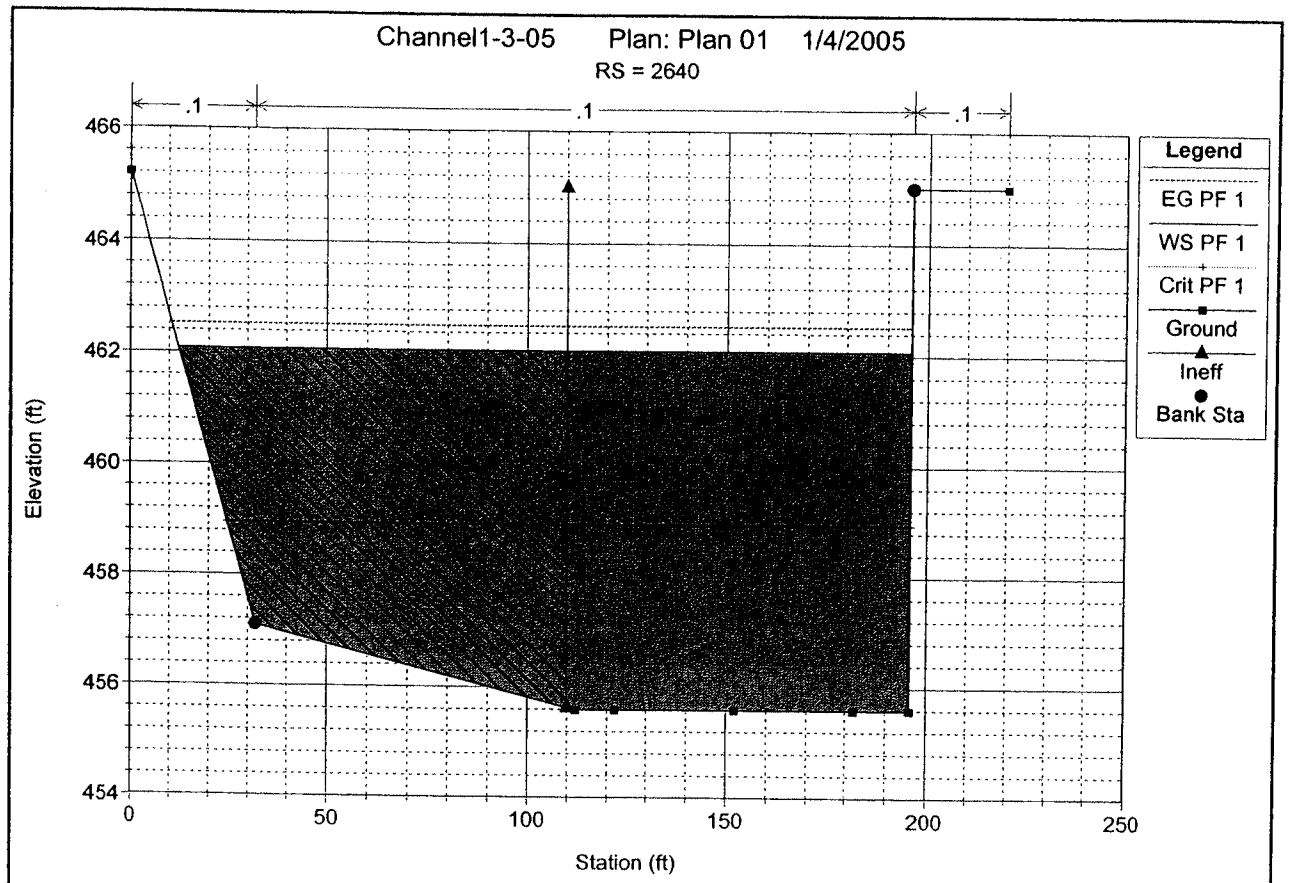
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Ineff
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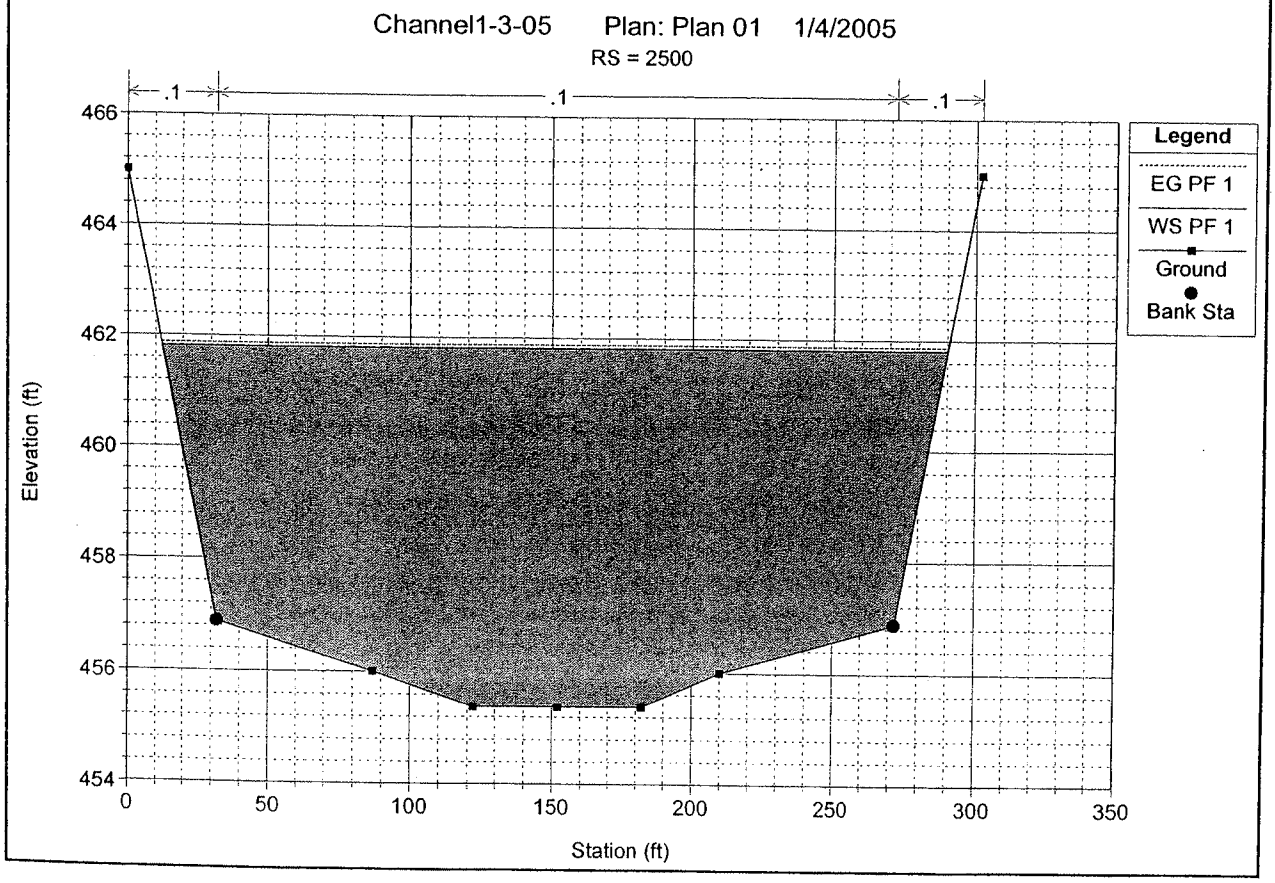
Station (ft)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WS PF 1
Ground
Bank Sta
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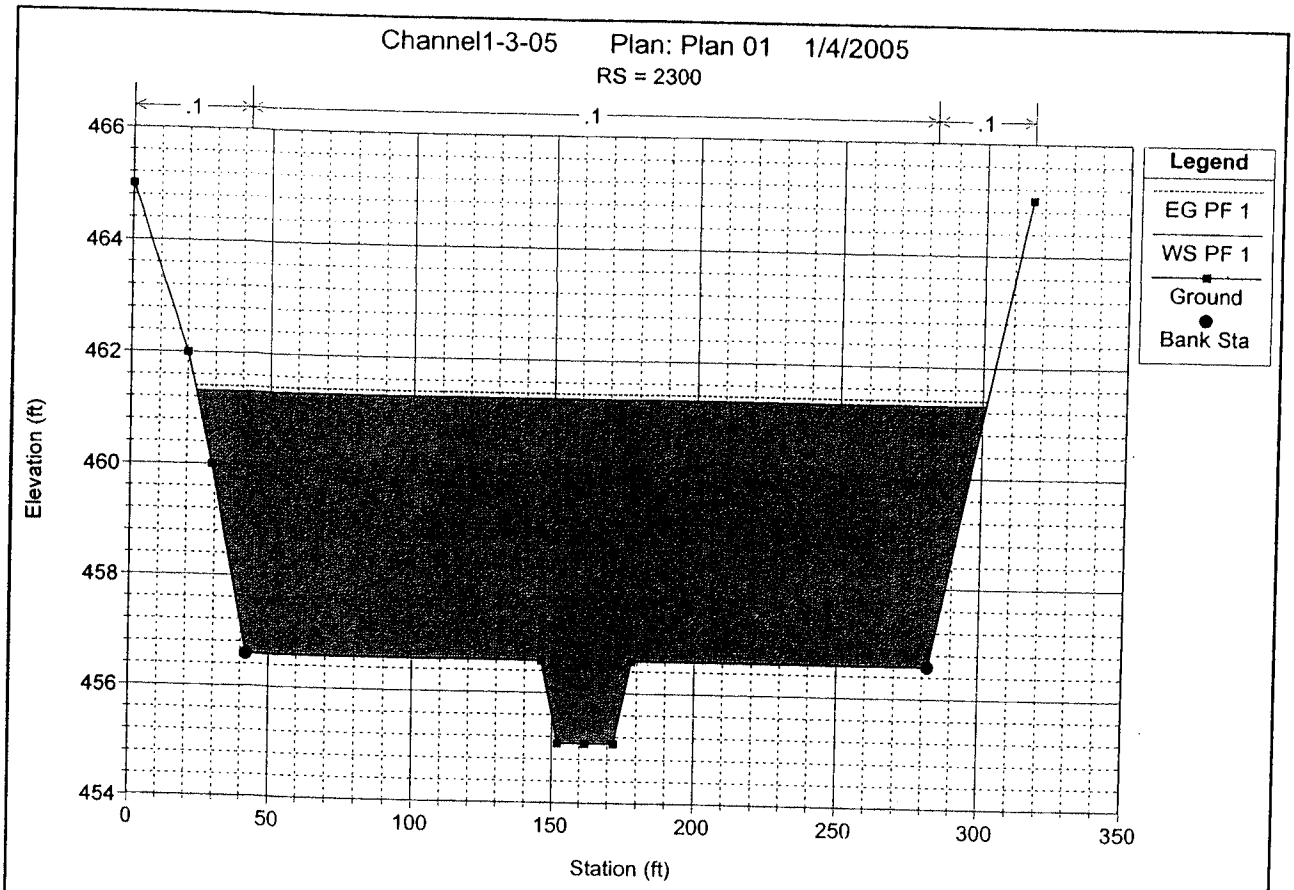
Station (ft)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Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
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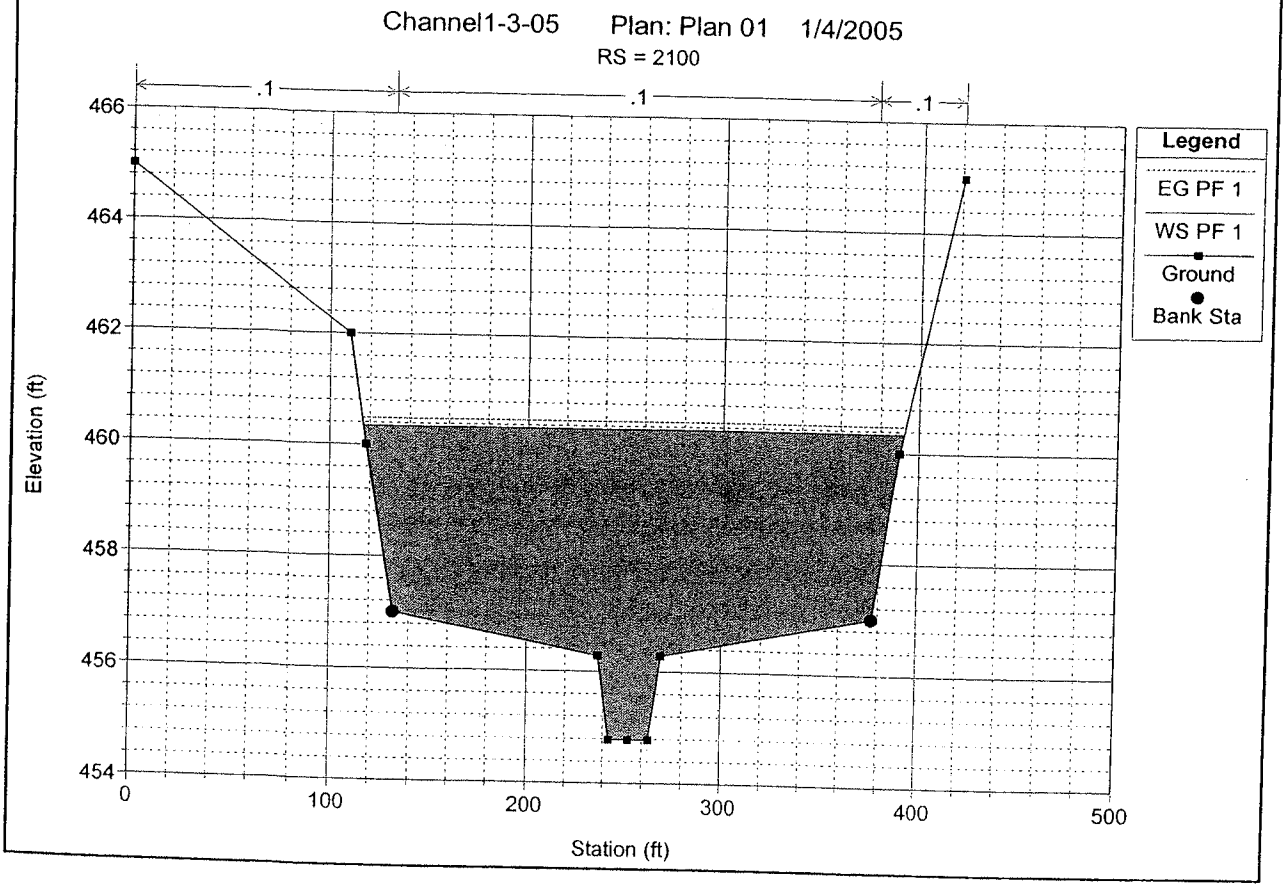
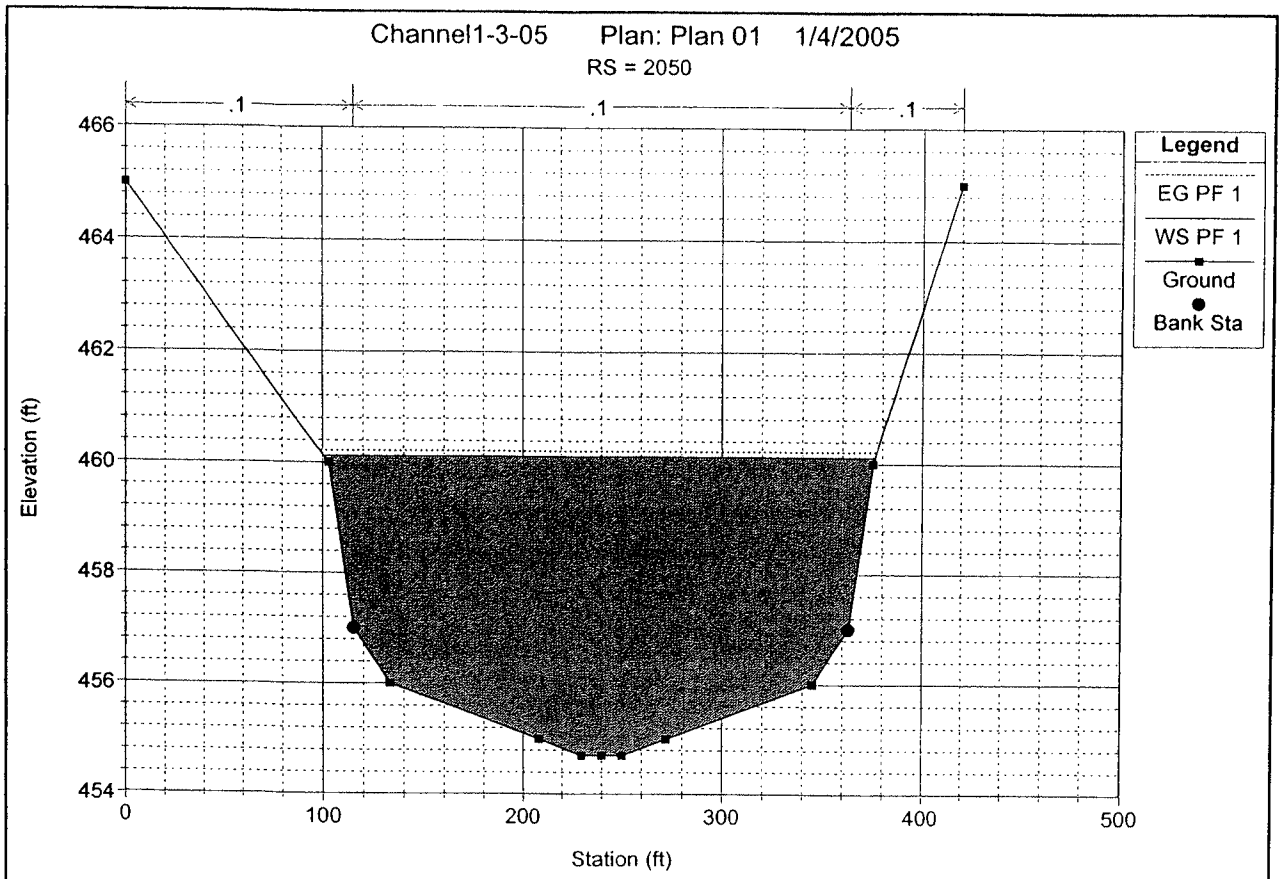
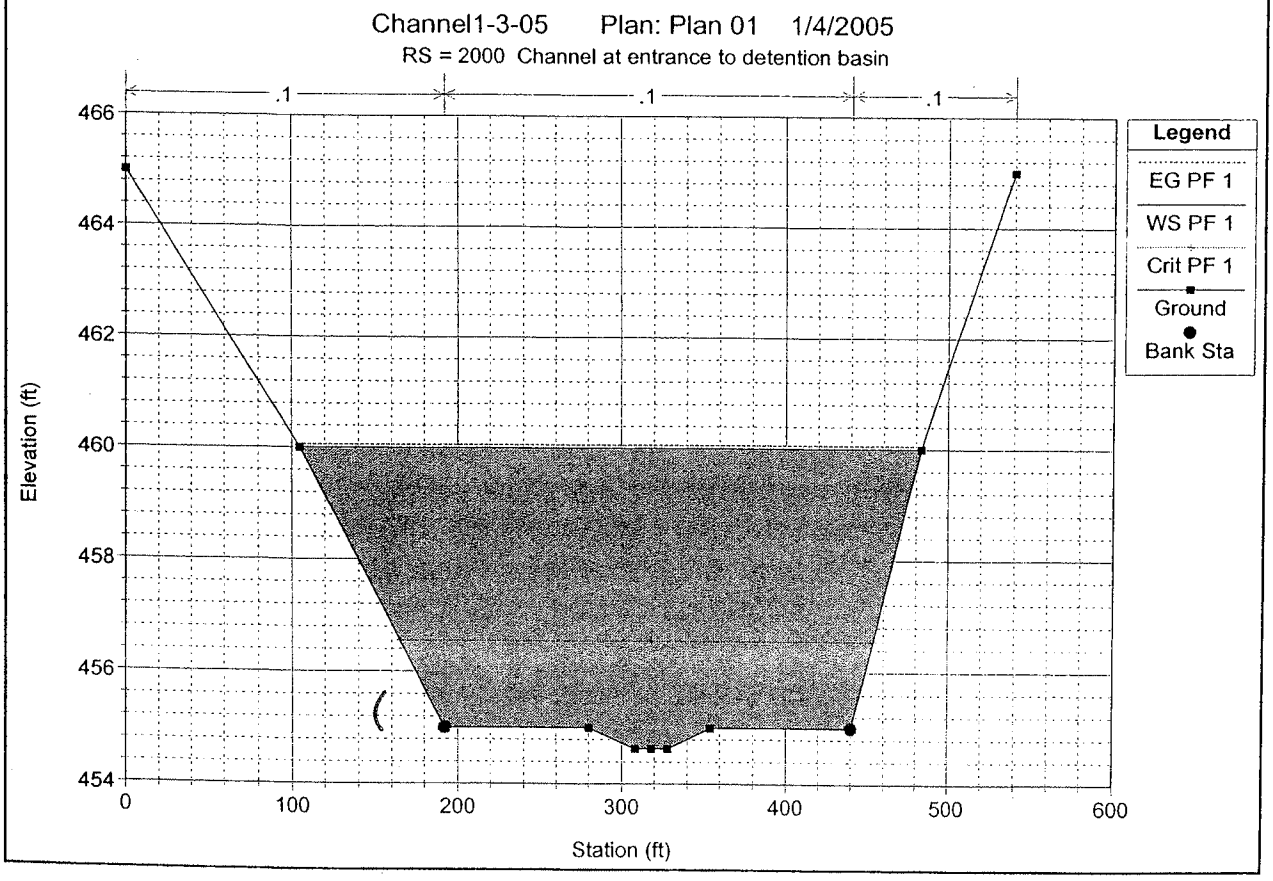
464
462
460
458
456
454
0
50
100
150
200
250
300
350
Station (ft)


Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 2100
.1
.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
466
464
462
460
458
456
454
0
100
200
300
400
500
Station (ft)


Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 2050
.1
.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
466
464
462
460
458
456
454
0
100
200
300
400
500
Station (ft)


Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 2000 Channel at entrance to detention basin
.1
.1
.1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
466
464
462
460
458
456
454
0
100
200
300
400
500
600
Station (ft)

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	Trapezoidal Channel - 1
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Discharge

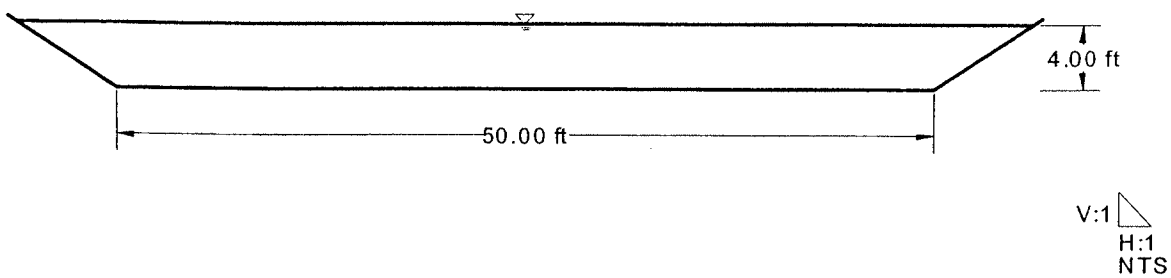
Input Data		
Mannings Coefficient	0.045	
Slope	0.006150	ft/ft
Depth	4.00	ft
Left Side Slope	1.50	H : V
Right Side Slope	1.50	H : V
Bottom Width	50.00	ft

Results		
Discharge	1,331.30	cfs
Flow Area	224.0	ft²
Wetted Perimeter	64.42	ft
Top Width	62.00	ft
Critical Depth	2.73	ft
Critical Slope	0.022466	ft/ft
Velocity	5.94	ft/s
Velocity Head	0.55	ft
Specific Energy	4.55	ft
Froude Number	0.55	
Flow Type	Subcritical	

Cross Section
Cross Section for Trapezoidal Channel

Project Description	
Worksheet	Trapezoidal Channel - 1
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Mannings Coefficient	0.045	
Slope	0.006150	ft/ft
Depth	4.00	ft
Left Side Slope	1.50	H : V
Right Side Slope	1.50	H : V
Bottom Width	50.00	ft
Discharge	1,331.30	cfs



V. PROPOSED DRAINAGE FACILITIES

For most of the Mesa, drainage facilities are constructed as part of development or road projects, and include only facilities in the immediate vicinity of the projects. For the proposed future private development, no designs are available to show these future facilities. Caltrans has prepared plans for their SR-905 project, and those facilities are shown on the attached map.

The only Master Planned facility which needs to be constructed before development takes place is the Main Channel and Detention basin in the East Watershed. Details of this system are presented in Section VI.

VI. PROPOSED DRAINAGE ALTERNATIVES

The historical drainage on the Mesa, with its flat terrain and shallow swales for drainage paths, did not become a problem until development started taking place in the 1960s. This development started concentrating flows in culverts under roads and redefined some of the historical drainage paths. Some of the development solved problems in some areas, but impacted other areas by moving the problem downstream. One of these areas is the existing creek that parallels La Media Road and eventually crosses the border into Mexico. The frequent flooding along portions of this channel is a constraint to future development for some of the areas along the creek.

1. NO PROJECT

The alternative of doing nothing to improve the drainage along the main creek channel would prevent future development from taking place along portions of La Media Road. The existing creek is not deep enough to allow the adjacent properties to drain effectively. To provide continued access along the truck route during storms, if the channel is not constructed, the roads will need to be raised or alternative routes identified. The existing intersection of Airway Road and La Media Road floods after any significant precipitation. The adjacent roads are too low to allow significant flows to pass under them, so they flood frequently. If the roads are raised to allow more flow to pass under them, they will impact the already-developed adjacent property, parts of which would now be lower than the roads, creating even more difficult drainage issues for the properties.

2. CONCRETE CHANNEL

The 1999 Otay Mesa Drainage Study recommended a concrete channel from Otay Mesa Road to the Border Detention Basin. The recommended plan was a concrete channel along the east side of La Media Road until reaching Siempre Viva Road, where it crossed under La Media and followed on the north side of Siempre Viva to box culverts under Siempre Viva that connected to the Border Detention Basin. All of the concrete channel alternatives assumed that the existing creek with its habitat would continue to carry low flows. The 1999 cost for this alternative was $10.6 million, which would be approximately $14.9 million in 2005 dollars without land acquisition.

3. LA MEDIA CHANNEL AND BORDER DETENTION BASIN

The largest watershed on the Mesa is the East Watershed, which covers an area at 6.78 square miles (4,340 Acres). All of the flow from this watershed collects at a concentration point at a large culvert where it crosses the border with Mexico and flows under the airport access road and airport runway before flowing into the Tijuana River.

This portion at the Mesa is extremely flat, and the adjacent properties can not effectively drain into the existing small creek channel without raising the elevations of the roads and developments near the creek. To allow for future development and to accommodate runoff from proposed future projects, a new channel is required with inverts from 3 to 5 feet below the existing creek channel.

The proposed channel has a bottom width that varies from 240 feet at the new border detention basin to 200 feet from north of Siempre Viva Road to the Airway Road/La Media Road intersection. The side slopes will vary between 4:1 to 10:1. Heavy riparian vegetation will be allowed to grow in the channel and no annual maintenance will be required. Once the vegetation has matured, maintenance of dead or fallen trees may be required every few years. There will be a 12 foot wide access road on each bank. The Channel will contain the 100 year flood flow with mature vegetation growth.

From the Airway Road/La Media Road intersection, a 35 foot wide concrete channel along the east side of La Media Road will connect with the proposed Caltrans culverts which will be constructed with SR 905. The RCB culverts under the intersection will need to accommodate existing utilities in both roads, which may impact the intersection and the utilities.

The Border Detention Basin will be designed to attenuate peak flows from 5 year to 100 year storms. The outlet structure will be less than six feet high, and will not be under the jurisdiction of the State of California DSOD. The design of the outlet structure will be prepared with final plans for the project. The Detention Basin will be approximately 1700' by 1500' and cover an area of approximately 58 acres.

Border Detention Basin

Area:	58 Acres
Max. Water Depth:	6.0 Feet
Max. Storage Volume:	308 AF

The basin will be graded to appear natural. Natural vegetation will be allowed to grow in the basin and no annual maintenance will be required. A low-flow stream will be created through the basin. A Maintenance Assessment District may be created for maintaining the channel and detention basin.

The basin and channel will require the removal of approximately 915,000 CY of soil. It is assumed that this export will be used on adjacent properties to raise the building pad grades thereby limiting the haul distance. A preliminary cost estimate was prepared which reflects both the construction costs and the land acquisition costs. A Property Ownership Map which shows the ownership within the East Watershed is attached.

La Media Channel and Border Detention Basin

Preliminary Opinion of Probable Construction Cost
2/8/2005
Kimley-Horn and Associates

Construction Items

Item No.	Description	Quantity	Units	Unit Price	Cost
1	Excavation	822,500	CY	$2	$1,645,000
2	Airway Road culvert (6~5'wx5'h)	300	CY	$1,500	$450,000
3	La Media/Airway Road intersection culvert (6~10'wx6'h)	1,500	CY	$1,500	$2,250,000
4	Siempre Viva Road culvert (8~10'wx8'h)	1,490	CY	$1,500	$2,235,000
5	Detention Basin Outlet Structure	1	LS	$100,000	$100,000
6	Traffic Control	1	LS	$100,000	$100,000
7	Utility Relocation	1	LS	$150,000	$150,000
8	Street Repair	1	LS	$50,000	$50,000
9	Erosion Control	1	LS	$50,000	$50,000
10	Revegetation	1	LS	$600,000	$600,000
		Subtotal			$7,630,000
		Contingency	20%		$1,526,000
		Total			$9,156,000

Land Acquisition

1	Land Acquisition (outside MHPA)*	2,610,000	SF	$4	$10,440,000
2	Land Acquisition (inside MHPA)**	1,820,000	SF	$1	$1,820,000
		Subtotal			$12,260,000
		Contingency	20%		$2,452,000
		Total			$14,712,000

Total Cost (Construction and Land Acquisition) $23,868,000

Notes: * Includes area of detention basin and channel south of Siempre Viva
** Includes entire area within MHPA boundary
*** Estimate does not include engineering, environmental, geotechnical, surveying, etc.

K:\095407000\Excel\[cost estimate.xls]Sheet1

VII. RECOMMENDED DRAINAGE DESIGN CRITERIA

Since the five watershed areas on the Mesa flow in every direction except east, they flow into different watersheds with different constraints and impacts. The runoff from the five watersheds will have different criteria for design of drainage facilities.

West Perimeter Watershed

This watershed consists of smaller Mesa-top watersheds with a total area of approximately 254 acres that drain to the west to three separate creeks in canyons and gullies. These creeks are carried under the SD&AE and Trolley tracks and through San Ysidro in buried storm drain systems. The storm drains under the tracks have hydraulic capacities of 30 cfs (18" RCP) and 125 cfs (36" RCP) based on the San Ysidro Boulevard Area Master Drainage plan prepared by BSI Consultants, February 15, 1996. Sub-basins OT3-7 and OT3-8 combine downstream into a single creek that flows to the 36" RCP. The current study estimates 140 cfs (Q100) will flow off of the Mesa into this sub-basin. This study does not address the capacity of the downstream system or include the hydrologic analysis for areas to the west of the Mesa, but clearly the 125 cfs capacity of the existing system will be exceeded. This area will need to be addressed in more detail during design of the upstream tributary development. Detention Basins are recommended which will reduce peak flows in the sub-basin to minimize impacts on the downstream system. These detention basins will reduce the peak, 50-year, and 100-year flow to predevelopment levels. Because of the unstable soils in this area, care should be taken that the proposed detention basins and relocated drainage facilities do not contribute to an increase in the risk of slides through increased saturation of the soil.

West Watershed

The West Watershed consists of smaller Mesa-top watersheds that drain into the tributary canyons of Spring Canyon. All of the flow from the watershed flows into Mexico at the Spring Canyon concentration point. Detention basins will be required to reduce the post-development peak flows to predevelopment levels for the 50-year and 100-year storm. If the detention basins concentrate flows at the upper edge of canyons, care must be taken to ensure that erosion potential is not increased downstream.

East Watershed

The East Watershed flows to Mexico at a single concentration point between Britannia and La Media roads. Requirements for the control of peak runoff from development in this watershed already exist. The "Notice" dated August 7, 1987 (page 2), sets criteria for detention basins and for storm drain sizing. As part of the future storm drain project in this watershed, a single detention basin will be constructed at the border. The construction of this basin will eliminate the need for individual on-site detention basins for subsequent development.

North Perimeter Watershed

These small watersheds along the northern edge of the Mesa flow into small canyons that flow into the Otay River. There are no peak flow attenuation requirements for flows from these watersheds. There may be water quality issues with the Otay River, and there may be erosion issues from storm drains on the Mesa. Only approximately 14 acres of Neighborhood 6 are in this watershed.

VIII. STORM WATER QUALITY REQUIREMENTS

Because of problems related to the poor water quality of storm water runoff from urban conveyance systems, the City requires that storm water Best Management Practices (BMPs) be constructed for all new projects. The storm water discharge contains pollution such as chemicals, trash, sediment, bacteria, metals, oil and grease. Construction projects which add impervious areas and change drainage patterns increase the discharge of these pollutants.

The Municipal Storm Water National Pollutant Discharge Elimination System Permit (NPDES Municipal Permit), approved February 21, 2001 by the San Diego Regional Water Quality Control Board (RWQCB), requires the City to implement regulations for constructing storm water BMPs for development projects.

In 2003, as part of the San Diego Municipal Code, the City published "Storm Water Standards – A Manual for Construction & Permanent Storm Water Best Management Practices Requirements." This manual is the reference document for all of the storm water issues encountered in development, including BMPs. Included in this report are Appendix C – Example Permanent Storm Water Best Management Practices, and the Storm Water Requirements Applicability Checklist from the City's Manual. Before preparing a drainage study, the "Storm Water Requirements Applicability Checklist" is completed. This checklist is used to determine the priority level of the project. Most of the projects on the Mesa will require Priority Project Permanent Storm Water BMPs and High Priority Construction Storm Water BMPs.

All projects subject to the priority permanent BMP requirements must include a "Water Quality Technical Report." From the manual, the report will include:

1. A drainage study report prepared by a civil engineer, hydrologist, or hydrogeologist registered in the State of California, with experience in the science of stream and river generated surface features (i.e., fluvial geomorphology) and water resources management, satisfactory to the City Engineer. The report shall consider the project area's location (from the larger watershed perspective), topography, soil and vegetation conditions, percent impervious area, natural and infrastructure drainage features, and any other relevant hydrologic and environmental factors to be protected specific to the project area's watershed.
2. A field reconnaissance to observe and report on downstream conditions, including undercutting erosion, slope stability, vegetative stress (due to flooding, erosion, water quality degradation, or loss of water supplies) and the area's susceptibility to erosion or habitat alteration as a result of any future upstream development.
3. A hydrologic analysis to include rainfall runoff characteristics from the project area including at a minimum, peak runoff, time of concentration, and detention volume (if appropriate). These characteristics shall be developed for the two-year and ten-year frequency, six-hour or 24-hour, type B storm for the coastal areas of San Diego County. The largest peak flow should be included in the report. The report shall also report the project's conditions of concern based on the hydrologic and downstream conditions discussed above. Where downstream conditions of concern have been identified, the drainage study shall establish that pre-project hydrologic conditions that minimize impacts on those downstream conditions of concern would be either improved or maintained by the proposed project, satisfactory to the City Engineer, by incorporating the permanent BMP requirements.

Appendix D of the Manual includes detailed guidelines for the Water Quality Technical Report.

There are numerous alternative permanent BMPs that can be used for each project. The alternatives include Site Design BMPs, Source Control BMPs, and Treatment Control BMPs. The Site Design BMPs are primary ways to reduce storm water runoff through means such as increased pervious areas, increased infiltration, use of natural channels, and appropriate landscaping. All of these except dry wells are applicable to the Mesa. Source Control BMPs are meant to control pollutants at their source before they enter storm water, and are all applicable to the Mesa. Treatment Control BMPs treat the storm water before it leaves the property, and include natural methods such as biofilters, detention basins, wetlands, and porous pavement, and mechanical methods such as filters and separators. The one Treatment Control BMP that is not applicable to the Mesa is infiltration, which is not very effective on the Mesa because of the clay soils.

Most of Otay Mesa drains to the south across the border with Mexico and eventually into the Tijuana River. A small portion flows north into the Otay River, and the far western part of the Mesa flows to the west through San Ysidro and then into the Tijuana River. The Tijuana River has been identified by the 2002 Clean Water Act as a "Section 303(d) Water Quality Limited" river. The pollutants of concern which are included in the attached pages from the USEPA, need to be listed, and the new development project's potential impacts on these pollutants need to be included in the project's drainage report.

Recommended Storm Water Policies

1. **Apply water quality protection measures to land development projects during project design, permitting, construction, and operations in order to minimize the quantity of runoff generated on-site, the disruption of natural water flows and the contamination of storm water runoff.**

    a. Increase on-site infiltration, and preserve, restore or incorporate natural drainage systems into site design
    b. Reduce the amount of impervious surfaces through selection of materials, site planning, and narrowing street widths where possible.
    c. Increase the use of natural vegetation and landscaping in drainage design.
    d. Avoid conversion of areas particularly susceptible to erosion and sediment loss (e.g.: steep slopes), and where unavoidable, enforce regulations that minimize these impacts.
    e. Avoid land use, site development, and zoning regulations that limit impacts on, and protect the natural integrity of topography, drainage systems, and water bodies.
    f. Maintain landscape design standards that minimize the use of pesticides and herbicides.
    g. Enforce maintenance requirements in development permit conditions.

2. **Require construction contractors to comply with accepted storm water pollution prevention planning practices for all projects.**

    a. Minimize the amount of graded land surface exposed to erosion and enforce control ordinances
    b. Continue routine inspection practices to check for proper erosion control methods and housekeeping practices during construction.
    c. Ensure that contractors are aware of and implement urban runoff control programs.

3. **Encourage measures to promote the proper collection and disposal of pollutants at the source, rather than allowing them to enter the storm drain system.**

    a. Promote the provision of used oil recycling and/or hazardous waste recycling facilities and drop-off locations.
    b. Follow up on complaints of illegal discharges and accidental spills to storm drains, waterways, and canyons.

K:\095407000\Drainage\Otay Mesa Drainage Study June 2006.doc

REFERENCES

This Water Quality Technical Report incorporates, by reference, the appropriate elements of the following documents and plans required by local; State or Federal agencies.

1. Municipal Storm Water National Pollutant Discharge Elimination System (NPDES) Permit

2. City of San Diego Storm Water Standards

3. Drainage Study for the Otay Mesa Community Plan

4. California Stormwater BMP Handbook, "Extended Detention Basin – TC-22" New Development and Redevelopment, January 2003

5. California Stormwater BMP Handbook, "Vegetated Swale – TC-30" New Development and Redevelopment, January 2003

NOISE STUDY

Otay Mesa Central Village Specific Plan
City of San Diego California

Prepared For:

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Prepared By:

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January 19, 2017

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GLOSSARY OF TERMS

Sound Pressure Level (SPL): a ratio of one sound pressure to a reference pressure (L_{ref}) of 20 µPa. Because of the dynamic range of the human ear, the ratio is calculated logarithmically by 20 log (L/L_{ref}).

A-weighted Sound Pressure Level (dBA): Some frequencies of noise are more noticeable than others. To compensate for this fact, different sound frequencies are weighted more.

Minimum Sound Level (L_{min}): Minimum SPL or the lowest SPL measured over the time interval using the A-weighted network and slow time weighting.

Maximum Sound Level (L_{max}): Maximum SPL or the highest SPL measured over the time interval the A-weighted network and slow time weighting.

Equivalent sound level (L_{eq}): the true equivalent sound level measured over the run time. Leq is the A-weighted steady sound level that contains the same total acoustical energy as the actual fluctuating sound level.

Day Night Sound Level (LDN): Representing the Day/Night sound level, this measurement is a 24 –hour average sound level where 10 dB is added to all the readings that occur between 10 pm and 7 am. This is primarily used in community noise regulations where there is a 10 dB "Penalty" for night time noise. Typically LDN's are measured using A weighting.

Community Noise Exposure Level (CNEL): The accumulated exposure to sound measured in a 24-hour sampling interval and artificially boosted during certain hours. For CNEL, samples taken between 7 pm and 10 pm are boosted by 5 dB; samples taken between 10 pm and 7 am are boosted by 10 dB.

Octave Band: An octave band is defined as a frequency band whose upper band-edge frequency is twice the lower band frequency.

Third-Octave Band: A third-octave band is defined as a frequency band whose upper band-edge frequency is 1.26 times the lower band frequency.

Response Time (F,S,I): The response time is a standardized exponential time weighting of the input signal according to fast (F), slow (S) or impulse (I) time response relationships. Time response can be described with a time constant. The time constants for fast, slow and impulse responses are 1.0 seconds, 0.125 seconds and 0.35 milliseconds, respectively.

1.0 PROJECT INTRODUCTION

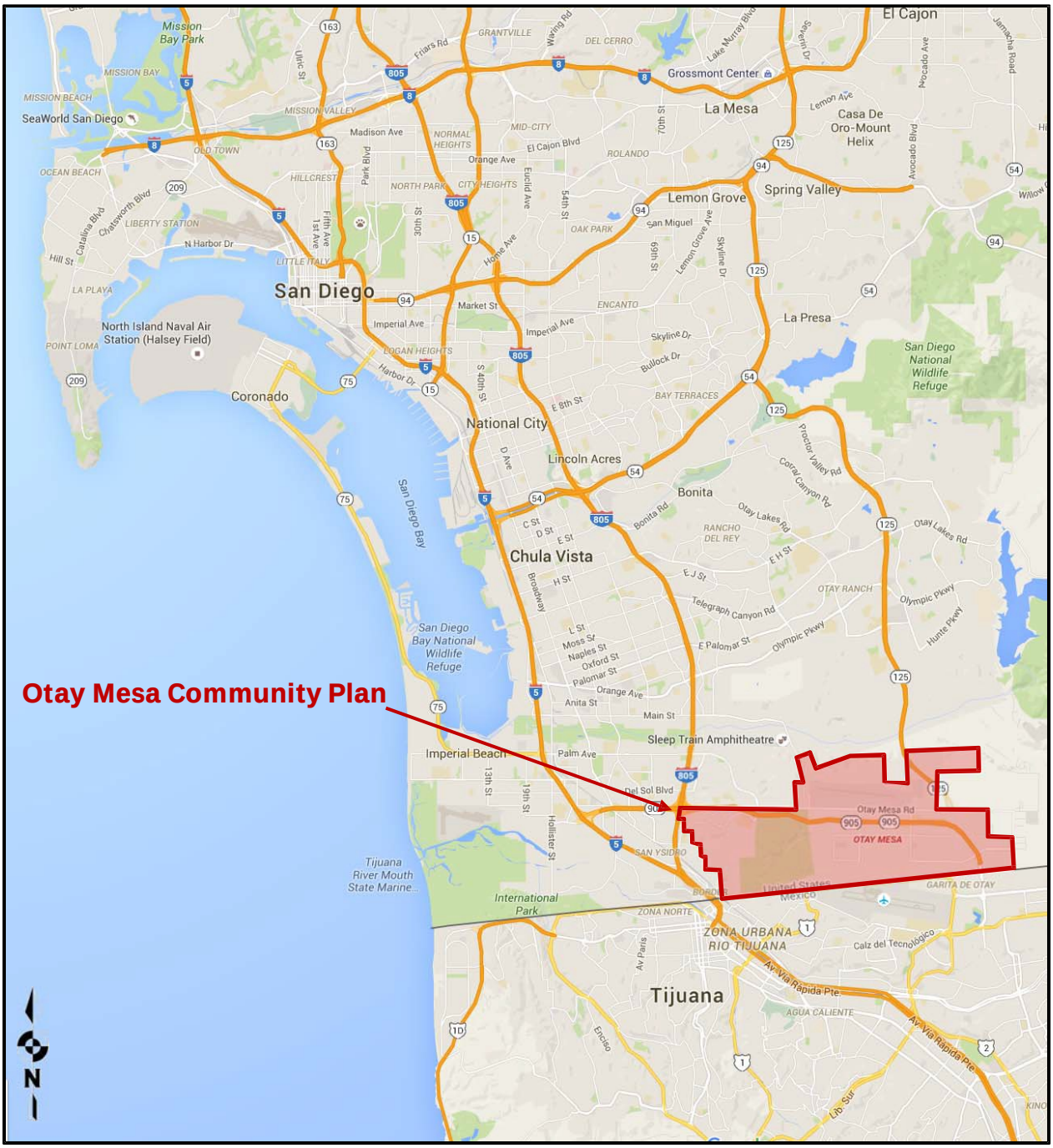
1.1 Purpose of this Study

The City of San Diego certified a Final Environmental Impact Report for the Otay Mesa Community Plan Update in 2014 (EIR). The EIR disclosed potential noise impacts that would result from implementing the Otay Mesa Community Plan Update (March 2014, "OMCPU") and presented mitigation measures to address the impacts. After the application of mitigation measures, the OMCPU concluded that noise impacts would be significant and unavoidable. The OMCPU requires the City of San Diego to adopt a Specific Plan for the Central Village portion of the community. The purpose of this Noise study is to evaluate the currently proposed Central Village Specific Plan (CVSP) and determine if expected noise impacts fall within the scope of impacts disclosed in the EIR, and whether any additional mitigation measures beyond those presented in the EIR are warranted. Because the proposed CVSP implements and is fully consistent with the OMCPU, the comparative portion of the analysis focuses on differences in noise levels disclosed by the OMCPU EIR in comparison to noise levels calculated by Ldn Consulting for the proposed CVSP project.

1.2 Project Location

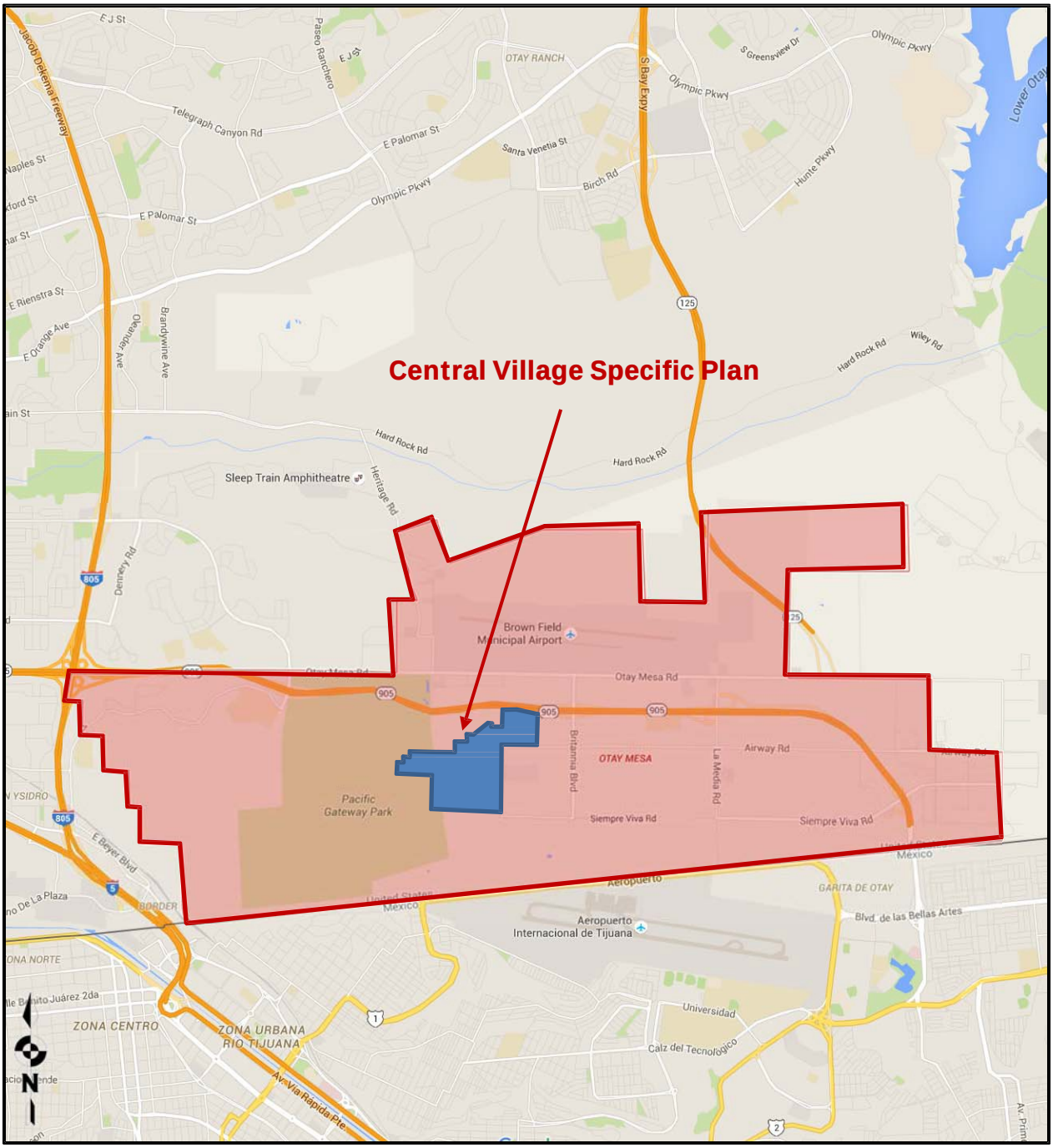
The Central Village Specific Plan (CVSP) area is located in the southern portion of the City of San Diego, within the Otay Mesa Community. The CVSP is situated immediately south of California State Route 905 (SR-905), approximately 2.4 miles east of Interstate 805 (I-805) and Interstate 5 (I-5), and 0.5 mile north of the United States and Mexico International Border. Specifically, the CVSP is bordered by SR-905 and Airway Road to the north, Cactus Road and Continental Road to the east, and Siempre Viva Road to the south, which terminates at its western extent at Cactus Road at the southwest corner of the CVSP boundary. A general vicinity map showing the Otay Mesa Community Plan boundaries is shown in Figure 1 on the following page and a map showing the CVSP within the Otay Mesa Community Plan is shown in Figure 2.

Figure 1: Otay Mesa Community Plan Location



Source: (Google 2016)

Figure 2: Central Village Specific Plan Location



Source: (Google 2016)

1.3 Project Description

The OMCPU and associated EIR assumed the following land uses within the Central Village portion of the OMCPU area:

- 5,246 multi-family dwelling units
- 32.7 ksf of community commercial
- 32.3 acres of active park space
- 1 elementary school

The CVSP is proposing to change the land uses within the Central Village area to the following:

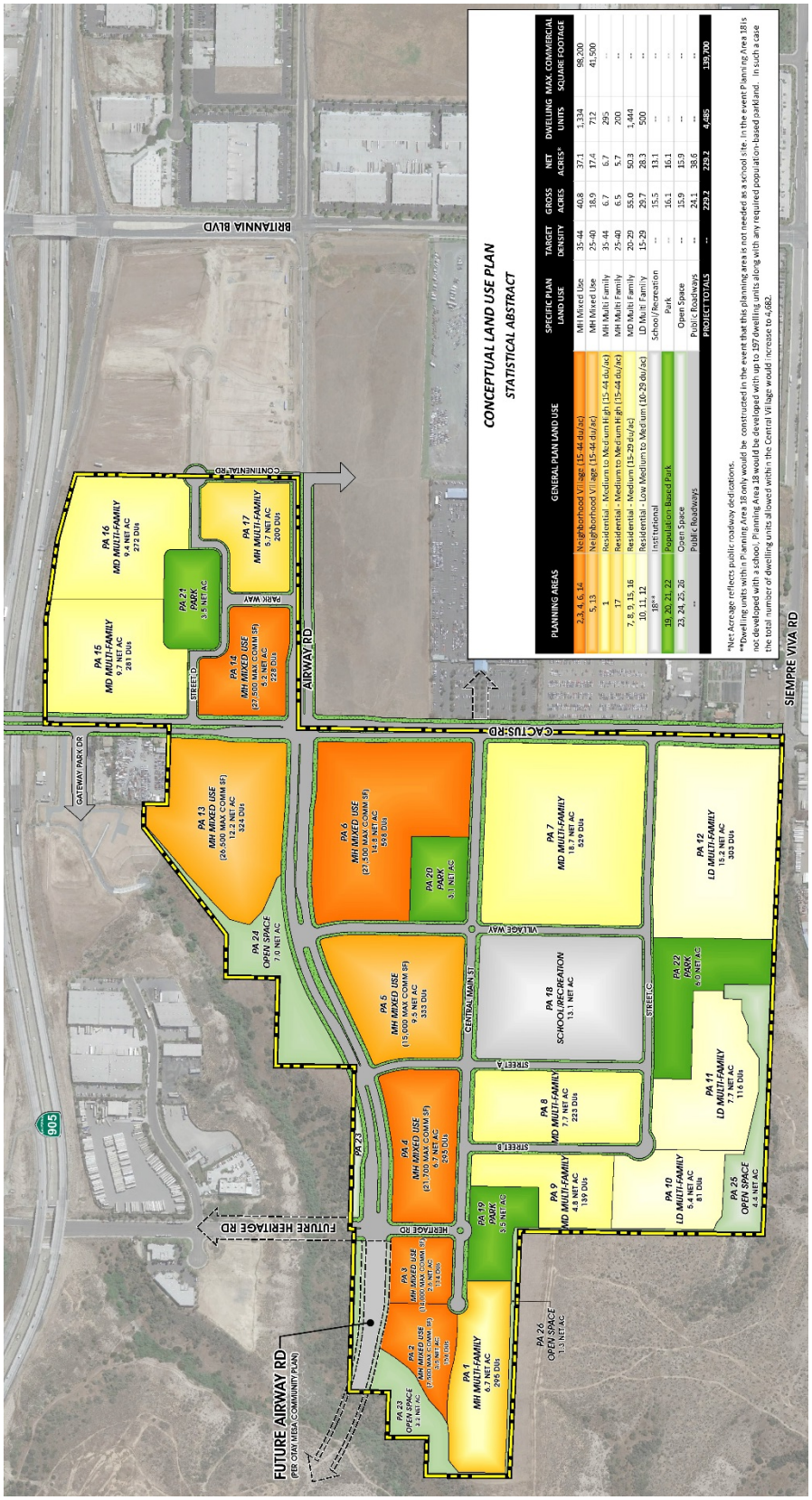
- 425 multi-family dwelling units (<20 du/ac)
- 4,060 multi-family dwelling units (>20 du/ac)
- 139.7 ksf of community commercial
- 16.1 acres of active park space
- 1 elementary school

Because the mix of land uses assumed by the OMCPU EIR and the land uses proposed by the CVSP are substantially similar, it is assumed that construction activities associated with buildout of the Central Village would largely remain the same as assumed by the OMCPU EIR in the Central Village area. Consistent with the assumptions used by the EIR for construction activity, CVSP Section 3.3 "Phasing Plan" indicates that the Central Village is likely to develop in multiple phases over time. The EIR assumed that construction activities would involve demolition, earthwork, construction, and surface preparation for implementing projects, and that typical construction equipment to be used would include scrapers, dump trucks, backhoes, front-end loaders, jackhammers, concrete mixers and others (see Table 8 of the Noise report appended to the OMCPU EIR). Based on industry-standard construction practices, these are reasonable assumptions for construction activities in the Central Village.

The land use modifications proposed by the CVSP in comparison to the mix of land uses assumed for the Central Village by the OMCPU EIR are summarized below. The proposed CVSP land use plan is shown in Figure 3.

- A reduction of 761 Multi-family dwelling units
- An increase of 107 ksf of community commercial floor space
- A reduction of 16.2 acres of active park space

Figure 3: Central Village Specific Plan Land Use Plan



2.0 PROJECT DESCRIPTION

2.1 Plan Location

The Central Village is located in the Otay Mesa Community Plan area in the southern portion of the City of San Diego, approximately 0.5-mile north of the United States-Mexico Border, approximately 2.7 miles east of the community of San Ysidro, and 1.6 miles south of the City of Chula Vista (See Figure 1, Vicinity Map). State Route 905 (SR-905) abuts the northern boundary of the CVSP, and Interstate 805 (I-805) is located approximately 2.9 miles west of the site. Specifically, the CVSP is bordered by SR-905 and Airway Road to the north, Cactus Road and Continental Road to the east, and Siempre Viva Road to the south, which terminates at Cactus Road.

2.2 Plan Description

The City of San Diego certified a Final Environmental Impact Report for the Otay Mesa Community Plan Update (OMCPU) in 2014 (FEIR; City of San Diego [City] 2014). The OMCPU requires the City to adopt a Specific Plan for the Central Village portion of the community. The purpose of this report is to evaluate the currently proposed Central Village Specific Plan (CVSP). Adoption of the proposed CVSP would develop up to 4,485 multi-family homes, 139,700 square feet (sf) of commercial space, a 13.1-acre combined school/recreation site, 16.1 acres of population-based park land uses, 15.9 acres of open space, and approximately 24.1 acres of major roadways within the 229.2-acre CVSP Area (SPA) (T&B Planning, Inc. 2017). The Project includes the adoption of the CVSP as an amendment to the Otay Mesa Community Plan and a rezoning program to implement the designated land uses. The land uses proposed by the CVSP are generally in conformance with the land uses analyzed in the FEIR for the SPA, which assumed up to 5,246 multi-family homes and up to 32,700 sf of commercial uses arranged as a predominately residential community with core areas of mixed uses and public spaces sited along Airway Road.

<u>Land Use Element</u>

Land uses that would occur as a result of the Specific Plan's buildout are summarized below:

The 229.2-acre Specific Plan area is divided for planning purposes into 26 planning areas, containing the following land uses:

Moderate to High Density (MH) Mixed Use: Allows for up to 139,700 square feet of commercial land uses and 2,046 homes on 54.5 acres, within an allowable density range of 15 to 44 dwelling units per acre (du/ac);

Moderate to High Density (MH) Multi-Family: Allows for up to 495 homes on 12.4 acres, within an allowable density range of 15 to 44 du/ac

Medium Density (MD) Multi-Family: Allows for up to 1,444 homes on 50.3 acres, within an allowable density range of 15 to 29 du/ac

Low Density (LD) Multi-Family: Allows for up to 500 homes on 28.3 acres, within an allowable density range of 10 to 29 du/ac

Parks: Provides for passive and active recreation on 16.1 acres.

Open Space: Provides for the preservation of 15.9 acres of open space to remain undeveloped

School/Recreation: Designates a public school site with public recreation areas on 13.1 acres. It is noted that recreation areas on this site may or may not be available for public use, as public use of this facility is subject to approval by the San Ysidro School District.

Mobility Element

Primary perimeter roadways would occur in the same locations and general alignments as assumed by the OMCPU EIR, including Airway Road, Cactus Road, and Heritage Road. The CVSP provides more detail on internal circulation roadways than was available in the OMCPU. The CVSP's proposed circulation system includes a hierarchy of roads throughout Central Village. The design and orientation of the internal roadway network provides the structure for grid pattern street systems within the individual planning areas. Main roads intersect one another at right angles. This forms the master grid, within which the secondary grids will occur. The Mobility Element also addresses alternative transportation facilities including public transit, bicycle facilities, and pedestrian facilities.

According to the CVSP's *Transportation Facilities Trigger Analysis* (Chen Ryan & Associates, 2017), the CVSP is calculated to generate 36,345 average daily vehicular trips (ADT), which is less traffic than was assumed for the Central Village by the OMCPU EIR, at 45,429 ADT.

Parks and Open Space Element

The CVSP provides more specificity about the location, size, and programming of park facilities in the CVSP area than was available in the OMCPU. Two parks are proposed interior to the CVSP (Planning Areas 20 and 21) and two parks are proposed that abut off-site open space (Planning Areas 19 and 22). All parks facilities in the CVSP would be deeded to the City for long-term ownership and maintenance. Within each park, conceptual amenities are identified by the CVSP, including passive and active recreational uses.

The location and configuration of open space areas within Central Village are consistent with the open space designations applied to the area by the OMCPU. These areas, generally located in the western (Planning Area 23), southwestern (Planning Area 25), and northern (Planning Area 24)

portions of the CVSP area, are designed to preserve existing open space and preclude development in these areas.

Urban Design Element

This section of the CVSP provides development standards and design guidelines for urban design elements including design principles, architectural design, and landscape design. The Urban Design Element contains several policies that specifically address noise, including but not limited to the following:

"Policy 2.5-46 Address the challenges presented by the collocation of industrial and residential uses by implementing the following design strategies:

- Provide landscape screening and/or patio walls to reduce noise impacts and protect the privacy of residential units along high traffic streets and intense uses.
- Address noise through the use of berms, planting, setbacks, and architectural design rather than with conventional wall barriers for generating uses.
- Minimize the number of residential units that have window and door openings that afford views into adjacent industrial uses located east of the Central Village. Whenever possible, orient the short end of buildings towards industrial uses."

"Policy 2.5-50: Use of landscaping and insulating materials is encouraged to attenuate noise generated within and outside the community."

"Policy 2.5-51: Use site planning to minimize noise in shared residential outdoor activity areas by locating the areas behind the buildings or in courtyards, or orienting the terraces to alleyways rather than streets, whenever possible."

"Policy 2.5-59: Provide mechanical ventilation in all residential units proposed along roadways carrying high traffic volumes and in the areas where noise levels could exceed interior noise standards such that windows can remain closed at the choice of the occupants."

"Policy 2.5-60: In commercial buildings, place loading and unloading areas so that commercial buildings shield nearby residential land uses from noise generated by loading dock and delivery activities. If necessary, additional sound barriers should be constructed on the commercial sites to reduce noise levels at nearby noise-sensitive uses."

"Policy 2.5-61: Place commercial heating, ventilation, and air conditioning (HVAC) machinery within mechanical equipment rooms, wherever possible."

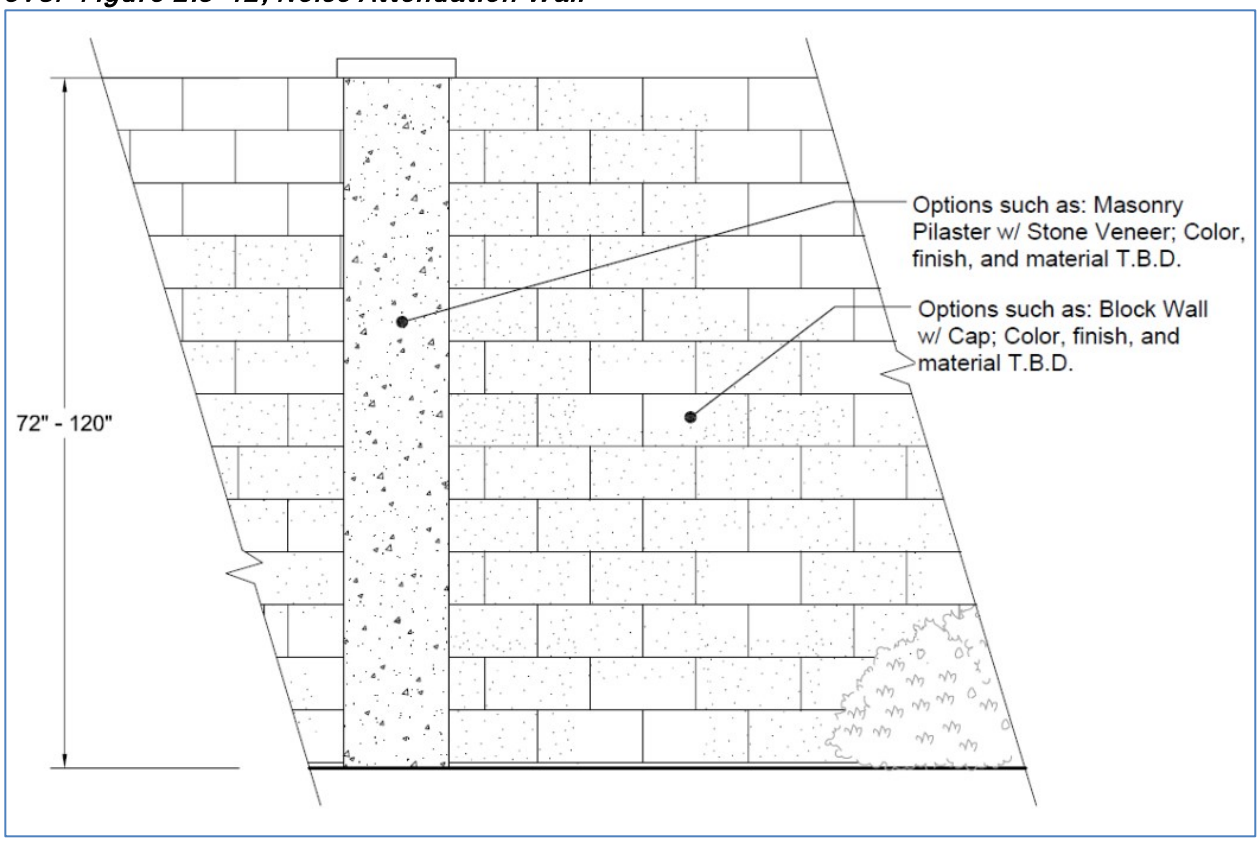
"Policy 2.5-62: Provide localized noise barriers or rooftop parapets around HVAC, cooling towers, and mechanical equipment so that line-of-sight to the noise source from the property line of the noise-sensitive receptors is blocked."

"Policy 2.5-146: Where berms, setbacks, and architectural design are inadequate to achieve required interior or exterior noise levels, physical noise walls may be provided at a maximum height of 120 inches."

"Policy 2.5-147: Where noise attenuation walls are required, materials may consist of concrete block, with stone veneer masonry pilaster treatments and a color finish. Materials for the block wall and pilasters will be determined during the tentative map stage."

"Policy 2.5-149: Noise attenuation walls, where required, should be designed to substantially conform to [CVSP] Figure 2.5-42, *Noise Attenuation Wall*." [Figure 2.5-24 from the CVSP is shown below.]

CVSP Figure 2.5-42, Noise Attenuation Wall



Infrastructure Element

Infrastructure improvements necessary within the CVSP include water, sewer, and storm water drainage systems. The installation and operation of utility infrastructure is not expected to generate measurable noise.

3.0 METHODOLOGY

3.1 Noise Terminology and Concepts

Sound is a vibratory disturbance created by a moving or vibrating source, which is capable of being detected by the hearing organs. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired, and may, therefore, be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment (Caltrans 2009).

Decibels and Frequency

In its most basic form, a continuous sound can be described by its frequency or wavelength (pitch) and its amplitude (loudness). Frequency is expressed in cycles per second, or hertz. Frequencies are heard as the pitch or tone of sound. High-pitched sounds produce high frequencies; low-pitched sounds produce low frequencies. Sound-pressure amplitude is measured in micro-Pascals (mPa). Sound-pressure amplitudes for different kinds of noise environments can range from 20 to 100,000,000 mPa. Because this huge range of values is cumbersome and difficult to use, a logarithmic scale is used to describe sound-pressure level in terms of decibels (dB). The threshold of hearing for young people is about 0 dB, which corresponds to 20 mPa (Caltrans 2009).

As dB are measured on a logarithmic scale that quantifies sound intensity, similar to the Richter scale used for earthquake magnitudes, dB cannot be added or subtracted through ordinary arithmetic. A doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; a halving of the energy would result in a 3-dB decrease. In way of example, if an air conditioner produces a sound pressure level of 65 dB at 50 feet, two air conditioners at the same distance would produce 68 dB—not 130 dB.

Perception of Noise at the Receiver and A-Weighting

The human ear is not equally sensitive to all frequencies within the sound spectrum. To accommodate this phenomenon, the A-scale, which approximates the frequency response of the average young ear when listening to most everyday sounds, was devised. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the A-scale for sound levels. Therefore, the “A-weighted” noise scale is used for measurements and standards involving the human perception of noise. Noise levels using A weighted measurements are written dB(A) or dBA. Table 1 shows the relationship of various noise levels to commonly experienced noise events.

Table 1: Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 meters (1,000 feet)	--100--	
Gas Lawn Mower at 1 meter (3 feet)	--90--	
Diesel Truck at 15 meters (50 feet), at 80 kilometers per hour (50 miles per hour)	--80--	Food Blender at 1 meter (3 feet); Garbage Disposal at 1 meter (3 feet)
Noisy Urban Area, Daytime Gas Lawn Mower at 30 meters (100 feet)	--70--	Vacuum Cleaner at 3 meters (10 feet)
Commercial Area Heavy Traffic at 90 meters (300 feet)	--60--	Normal Speech at 1 meter (3 feet)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans 2009

Human perception of noise has no simple correlation with acoustical energy. The perception of noise is not linear in terms of dBA or in terms of acoustical energy. Two noise sources do not "sound twice as loud" as one source. It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA, increase or decrease; that a change of 5 dBA is readily perceptible; and that an increase (decrease) of 10 dBA sounds twice (half) as loud (Caltrans 2009).

Noise Propagation

From the source to the receiver, noise changes both in level and frequency. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on the important factors described in the following discussion.

Geometric spreading from point and line sources: Sound from a small localized source (approximating a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates, or drops off, at a rate of 6 dBA for each doubling of

the distance. Movement makes the source of the sound appear to emanate from a line (line source) rather than a point when viewed over some time interval. The sound level attenuates at a rate of 3 dBA per doubling of distance for line sources (Crocker 2007).

Ground absorption: Hard sites (i.e., sites with a reflective surface between the source and the receiver, such as parking lots or smooth bodies of water) receive no excess ground attenuation, and the changes in noise levels with distance (drop-off rate) are simply the geometric spreading of the source. Soft sites are sites that have an absorptive ground surface such as soft dirt, grass, or scattered bushes and trees and receive an excess ground attenuation value of 1.5 dBA per doubling of distance (Crocker 2007).

Atmospheric effects: Wind speed will bend the path of sound to "focus" it on the downwind side and make a "shadow" on the upwind side of the source. At short distances, up to 164 feet, the wind has minor influence on the measured sound level. For longer distances, the wind effect becomes appreciably greater. Temperature gradients create effects similar to those of wind gradients, except that they are uniform in all directions from the source. On a sunny day with no wind, temperature decreases with altitude, giving a shadow effect for sound. On a clear night, temperature may increase with altitude, focusing sound on the ground surface (Caltrans 2009).

Shielding by natural and human-made features, noise barriers, diffraction, and reflection: A large object in the path between a noise source and a receiver can significantly attenuate noise levels at that receiver location. The amount of attenuation provided by this "shielding" depends on the size of the object and the frequencies of the noise levels. Natural terrain features such as hills and dense woods, as well as fabricated features such as buildings and walls, can significantly alter noise levels.

Noise Descriptors

The intensity of environmental noise fluctuates over time, and several different descriptors of time-averaged noise levels are used. The selection of a proper noise descriptor for a specific source depends on the spatial and temporal distribution, duration, and fluctuation of both the noise source and the environment. The noise descriptors used in this report to describe environmental noise are defined below:

- Lmax (Maximum Noise Level): The highest A-weighted integrated noise level occurring during a specific period of time.
- Lmin (Minimum Noise Level): The lowest A-weighted integrated noise level during a specific period of time.
- Peak: The highest weighted or unweighted instantaneous peak-to-peak value occurring during a measurement period.

- Ln (Statistical Descriptor): The noise level exceeded “n%” of a specific period of time, generally accepted as an hourly statistic. An L10 would be the noise level exceeded 10% of the measurement period.
- Leq (Equivalent Noise Level): The energy mean (average) noise level. The steady-state sound level that, in a specified period of time, contains the same acoustical energy as a varying sound level over the same time period.
- CNEL (Day-Night Noise Level): The 24-hour Leq with a 10-dBA “penalty” applied during nighttime noise-sensitive hours, 10:00 p.m. through 7:00 a.m. The CNEL attempts to account for the fact that noise during this specific period of time is a potential source of disturbance with respect to normal sleeping hours.

4.0 EXISTING CONDITIONS

4.1 Plan Area

Existing land uses within the Central Village area consist of undeveloped lands, agricultural operations, a few single-family residential homes, and open space. Consistent with the existing conditions reported in the OMCPU EIR and as indicated below in Section 4.3, noise generated by these existing uses is nominal.

4.2 Sensitive Noise Receptors

Noise-sensitive receptors are generally considered humans engaged in activities or utilizing land uses that may be subject to the stress of significant interference from noise. Activities usually associated with sensitive receptors include, but are not limited to, talking, reading, and sleeping. Land uses often associated with noise-sensitive receptors include residential dwellings, mobile homes, hotels, motels, hospitals, nursing homes, education facilities, and libraries. The only noise-sensitive receptors located in the CVSP area under existing conditions are a few residential structures. The majority of the subject property, particularly in the northern portions of the site (west of Cactus Road), is used for crop production (oats). Along Cactus Road in the southern portions of the CVSP area are greenhouses and goat husbandry operations. Agricultural activity is not a noise-sensitive use. Along the southern, western, and northwestern boundaries of the site and extending off-site are open space areas. Open space is not a noise-sensitive use, although wildlife species that have the potential to use these open spaces can be affected by noise. Other land uses surrounding the Central Village area include a mixture of open space, undeveloped lands, agricultural uses, and light and heavy industrial uses. None of these uses are noise-sensitive.

4.3 Existing Noise Levels

Noise measurements were taken on Monday, March 21, 2016 by Ldn Consulting to determine existing noise conditions in the CVSP area. Noise measurements were taken with a Larson-Davis Model LxT Type 1 Integrating Sound Level Meter, serial number 2412. The noise meter was programmed, in "slow" mode, to record noise levels in "A" weighted form. The sound level meter and microphone were mounted on a tripod, five feet above the ground and equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200.

The ambient measurements were taken at four locations, which were selected for their ability to provide a representative range of noise levels throughout the CVSP area. The noise measurement locations are shown in Figure 4. During the collection of these noise measurements, the weather was mostly cloudy to clear and dry with moderate breezes from the northwest averaging 6 miles per hour (mph) with occasional gusts of up to 15 mph. The results of the noise

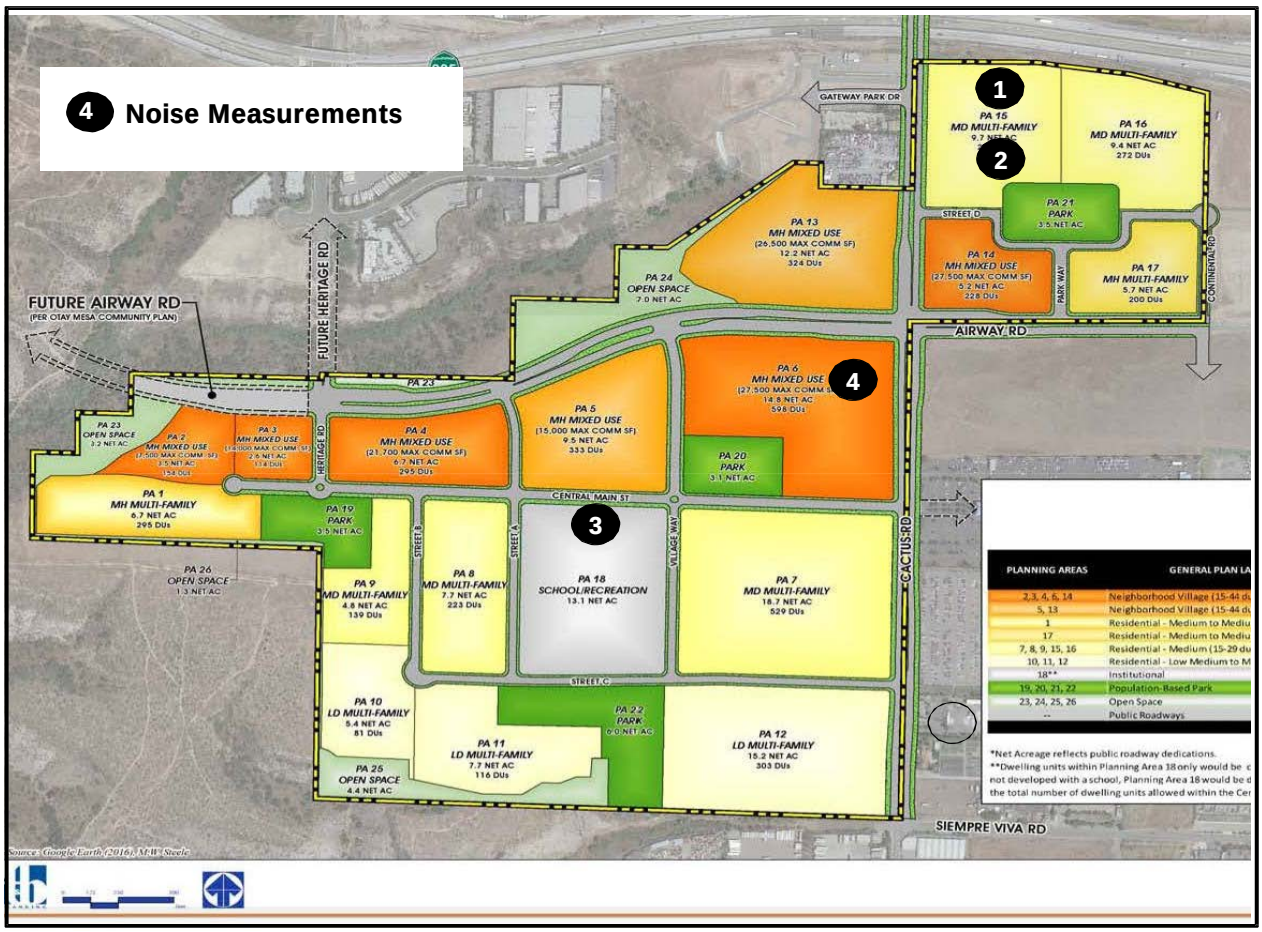
measurements are summarized in Table 2 and ranged from 53.8 dB(A) to 68.1 dB(A). No existing noise measurements were collected within the CVSP area as part of the OMCPU EIR, although noise measurements taken in other parts of the OMCPU area in 2011 and 2012 were reported in the EIR as ranging from 55.2 dB(A) (near State Route 125 at Lonestar Road) to 77.3 dB(A) (near State Route 905 at Otay Mesa Road) (RECON, 2013).

Table 2: Short-term Noise Measurement Summary

Location*	Description	Date	Start Time of Measurement	L_{eq} dBA
1	PA 25 – 400 Feet from SR-905	3/21/2016	8:50 AM	68.1
2	PA 25 – 800 Feet from SR-905	3/21/2016	9:05 AM	60.7
3	PA 13 – 1,400 Feet from Cactus Road	3/21/2016	9:30 AM	51.4
4	PA 16 – 200 Feet from Cactus Road	3/21/2016	9:45 AM	53.8

*The Location or Site ID number corresponds to locations shown in Figure 4.

Figure 4: Noise Measurement Locations



Source: Ldn Consulting, 2016

4.4 Airport Noise

Otay Mesa Central Village is located within the Airport Influence Area (AIA) for the Brown Field Municipal Airport. The AIA serves as the boundary for the Airport Land Use Compatibility Plan (ALUCP). The ALUCP contains policies and criteria that address land use compatibilities concerning noise and safety aspects of airport operations and requirements for land uses, heights of buildings, and residential densities/intensities within the AIA. Noise is one of the compatibility factors affecting the Otay Mesa Central Village area.

Serving as the Airport Land Use Commission (ALUC), the San Diego County Regional Airport Authority establishes the policies and criteria that affect properties in the AIA. Current policies addressing airport land use compatibility are contained in the ALUCP as amended in 2010 and are implemented by the Airport Approach and Airport Environs overlay zones of the San Diego Municipal Code. As depicted on ALUCP Exhibit III-1, *Compatibility Policy Map: Noise*, the CVSP area is located outside of the 60-65 dB CNEL contour, indicating that the subject property is not exposed to airport-related noise levels exceeding 60 dB CNEL.

5.0 SIGNIFICANCE THRESHOLDS AND STANDARDS

The City developed and published Significance Determination Thresholds for use in California Environmental Quality Act (CEQA) determinations; these thresholds were used by the OMCPU EIR to determine the significance of noise impacts associated with implementation of the OMCPU. Those same thresholds are used herein to evaluate potential noise impacts associated with approval of the CVSP. Impacts would be significant if the CVSP would:

1. Result in the exposure of people to current or future transportation noise levels that would exceed standards established in the Transportation Element of the General Plan [see Table 3 below, which represents Table NE-3 of the General Plan] and land use compatibility guidelines in the Brown Field Comprehensive Land Use Plan [see Table 4 below];

2. Result in exposure of future residents to excessive noise levels from airport and aircraft operations;

3. Allow collocation of residential and commercial or industrial uses where exposure of people to noise levels would exceed the City's Noise Abatement and Control Ordinance [see Table 5 below];

4. Adversely impact sensitive species within the MHPA due to construction noise.

Table 3: Land Use - Noise Compatibility Guidelines

Land Use Category	Exterior Noise Exposure (dBA CNEL)				
	60	65	70	75	
Parks and Recreational					
Parks, Active and Passive Recreation					
Outdoor Spectator Sports, Golf Courses; Water Recreational Facilities; Indoor Recreational Facilities					
Agricultural					
Crop Raising & Farming; Community Gardens, Aquaculture, Dairies; Horticulture Nurseries & Greenhouses; Animal Raising, Maintain & Keeping; Commercial Stables					
Residential					
Single Dwelling Units; Mobile Homes		45			
Multiple Units; **For uses affected by aircraft noise, refer to Policies NE-D.2. & NE-D.3.*		45	45*		
Institutional					
Hospitals; Nursing Facilities; Intermediate Care Facilities; Kindergarten through Grade 12 Educational Facilities; Libraries; Museums; Child Care Facilities		45			
Other Educational Facilities including Vocational/Trade Schools and Colleges, and Universities		45	45		
Cemeteries					
Retail Sales					
Building Supplies/Equipment; Food, Beverages & Groceries; Pets & Pet Supplies; Sundries, Pharmaceutical, & Convenience Sales; Wearing Apparel & Accessories			50	50	
Commercial Services					
Building Services; Business Support; Eating & Drinking; Financial Institutions; Maintenance & Repair; Personal Services; Assembly & Entertainment (includes public and religious assembly); Radio & Television Studios; Golf Course Support			50	50	
Visitor Accommodations		45	45	45	
Offices					
Business & Professional; Government; Medical, Dental & Health Practitioner; Regional & Corporate Headquarters			50	50	
Vehicle and Vehicular Equipment Sales and Services Use					
Commercial or Personal Vehicle Repair & Maintenance; Commercial or Personal Vehicle Sales & Rentals; Vehicle Equipment & Supplies Sales & Rentals; Vehicle Parking					
Wholesale, Distribution, Storage Use Category					
Equipment & Materials Storage Yards; Moving & Storage Facilities; Warehouse; Wholesale Distribution					
Industrial					
Heavy Manufacturing; Light Manufacturing; Marine Industry; Trucking & Transportation Terminals; Mining & Extractive Industries					
Research & Development				50	

	Compatible	Indoor Uses	Standard construction methods should attenuate exterior noise to an acceptable indoor noise level. Refer to Section I.
		Outdoor Uses	Activities associated with the land use may be carried out.
45, 50	Conditionally Compatible	Indoor Uses	Building structure must attenuate exterior noise to the indoor noise level indicated by the number (45 or 50) for occupied areas. Refer to Section I.
		Outdoor Uses	Feasible noise mitigation techniques should be analyzed and incorporated to make the outdoor activities acceptable. Refer to Section I.
	Incompatible	Indoor Uses	New construction should not be undertaken.
		Outdoor Uses	Severe noise interference makes outdoor activities unacceptable.

Source: City of San Diego Noise Element (2015)

Table 4: Brown Field Noise Compatibility Criteria

Land Use Category[1] *Note: Multiple categories may apply to a project*	Exterior Noise Exposure (CNEL)			
	60-65	65-70	70-75	75-80
Agricultural and Animal-Related				
Horse stables; livestock breeding or farming	A	A	A	
Nature preserves; wildlife preserves				
Interactive nature exhibits	A			
Zoos	A	A		
Agriculture (except residences and livestock); greenhouses; fishing				A
Recreational				
Children-oriented neighborhood parks; playgrounds	A			
Campgrounds; recreational vehicle/motor home parks				
Community parks; regional parks; golf courses; tennis courts; athletic fields; outdoor spectator sports; fairgrounds; water recreation facilities		A		
Recreation buildings; gymnasiums; club houses; athletic clubs; dance studios		50	50	
Public				
Outdoor amphitheaters	A			
Children's schools (K-12); day care centers (>14 children)	45			
Libraries	45			
Auditoriums; concert halls; indoor arenas; places of worship	45	45		
Adult schools; colleges; universities[2]	45	45		
Prisons; reformatories		50		
Public safety facilities (e.g., police, fire stations)		50	50	
Cemeteries; cemetery chapels; mortuaries		45 A	45 A	
Residential, Lodging, and Care				
Residential (including single-family, multi-family, and mobile homes); family day care homes (≤14 children)	45			
Extended-stay hotels; retirement homes; assisted living; hospitals; nursing homes; intermediate care facilities	45			
Hotels; motels; other transient lodging[3]	45	45	45	
Commercial and Industrial				
Office buildings; office areas of industrial facilities; medical clinics; clinical laboratories; radio, television, recording studios		50	50	
Retail sales; eating/drinking establishments; movie theaters; personal services		50	50 B	
Wholesale sales; warehouses; mini/other indoor storage			50 C	
Industrial manufacturing; research & development; auto, marine, other sales & repair services; car washes; gas stations; trucking, transportation terminals			50 C	
Extractive industry; utilities; road, rail right-of-ways; outdoor storage; public works yards; automobile parking; automobile dismantling; solid waste facilities				50 C
Animal shelters/kennels	50	50	50	

Land Use Acceptability		Interpretation/Comments
	Compatible	Indoor Uses: Standard construction methods will sufficiently attenuate exterior noise to an acceptable indoor community noise equivalent level (CNEL). Outdoor Uses: Activities associated with the land use may be carried out with essentially no interference from aircraft noise.
45 **50**	Conditional[4]	Indoor Uses: Building structure must be capable of attenuating exterior noise to the indoor CNEL indicated by the number, standard construction methods will normally suffice. Outdoor Uses: CNEL is acceptable for outdoor activities, although some noise interference may occur.
A **B** **C**	Conditional[4]	Indoor and Outdoor Uses: A Caution should be exercised with regard to noise-sensitive outdoor uses; these uses are likely to be disrupted by aircraft noise events; acceptability is dependent upon characteristics of the specific use.[5] B Outdoor dining or gathering places incompatible above 70 CNEL. C Sound attenuation must be provided for associated office, retail, and other noise-sensitive indoor spaces sufficient to reduce exterior noise to an interior maximum of 50 CNEL.
	Incompatible	Use is not compatible under any circumstances.

SOURCE: San Diego County Regional Airport Authority 2010.

[1]Land uses not specifically listed shall be evaluated, as determined by the ALUC, using the criteria for similar uses.

[2]Applies only to classrooms, offices, and related indoor uses. Laboratory facilities, gymnasiums, outdoor athletic facilities, and other uses to be evaluated as indicated for those land use categories.

[3]Lodging intended for stays by an individual person of no more than 25 days consecutively and no more than 90 days total per year; facilities for longer stays are in the extended-stay hotel category.

[4]An *aviation easement* is required for any project situated on a property lying within the projected 65 CNEL noise contour. See Policy 2.11.5 and Policy 3.3.3(d).

[5]Noise-sensitive land uses are ones for which the associated primary activities, whether indoor or outdoor, are susceptible to disruption by loud noise events. The most common types of noise-sensitive land uses include, but are not limited to, the following: residential, hospitals, nursing facilities, intermediate care facilities, educational facilities, libraries, museums, places of worship, child-care facilities, and certain types of passive recreational parks and open space.

Table 5: Sound Abatement and Control Noise Ordinance Noise Limits

Land Use	Time of Day	One-Hour Average Sound Level (decibels)
1. Single Family Residential	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	50 45 40
2. Multi-Family Residential (Up to a maximum density of 1/2000)	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	55 50 45
3. All other Residential	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55 50
4. Commercial	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	65 60 60
5. Industrial or Agricultural	any time	75

Source: City of San Diego Noise Ordinance Section 59.5.0401

6.0 IMPACT ANALYSIS

6.1 Traffic Noise

Traffic-generated noise impacts reported in the OMCPU EIR were calculated based on future traffic volumes for buildout of the OMCPU published in the OMCPU's traffic study (Appendix J of the OMCPU EIR), in addition to posted speed limits, proposed truck routes, and estimated vehicle mix on various roads.

According to the CVSP's *Transportation Facilities Trigger Analysis* (Chen Ryan & Associates, 2017), the CVSP would generate up to 36,345 average daily vehicular trips (ADT), which is less traffic than was assumed for the Central Village by the OMCPU EIR, at 45,429 daily trips (Urban Systems Associates, Inc. 2012).

Even though traffic volumes would be less with approval of the CVSP, an analysis was conducted to determine if approval of the CVSP would result in the exposure of noise-sensitive receptors to transportation noise levels that would exceed City standards. The City uses the Land Use - Noise Compatibility Guidelines as shown on Table NE-3 in the Noise Element of the General Plan (provided as Table 3 above) for evaluating land use noise compatibility when reviewing proposed land use development projects. A "compatible" land use indicates that standard construction methods will attenuate exterior noise to an acceptable indoor noise level and people can carry out outdoor activities with minimal noise interference. Land uses that fall into the "conditionally compatible" noise environment should be subject to acoustical study. The acoustical study should consider the type of noise source, the sensitivity of the noise receptor, and the degree to which the noise source may interfere with speech, sleep, or other activities characteristic of the land use. For land uses indicated as "incompatible" with certain noise levels, new construction of those land uses should generally not be undertaken.

In addition, and in accordance with the CEQA Guidelines, a project should not result in a substantial permanent increase in ambient noise levels. The definition of a substantial increase is not defined by CEQA and is left to each lead agency to determine an appropriate threshold. Noise level changes greater than 3 dBA, or a doubling of the acoustic energy, are often identified as an audible change in the ambient noise levels and an increase of this magnitude may be considered potentially significant in locations with existing high ambient noise levels. Therefore, for the purposes of this analysis, a direct and cumulatively considerable roadway noise impact would be considered significant if the CVSP would increase noise levels at a noise sensitive land use by +3 dBA CNEL or more, and the future noise level at the same noise sensitive land use is in excess of the "compatible" noise level per the City's General Plan (Table 3, above).

Noise levels projected for various roadway segments in this report were calculated using the methods in the *Highway Noise Prediction Model* published by the Federal Highway Administration

(FHWA Highway Traffic Noise Prediction Model, FHWA-RD-77-108, December, 1978). The FHWA Model uses the traffic volume, vehicle mix, speed, and roadway geometry to compute the equivalent noise level. The noise contours are then established by iterating the equivalent noise level over many distances until the distance to the desired noise contour(s) are found.

CVSP traffic volumes were taken from the *Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis* (Chen Ryan & Associates, 2017). OMCPU traffic volumes were taken from the traffic report prepared to support the OMCPU EIR (Urban Systems Associates, Inc. 2012). The traffic classification mix used in the acoustical modeling conducted for this report was developed from traffic counts taken during the noise measurements (refer to Table 2 above), reflecting an atypically large percentage of truck traffic given the high volume of industrial activity in the surrounding area. This vehicle mix is consistent with the 15-minute traffic count mix data reported in the OMCPU EIR (refer to EIR Table 5.10-5, "15-Minute Traffic Counts"), which indicates that the existing condition is similar to the condition that existed at the time the OMCPU EIR analysis was conducted. Existing truck volumes along SR-905 used in this acoustical analysis were obtained from the California Department of Transportation (Caltrans) truck counts (Caltrans 2014). A traffic mix of 91.9 percent cars, 5.5 percent medium trucks, and 2.6 heavy trucks was observed along SR-905.

Truck routes were modeled using an assumed traffic mix of 65 percent cars, 10 percent medium trucks, 20 percent heavy trucks, 2 percent buses, and 3 percent motorcycles, consistent with the OMCPU EIR. The remaining circulation roadways were modeled using an industry standard mix of 90 percent cars, 3 percent medium trucks, 20 percent heavy trucks, 2 percent buses, and 3 percent motorcycles and which is reflective of the vehicle mix reported in the OMCPU EIR (refer to EIR Table 5.10-5, "15-Minute Traffic Counts").

Traffic speeds were obtained from the San Diego Association of Governments (SANDAG; 2016) and observed posted speed limits. All roadways were modeled on acoustically hard ground type. The model outputs are noise levels at 100 feet from the centerline of affected streets with distances to various noise level contours (see Table 6). These noise contours do not account for intervening structures, differences in ground absorption or other shielding objects that could absorb or deflect sound and lower noise levels. The noise contours that would occur from implementation of the adopted OMCPU EIR are provided in Figure 5.

Adoption of the CVSP would alter the land use mix and lower the traffic volumes that were assumed for the Central Village by the OMCPU. Also, due to the land use changes and knowledge of the CVSP's proposed street pattern inside the Central Village (which was not known at the time of OMCPU approval), the directional distribution of traffic generated by development in the Central Village would slightly change from that reported in the OMCPU FEIR. To quantify future noise levels with adoption of the CVSP compared to future noise levels that were reported in the OMCUP EIR, Ldn Consulting calculated the comparative noise levels. Future noise levels along study area roadways assuming approval of the CVSP are shown in Table 7. The future (OMCPU as amended by

the CVSP) anticipated noise contours in the CVSP area are provided graphically in Figure 6. The changes in traffic noise levels between adopted (OMCPU) and proposed (OMCPU as amended to account for the CVSP) traffic volumes are shown in Table 8.

Table 6: Adopted (OMCPU) Modeled Noise Levels

Roadway	Segment	CNEL @ 100 Feet	Distance in feet to Noise Level Contour (CNEL)		
			75 dB	70 dB	65 dB
Airway Road	Old Otay Mesa Rd to Caliente Ave	68	37	79	170
	Caliente Ave to Heritage Rd	73	74	159	343
	Heritage Rd to Cactus Rd	71	57	122	263
	Cactus Rd to Britannia Blvd	72	63	136	293
	Britannia Blvd to La Media Rd	71	56	121	261
	La Media Rd to Harvest Rd	73	70	151	326
	Harvest Rd to Sanyo Ave	72	66	142	305
Beyer Boulevard	Alaquinas Dr to Old Otay Mesa Rd	68	34	74	159
	Old Otay Mesa Rd to East End	61	12	26	56
Britannia Boulevard	Otay Mesa Rd to SR-905	68	35	76	164
	SR-905 to Airway Rd	78	167	359	774
	Siempre Viva Rd to South End	76	122	263	566
	Airway Rd to Siempre Viva Rd	76	123	265	571
Cactus Road	Otay Mesa Rd to Airway Rd	72	62	133	287
	Airway Rd to Siempre Viva Rd	70	47	101	217
Caliente Avenue	Otay Mesa Rd to SR-905	69	42	91	197
	SR-905 to Airway Rd	71	55	119	256
	Airway Rd to Siempre Viva Rd	72	64	139	299
Camino Maquiladora	Pacific Rim Ct. to Cactus Rd	61	12	26	57
	Cactus Rd to Continental St	61	11	25	53
Heritage Road	Avenida De Las Vistas to Datsun St	75	105	226	488
	Datsun St to Otay Mesa Rd	73	76	163	352
	Otay Mesa Rd to SR-905	69	39	84	181
	SR-905 to Airway Rd	74	81	174	374
La Media Road	Aviator Rd to Otay Mesa Rd	80	212	457	984
	Otay Mesa Rd to SR-905	79	174	375	808
	SR-905 to Airway Rd	80	214	461	992
	Airway Rd to Siempre Viva Rd	76	121	260	560
Ocean View Hills Pkwy	Dennery Rd to Del Sol Blvd	71	52	112	242
	Del Sol Blvd to Street A	72	62	133	287
	Street A to Otay Mesa Rd	69	40	86	186
Otay Mesa Road	Caliente Ave to Corporate Center Dr	75	106	227	490
	Corporate Center Dr to Innovative Dr	72	63	136	293
	Innovative Dr to Heritage Rd	73	70	151	324
	Heritage Rd to Cactus Rd	76	119	257	554
	Cactus Rd to Britannia Blvd	74	89	191	412
	Britannia Blvd to Ailsa Ct	75	102	220	473
	Ailsa Ct to La Media Rd	74	91	197	423
	La Media Rd to Piper Ranch Rd	73	78	169	364
Siempre Viva Rd	Cactus Rd to Britannia Blvd	72	61	132	285
	Britannia Blvd to La Media Rd	73	68	147	318
	La Media Rd to Harvest Rd	71	52	111	240
	Harvest Rd to Otay Center Dr	71	52	113	242
	Otay Center Dr to SR-905	73	79	169	364
St Andrews Avenue	Otay Mesa Center Rd To La Media Rd	82	309	665	1,433
Street A	Ocean View Hills Pkwy to Otay Mesa Rd	85	449	968	2,085

Figure 5: Adopted (OMCPU) Modeled Transportation Noise Contours

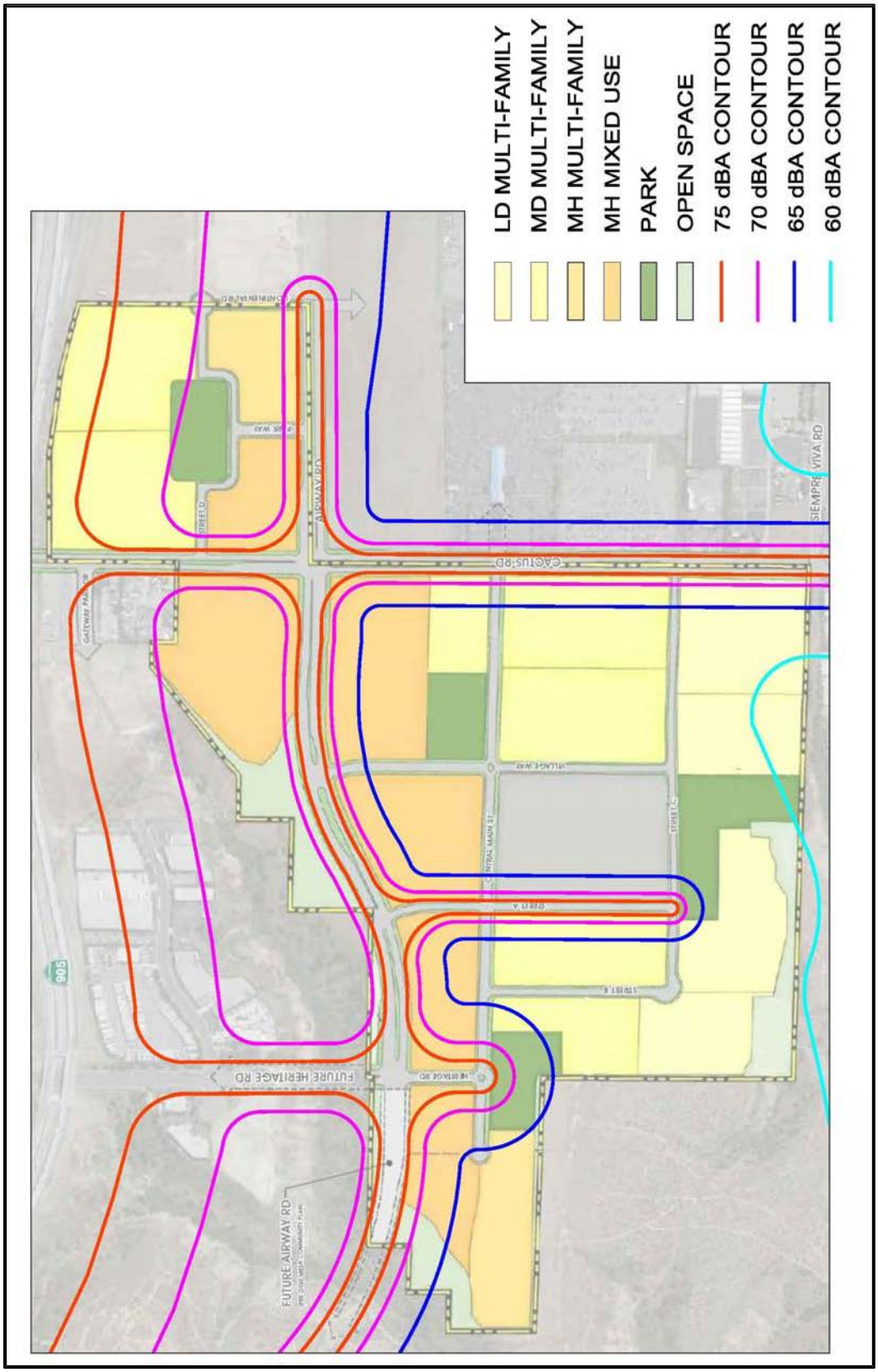


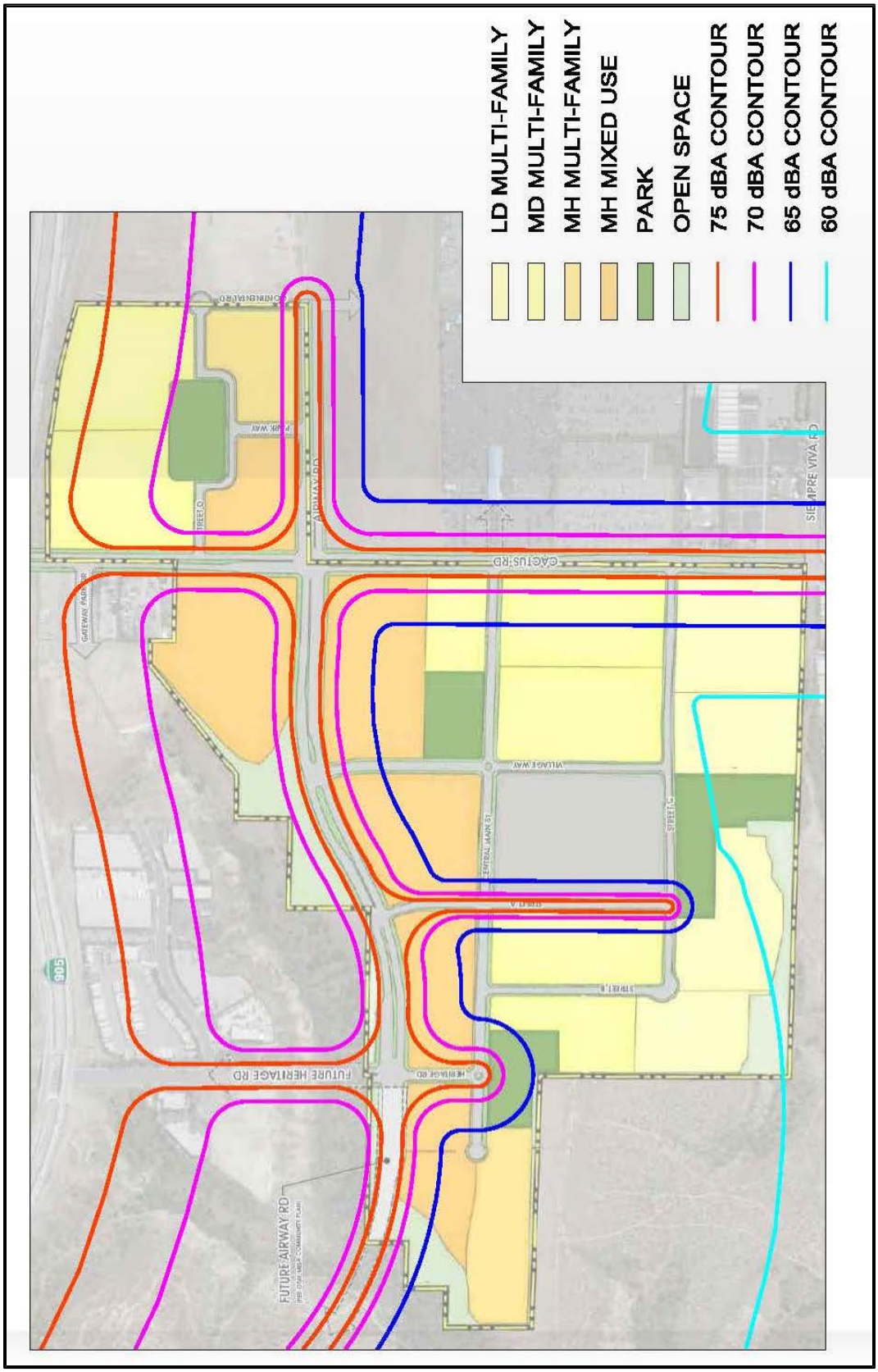
Table 7: Future (OMCPU as amended by the CVSP) Modeled Noise Levels

Roadway	Segment	CNEL @ 100 Feet	Distance in feet to Noise Level Contour (CNEL)		
			75 dB	70 dB	65 dB
Airway Road	Old Otay Mesa Rd to Caliente Ave	66	23	50	109
	Caliente Ave to Heritage Rd	71	55	119	256
	Heritage Rd to Cactus Rd	73	75	162	349
	Cactus Rd to Britannia Blvd	72	61	132	285
	Britannia Blvd to La Media Rd	71	52	113	242
	La Media Rd to Harvest Rd	71	51	110	238
	Harvest Rd to Sanyo Ave	70	43	93	201
Beyer Boulevard	Alaquinas Dr to Old Otay Mesa Rd	69	41	89	192
	Old Otay Mesa Rd to Caliente Ave	71	57	123	265
Britannia Boulevard	Otay Mesa Rd to SR-905	68	33	71	153
	SR-905 to Airway Rd	79	189	408	879
	Airway Rd to Siempre Viva Rd	78	150	324	697
	Siempre Viva Rd to South End	75	94	202	436
Cactus Road	Otay Mesa Rd to Airway Rd	73	68	147	317
	Airway Rd to Siempre Viva Rd	73	68	147	317
Caliente Avenue	Otay Mesa Rd to SR-905	69	42	90	194
	SR-905 to Airway Rd	70	49	106	228
	Airway Rd to Beyer Blvd	72	63	135	291
	Beyer Blvd to Siempre Viva Rd	71	58	125	269
Camino Maquiladora	Pacific Rim Ct to Cactus Rd	62	14	30	66
	Cactus Rd to Continental St	61	12	26	57
Heritage Road	Avenida De Las Vistas to Datsun St.	75	103	223	479
	Datsun St to Otay Mesa Rd	73	76	165	354
	Otay Mesa Rd to SR-905	70	47	102	220
	SR-905 to Airway Rd	72	62	133	287
La Media Road	Aviator Rd to Otay Mesa Rd	75	105	226	488
	Otay Mesa Rd to SR-905	78	148	318	685
	SR-905 to Airway Rd	79	191	412	889
	Airway Rd to Siempre Viva Rd	76	123	265	571
Ocean View Hills Pkwy	Dennery Rd to Del Sol Blvd	70	45	98	211
	Del Sol Blvd to Street “A”	71	52	113	242
	Street “A” to Otay Mesa Rd	69	40	86	186
Otay Mesa Road	Caliente Ave to Corporate Center Dr	75	101	217	467
	Corporate Center Dr to Innovative Dr	74	80	172	372
	Innovative Dr to Heritage Rd	73	75	161	347
	Heritage Rd to Cactus Rd	76	122	263	566
	Cactus Rd to Britannia Blvd	74	84	182	391
	Britannia Blvd to Ailsa Ct	74	92	199	429
	Ailsa Ct to La Media Rd	74	82	178	383
	La Media Rd to Piper Ranch Rd	74	83	178	383
Siempre Viva Rd	Cactus Rd to Britannia Blvd	71	54	117	252
	Britannia Blvd to La Media Rd	72	59	128	276
	La Media Rd to Harvest Rd	71	58	124	267
	Harvest Rd to Otay Center Dr	71	51	110	238
	Otay Center Dr to SR-905	73	75	161	347
St Andrews Avenue	Otay Mesa Center Rd to La Media Rd	82	286	615	1,325
Street A	Ocean View Hills Pkwy to Otay Mesa Rd	84	410	883	1,903

Table 8: Change in Adopted (OMCPU) and Future (OMCPU as amended by the CVSP) Modeled Noise Levels (dBA at 100 feet)

Roadway	Segment	Existing CNEL	Future CNEL	Change
Airway Road	Old Otay Mesa Rd to Caliente Ave	68	66	-2
	Caliente Ave to Heritage Rd	73	71	-2
	Heritage Rd to Cactus Rd	71	73	+2
	Cactus Rd to Britannia Blvd	72	72	0
	Britannia Blvd to La Media Rd	71	71	0
	La Media Rd to Harvest Rd	73	71	-2
	Harvest Rd to Sanyo Ave	72	70	-2
Beyer Boulevard	Alaquinas Dr to Old Otay Mesa Rd	68	69	+1
	Old Otay Mesa Rd to Caliente Ave	61	71	**+10**
Britannia Boulevard	Otay Mesa Rd to SR-905	68	68	0
	SR-905 to Airway Rd	78	79	+1
	Airway Rd to Siempre Viva Rd	76	78	+2
	Siempre Viva Rd to South End	76	75	-1
Cactus Road	Otay Mesa Rd to Airway Rd	72	73	+1
	Airway Rd to Siempre Viva Rd	70	73	**+3**
Caliente Avenue	Otay Mesa Rd to SR-905	69	69	0
	SR-905 to Airway Rd	71	70	-1
	Airway Rd to Beyer Blvd	72	72	0
	Beyer Blvd to Siempre Viva Rd	72	71	-1
Camino Maquiladora	Pacific Rim Ct to Cactus Rd	61	62	+1
	Cactus Rd to Continental St	61	61	0
Heritage Road	Avenida De Las Vistas to Datsun St.	75	75	0
	Datsun St to Otay Mesa Rd	73	73	0
	Otay Mesa Rd to SR-905	69	70	+1
	SR-905 to Airway Rd	74	72	-2
La Media Road	Aviator Rd to Otay Mesa Rd	80	75	-5
	Otay Mesa Rd to SR-905	79	78	-1
	SR-905 to Airway Rd	80	79	-1
	Airway Rd to Siempre Viva Rd	76	76	0
Ocean View Hills Pkwy	Dennery Rd to Del Sol Blvd	71	70	-1
	Del Sol Blvd to Street “A”	72	71	-1
	Street “A” to Otay Mesa Rd	69	69	0
Otay Mesa Road	Caliente Ave to Corporate Center Dr	75	75	0
	Corporate Center Dr to Innovative Dr	72	74	+2
	Innovative Dr to Heritage Rd	73	73	0
	Heritage Rd to Cactus Rd	76	76	0
	Cactus Rd to Britannia Blvd	74	74	0
	Britannia Blvd to Ailsa Ct	75	74	-1
	Ailsa Ct to La Media Rd	74	74	0
	La Media Rd to Piper Ranch Rd	73	74	+1
Siempre Viva Rd	Cactus Rd to Britannia Blvd	72	71	-1
	Britannia Blvd to La Media Rd	73	72	-1
	La Media Rd to Harvest Rd	71	71	0
	Harvest Rd to Otay Center Dr	71	71	0
	Otay Center Dr to SR-905	73	73	0
St Andrews Avenue	Otay Mesa Center Rd to La Media Rd	82	82	0
Street A	Ocean View Hills Pkwy to Otay Mesa Rd	85	84	-1

Figure 6: Future (OMCPU as Amended by the CVSP) Transportation Noise Contours



As shown in Table 8, changes in future noise levels along studied roadways would range between -2 dB(A) and +10 dB(A). Based on the results shown in Table 8, the CVSP would cause traffic noise levels to decrease along 17 road segments, stay the same along 19 road segments, and increase by +1 dB(A)or +2 dB(A) along nine roadway segments compared to the noise levels reported by the OMCPU EIR. Decreases in noise levels, no changes in noise levels, and increases in noise levels of less than +3 dB(A) are considered to be less than significant differences. Along the segment of Beyer Boulevard between Old Otay Mesa Road and Caliente Avenue, the CVSP would cause future projected noise levels to increase by +10dB(A) and along Cactus north of Siempre Viva Road, the CVSP would cause future projected noise levels to increase by + 3 dB(A), which are potentially significant noise level increases if these increases affect sensitive noise receivers. The increases are discussed in more detail below.

For the segment of Beyer Boulevard between Old Otay Mesa Road and Caliente Avenue, the noise impact analysis prepared for the OMCPU EIR (RECON, 2013) determined that with buildout of the OMCPU (including the Central Village as originally envisioned by the OMCPU), planned residential uses along this portion of Beyer Boulevard would be exposed to noise levels exceeding 60 dBA. Similarly, for the segment of Cactus Road north of Siempre Viva Road, the noise impact analysis prepared for the OMCPU EIR (RECON, 2013) determined that with buildout of the OMCPU (including the Central Village as originally envisioned by the OMCPU), planned residential and park uses along this portion of Cactus Road would be exposed to noise levels exceeding 60 dBA. Consistent with the conclusion drawn by the OMCPU EIR, implementation of the proposed CVSP project would contribute to *significant impacts* to the above-referenced segments of Beyer Avenue and Cactus Avenue. The OMCPU EIR concluded that noise impacts to residential and/or park uses along these and other road segments would be significant and potentially unavoidable. Thus, this is not a new impact as the result of the CVSP.

In regards to on-site land uses, the proposed CVSP designates development areas for residential uses where traffic-related noise levels would exceed the City's noise level compatibility standards (i.e., proposed residential uses adjacent to Airway Road, Cactus Road, and SR-905, as reported in the OMCPU EIR and substantiated in this report). Typical residential construction in California, conducted in compliance with the California Building Standards Code, provides approximately 10 to 15 dBA of noise reduction from exterior noise sources with windows partially open, and approximately 20 to 25 dBA of noise reduction with windows closed. Thus, as a rule of thumb, where exterior noise levels are below 65-dBA CNEL, interior noise levels for new construction would typically meet the interior 45-dBA CNEL standard for residential uses established in the California Code of Regulations, Title 24.

Additionally, where exterior noise levels are 65 to 70 dBA CNEL, interior noise can be reduced with standard wall and window construction, and the inclusion of mechanical forced-air ventilation to allow occupants the option of maintaining windows closed to control noise. As stated in the OMCPU EIR, where exterior noise levels exceed 70 dBA CNEL, residential units would not normally

be able to meet the 45-dBA CNEL interior standard through typical construction methods. Thus, the OMCPU EIR stated that noise-sensitive uses located within the 70 dBA CNEL will require acoustical study at the project-level, and may require enhanced design features, such as windows and doors with higher Sound Transition Class (STC) ratings to meet the 45-dBA CNEL criteria. All development projects that would implement the CVSP (including those with uses that would occur within the 65-dBA CNEL contour (refer to Figure 6)) would be subject to a discretionary review process and evaluated under CEQA, including a requirement for additional site-specific acoustical analysis. Applicable provisions of OMCPU EIR Mitigation Measures NOI-1 and NOI-2, which require acoustical study at the implementing project level, are listed in Section 7.0 of this report.

Commercial uses developed under the CVSP in mixed-use planning areas would be a compatible use for the future noise levels calculated for these areas. The interior noise level criterion for commercial sales and offices is 50 dBA CNEL. The majority of planned commercial land uses in the CVSP area are located along Airway Road. As shown in Table 7, noise levels along this roadway would be above 70 dBA CNEL at 100 feet. As noted in the OMCPU EIR, interior noise can be reduced with standard wall and window construction, and the inclusion of mechanical forced-air ventilation to allow occupants the option of maintaining windows closed to control noise. Thus, no additional noise reduction measures are needed for the proposed commercial areas on-site beyond those presented in the OMCPU EIR. The OMCPU EIR's noise mitigation measures are listed in Section 7.0 of this report.

6.2 Cumulative Traffic Noise

The cumulative study area for traffic-related noise was determined to include those roadway segments throughout the CVSP area and the immediate community that would have an increase in traffic as a result of the CVSP and, thus, a potential increase in noise. However, the proposed CVSP project would result in fewer daily trips than assumed for the Central Village by the OMCPU EIR; thus, implementation of the CVSP as proposed would have overall reduced cumulatively considerable impacts associated with transportation-related noise as compared to what was disclosed by the OMCPU EIR. Nonetheless, and consistent with the findings of the OMCPU EIR, implementation of the proposed CVSP project, in conjunction with other cumulative traffic expected upon buildout of the OMCPU and ambient growth, would expose sensitive receptors to significant noise impacts particularly where residential and/or park uses exist or are planned to be located along roadways impacted by noise levels above 65 dB(A). Although mitigation measures, consistent with OMCPU Mitigation Measures NOI-1 and NOI-2, are presented in Section 7.0 of this report, transportation-related noise impacts would nonetheless remain cumulatively considerable and unavoidable. This conclusion is consistent with the conclusion reached by the OMCPU EIR.

Cumulative traffic noise levels (i.e., existing plus future with Proposed Project), were calculated using future traffic volumes from the CVSP/s *Transportation Facilities Trigger Analysis* (Chen Ryan

Associates, 2017) and were presented in Tables 7 and 8 above. As shown in Table 8, the CVSP would cause traffic noise to increase by 3 dBA or more along two study area road segments: Beyer Boulevard between Old Otay Mesa Road and Caliente Avenue; and Cactus Road north of Siempre Viva Road. Cumulative traffic-related noise levels along Beyer Boulevard would expose future residential uses in the Southwest Village portion of the OMCPU to noise levels exceeding City thresholds of significance. Cumulative traffic-related noise levels along Cactus Road north of Siempre Viva Road would expose off- site recreational uses (i.e., Grand Park) to unacceptable noise levels, and also would expose proposed on-site residential uses abutting Cactus Road to noise levels exceeding the City's land use compatibility guidelines as presented in Table 3. Thus, and consistent with the conclusions of the OMCPU EIR, even with the incorporation of mitigation measures, impacts to sensitive receptors abutting the Beyer Boulevard or Cactus Avenue roadway segments would be cumulatively considerable and unavoidable.

6.3 Airport Noise

The CVSP is located outside of the 60-65 dB CNEL contour for the Brown Field Municipal Airport. Thus, the CVSP has no potential to conflict with the land use compatibility guidelines of the Brown Field Comprehensive Land Use Plan (see Table 4 above). A *less-than-significant* impact would occur.

6.4 Operational Noise and Collocation of Land Uses

The generation of noise from certain types of land uses in the CVSP area could cause potential land use incompatibility. A project which would generate noise levels at the property line which exceed Section 59.5.0401 of the City's Municipal Code is considered potentially significant, as identified in Table 5 above.

Section 59.5.0401 of the City's Noise Ordinance sets the operational exterior noise limit for commercial uses at 65 dBA Leq for daytime hours of 7 a.m. to 7 p.m. and 60 dBA Leq during the noise sensitive nighttime hours of 7 p.m. to 7 a.m. Although commercial uses permitted in the CVSP's mixed-use planning areas are expected to only operate during the daytime hours, there is still a potential that businesses may operate during nighttime or early morning hours and therefore the most restrictive and conservative approach is to apply the 60 dBA Leq nighttime standard at the property lines.

Development projects that would be implemented pursuant to the CVSP would result in the collocation of residential and recreational land uses with commercial uses (i.e., within and adjacent to the mixed-use portions of the CVSP area). Additionally, the Project also would introduce residential and recreational land uses in the northern and southern portions of the site in close proximity to existing or planned off-site light and/or heavy industrial land uses.

Noise sources associated with commercial land uses include mechanical equipment operations, public address systems, parking lot noise (e.g., opening and closing of vehicle doors, people talking, car alarms), delivery activities (e.g., use of forklifts, hydraulic lifts), trash compactors, and air compressors. Noise from such equipment can reach intermittent levels of approximately 90 dBA, 50 feet from the source (EPA 1974). The noise levels that have the potential to be generated by commercial uses within mixed-use land use designations could expose nearby noise-sensitive land uses (e.g., residential units and parks) to noise levels that may exceed the noise level limits specified in the City's Noise Ordinance.

Additionally, the CVSP area abuts off-site light industrial land uses north of Planning Area 13 and east of Planning Areas 6, 7, and 12, and occurs in close proximity to heavy industrial uses located south of Planning Area 12. Noise sources associated with light and heavy industrial sources include mechanical equipment, public address systems, parking lot noise (e.g., opening and closing of vehicle doors, trucks idling, car alarms), delivery activities (e.g., use of forklifts, hydraulic lifts, truck movements), trash compactors, and air compressors. Noise from such equipment can reach intermittent levels of approximately 90 dBA, 50 feet from the source (EPA 1974). These noise levels that have the potential to be generated by off-site industrial uses could expose noise-sensitive land uses within the CVSP (e.g., residential units) to noise levels that may exceed noise level limits specified in the City's Noise Ordinance.

The juxtaposition of future land uses within the CVSP could result in significant noise impacts to sensitive receptors on-site. This potential was acknowledged by the OMCPU EIR. While the City's applicable regulations and policies would reduce direct and indirect impacts associated with the generation of noise levels in excess of standards established in the General Plan or Noise Ordinance, no project level site plans are proposed as part of the CVSP. Without detailed operational data and site plans for the land uses within each CVSP planning area, it cannot be verified if future projects would be capable of reducing noise levels to comply with City standards. As the degree of success cannot be adequately known for specific projects at a program level of analysis, consistent with the conclusion drawn by the OMCPU EIR, mitigation would be required to provide verification that City standards have been met for operational noise. As a result, and consistent with the findings of the OMCPU EIR, this impact is *potentially significant*. Noise attenuation measures, consistent with OMCPU EIR Mitigation Measure NOI-3, are identified in Section 7.0 of this report to reduce this impact; however, and consistent with the conclusions reached by the OMCPU EIR, even with strict adherence to the required mitigation (see Section 7.0 of this report), impacts associated with collocation of residential, commercial, and light/heavy industrial land uses has the potential to remain significant and unavoidable. There is no aspect of the CVSP that would worsen the level of impact compared to the potential impacts disclosed in the OMCPU EIR. The impact would be the same.

6.5 Cumulative Operational Noise

Operational noise sources, such as noise from mechanical equipment, are temporary and more localized and controlled at the source such that they do not typically combine with other sources to create cumulative noise impacts. Nonetheless, and consistent with the conclusions drawn by the OMCPU EIR, operational-related noise from on-site commercial areas and off-site light/heavy industrial areas could combine to expose on-site residents and/or recreational uses to cumulatively considerable noise impacts. Although mitigation consistent with OMCPU EIR Mitigation Measure NOI-3 is presented in Section 7.0 of this report, the required mitigation would not reduce stationary noise impacts to below a level of significant. Therefore, and consistent with the conclusion reached in the OMCPU EIR, impacts due to noise from commercial and/or industrial land uses affecting on-site residential and/or recreational uses is a cumulatively-considerable and unavoidable impact for which additional feasible mitigation is not available.

6.6 Construction Noise

Division 4 of Article 9.5 of the City of San Diego Municipal Code addresses the limits of disturbing or offensive construction noise. The Municipal Code states that with the exception of an emergency, it should be unlawful to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12–hour period from 7:00 a.m. to 7:00 p.m.

Noise impacts from construction are dependent on the noise generated by the construction equipment, the location and sensitivity of affected land uses, as well as the timing and duration of the activities. Noise levels adjacent to active construction sites would increase during construction. Construction would not result in long-term impacts, since it would be temporary and daily construction activities would be limited by the City's Noise Ordinance (Section 59.5.0404) to hours of less noise sensitivity.

In general, construction activities are carried out in stages, and each stage has its own noise characteristics based on the construction equipment in use. Typical maximum noise levels at a distance of 50 feet from various pieces of construction equipment are shown in Table 9.

Typical construction projects, with equipment moving from one point to another, work breaks, and idle time, have hourly noise level that are lower than loud short-term, or instantaneous, peak noise events. For purposes of analysis of this project, a maximum 1-hour average noise level of 80 dBA L_{eq} at a distance of 50 feet from the center of the construction area is assumed to occur. Noise levels of other activities, such as framing or paving, would be less. Maximum noise levels of 90 dBA L_{max} may occur during grading and excavation, when there may be a combination of noise from several pieces of equipment in close proximity, including the noise of

backup alarms, and these activities are near the construction site periphery.

Noise levels from construction activities are considered as point sources and would drop off at a rate of 6 dBA per doubling of distance over hard sites, such as streets and parking lots; the drop-off rate would increase slightly to 7.5 dBA over soft sites such as grass fields and open terrain with vegetation (FTA 2006). For purposes of this analysis the project area is considered acoustically hard, and all potential exterior receptors were assumed to be 5 feet above grade. All construction equipment is assumed to have an exhaust outlet height (source height) of 10 to 14 feet.

The majority of the CVSP area is proposed for multiple-family residential and mixed use development. A proposed school and recreation area is planned near the center of the CVSP area with four parks and open space areas designated throughout the CVSP.

Table 9: Typical Maximum Construction Equipment Noise Levels

Equipment	Noise Level at 50 feet (dBA L_{max})	Typical Duty Cycle
Auger Drill Rig	85	20%
Backhoe	80	40%
Blasting	94	1%
Chain Saw	85	20%
Clam Shovel	93	20%
Compactor (ground)	80	20%
Compressor (air)	80	40%
Concrete Mixer Truck	85	40%
Concrete Pump	82	20%
Concrete Saw	90	20%
Crane (mobile or stationary)	85	20%
Dozer	85	40%
Dump Truck	84	40%
Excavator	85	40%
Front End Loader	80	40%
Generator (25 KVA or less)	70	50%
Generator (more than 25 KVA)	82	50%
Grader	85	40%
Hydra Break Ram	90	10%
Impact Pile Driver (diesel or drop)	95	20%
Insitu Soil Sampling Rig	84	20%
Jackhammer	85	20%
Mounted Impact Hammer (hoe ram)	90	20%
Paver	85	50%
Pneumatic Tools	85	50%
Pumps	77	50%
Rock Drill	85	20%
Roller	74	40%
Scraper	85	40%
Tractor	84	40%
Vacuum Excavator (vac-truck)	85	40%
Vibratory Concrete Mixer	80	20%
Vibratory Pile Driver	95	20%

Source: FTA 2006; Thalheimer 2000
KVA = kilovolt amps

Construction noise impacts to humans primarily result when construction activities occur during noise-sensitive times of the day (early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise-sensitive land uses, or when construction durations last over extended periods of time. The highest construction noise levels during typical construction activities would be generated during grading, excavation, road base construction, and foundation work, with lower noise levels occurring during building construction and paving. As shown in Table 9, large pieces of earth-moving equipment, such as graders, scrapers, and bulldozers, generate maximum noise levels of 85 to 90 dBA L_{max} at a distance of 50 feet. However, typical construction-generated hourly noise levels are about 75 to 80 dBA L_{eq} measured at a distance of 50 feet from the site during busy construction periods.

Noise levels drop off at a rate of about 6 dBA per doubling of distance between the noise source and receptor. However, intervening structures would result in lower noise levels at greater distances. Sound levels may be attenuated 3.0 to 5.0 dBA by a first row of houses/buildings and 1.5 dBA for each additional row of houses in built-up environments (FHWA 1978). These factors generally limit the distance construction noise travels and ensure noise impacts from construction are localized.

Although construction noise would be localized to discrete locations during construction, businesses, residences, recreational facilities, and noise-sensitive wildlife species using open space areas in and around the CVSP area could be intermittently exposed to temporary elevated levels of noise throughout the construction period. Specifically, the OMCPU EIR indicated that coastal California gnatcatcher (CAGN) occupying habitat in the Multiple Species Habitat Area (MHPA) could be adversely impacted by temporary construction noise if construction occurs during the breeding season. Therefore, adoption of the proposed CVSP with its potential to directly and indirectly affect the CAGN by construction noise does not represent a new impact.

Consistent with the findings of the OMCPU EIR, this is a *potentially significant impact* to humans and potentially to wildlife (CAGN in particular) due to the potential for high short-term and instantaneous noise levels during peak construction activity; mitigation consistent with OMCPU EIR Mitigation Measure NOI-4 and Mitigation Measure LU-2 is identified in Section 7.0 of this report. Consistent with the findings of the OMCPU EIR, even with the application of mitigation measures, construction noise impacts cannot be reduced to below a level of significance; therefore, construction-related noise impact would remain significant and unavoidable.

7.0 NOISE ABATEMENT AND MITIGATION MEASURES

Compliance with City regulatory standards addressing noise abatement is required of all projects and is not considered to be mitigation. However, and consistent with the conclusions of the OMCPU EIR, it is possible that for certain projects that implement the CVSP, adherence to the regulations may not adequately reduce noise levels to below City standards. As such, implementing projects may require noise attenuation mitigation. To reduce potential noise-related impacts, the City will verify that the following mitigation measures required by the OMCPU EIR are incorporated into each project that implements the CVSP, as applicable. As required by the CVSP, every development project that implements the CVSP will be subject to a discretionary review and approval process, including CEQA compliance. Even with the incorporation of mitigation, however, traffic-related, operational-related, and construction-related noise impacts have the potential to be *significant and unavoidable* as disclosed in the OMCPU EIR.

NOI-1: Prior to the issuance of building permits, site-specific exterior noise analyses that demonstrate that the project would not place residential receptors in locations where the exterior existing or future noise levels would exceed the noise compatibility standards of the City's General Plan shall be required as part of the review of future residential development proposals. Noise reduction measures, including but not limited to building noise barriers, increased building setbacks, speed reductions on surrounding roadways, alternative pavement surfaces, or other relevant noise attenuation measures, may be used to achieve the noise compatibility standards. Exact noise mitigation measures and their effectiveness shall be determined by the site-specific exterior noise analyses.

NOI-2: When building plans are available and prior to the issuance of building permits, site specific interior noise analyses demonstrating compliance with the interior noise compatibility standards of the City's General Plan and other applicable regulations shall be prepared for noise sensitive land uses located in areas where the exterior noise levels exceed the noise compatibility standards of the City's General Plan. Noise control measures, including but not limited to increasing roof, wall, window, and door sound attenuation ratings, placing HVAC in noise reducing enclosures, or designing buildings so that no windows face freeways or major roadways may be used to achieve the noise compatibility standards. Exact noise mitigation measures and their effectiveness shall be

NOI-3: Prior to the issuance of a building permit, a site-specific acoustical/noise analysis of any on-site generated noise sources, including generators, mechanical equipment, and trucks, shall be prepared which identifies all noise generating equipment, predicts noise levels at property lines from all identified equipment, and recommends mitigation to be implemented (e.g., enclosures, barriers, site orientation), to ensure compliance with the City's Noise Abatement and Control Ordinance. Noise reduction measures shall include building noise-attenuating walls, reducing noise

at the source by requiring quieter machinery or limiting the hours of operation, or other attenuation measures. Additionally, future projects shall be required to buffer sensitive receptors from noise sources through the use of open space and other separation techniques as recommended after thorough analysis by a qualified acoustical engineer. Exact noise mitigation measures and their effectiveness shall be determined by the site-specific noise analyses.

NOI-4: For projects that exceed daily construction noise thresholds established by the City of San Diego, best construction management practices shall be used to reduce construction noise levels to comply with standards established by the Municipal Code in Chapter 5, Article 9.5, Noise Abatement and Control. Project applicant shall prepare and implement a Construction Noise Management Plan. Appropriate management practices shall be determined on a project-by-project basis, and are specific to the location. Control measures shall include:

a. Minimizing simultaneous operation of multiple construction equipment units;

b. Locating stationary equipment as far as reasonable from sensitive receptors;

c. Requiring all internal combustion-engine-driven equipment to be equipped with mufflers that are in good operating condition and appropriate for the equipment; and

d. Construction of temporary noise barriers around construction sites that block the line-of-sight to surrounding receptors.

A tailored version of NOI-4 to more specifically address the impacts of the CVSP project is as follows. N-4 is recommended to replace NOI-4:

N-4: Prior to approval of implementing Development Permits within the Central Village, and consistent with OMCPU EIR Mitigation Measure NOI-4, the City of San Diego Development Services Department (DSD) shall ensure that all future Development Permits are appropriately conditioned to prepare a Construction Noise Management Plan (CNMP) that shall establish appropriate management practices that are specific to the property proposed for development. The CNMP shall incorporate best construction management practices, to the extent feasible, to ensure compliance with the standards established by the Municipal Code in Chapter 5, Article 9.5, *Noise Abatement and Control*. The CNMP shall require, at a minimum, the following measures to reduce noise associated with construction:

- Simultaneous operation of multiple construction equipment units shall be minimized.
- Stationary construction equipment shall be located as far as reasonable from sensitive receptors.
- All internal combustion-engine-driven equipment will be equipped with mufflers that are in good operating condition and appropriate for the equipment.
- Where physically feasible, temporary noise barriers shall be erected around construction sites adjacent to, or within 150 feet of, operational business, residences, or other noise-sensitive land uses. Temporary noise barriers must be constructed of material with a minimum weight of 3 pounds per square foot with no gaps or

perforations. Noise barriers may be constructed of, but are not limited to, 5/8 inch plywood, 5/8 inch oriented strand board, or hay bales.

- For construction projects within 150 feet of residential uses, a temporary sound-control blanket barrier shall be erected, if necessary, along building façades facing construction sites. This requirement shall only be imposed if conflicts occur that are irresolvable by proper scheduling, compliance with the CNMP, or other means of noise control. The sound blankets shall have a minimum breaking and tear strength of 120 pounds and 30 pounds, respectively. The sound blankets shall have a minimum sound transmission classification of 27 and noise-reduction coefficient of 0.70. The sound blankets shall be of sufficient length to extend from the top of the building and drape onto the ground or be sealed at the ground. The sound blankets also shall have a minimum overlap of 2 inches.
- "Quiet" models of air compressors and other stationary construction equipment shall be employed where such technology exists.
- Stationary noise-generating equipment shall be located as far as reasonable from sensitive receptors when sensitive receptors adjoin or are within 150 feet of a construction site.
- Unnecessary idling of internal combustion engines (i.e., in excess of 5 minutes) shall be prohibited.
- Foundation pile holes shall be predrilled, as feasible based on geologic conditions, to minimize the number of impacts required to seat the pile.
- Construction-related traffic shall be routed along major roadways and away from noise-sensitive receptors.
- Construction activities, including the loading and unloading of materials and truck movements, shall be limited to the hours specified in the City Noise Ordinance (Section 8.80.202).
- Businesses, residences, and noise-sensitive land uses within 150 feet of construction sites shall be notified of the construction in writing. The notification shall describe the activities anticipated, provide dates and hours, and provide contact information with a description of the complaint and response procedure.
- Each project implemented within the CVSP shall designate a "construction liaison" that will be responsible for responding to any local complaints about construction noise. The liaison shall determine the cause of the noise complaints (starting too early, bad muffler, etc.) and institute reasonable measures to correct the problem. A telephone number for the liaison shall be conspicuously posted at the construction site.

LU-2: All subsequent development projects that are implemented in accordance with the CPU which is adjacent to designated MHPA areas shall comply with the Land Use Adjacency Guidelines of the MSCP in terms of noise. The project biologist for each proposed project would identify specific mitigation measures needed to reduce impacts to below a level of significance.

Subsequent environmental review would be required to determine the significance of impacts from land use adjacency and compliance with the Land Use Adjacency Guidelines of the MSCP. Prior to approval of any subsequent development project in an area adjacent to a designated MHPA, the City shall identify specific conditions of approval in order to avoid or to reduce potential impacts to adjacent the MHPA.

As recommended supplements to the applicable mitigation measures presented in the OMCPU EIR, the following additional mitigation measures are recommended.

N-1 In areas where new residential development would be exposed to a CNEL of greater than 60 dBA associated with stationary noise sources, site-specific noise studies shall be prepared which identifies all noise-generating equipment, predicts noise levels at property lines from all identified equipment, and recommends noise attenuating features to be implemented (e.g., enclosures, barriers, site orientation), to ensure compliance with the City's Noise Abatement and Control Ordinance. Noise reduction measures may include one or more of the following measures, and/or other measures as determined necessary by the site-specific noise analyses:

- Use site planning to minimize noise in shared residential outdoor activity areas by locating the areas behind the buildings or in courtyards, or orienting the terraces to alleyways rather than streets whenever possible. [CVSP Policy 2.5-51]
- Provide mechanical ventilation in all residential units proposed along roadways carrying high traffic volumes and in areas where noise levels could exceed interior noise standards such that windows can remain closed at the choice of the occupants. [CVSP Policy 2.5-59]
- Provide landscape screening and/or patio walls to reduce noise impacts and protect the privacy of residential units along high traffic streets and intense uses. [CVSP Policy 2.5-46].
- Minimize the number of residential units that have window and door openings that afford views into adjacent industrial uses located east of the Central Village. Whenever possible, orient the short end of buildings towards industrial uses. [CVSP Policy 2.5-46].
- Where berms, setbacks, and architectural design are inadequate to achieve required interior or exterior noise levels, provide physical noise walls. [CVSP Policy 2.5-146].
- Install sound-rated windows and construction methods to provide the requisite noise control for residential units proposed in areas where noise levels could exceed 70 dBA CNEL.
- Where necessary to achieve the City's nighttime noise standards, limit the hours of operation of on-site commercial uses.

N-2: Prior to Development Plan approval for any commercial structure, a site-specific noise study should be conducted to determine the area of noise impact on noise-sensitive uses and to identify noise attenuation features to reduce impacts to the extent feasible or below a level of significance

(whichever is applicable), which could include, but are not limited to the following:

- In commercial buildings, place loading and unloading areas so that commercial buildings shield nearby residential land uses from noise generated by loading dock and delivery activities. If necessary, additional sound barriers should be constructed on the commercial sites to reduce noise levels at nearby noise-sensitive uses. [CVSP Policy 2.5-60]
- Place commercial heating, ventilation, and air conditioning (HVAC) machinery within mechanical equipment rooms wherever possible. [CVSP Policy 2.5-61]
- Provide localized noise barriers or rooftop parapets around HVAC, cooling towers, and mechanical equipment so that line-of-sight to the noise source from the property line of the noise-sensitive receptors is blocked. [CVSP Policy 2.5-62]

8.0 CERTIFICATIONS

The contents of this report represent an accurate depiction of the projected noise from the proposed CVSP development. This report was prepared utilizing the latest emission rates and reduction methodologies.

Jeremy Louden, Principal
Ldn Consulting, Inc.
760-473-1253
jlouden@ldnconsulting.net

Date January 19, 2017

ATTACHMENT A

FHWA RD-77-108 Traffic Noise Prediction Model

FHWA RD-77-108

Traffic Noise Prediction Model

Data Input Sheet

Project Name : OMCPU
Project Number : 3957.1
Modeled Condition : Adopted

Surface Refelction: CNEL
Assessment Metric: Soft
Peak ratio to ADT: 10.00
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment From	To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	K-Factor
1	Airway Road	Old Otay Mesa Rd. to Caliente Ave.		20,500	40	100	90	3	2	78.00	8.00	14.00	
2	Airway Road	Caliente Ave. to Heritage Rd.		59,000	40	100	90	3	2	78.00	8.00	14.00	
3	Airway Road	Heritage Rd. to Cactus Rd.		39,500	40	100	90	3	2	78.00	8.00	14.00	
4	Airway Road	Cactus Rd. to Britannia Blvd.		46,500	40	100	90	3	2	78.00	8.00	14.00	
5	Airway Road	Britannia Blvd. to La Media Rd.		39,000	40	100	90	3	2	78.00	8.00	14.00	
6	Airway Road	La Media Rd. to Harves t Rd.		54,500	40	100	90	3	2	78.00	8.00	14.00	
7	Airway Road	Harvest Rd. to Sanyo Ave.		49,500	40	100	90	3	2	78.00	8.00	14.00	
8	Beyer Boulevard	Alaquinas Dr. to Old Otay Mesa Rd.		24,500	35	100	90	3	2	78.00	8.00	14.00	
9	Beyer Boulevard	Old Otay Mesa Rd. to East End		3,000	45	100	90	3	2	78.00	8.00	14.00	
10	Britannia Boulevard	Otay Mesa Rd. to SR-905		19,500	40	100	90	3	2	78.00	8.00	14.00	
11	Britannia Boulevard	SR-905 to Airway Rd.		52,000	40	100	65	10	20	78.00	8.00	14.00	
12	Britannia Boulevard	Siempre Viva Rd. to South End		32,500	40	100	65	10	20	78.00	8.00	14.00	
13	Britannia Boulevard	Airway Rd. to Siempre Viva Rd.		33,000	40	100	65	10	20	78.00	8.00	14.00	
14	Cactus Road	Otay Mesa Rd. to Airway Rd.		35,000	45	100	90	3	2	78.00	8.00	14.00	
15	Cactus Road	Airway Rd. to Siempre Viva Rd.		23,000	45	100	90	3	2	78.00	8.00	14.00	
16	Caliente Avenue	Otay Mesa Rd. to SR-905		39,000	30	100	90	3	2	78.00	8.00	14.00	
17	Caliente Avenue	SR-905 to Airway Rd.		38,000	40	100	90	3	2	78.00	8.00	14.00	
18	Caliente Avenue	Airway Rd. to Siempre Viva Rd.		48,000	40	100	90	3	2	78.00	8.00	14.00	
19	Camino Maquiladora	Pacific Rim Ct . to Cactus Rd.		6,000	30	100	90	3	2	78.00	8.00	14.00	
20	Camino Maquiladora	Cactus Rd. to Continental St.		5,500	30	100	90	3	2	78.00	8.00	14.00	
21	Heritage Road	Avenida De Las Vistas to Datsun St.		77,500	45	100	90	3	2	78.00	8.00	14.00	
22	Heritage Road	Datsun St. to Otay Mesa Rd.		47,500	45	100	90	3	2	78.00	8.00	14.00	
23	Heritage Road	Otay Mesa Rd. to SR-905		17,500	45	100	90	3	2	78.00	8.00	14.00	
24	Heritage Road	SR-905 to Airway Rd.		52,000	45	100	90	3	2	78.00	8.00	14.00	
25	La Media Road	Aviator Rd. to Otay Mesa Rd.		64,500	45	100	65	10	20	78.00	8.00	14.00	
26	La Media Road	Otay Mesa Rd. to SR-905		48,000	45	100	65	10	20	78.00	8.00	14.00	
27	La Media Road	SR-905 to Airway Rd.		75,500	40	100	65	10	20	78.00	8.00	14.00	
28	La Media Road	Airway Rd. to Siempre Viva Rd.		32,000	40	100	65	10	20	78.00	8.00	14.00	
29	Ocean View Hills Pkwy	Dennery Rd. to Del Sol Blvd.		27,000	45	100	90	3	2	78.00	8.00	14.00	
30	Ocean View Hills Pkwy	Del Sol Blvd. to Street A		45,000	40	100	90	3	2	78.00	8.00	14.00	
31	Ocean View Hills Pkwy	Street A to Otay Mesa Rd.		23,500	40	100	90	3	2	78.00	8.00	14.00	
32	Otay Mesa Road	Caliente Ave. to Corporate Center Dr.		78,000	45	100	90	3	2	78.00	8.00	14.00	
33	Otay Mesa Road	Corporate Center Dr. to Innovative Dr.		36,000	45	100	90	3	2	78.00	8.00	14.00	
34	Otay Mesa Road	Innovative Dr. to Heritage Rd.		42,000	45	100	90	3	2	78.00	8.00	14.00	
35	Otay Mesa Road	Heritage Rd. to Cactus Rd.		74,000	50	100	90	3	2	78.00	8.00	14.00	
36	Otay Mesa Road	Cactus Rd. to Britannia Blvd.		47,500	50	100	90	3	2	78.00	8.00	14.00	
37	Otay Mesa Road	Britannia Blvd. to Ailsa Ct.		58,500	50	100	90	3	2	78.00	8.00	14.00	
38	Otay Mesa Road	Ailsa Ct. to La Media Rd.		49,500	50	100	90	3	2	78.00	8.00	14.00	
39	Otay Mesa Road	La Media Rd. to Piper Ranch Rd.		50,000	45	100	90	3	2	78.00	8.00	14.00	
40	Siempre Viva Rd.	Cactus Rd. to Britannia Blvd.		44,500	40	100	90	3	2	78.00	8.00	14.00	
41	Siempre Viva Rd.	Britannia Blvd. to La Media Rd.		52,500	40	100	90	3	2	78.00	8.00	14.00	
42	Siempre Viva Rd.	La Media Rd. to Harvest Rd.		34,500	40	100	90	3	2	78.00	8.00	14.00	
43	Siempre Viva Rd.	Harvest Rd. to Otay Center Dr.		35,000	40	100	90	3	2	78.00	8.00	14.00	
44	Siempre Viva Rd.	Otay Center Dr. to SR-905		64,500	40	100	90	3	2	78.00	8.00	14.00	
45	SR-905	Picador Blvd. to I-805		144,500	65	100	91.9	5.5	2.6	78.00	8.00	14.00	
46	SR-905	I-805 to Caliente Ave.		253,500	65	100	91.9	5.5	2.6	78.00	8.00	14.00	
47	SR-905	Caliente Ave. to Heritage Rd.		224,000	65	100	91.9	5.5	2.6	78.00	8.00	14.00	
48	SR-905	Heritage Rd. to Britannia Blvd.		193,000	65	100	91.9	5.5	2.6	78.00	8.00	14.00	
49	SR-905	Britannia Blvd. to La Media Rd.		167,000	65	100	91.9	5.5	2.6	78.00	8.00	14.00	
50	SR-905	La Media Rd. to SR-125		121,000	65	100	91.9	5.5	2.6	78.00	8.00	14.00	
51	SR-905	SR-125 to Siempre Viva Rd.		103,000	65	100	91.9	5.5	2.6	78.00	8.00	14.00	
52	SR-905	Siempre Viva Rd. to Border		64,500	65	100	91.9	5.5	2.6	78.00	8.00	14.00	
53	St. Andrews Avenue	Otay Mesa Center Rd. To La Media Rd.		20,500	30	100	90	3	2	78.00	8.00	14.00	
54	Street A	Ocean View Hills Pkwy. to Otay Mesa Rd.		19,500	40	100	90	3	2	78.00	8.00	14.00	

FHWA RD-77-108

Traffic Noise Prediction Model

Predicted Noise Levels

Project Name : OMCPU
Project Number : 3957.1
Modeled Condition : Adopted
Assessment Metric: Soft

		Segment		Noise Levels, dBA Soft				Distance to Traffic Noise Level Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	75 dB	70 dB	65 dB	60 dB	55 dB
1	Airway Road	Old Otay Mesa Rd. to Caliente Ave.		65.9	60.1	63.1	68	37	79	170	366	788
2	Airway Road	Caliente Ave. to Heritage Rd.		70.5	64.7	67.7	73	74	159	343	740	1,594
3	Airway Road	Heritage Rd. to Cactus Rd.		68.8	62.9	66.0	71	57	122	263	566	1,220
4	Airway Road	Cactus Rd. to Britannia Blvd.		69.5	63.6	66.7	72	63	136	293	631	1,360
5	Airway Road	Britannia Blvd. to La Media Rd.		68.7	62.9	65.9	71	56	121	261	561	1,210
6	Airway Road	La Media Rd. to Harves t Rd.		70.2	64.3	67.4	73	70	151	326	702	1,512
7	Airway Road	Harvest Rd. to Sanyo Ave.		69.8	63.9	67.0	72	66	142	305	658	1,418
8	Beyer Boulevard	Alaquinas Dr. to Old Otay Mesa Rd.		65.0	59.9	63.4	68	34	74	159	343	739
9	Beyer Boulevard	Old Otay Mesa Rd. to East End		59.1	52.5	55.3	61	12	26	56	120	259
10	Britannia Boulevard	Otay Mesa Rd. to SR-905		65.7	59.9	62.9	68	35	76	164	354	762
11	Britannia Boulevard	SR-905 to Airway Rd.		68.6	69.3	77.2	78	167	359	774	1,667	3,592
12	Britannia Boulevard	Siempre Viva Rd. to South End		66.5	67.3	75.1	76	122	263	566	1,219	2,626
13	Britannia Boulevard	Airway Rd. to Siempre Viva Rd.		66.6	67.4	75.2	76	123	265	571	1,231	2,652
14	Cactus Road	Otay Mesa Rd. to Airway Rd.		69.7	63.2	65.9	72	62	133	287	619	1,333
15	Cactus Road	Airway Rd. to Siempre Viva Rd.		67.9	61.4	64.1	70	47	101	217	468	1,007
16	Caliente Avenue	Otay Mesa Rd. to SR-905		65.1	60.9	66.3	69	42	91	197	424	914
17	Caliente Avenue	SR-905 to Airway Rd.		68.6	62.8	65.8	71	55	119	256	552	1,189
18	Caliente Avenue	Airway Rd. to Siempre Viva Rd.		69.6	63.8	66.8	72	64	139	299	645	1,389
19	Camino Maquiladora	Pacific Rim Ct . to Cactus Rd.		57.0	52.8	58.2	61	12	26	57	122	262
20	Camino Maquiladora	Cactus Rd. to Continental St.		56.6	52.4	57.8	61	11	25	53	115	248
21	Heritage Road	Avenida De Las Vistas to Datsun St.		73.2	66.7	69.4	75	105	226	488	1,051	2,264
22	Heritage Road	Datsun St. to Otay Mesa Rd.		71.0	64.5	67.3	73	76	163	352	758	1,634
23	Heritage Road	Otay Mesa Rd. to SR-905		66.7	60.2	62.9	69	39	84	181	390	840
24	Heritage Road	SR-905 to Airway Rd.		71.4	64.9	67.7	74	81	174	374	806	1,735
25	La Media Road	Aviator Rd. to Otay Mesa Rd.		71.0	71.1	78.6	80	212	457	984	2,120	4,567
26	La Media Road	Otay Mesa Rd. to SR-905		69.7	69.8	77.3	79	174	375	808	1,741	3,750
27	La Media Road	SR-905 to Airway Rd.		70.2	71.0	78.8	80	214	461	992	2,138	4,605
28	La Media Road	Airway Rd. to Siempre Viva Rd.		66.4	67.2	75.1	76	121	260	560	1,206	2,599
29	Ocean View Hills Pkwy	Dennery Rd. to Del Sol Blvd.		68.6	62.1	64.8	71	52	112	242	520	1,121
30	Ocean View Hills Pkwy	Del Sol Blvd. to Street A		69.3	63.5	66.6	72	62	133	287	618	1,331
31	Ocean View Hills Pkwy	Street A to Otay Mesa Rd.		66.5	60.7	63.7	69	40	86	186	401	863
32	Otay Mesa Road	Caliente Ave. to Corporate Center Dr.		73.2	66.7	69.4	75	106	227	490	1,056	2,274
33	Otay Mesa Road	Corporate Center Dr. to Innovative Dr.		69.8	63.3	66.1	72	63	136	293	630	1,358
34	Otay Mesa Road	Innovative Dr. to Heritage Rd.		70.5	64.0	66.7	73	70	151	324	699	1,505
35	Otay Mesa Road	Heritage Rd. to Cactus Rd.		74.3	67.2	69.6	76	119	257	554	1,193	2,570
36	Otay Mesa Road	Cactus Rd. to Britannia Blvd.		72.4	65.2	67.7	74	89	191	412	888	1,912
37	Otay Mesa Road	Britannia Blvd. to Ailsa Ct.		73.3	66.1	68.6	75	102	220	473	1,020	2,197
38	Otay Mesa Road	Ailsa Ct. to La Media Rd.		72.5	65.4	67.9	74	91	197	423	912	1,966
39	Otay Mesa Road	La Media Rd. to Piper Ranch Rd.		71.3	64.7	67.5	73	78	169	364	785	1,691
40	Siempre Viva Rd.	Cactus Rd. to Britannia Blvd.		69.3	63.4	66.5	72	61	132	285	613	1,321
41	Siempre Viva Rd.	Britannia Blvd. to La Media Rd.		70.0	64.2	67.2	73	68	147	318	684	1,475
42	Siempre Viva Rd.	La Media Rd. to Harvest Rd.		68.2	62.3	65.4	71	52	111	240	517	1,115
43	Siempre Viva Rd.	Harvest Rd. to Otay Center Dr.		68.2	62.4	65.5	71	52	113	242	522	1,125
44	Siempre Viva Rd.	Otay Center Dr. to SR-905		70.9	65.1	68.1	73	79	169	364	785	1,692
45	SR-905	Picador Blvd. to I-805		80.6	74.5	74.7	82	309	665	1,433	3,088	6,652
46	SR-905	I-805 to Caliente Ave.		83.0	76.9	77.1	85	449	968	2,085	4,491	9,677
47	SR-905	Caliente Ave. to Heritage Rd.		82.5	76.4	76.6	84	414	891	1,920	4,136	8,911
48	SR-905	Heritage Rd. to Britannia Blvd.		81.8	75.7	76.0	84	374	807	1,738	3,745	8,068
49	SR-905	Britannia Blvd. to La Media Rd.		81.2	75.1	75.3	83	340	733	1,578	3,401	7,326
50	SR-905	La Media Rd. to SR-125		79.8	73.7	73.9	82	274	591	1,273	2,743	5,910
51	SR-905	SR-125 to Siempre Viva Rd.		79.1	73.0	73.2	81	246	531	1,144	2,464	5,308
52	SR-905	Siempre Viva Rd. to Border		77.1	71.0	71.2	79	180	389	837	1,803	3,885
53	St. Andrews Avenue	Otay Mesa Center Rd. To La Media Rd.		62.3	58.1	63.5	67	28	60	128	276	595
54	Street A	Ocean View Hills Pkwy. to Otay Mesa Rd.		65.7	59.9	62.9	68	35	76	164	354	762
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0												

FHWA RD-77-108

Traffic Noise Prediction Model

Data Input Sheet

Project Name : OMCPU
Project Number : 3957.1
Modeled Condition : Proposed

Surface Refelction: CNEL
Assessment Metric: Soft
Peak ratio to ADT: 10.00
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	K-Factor
1	Airway Road	Old Otay Mesa Rd. to Caliente Ave.		10,500	40	100	90	3	2	78.00	8.00	14.00	
2	Airway Road	Caliente Ave. to Heritage Rd.		38,000	40	100	90	3	2	78.00	8.00	14.00	
3	Airway Road	Heritage Rd. to Cactus Rd.		60,500	40	100	90	3	2	78.00	8.00	14.00	
4	Airway Road	Cactus Rd. to Britannia Blvd.		44,500	40	100	90	3	2	78.00	8.00	14.00	
5	Airway Road	Britannia Blvd. to La Media Rd.		35,000	40	100	90	3	2	78.00	8.00	14.00	
6	Airway Road	La Media Rd. to Harvest Rd.		34,000	40	100	90	3	2	78.00	8.00	14.00	
7	Airway Road	Harvest Rd. to Sanyo Ave.		26,500	40	100	90	3	2	78.00	8.00	14.00	
8	Beyer Boulevard	Alaquinas Dr. to Old Otay Mesa Rd.		32,500	35	100	90	3	2	78.00	8.00	14.00	
9	Beyer Boulevard	Old Otay Mesa Rd. to Caliente Ave.		31,000	45	100	90	3	2	78.00	8.00	14.00	
10	Britannia Boulevard	Otay Mesa Rd. to SR-905		17,500	40	100	90	3	2	78.00	8.00	14.00	
11	Britannia Boulevard	SR-905 to Airway Rd.		63,000	40	100	65	10	20	78.00	8.00	14.00	
12	Britannia Boulevard	Airway Rd. to Siempre Viva Rd.		44,500	40	100	65	10	20	78.00	8.00	14.00	
13	Britannia Boulevard	Siempre Viva Rd. to South End		22,000	40	100	65	10	20	78.00	8.00	14.00	
14	Cactus Road	Otay Mesa Rd. to Airway Rd.		40,500	45	100	90	3	2	78.00	8.00	14.00	
15	Cactus Road	Airway Rd. to Siempre Viva Rd.		40,500	45	100	90	3	2	78.00	8.00	14.00	
16	Caliente Avenue	Otay Mesa Rd. to SR-905		38,000	30	100	90	3	2	78.00	8.00	14.00	
17	Caliente Avenue	SR-905 to Airway Rd.		32,000	40	100	90	3	2	78.00	8.00	14.00	
18	Caliente Avenue	Airway Rd. to Beyer Blvd.		46,000	40	100	90	3	2	78.00	8.00	14.00	
19	Caliente Avenue	Beyer Blvd. to Siempre Viva Rd.		41,000	40	100	90	3	2	78.00	8.00	14.00	
20	Camino Maquiladora	Pacific Rim Ct. to Cactus Rd.		7,500	30	100	90	3	2	78.00	8.00	14.00	
21	Camino Maquiladora	Cactus Rd. to Continental St.		6,000	30	100	90	3	2	78.00	8.00	14.00	
22	Heritage Road	Avenida De Las Vis tas to Datsun St .		75,500	45	100	90	3	2	78.00	8.00	14.00	
23	Heritage Road	Datsun St. to Otay Mesa Rd.		48,000	45	100	90	3	2	78.00	8.00	14.00	
24	Heritage Road	Otay Mesa Rd. to SR-905		23,500	45	100	90	3	2	78.00	8.00	14.00	
25	Heritage Road	SR-905 to Airway Rd.		35,000	45	100	90	3	2	78.00	8.00	14.00	
26	La Media Road	Aviator Rd. to Otay Mesa Rd.		22,500	45	100	65	10	20	78.00	8.00	14.00	
27	La Media Road	Otay Mesa Rd. to SR-905		37,500	45	100	65	10	20	78.00	8.00	14.00	
28	La Media Road	SR-905 to Airway Rd.		64,000	40	100	65	10	20	78.00	8.00	14.00	
29	La Media Road	Airway Rd. to Siempre Viva Rd.		33,000	40	100	65	10	20	78.00	8.00	14.00	
30	Ocean View Hills Pkwy	Dennery Rd. to Del Sol Blvd.		22,000	45	100	90	3	2	78.00	8.00	14.00	
31	Ocean View Hills Pkwy	Del Sol Blvd. to Street “A”		35,000	40	100	90	3	2	78.00	8.00	14.00	
32	Ocean View Hills Pkwy	Street “A” to Otay Mesa Rd.		23,500	40	100	90	3	2	78.00	8.00	14.00	
33	Otay Mesa Road	Caliente Ave. to Corporate Center Dr.		72,500	45	100	90	3	2	78.00	8.00	14.00	
34	Otay Mesa Road	Corporate Center Dr. to Innovative Dr.		51,500	45	100	90	3	2	78.00	8.00	14.00	
35	Otay Mesa Road	Innovative Dr. to Heritage Rd.		46,500	45	100	90	3	2	78.00	8.00	14.00	
36	Otay Mesa Road	Heritage Rd. to Cactus Rd.		76,500	50	100	90	3	2	78.00	8.00	14.00	
37	Otay Mesa Road	Cactus Rd. to Britannia Blvd.		44,000	50	100	90	3	2	78.00	8.00	14.00	
38	Otay Mesa Road	Britannia Blvd. to Ailsa Ct.		50,500	50	100	90	3	2	78.00	8.00	14.00	
39	Otay Mesa Road	Ailsa Ct. to La Media Rd.		42,500	50	100	90	3	2	78.00	8.00	14.00	
40	Otay Mesa Road	La Media Rd. to Piper Ranch Rd.		54,000	45	100	90	3	2	78.00	8.00	14.00	
41	Siempre Viva Rd.	Cactus Rd. to Britannia Blvd.		37,000	40	100	90	3	2	78.00	8.00	14.00	
42	Siempre Viva Rd.	Britannia Blvd. to La Media Rd.		42,500	40	100	90	3	2	78.00	8.00	14.00	
43	Siempre Viva Rd.	La Media Rd. to Harves t Rd.		40,500	40	100	90	3	2	78.00	8.00	14.00	
44	Siempre Viva Rd.	Harves t Rd. to Otay Center Dr.		34,000	40	100	90	3	2	78.00	8.00	14.00	
45	Siempre Viva Rd.	Otay Center Dr. to SR-905		60,000	40	100	90	3	2	78.00	8.00	14.00	
46	SR-905	Picador Blvd. to I-805		128,500	65	100	91.9	5.5	2.6	78.00	8.00	14.00	
47	SR-905	I-805 to Caliente Ave.		221,000	65	100	91.9	5.5	2.6	78.00	8.00	14.00	
48	SR-905	Caliente Ave. to Heritage Rd.		196,000	65	100	91.9	5.5	2.6	78.00	8.00	14.00	
49	SR-905	Heritage Rd. to Britannia Blvd.		173,000	65	100	91.9	5.5	2.6	78.00	8.00	14.00	
50	SR-905	Britannia Blvd. to La Media Rd.		154,000	65	100	91.9	5.5	2.6	78.00	8.00	14.00	
51	SR-905	La Media Rd. to SR-125		103,500	65	100	91.9	5.5	2.6	78.00	8.00	14.00	
52	SR-905	SR-125 to Siempre Viva Rd.		99,000	65	100	91.9	5.5	2.6	78.00	8.00	14.00	
53	SR-905	Siempre Viva Rd. to Border		64,500	65	100	91.9	5.5	2.6	78.00	8.00	14.00	
54	St. Andrews Avenue	Otay Mesa Center Rd. to La Media Rd.		13,500	30	100	90	3	2	78.00	8.00	14.00	
55	Street A	Ocean View Hills Pkwy. to Otay Mesa Rd.		13,500	40	100	90	3	2	78.00	8.00	14.00	

FHWA RD-77-108

Traffic Noise Prediction Model

Predicted Noise Levels

Project Name : OMCPU
Project Number : 3957.1
Modeled Condition : Proposed
Assessment Metric: Soft

		Segment		Noise Levels, dBA Soft				Distance to Traffic Noise Level Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	75 dB	70 dB	65 dB	60 dB	55 dB
1	Airway Road	Old Otay Mesa Rd. to Caliente		63.0	57.2	60.2	66	23	50	109	234	504
2	Airway Road	Caliente Ave. to Heritage Rd.		68.6	62.8	65.8	71	55	119	256	552	1,189
3	Airway Road	Heritage Rd. to Cactus Rd.		70.6	64.8	67.8	73	75	162	349	752	1,621
4	Airway Road	Cactus Rd. to Britannia Blvd.		69.3	63.4	66.5	72	61	132	285	613	1,321
5	Airway Road	Britannia Blvd. to La Media Rd.		68.2	62.4	65.5	71	52	113	242	522	1,125
6	Airway Road	La Media Rd. to Harvest Rd.		68.1	62.3	65.3	71	51	110	238	512	1,104
7	Airway Road	Harvest Rd. to Sanyo Ave.		67.0	61.2	64.3	70	43	93	201	434	935
8	Beyer Boulevard	Alaquinas Dr. to Old Otay Mes		66.3	61.2	64.6	69	41	89	192	414	892
9	Beyer Boulevard	Old Otay Mesa Rd. to Caliente		69.2	62.7	65.4	71	57	123	265	571	1,229
10	Britannia Boulevard	Otay Mesa Rd. to SR-905		65.2	59.4	62.5	68	33	71	153	329	709
11	Britannia Boulevard	SR-905 to Airway Rd.		69.4	70.2	78.0	79	189	408	879	1,895	4,082
12	Britannia Boulevard	Airway Rd. to Siempre Viva Rd		67.9	68.7	76.5	78	150	324	697	1,503	3,237
13	Britannia Boulevard	Siempre Viva Rd. to South End		64.8	65.6	73.4	75	94	202	436	940	2,024
14	Cactus Road	Otay Mesa Rd. to Airway Rd.		70.4	63.8	66.6	73	68	147	317	682	1,469
15	Cactus Road	Airway Rd. to Siempre Viva Rd		70.4	63.8	66.6	73	68	147	317	682	1,469
16	Caliente Avenue	Otay Mesa Rd. to SR-905		65.0	60.8	66.2	69	42	90	194	417	898
17	Caliente Avenue	SR-905 to Airway Rd.		67.9	62.0	65.1	70	49	106	228	492	1,060
18	Caliente Avenue	Airway Rd. to Beyer Blvd.		69.4	63.6	66.7	72	63	135	291	627	1,350
19	Caliente Avenue	Beyer Blvd. to Siempre Viva Rd		68.9	63.1	66.2	71	58	125	269	580	1,251
20	Camino Maquiladora	Pacific Rim Ct. to Cactus Rd.		58.0	53.8	59.1	62	14	30	66	141	305
21	Camino Maquiladora	Cactus Rd. to Continental St.		57.0	52.8	58.2	61	12	26	57	122	262
22	Heritage Road	Avenida De Las Vis tas to Dat		73.1	66.5	69.3	75	103	223	479	1,033	2,225
23	Heritage Road	Datsun St. to Otay Mesa Rd.		71.1	64.6	67.3	73	76	165	354	764	1,645
24	Heritage Road	Otay Mesa Rd. to SR-905		68.0	61.5	64.2	70	47	102	220	474	1,022
25	Heritage Road	SR-905 to Airway Rd.		69.7	63.2	65.9	72	62	133	287	619	1,333
26	La Media Road	Aviator Rd. to Otay Mesa Rd.		66.4	66.5	74.0	75	105	226	488	1,050	2,263
27	La Media Road	Otay Mesa Rd. to SR-905		68.6	68.7	76.2	78	148	318	685	1,477	3,181
28	La Media Road	SR-905 to Airway Rd.		69.5	70.3	78.1	79	191	412	889	1,915	4,125
29	La Media Road	Airway Rd. to Siempre Viva Rd		66.6	67.4	75.2	76	123	265	571	1,231	2,652
30	Ocean View Hills Pkwy	Dennery Rd. to Del Sol Blvd.		67.7	61.2	63.9	70	45	98	211	454	978
31	Ocean View Hills Pkwy	Del Sol Blvd. to Street “A”		68.2	62.4	65.5	71	52	113	242	522	1,125
32	Ocean View Hills Pkwy	Street “A” to Otay Mesa Rd.		66.5	60.7	63.7	69	40	86	186	401	863
33	Otay Mesa Road	Caliente Ave. to Corporate Cen		72.9	66.4	69.1	75	101	217	467	1,005	2,166
34	Otay Mesa Road	Corporate Center Dr. to Innoval		71.4	64.9	67.6	74	80	172	372	800	1,724
35	Otay Mesa Road	Innovative Dr. to Heritage Rd.		71.0	64.4	67.2	73	75	161	347	748	1,611
36	Otay Mesa Road	Heritage Rd. to Cactus Rd.		74.4	67.3	69.8	76	122	263	566	1,220	2,627
37	Otay Mesa Road	Cactus Rd. to Britannia Blvd.		72.0	64.9	67.4	74	84	182	391	843	1,817
38	Otay Mesa Road	Britannia Blvd. to Ailsa Ct.		72.6	65.5	67.9	74	92	199	429	925	1,992
39	Otay Mesa Road	Ailsa Ct. to La Media Rd.		71.9	64.8	67.2	74	82	178	383	824	1,776
40	Otay Mesa Road	La Media Rd. to Piper Ranch R		71.6	65.1	67.8	74	83	178	383	826	1,780
41	Siempre Viva Rd.	Cactus Rd. to Britannia Blvd.		68.5	62.6	65.7	71	54	117	252	542	1,168
42	Siempre Viva Rd.	Britannia Blvd. to La Media Rd.		69.1	63.2	66.3	72	59	128	276	595	1,281
43	Siempre Viva Rd.	La Media Rd. to Harves t Rd.		68.9	63.0	66.1	71	58	124	267	576	1,240
44	Siempre Viva Rd.	Harves t Rd. to Otay Center Dr.		68.1	62.3	65.3	71	51	110	238	512	1,104
45	Siempre Viva Rd.	Otay Center Dr. to SR-905		70.6	64.7	67.8	73	75	161	347	748	1,612
46	SR-905	Picador Blvd. to I-805		80.1	74.0	74.2	82	286	615	1,325	2,855	6,152
47	SR-905	I-805 to Caliente Ave.		82.4	76.3	76.5	84	410	883	1,903	4,099	8,831
48	SR-905	Caliente Ave. to Heritage Rd.		81.9	75.8	76.0	84	378	815	1,756	3,784	8,152
49	SR-905	Heritage Rd. to Britannia Blvd.		81.4	75.3	75.5	83	348	750	1,616	3,482	7,501
50	SR-905	Britannia Blvd. to La Media Rd.		80.8	74.8	75.0	83	322	694	1,495	3,222	6,941
51	SR-905	La Media Rd. to SR-125		79.1	73.0	73.3	81	247	533	1,147	2,472	5,326
52	SR-905	SR-125 to Siempre Viva Rd.		78.9	72.8	73.1	81	240	517	1,114	2,400	5,170
53	SR-905	Siempre Viva Rd. to Border		77.1	71.0	71.2	79	180	389	837	1,803	3,885
54	St. Andrews Avenue	Otay Mesa Center Rd. to La Me		60.5	56.3	61.7	65	21	45	97	209	451
55	Street A	Ocean View Hills Pkwy. to Otay		64.1	58.3	61.3	67	28	60	128	277	596
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Otay Mesa Central Village Specific Plan

Transportation Facilities Trigger Analysis

Final Report | January 2017

Prepared For:

CENTRAL VILLAGE

444West Beech Street, Suite 300
San Diego, CA 92103

Prepared By:

CHEN RYAN

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Transportation Facilities Trigger Analysis

Otay Mesa Central Village Specific Plan

Final Report

Prepared for:

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San Diego, CA 92101

Prepared by:

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January 13, 2017

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EXECUTIVE SUMMARY

ES.1 Study Purpose and Project Description

The purpose of this Transportation Facilities Trigger Analysis (TFTA) is to identify transportation facility improvements warranted with buildout of the Central Village Specific Plan (the "Project"), and to determine whether the Central Village Specific Plan impacts to traffic/circulation and recommended improvements are consistent with the findings and conclusions of the Otay Mesa Community Plan Update (OMCPU) EIR.

The Project site contains the entire Otay Mesa Central Village Specific Plan Area, located within the City of San Diego Otay Mesa Community Planning Area (CPA). The recently adopted Otay Mesa Community Plan (March 2014) assumes the following land uses within Otay Mesa Central Village Specific Plan Area:

- 5,246 multi-family dwelling units (<20 ac/du)
- 32.7 ksf of community commercial
- 32.3 acres of active park space
- 1 elementary school

However, the Project is proposing to change the land uses within the Otay Mesa Central Village Specific Plan Area to the following:

- 425 multi-family dwelling units (<20 du/ac)
- 4,060 multi-family dwelling units (>20 du/ac)
- 139.7 ksf of community commercial
- 16.1 acres of active park space
- 1 elementary school (K-8)

Project access is proposed via Heritage Road, Cactus Road, Airway Road, and the future Continental Road.

The following facilities are assumed to be constructed by the Project as a part of project frontage and access improvements. Note that triggers for the improvements described below cannot be determined at this point in time since the phases of construction are unknown, therefore, a trigger analysis for facilities accessing and fronting the project will be conducted at a later time for each project that takes place within the Otay Mesa Central Village.

<u>Roadway Segments</u>

- Airway Road, between Heritage Road (Project Access) and Cactus Road – This segment serves as the project frontage and will be constructed to a 6-lane Prime Arterial, consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).

- Airway Road, between Cactus Road and Continental Road – This segment serves as the project frontage and the north side of the roadway (westbound direction) will be improved to a 4-lane street (1 eastbound lane and 3 westbound lanes). This roadway is classified as a 6-lane Major Arterial in the currently adopted Otay Mesa Community Plan, which is consistent with the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).
- Cactus Road, between SR-905 and Street "D" - This segment serves as the project frontage and the east side of the roadway (northbound direction) will be improved to a 3-lane street (2 northbound lanes and 1 southbound lane). This roadway is classified as a 4-lane Major Arterial in the currently adopted Otay Mesa Community Plan, which is consistent with the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).
- Cactus Road, between Street "D" and Airway Road - This segment serves as the project frontage and will be improved to a 4-lane Major Arterial, consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).
- Cactus Road, between Airway Road and Siempre Viva Road - This segment serves as the project frontage and the west side of the roadway (southbound direction) will be improved to a 3-lane street (1 northbound lane and 2 southbound lanes). This roadway is classified as a 4-lane Major Arterial in the currently adopted Otay Mesa Community Plan, which is consistent with the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).

Although the Otay Mesa Community Plan also identifies future improvements to mobility element roadways such as Airway Road, west of Heritage, La Media Road, and Heritage Road north of Airway Road, it is expected that these facilities would not be in place prior to development within the Central Village. Accordingly, the analysis herein assumes that none of these facilities is in place under near-term conditions in order to identify near-term roadway improvements required of future implementing developments within the Central Village.

<u>Intersections</u>

12. Heritage Road / Airway Road – Construction of an L-shaped intersection providing movements between the project site and Airway Road, east of the Heritage Road project access.
14. Cactus Road / Airway Road – Construction of the west leg to form a four-legged intersection, and expanding the intersection lane configurations to match up with the roadway cross-sections. This intersection is proposed to be signalized.
33. Street "A" / Airway Road – Construction of a signalized T-intersection.
34. Village Way / Airway Road – Construction of a signalized T-intersection.
35. Cactus Road / Street "D" – Construction of a signalized four-legged intersection.
36. Cactus Road / Central Main Street – Construction of a signalized T-intersection.
37. Cactus Road / Street "C" – Construction of a signalized T-intersection.

38. Park Way / Airway Road – Construction of a side-street stop controlled right-turn in/out only T-intersection.
39. Continental Road / Airway Road – construction of a signalized T-intersection at Airway Road (east and west legs) and Continental Road (north leg).

ES.2 Project Trip Generation and Distribution

Project trip generation estimates were derived utilizing the trip generation rates outlined in *Table 1* of the *City of San Diego Land Development Code – Trip Generation Manual, May 2003*. The Project is anticipated to generate a **total** of 40,126 daily vehicular trips. Based on the SANDAG Select Zone Analysis, the Project is estimated to have an internal capture rate of 9.4%, *i.e.*, 3,772 trips will have both an origin and destination within the project site, and not utilize external roadway facilities. As a result, the Project is anticipated to add 36,354 new daily trips (under project buildout) to the external roadway network, including 2,808 AM peak hour trips (876-in, 1,931-out) and 3,545 PM peak hour trips (2,201-in, 1,345-out).

By comparison, the land use assumptions utilized in the OMCPU EIR resulted in a **total** of 47,654 daily vehicular trips for the Central Village area, of which 45,429 were external trips to Central Village including 3,876 AM peak hour trips (1,038-in, 2,838-out) and 4,287 PM peak hour trips (2,831-in, 1,456-out). Thus, external to Central Village daily traffic under the proposed Project would be reduced by approximately 20% as compared to what was disclosed in the OMCPU EIR, while peak hour traffic would be reduced by approximately 28% and 17%, respectively, in the AM and PM peak hours. **Table 4.1** in Page 30 of this report contains detailed trip generation information for the OMCPU EIR land use assumptions.

In order to determine the project trip assignment, a select zone analysis was conducted for the proposed Project land use. The select zone analysis consists of two individual TAZs (4623 & 4683). TAZ 4623 contains project's land uses south of Airway Road, whereas TAZ 4683 contains project's land uses located north of Airway Road.

Project trip distribution was determined by combining the project trip assignment from TAZ 4623 and TAZ 4683 and dividing by the total external trips. The select zone analysis results and trip distribution calculation details are provided in Appendix B.

ES.3 Timing of Required Improvements

Based on the significance criteria contained in the City of San Diego Significance Thresholds and the City of Chula Vista Guidelines for Traffic Impact Studies for each respective jurisdiction, the timing of required improvements associated with the development of the Otay Mesa Central Village Specific Plan were analyzed under the following two (2) scenarios:

- Existing Plus Project Conditions
- Year 2025 Cumulative (Existing Plus Cumulative Projects) Plus Project Conditions

The Cumulative model forecast was based on the recent City of Chula Vista and County of San Diego approved model (developed for the Otay Ranch Resort Village 13 project). Note that some of the cumulative projects have been constructed and occupied when traffic counts were collected (October 2015) for this Project, however, based on further review together with City staff, it was determined that the Cumulative model forecast used for the analyses of this Project represents a more conservative assessment and the worst-case scenario.

Since this is a program level analysis and the proposed Project would generate less traffic (both daily and peak hours) than what was adopted in the Otay Mesa Community Plan, long term horizon year impact analysis was not necessary. In fact, as the analysis in Section 4.0 demonstrates, the proposed Project would result in 36,354 **external trips** per day out of the 40,126 **total** project trips, including 2,808 external trips in the AM peak hour (876-in, 1,931-out) and 3,545 external trips in the PM peak hour (2,201-in, 1,345-out), as compared to the 45,429 **external trips** per day out of the 47,654 **total** project trips assumed in the OMCPU EIR, which included 3,876 external trips in the AM peak hour (1,038-in, 2,838-out) and 4,287 external trips in the PM peak hour (2,831-in, 1,456-out). Accordingly, all potential impacts associated with buildout of the Otay Mesa Community Plan were disclosed in the OMCPU EIR (State Clearinghouse No. 2004651076). Therefore, this analysis focuses on the timing of improvements identified by the OMCPU EIR required with buildout of the Central Village Specific Plan.

Existing Plus Project Conditions

The following roadway segment improvement triggers are based on the proposed project's total trip generation, which includes internal capture trips as well as external trips.

Roadway Segment Improvements

- *Britannia Boulevard, between SR-905 Eastbound Ramps and Airway Road* – The Project shall widen this roadway from a 5-lane roadway (2 NB & 3 SB) to a 6-lane Prime Arterial prior to the project's **total trip generation** of 37,678 ADT. This cross-section along Britannia Boulevard is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this roadway segment would operate at LOS F with buildout of the OMCPU. As shown in Table 6.6, this segment would operate at LOS C with the recommended improvements under Existing Plus Project conditions. It is important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.

- Airway Road, between Cactus Road and Continental Road – The Project shall widen this roadway segment from a 4-lane roadway (1 EB & 3 WB) to a 6-lane Major Arterial prior to the project's **total trip generation** of 36,926 ADT. This cross-section is consistent with

the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this roadway segment would operate at LOS D with buildout of the OMCPU. As shown in Table 6.6, this segment would operate at LOS C with the recommended improvements under Existing Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.

- Airway Road, between Continental Road and Britannia Boulevard – The Project shall widen this roadway segment from a 2-lane roadway to a 6-lane Major Arterial prior to the project's **total trip generation** of 5,543 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this roadway segment would operate at LOS D with buildout of the OMCPU. As shown in Table 6.6, this segment would operate at LOS C with the recommended improvements under Existing Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.

- Airway Road, between Britannia Boulevard and La Media Road - The Project shall widen this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 39,437 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the

required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this roadway segment would operate at LOS D with buildout of the OMCPU. As shown in Table 6.6, this segment would operate at LOS A with the recommended improvements under Existing Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.

- *Airway Road, between La Media Road and Avenida Costa Azul* – The Project shall widen this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 5,886 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this roadway segment would operate at LOS D with buildout of the OMCPU. As shown in Table 6.6, this segment would operate at LOS A with the recommended improvements under Existing Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.

- *Siempre Viva Road, between Cactus Road and Britannia Boulevard* – The Project shall widen this roadway segment from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 37,001 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this roadway segment would operate at LOS C with buildout of the OMCPU. As shown in Table 6.6, this segment would operate at LOS A with the

recommended improvements under Existing Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis

Intersection Improvements

16. *Britannia Boulevard / Otay Mesa Road* – The Project shall restripe an additional exclusive left-turn lane at the westbound approach of the intersection of Britannia Boulevard / Otay Mesa Road prior to the project's **total trip generation** of 24,512 ADT. This recommended additional westbound left-turn lane is within the intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS E in the AM peak hour and LOS D in the PM peak hour with buildout of the OMCPU. As shown in Table 6.7, this intersection would operate at LOS D during both peak hours with the recommended improvements under Existing Plus Project conditions. It is important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.

19. *Britannia Boulevard / Airway Road* – The Project shall widen the eastbound approach (Airway Road) of this intersection to accommodate dual left-turn lanes, two through lanes, and a through-right-turn shared lane, widen the westbound approach (Airway Road) to accommodate an exclusive left-turn lane, two through lanes, and construct an exclusive right-turn lane with right-turn overlap phasing, and widen the southbound approach (Britannia Boulevard) to accommodate an exclusive left-turn lane, two through lanes, and two exclusive right-turn lanes with right-turn overlap phasing, prior to the project's **total trip generation** of 16,187 ADT. These recommended improvements are within the intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F during both peak hours with buildout of the OMCPU. As shown in Table 6.7, this intersection would operate at LOS D during both peak hours with the recommended improvements under Existing Plus Project conditions. It is important to note that interim improvement with fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this

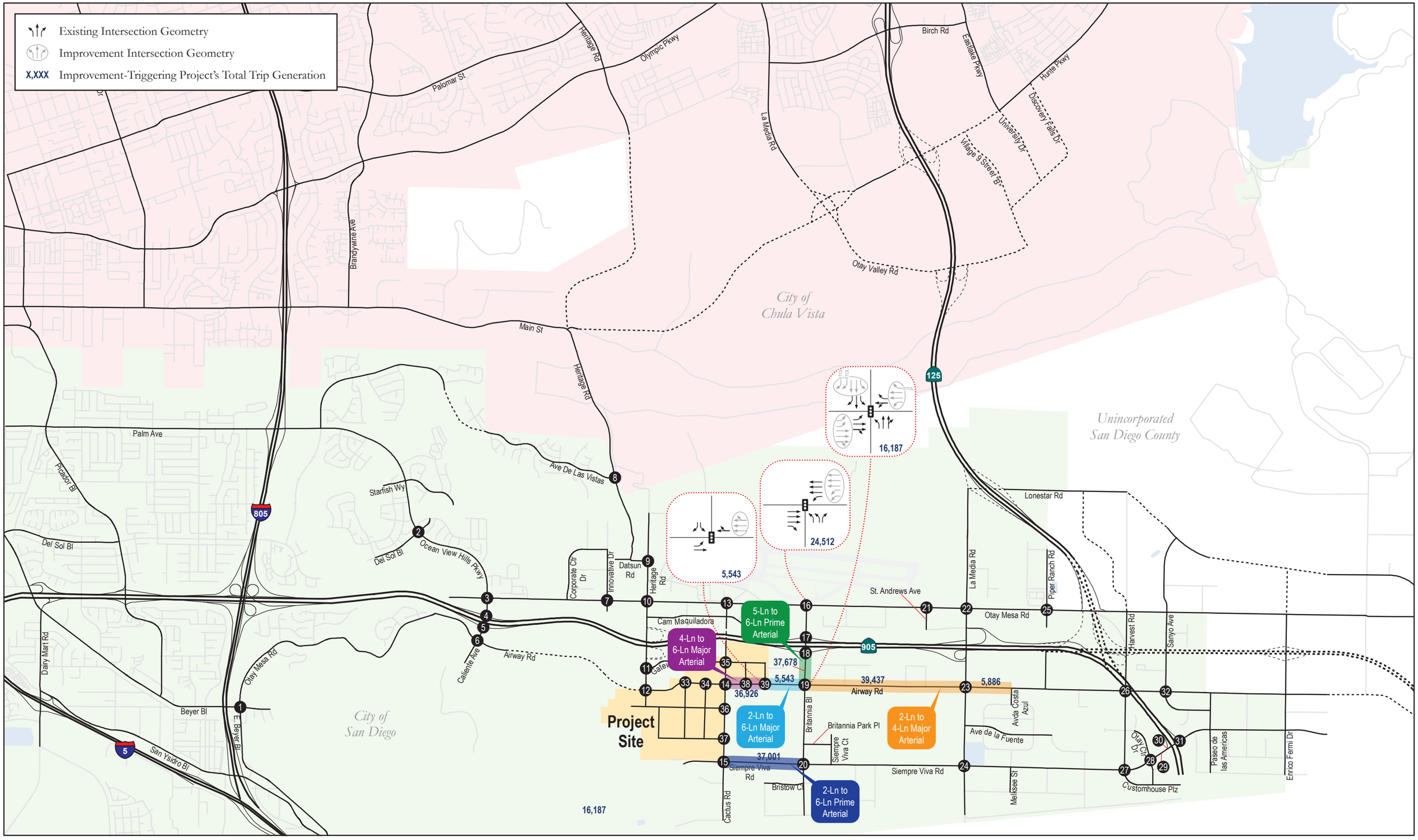
improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.

39. *Continental Road / Airway Road* – As described earlier in this section under "Roadway Segments", Airway Road between Continental Road and Britannia Boulevard shall be widened from a 2-lane roadway to a 6-lane Major Arterial prior to the project's **total trip generation** of 5,543 ADT by the project applicant. This improvement will improve traffic operations at this intersection. As shown in Table 6.7, this intersection would operate at LOS D during the AM peak hour and LOS B during the PM peak hour with the recommended improvements under Existing Plus Project conditions. It is important to note that this improvement and identified trigger have been identified at the program level, only. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.

Freeway Segment Improvements

No freeway facilities would be significantly impacted with the addition of project traffic within the project study area, therefore, no freeway improvements are recommended under Existing Plus Project conditions.

Figure ES-1 displays the recommended improvements under Existing Plus Project Conditions.



Otay Mesa Central Village Specific Plan

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Figure ES-1

Geometrics with Recommended Improvements - Existing Plus Project Conditions

Year 2025 Cumulative Traffic Plus Project Conditions

Roadway Segment Improvements

- *Heritage Road*, between Avenida De Las Vistas and Datsun Street – The Project shall pay a 13% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 1,003 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS F with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS C with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Heritage Road, between Datsun Street and Otay Mesa Road* – The Project shall pay a 12% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 1,380 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS C with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS C with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that

are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Cactus Road, between Otay Mesa Road and SR-905* – The Project shall pay a 23% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 6,623 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS D with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS A with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Britannia Boulevard, between SR-905 EB Ramps and Airway Road* - The Project shall pay a 92% fair share contribution towards the widening of this roadway from a 5-lane roadway (2 NB & 3 SB) to a 6-lane Prime Arterial prior to the project's **total trip generation** of 34,183 ADT. This cross-section along Britannia Boulevard is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this roadway segment would operate at LOS F with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS C with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. However, this improvement was also identified under the Existing Plus Project scenario and the project will be expected to construct this improvement. It is important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *La Media Road, between northern terminus and Otay Mesa Road* – The Project shall pay a 4% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 4,415 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS C with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at an acceptable LOS C with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *La Media Road, between Avenida De La Fuente and Siempre Viva Road* – The Project shall pay a 4% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 5-lane Major Arterial prior to the project's **total trip generation** of 3,679 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS C with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at an acceptable LOS B with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Airway Road, between Cactus Road and Continental Road* – The Project shall pay an 83% fair share contribution towards the widening of this roadway segment from a 4-lane roadway (1 EB & 3 WB) to a 6-lane Major Arterial prior to the project's **total trip generation** of 444 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS F with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS C with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. However, this improvement was also identified under the Existing Plus Project scenario and the project will be expected to construct this improvement. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Airway Road, between Continental Road and Britannia Boulevard* – The Project shall pay an 83% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 6-lane Major Arterial prior to the project's **total trip generation** of 106 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS F with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS C with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. However, this improvement was also identified under the Existing Plus Project scenario and the project will be expected to construct this improvement. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by

the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Airway Road, between Britannia Boulevard and La Media Road* – The Project shall pay a 24% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 883 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS D with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS B with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. However, this improvement was also identified under the Existing Plus Project scenario and the project will be expected to construct this improvement. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Airway Road, between La Media Road and Avenida Costa Azul* – The Project shall pay a 24% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 2,944 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS D with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS A with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. However, this improvement was also identified under the Existing Plus Project scenario and the project will be expected to construct this improvement. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also

important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Airway Road, between Piper Ranch Road and Harvest Road* – The Project shall pay a 7% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 8,278 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS D with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS B with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Airway Road, between Harvest Road and Sanyo Avenue* – The Project shall pay a 4% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 33,113 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS C with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS A with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share

contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Siempre Viva Road, between Cactus Road and Britannia Boulevard* – The Project shall pay a 53% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 849 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS C with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS A with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. However, this improvement was also identified under the Existing Plus Project scenario and the project will be expected to construct this improvement. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Siempre Viva Road, between Britannia Boulevard and La Media Road* – The Project shall pay a 26% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 679 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS C with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS A with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable

LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

Intersection Improvements

6. *Caliente Avenue / Airway Road* – The Project shall pay a 17% fair share contribution towards the installation of the traffic signal at this intersection prior to the project's **total trip generation** of 2,600 ADT. The recommended traffic signal is consistent with the assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F during both peak hours with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS C during both peak hours with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. Signal warrant analysis worksheets are provided in Appendix K. It is important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

8 *Heritage Road / Avenida De Las Vistas* – The Project shall pay a 12% fair share contribution towards the installation of the traffic signal at this intersection prior the project's **total trip generation** of 3,134 ADT. The recommended traffic signal is consistent with the assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F during both peak hours with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS B during both peak hours with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. Signal warrant analysis worksheets are provided in Appendix K. It is important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

9 *Heritage Road / Datsun Street* - The Project shall pay a 20% fair share contribution towards the installation of the traffic signal at this intersection prior to the project's **total trip generation** of 1,003 ADT. The recommended traffic signal is consistent with the assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F during both peak hours with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS B in the AM peak hour and LOS C during the PM peak hour with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. Signal warrant analysis worksheets are provided in Appendix K. It is important to note that this

improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

10 *Heritage Road / Otay Mesa Road* – The project shall pay a 20% fair share contribution towards the widening of Otay Mesa Road to construct an additional exclusive right-turn lane at the westbound approach of the intersection of Heritage Road / Otay Mesa Road prior to the project's **total trip generation** of 11,019 ADT. This recommended improvement is within the intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F during both peak hours with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS C during the AM peak hour and LOS D during the PM peak hour with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

16. *Britannia Boulevard / Otay Mesa Road* – The Project shall pay a 100% contribution towards the restriping of Otay Mesa Road to add an additional exclusive left-turn lane at the westbound approach and the extension of Heritage Road southerly to connect to Airway Road (Intersection #12) and widen Heritage Road between Otay Mesa Road and Airway Road, from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 12,276 ADT. This recommended improvement is within the intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. Furthermore, the construction of the Heritage Road connection alleviate congestion at Britannia Boulevard / Otay Mesa Road intersection due to the rerouting of approximately 1/3 (33%) of the project trips. This recommended improvement is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS E in the AM peak hour and LOS D in the PM peak hour with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS B during the AM peak hour and LOS C during the PM peak hour with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction

with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

18. *Britannia Boulevard / SR-905 EB Ramps* - The Project shall pay a 100% contribution towards the extension of Heritage Road southerly to connect to Airway Road (Intersection #12) and widen Heritage Road between Otay Mesa Road and Airway Road, from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 27,225 ADT. The construction of this roadway connection would alleviate congestion at Britannia Boulevard / SR-905 EB Ramps intersection due to the rerouting of approximately 1/3 (33%) of the project trips. The recommended improvements are consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F in the AM peak hour and LOS E in the PM peak hour with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS C during the AM peak hour and LOS D in the PM peak hour with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

19. *Britannia Boulevard / Airway Road* - The Project shall pay a 69% fair share contribution towards the widening of the eastbound approach (Airway Road) of this intersection to accommodate dual left-turn lanes, three through lanes, and an exclusive right-turn lane with right-turn overlap phasing, widen the westbound approach (Airway Road) to accommodate exclusive dual left-turn lanes, two through lanes, and exclusive dual right-turn lane with right-turn overlap phasing, widen the southbound approach (Britannia Boulevard) to accommodate exclusive dual left-turn lanes, three through lanes, and two exclusive right-turn lanes with right-turn overlap phasing, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes, and an exclusive right-turn lane with right-turn overlap phasing, prior to the project's **total trip generation**

of 111 ADT. These recommended improvements are consistent with the intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F during both peak hours with buildout of the OMCPU. As shown in Table 6.7, this intersection would operate at LOS D during both peak hours with the recommended improvements under Year 2025 Cumulative Plus Project conditions. It is important to note that interim improvement with fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

20. *Britannia Boulevard / Siempre Viva Road* - The Project shall pay a 43% fair share contribution towards the widening of the westbound approach (Siempre Viva Road) to accommodate two through lanes and an exclusive left-turn lane, and widen the eastbound approach to accommodate two through lanes and an exclusive left-turn-lane, prior to the project's **total trip generation** of 70 ADT. The recommended improvements are within the intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F during both peak hours with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS C during the AM peak hour and LOS D during the PM peak hour with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that interim improvement with fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

22. *La Media Road / Otay Mesa Road* – The Project shall pay a 7% fair share contribution towards the widening of the northbound approach (La Media Road) to accommodate two through lanes and an exclusive left turn lane, and widen the southbound approach (La Media Road) to accommodate an additional through lane, prior the project's **total trip generation** of 5,471 ADT. The recommended improvements are within the intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F during both peak hours with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS D during both peak hours with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that interim

improvement with fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

30. *SR-905 SB Off-Ramp / Siempre Viva Road* – The Project shall pay a 6% fair share contribution towards the installation of the traffic signal at this intersection prior to the project's **total trip generation** of 12,037 ADT. The recommended traffic signal is consistent with the assumption of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this intersection would operate at LOS F during the AM peak hour with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS B during both peak hours with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. Signal warrant analysis worksheets are provided in Appendix K. It is important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

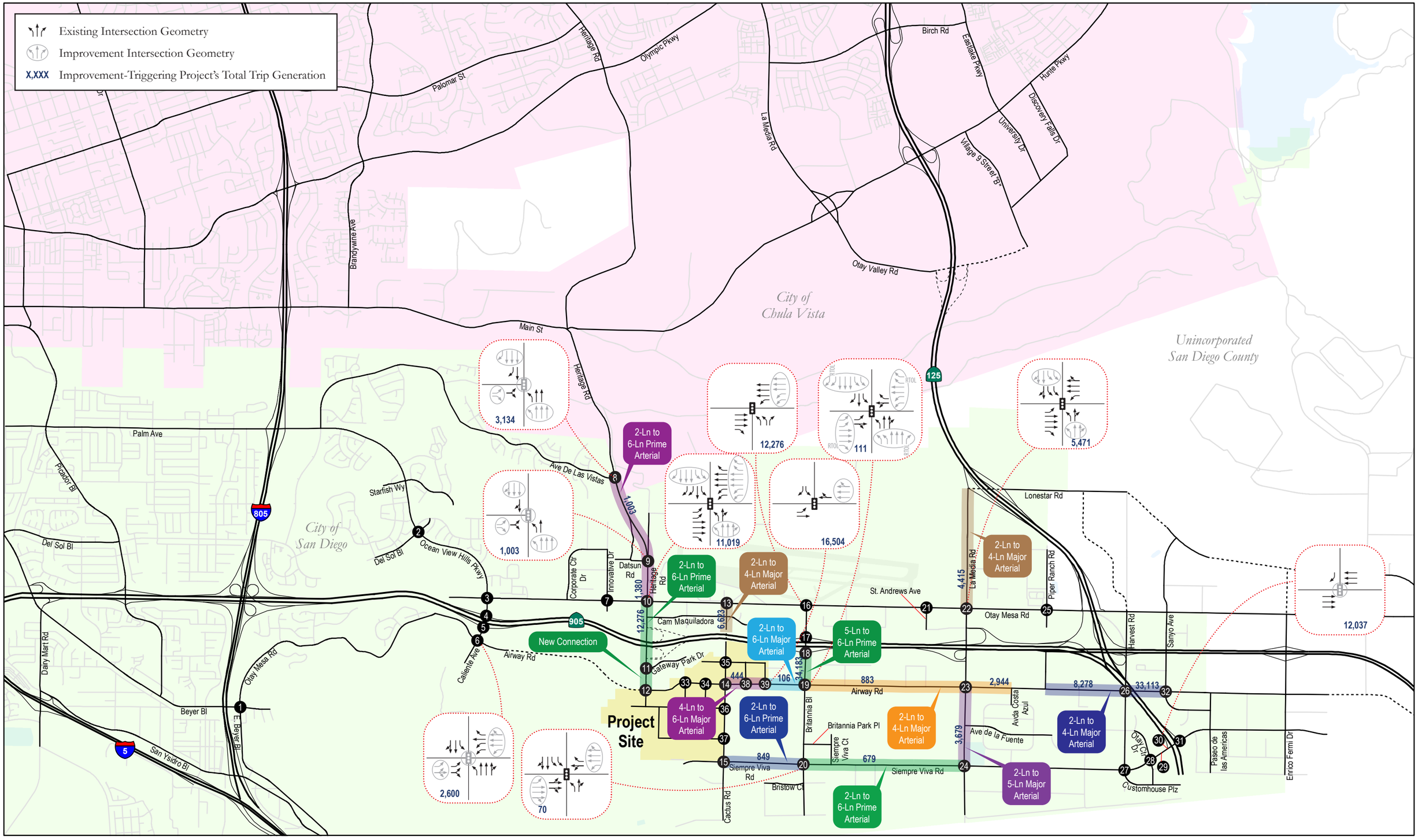
39. *Continental Road / Airway Road* – As described earlier in this section under "Roadway Segments", Airway Road between Continental Road and Britannia Boulevard shall be widened from a 2-lane roadway to a 6-lane Major Arterial prior to the project's **total trip generation** of 106 ADT by the project applicant. This improvement will improve traffic operations at this intersection. As shown in Table 8.7, this intersection would operate at LOS D during the AM peak hour and LOS B during the PM peak hour with the recommended improvements under Year 2025 Cumulative Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

Freeway Segment Improvements

- *SR-905, between I-805 and Caliente Avenue – LOS F in the WB direction.*

Neither Caltrans nor SANDAG have plans to construct additional lanes on State Route 905, nor is there a plan or program in place into which the project applicant could pay its fair-share towards the cost of such improvements. Therefore, improvement is considered infeasible and the impacts along SR-905 would remain significant and unavoidable. This finding is consistent with the findings identified in the OMCPU EIR.

Figure ES-2 displays the recommended improvements under Year 2025 Cumulative Plus Project Conditions.



Otay Mesa Central Village Specific Plan

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Figure ES-2

Geometrics with Recommended Improvements - Year 2025 Cumulative Plus Project Conditions

1.0 Introduction

1.1 Purpose of the Report

The purpose of this Transportation Facilities Trigger Analysis (TFTA) is to identify transportation facility improvements warranted with buildout of the Central Village Specific Plan (the "Project"), and to determine whether the Central Village Specific Plan impacts to traffic/circulation and recommended improvements are consistent with the findings and conclusions of the Otay Mesa Community Plan Update (OMCPU) EIR.

1.2 Study Area and Project Background

The Project site contains the entire Otay Mesa Central Village Specific Plan Area, located within the City of San Diego Otay Mesa Community Planning Area (CPA), as displayed in **Figure 1-1**. The recently adopted Otay Mesa Community Plan (March 2014) assumes the following land uses within Otay Mesa Central Village Specific Plan Area:

- 5,246 multi-family dwelling units (<20 ac/du)
- 32.7 ksf of community commercial
- 32.3 acres of active park space
- 1 elementary school

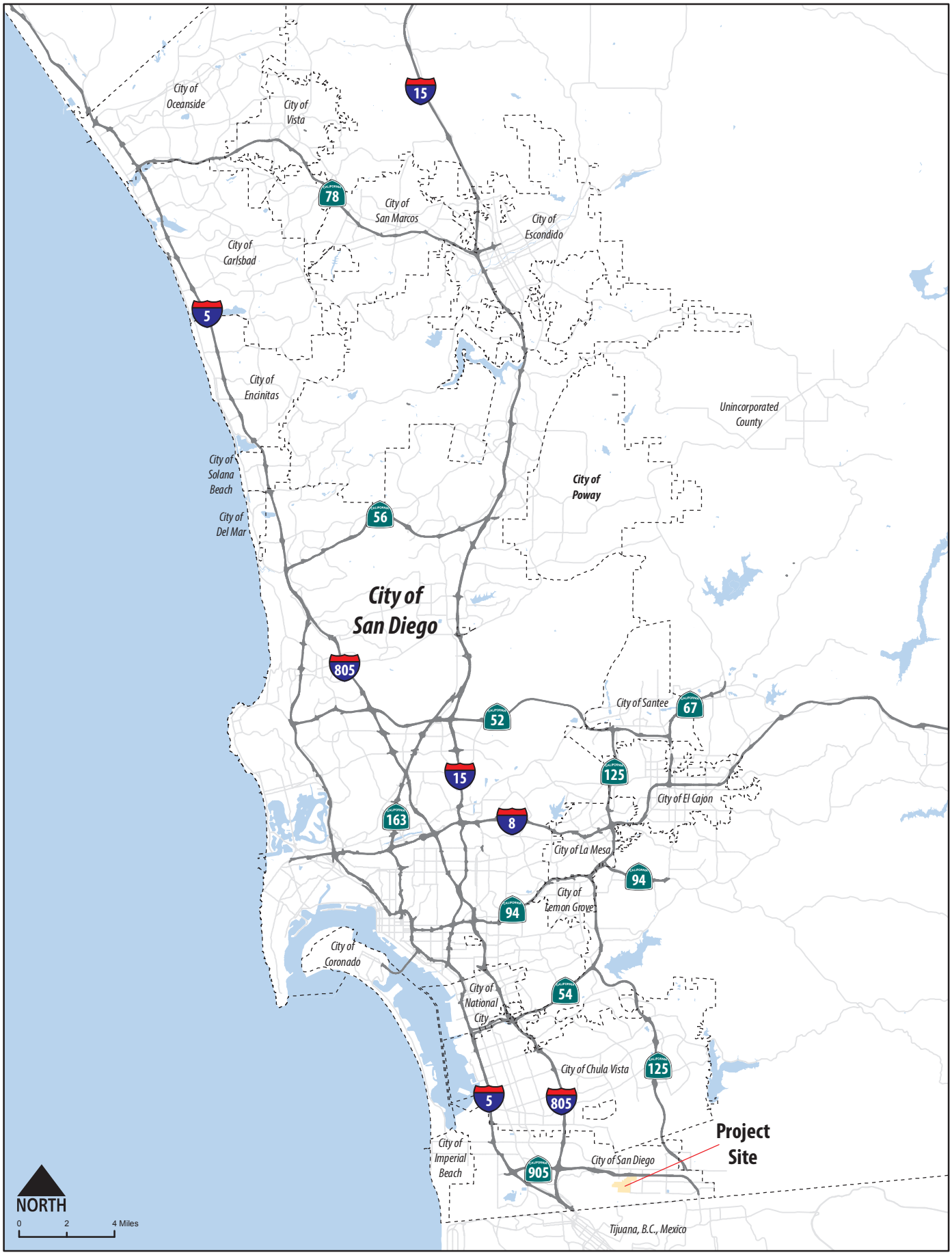
However, the Project is proposing to change the land uses within the Otay Mesa Central Village Specific Plan Area to the following:

- 425 multi-family dwelling units (<20 du/ac)
- 4,060 multi-family dwelling units (>20 du/ac)
- 139.7 ksf of community commercial
- 16.1 acres of active park space
- 1 elementary school (K-8)

Project access is proposed via Heritage Road, Cactus Road, Airway Road, and the future Continental Road. **Figure 1-2** displays the Project study area.

Five (5) scenarios were analyzed in this study, including:

- Existing Conditions – utilized to establish the existing baseline traffic operations within the study area.
- Existing Plus Project Conditions – represents existing traffic conditions with the addition of traffic from the proposed Otay Mesa Central Village Specific Plan project.



Otay Mesa Central Village Specific Plan

Figure 1-1
Project Regional Location

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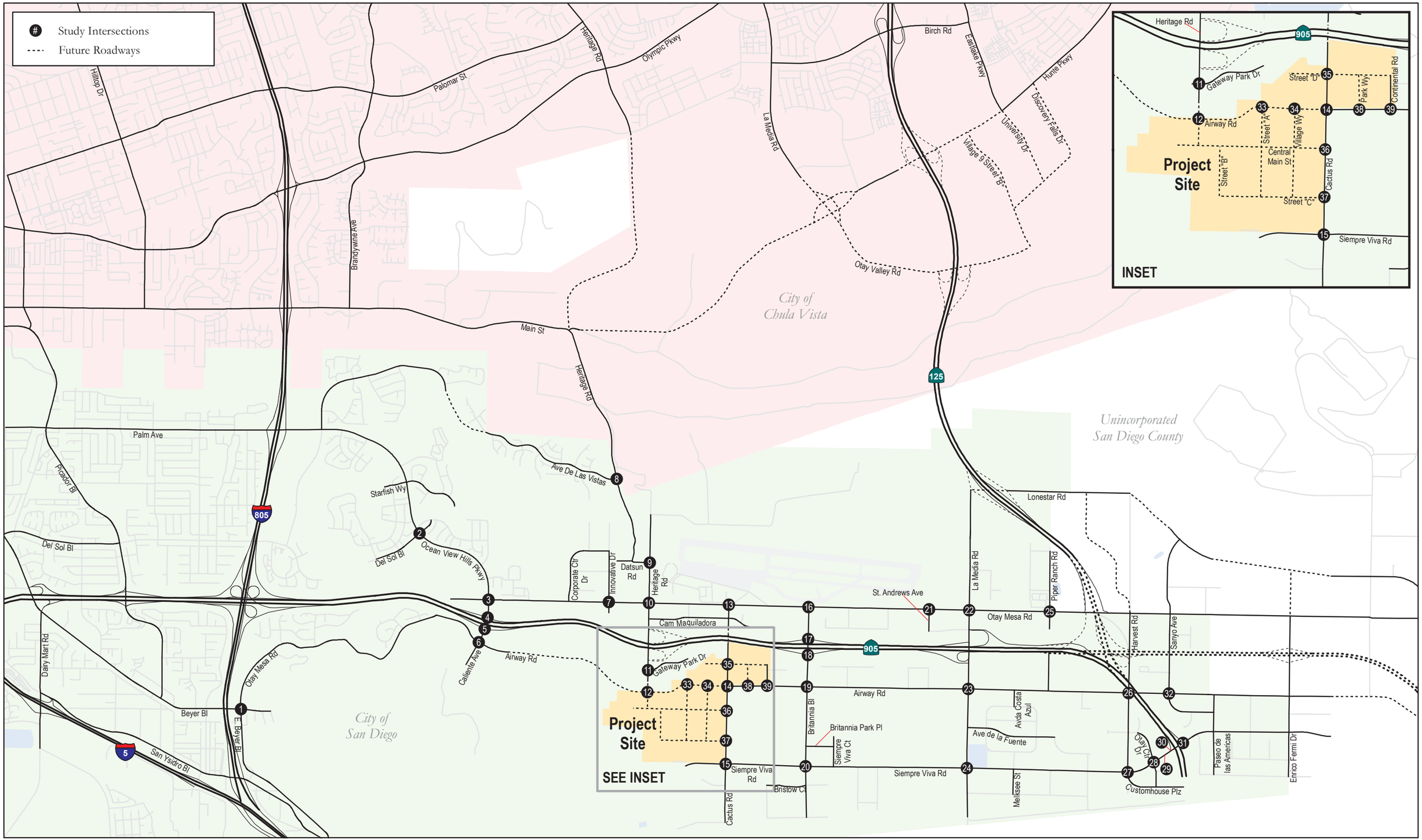

Otay Mesa Central Village Specific Plan

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Figure 1-2
Project Study Area

- Year 2025 Cumulative (Existing Plus Cumulative Projects) Conditions – represents cumulative traffic conditions including traffic from anticipated land development projects.

- Year 2025 Cumulative (Existing Plus Cumulative Projects) Plus Project Conditions – represents cumulative traffic conditions including traffic from anticipated land development projects with the addition of traffic from buildout of the proposed project.

- Plan-to-Plan Analysis (Horizon Year Community Plan Compliance) – provides a trip generation comparison between the buildout land use assumed in the Otay Mesa Community Plan and the proposed project to determine whether the proposed project would cause additional cumulative impacts, outside of those already identified in the Community Plan. Since this is a program level analysis and the proposed project would generate less traffic than what was adopted in the Otay Mesa Community Plan, long term horizon year impact analysis was not conducted. All potential impacts associated with this project in the future were disclosed and addressed in the Otay Mesa Community Plan EIR.

This traffic analysis was performed in accordance with *City of San Diego (City) Traffic Impact Study Manual, July 199*8 (TIS Manual). The Project study area includes all freeway segments, roadway segments, and intersections where the proposed project would add 50 or more peak hour trips in either direction within the study area defined for the Otay Mesa Community Plan Update EIR.

Improvement recommendations and required site access improvements to maintain acceptable transportation operations were also documented as part of this analysis. The roadway segment analyses included herein are based upon the Level of Service (LOS) criteria outlined in the City's TIS Manual. The City's LOS standards are included in Chapter 2.

1.3 Report Organization

Following this Introduction chapter, this report is organized into the following chapters:

2.0 Analysis Methodology – This chapter describes the methodologies and standards utilized to analyze roadway and intersection traffic conditions.

3.0 Project Description – This chapter describes the proposed Otay Mesa Central Village Specific Plan including project traffic generation, trip distribution patterns, and project trip assignments.

4.0 Plan-to-Plan Analysis (Horizon Year Community Plan Compliance) – This chapter provides a trip generation comparison between the buildout land use assumed in the Otay Mesa Community Plan and the proposed project to determine whether the proposed project would cause additional cumulative impacts, outside of those already identified in the Community Plan. Since this is a program level analysis and the proposed Project would generate less traffic than what was adopted in the Otay Mesa Community Plan, long term horizon year impact analysis was not conducted. Any potential impacts

associated with this project in the future should have been disclosed and addressed in the Otay Mesa Community Plan.

5.0 Existing Conditions – This chapter describes the existing transportation network within the study area and provides analysis results for the existing traffic conditions.

6.0 Existing Plus Project Conditions – This chapter describes the existing traffic network with the addition of the proposed project. Improvements, if necessary, related to the proposed Project are also identified.

7.0 Year 2025 Cumulative Traffic Conditions – This chapter describes near-term developments anticipated to generate additional traffic to the project study area. Analysis results are provided for the Year 2025 Existing Plus Cumulative conditions, along with recommended improvements (if necessary).

8.0 Year 2025 Cumulative Plus Project Traffic Conditions – This chapter describes near-term developments anticipated to generate additional traffic to the project study area plus the addition of the proposed project. Analysis results are provided for the Year 2025 Existing Plus Cumulative Plus Project conditions, along with recommended improvements (if necessary).

9.0 Alternative Transportation and Transportation Demand Management – This chapter focuses on alternative modes of travel (walking, bicycling and transit) to/from and within the project site. It also outlines a proposed Transportation Demand Management (TDM) Plan to help reduce vehicular traffic and parking demand associated with the proposed project.

10.0 On-site Circulation and Parking – This chapter discusses access to the project site and recommends functional classifications for internal roadways to the Project. This section also discusses the required and provided parking within the project site.

11.0 Findings and Recommendations – Outlines overall study findings, identifies recommended project-related improvements.

2.0 Analysis Methodology

This TIS was performed in accordance with the requirements of the *City of San Diego Traffic Impact Study Manual, July 1998*, the *City of San Diego Significance Determination Thresholds, January 2011*, and the enhanced California Environmental Quality Act (CEQA) project review process. Detailed information on roadway segment and intersection analysis methodologies, standards, and thresholds are discussed in the following sections.

2.1 Level of Service Definition

Level of Service (LOS) is a quantitative measure describing operational conditions within a traffic stream, and the motorist's and/or passengers' perception of operations. A LOS definition generally describes these conditions in terms of such factors as delay, speed, travel time, freedom to maneuver, interruptions in traffic flow, queuing, comfort, and convenience. **Table 2.1** describes generalized definitions of the various LOS categories (A through F) as applied to roadway operations.

TABLE 2.1
LEVEL OF SERVICE DEFINITIONS

LOS Category	Definition of Operation
A	This LOS represents a completely free-flow condition, where the operation of vehicles is virtually unaffected by the presence of other vehicles and only constrained by the geometric features of the highway and by driver preferences.
B	This LOS represents a relatively free-flow condition, although the presence of other vehicles becomes noticeable. Average travel speeds are the same as in LOS A, but drivers have slightly less freedom to maneuver.
C	At this LOS the influence of traffic density on operations becomes marked. The ability to maneuver within the traffic stream is clearly affected by other vehicles.
D	At this LOS, the ability to maneuver is notably restricted due to traffic congestion, and only minor disruptions can be absorbed without extensive queues forming and the service deteriorating.
E	This LOS represents operations at or near capacity. LOS E is an unstable level, with vehicles operating with minimum spacing for maintaining uniform flow. At LOS E, disruptions cannot be dissipated readily thus causing deterioration down to LOS F.
F	At this LOS, forced or breakdown of traffic flow occurs, although operations appear to be at capacity, queues form behind these breakdowns. Operations within queues are highly unstable, with vehicles experiencing brief periods of movement followed by stoppages.

Source: Highway Capacity Manual 2000

2.2 Roadway Segment Level of Service Standards and Thresholds

Roadway segment LOS standards and thresholds provide the basis for analysis of arterial roadway segment performance. The analysis of roadway segment LOS is based on the functional classification of the roadway, the maximum capacity, roadway geometrics, and existing or forecast Average Daily Traffic (ADT) volumes. **Table 2.2** and **Table 2.3** present the roadway

segment capacity and LOS standards for the City of San Diego and the City of Chula Vista, respectively. These standards were utilized to analyze roadways evaluated in this report.

TABLE 2.2
CITY OF SAN DIEGO
ROADWAY CLASSIFICATIONS AND LOS STANDARDS

Roadway Classification	LOS A	LOS B	LOS C	LOS D	LOS E
Expressway (6-lane)	< 30,000	< 42,000	< 60,000	< 70,000	< 80,000
Prime Arterial (6-lane)	< 25,000	< 35,000	< 50,000	< 55,000	< 60,000
Major Arterial (6-lane, divided)	< 20,000	< 28,000	< 40,000	< 45,000	< 50,000
Major Arterial (4-lane, divided)	< 15,000	< 21,000	< 30,000	< 35,000	< 40,000
Collector (4-lane w/ center lane)	< 10,000	< 14,000	< 20,000	< 25,000	< 30,000
Collector (4-lane w/o center lane)	< 5,000	< 7,000	< 10,000	< 13,000	< 15,000
Collector (2-lane w/continuous left-turn lane)	< 5,000	< 7,000	< 10,000	< 13,000	< 15,000
Collector (2-lane no fronting property)	< 4,000	< 5,500	< 7,500	< 9,000	< 10,000
Collector (2-lane w/commercial fronting)	< 2,500	< 3,500	< 5,000	< 6,500	< 8,000
Collector (2-lane multi-family)	< 2,500	< 3,500	< 5,000	< 6,500	< 8,000
Sub-Collector (2-lane single-family)	-	-	< 2,200	-	-

Source: City of San Diego Traffic Impact Study Manual (1998)

These standards are generally used as long-range planning guidelines to determine the functional classification of roadways. The actual capacity of a roadway facility varies according to its physical attributes. Typically, the performance and LOS of a roadway segment is heavily influenced by the ability of its intersections to accommodate peak hour traffic volumes. For the purposes of this traffic analysis, LOS D is considered acceptable for circulation element roadway segments within the City of San Diego.

TABLE 2.3
CITY OF CHULA VISTA
ROADWAY CLASSIFICATION AND LOS STANDARDS

Roadway Classification	LOS A	LOS B	LOS C	LOS D	LOS E
Expressway (7 or 8-lane)	52,500	61,300	**70,000**	78,800	87,500
Gateway Street (6-lane)	40,800	47,600	54,400	**61,200**	68,000
Prime Arterial (6-lane)	37,500	43,800	**50,000**	56,300	62,500
Major Street (6-lane)	30,000	35,000	**40,000**	45,000	50,000
Major Street (4-lane)	22,500	26,300	**30,000**	33,800	37,500
Town Center Arterial (6-lane)	37,500	43,800	**50,000**	56,300	62,500
Town Center Arterial (4-lane)	22,500	26,300	**30,000**	33,800	37,500
Class I Collector (4-lane)	16,500	19,300	**22,000**	24,800	27,500
Class II Collector (3-lane)	9,000	10,500	**12,000**	13,500	15,000
Class III Collector (2-lane)	5,600	6,600	**7,500**	8,400	9,400

Source: City of Chula Vista

Note:
Bold numbers indicate the ADT thresholds for acceptable LOS.

LOS C is considered acceptable for Circulation Element roadway segments within the City of Chula Vista. Per the Otay SRP (Page 104), LOS D is permitted within the Otay Ranch Villages.

2.3 Peak Hour Intersection Level of Service Standards and Thresholds

This section presents the methodologies used to perform peak hour intersection capacity analysis, including both signalized and unsignalized intersections. The following assumptions were utilized in conducting all intersection level of service analyses:

- *Pedestrian Calls per Hour:* 10 calls per hour for each pedestrian movement was assumed.
- *Heavy Vehicle Factor:* Heavy vehicle factors utilized for the analyses for this report are consistent with those utilized in the Otay Mesa Community Plan Update Traffic Impact Study.
- *Signal Timing:* Based on existing signal timing plans (as of November 2015), provided in **Appendix A.**
- *Peak Hour Factor*: Based on existing peak hour count data for existing conditions.

Signalized Intersection Analysis

The analysis of signalized intersections utilized the operational analysis procedures as outlined in the *2000 Highway Capacity Manual (HCM), Transportation Research Board Special Report 209*. This method defines LOS in terms of delay, or more specifically, average stopped delay per vehicle. Delay is a measure of driver and/or passenger discomfort, frustration, fuel consumption and lost travel time. This technique uses 1,900 vehicles per hour per lane (VPHPL) as the maximum saturation volume of an intersection. This saturation volume is adjusted to account for lane width, on-street parking, pedestrians, traffic composition (i.e., percentage trucks) and shared lane movements (i.e. through and right-turn movements originating from the same lane). The LOS criteria used for this technique are described in **Table 2.4**. The computerized analysis of intersection operations was performed utilizing the *SYNCHRO 8.0* traffic analysis software.

TABLE 2.4
SIGNALIZED INTERSECTION LEVEL OF SERVICE CRITERIA

Average Stopped Delay Per Vehicle (seconds)	Level of Service (LOS) Characteristics
<10.0	*LOS A* describes operations with very low delay. This occurs when progression is extremely favorable, and most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
10.1 – 20.0	*LOS B* describes operations with generally good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
20.1 – 35.0	*LOS C* describes operations with higher delays, which may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
35.1 – 55.0	*LOS D* describes operations with high delay, resulting from some combination of unfavorable progression, long cycle lengths, or high volumes. The influence of congestion becomes more noticeable, and individual cycle failures are noticeable.
55.1 – 80.0	*LOS E* is considered the limit of acceptable delay. Individual cycle failures are frequent occurrences.
>80.0	*LOS F* describes a condition of excessively high delay, considered unacceptable to most drivers. This condition often occurs when arrival flow rates exceed the LOS D capacity of the intersection. Poor progression and long cycle lengths may also be major contributing causes to such delay.

Source: Highway Capacity Manual 2000, TRB Special Report 209

Unsignalized Intersection Analysis

Unsignalized intersections, including two-way and all-way stop controlled intersections, were analyzed using the 2000 Highway Capacity Manual (Section 10) unsignalized intersection analysis methodology. The SYNCHRO 8.0 Traffic Analysis software supports this methodology and was utilized to produce LOS results. The LOS for a two-way stop controlled (TWSC) intersection is determined by the computed control delay and is defined for each minor movement. **Table 2.5** summarizes the LOS criteria for unsignalized intersections. The City of San Diego considers LOS D or better during the AM and PM peak hours to be acceptable for intersection LOS.

TABLE 2.5
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE CRITERIA

Average Control Delay (sec/veh)	Level of Service (LOS)
≤10	A
>10 and ≤15	B
>15 and ≤25	C
>25 and ≤35	D
>35 and ≤50	E
>50	F

Source: Highway Capacity Manual 2000, TRB Special Report 209

2.4 Ramp Intersection Capacity Analysis

Consistent with Caltrans requirements, all signalized intersections at freeway ramps were analyzed using Intersecting Lane Volume (ILV) procedures as described in Topic 406 of the Caltrans *Highway Design Manual* (HDM). This methodology is based upon an assessment of each intersection as an isolated unit, without consideration of the effects from adjacent intersections. For this reason, the ILV analysis is utilized as an additional validation of signalized ramp intersection operations derived from the 2000 Highway Capacity Manual methodology. **Table 2.6** provides values of ILV/hr associated with various traffic flow thresholds. Neither Caltrans nor the City uses ILV results in determining significance of project impacts, but the analyses are included for informational purposes.

TABLE 2.6
TRAFFIC FLOW CONDITIONS AT RAMP INTERSECTIONS
AT VARIOUS LEVELS OF OPERATION

ILV/hr	**Description**
<1200: (Under Capacity)	Stable flow with slight, but acceptable delay. Occasional signal loading may develop. Free midblock operations.
1200-1500: (At Capacity)	Unstable flow with considerable delays possible. Some vehicles occasionally wait two or more cycles to pass through the intersection. Continuous backup occurs on some approaches.
>1500: (Over Capacity)	Stop-and-go operation with severe delay and heavy congestion(1). Traffic volume is limited by maximum discharges rates of each phase. Continuous backup in varying degrees occurs on all approaches. Where downstream capacity is restrictive, mainline congestion can impede orderly discharge through the intersection.

Source: Caltrans Highway Design Manual, Topic 406

Note:
(1)The amount of congestion depends on how much the ILV/hr value exceeds 1500. Observed flow rates will normally not exceed 1500ILV/hr, and the excess will be delayed in a queue.

2.5 Ramp Metering Analysis

Ramp metering is a means of controlling the volume of traffic entering the freeway with the goal of improving the traffic operations and flow on the freeway main lanes. Freeway ramp meter analysis estimates the peak hour queues and delays at freeway ramps by comparing existing volumes to the meter rate at the given location. However, since no ramp meters exist within the project study area, ramp metering analysis is not required and, therefore, not included in this study.

2.6 Freeway Level of Service Standards and Thresholds

Freeway level of service analysis is based upon procedures developed by Caltrans District 11. The procedure for calculating freeway level of service involves estimating a peak hour volume to capacity (V/C) ratio. Peak hour volumes are estimated from the application of design hour ("K"), directional ("D") and truck ("T") factors to Average Daily Traffic (ADT) volumes. The base capacities were assumed to be 2,350 passenger-car per hour per main lane (pc/h/ln) and 1,410 pc/h/ln for auxiliary lane, respectively. A 0.95 peak-hour factor (PHF) is utilized for this analysis.

The resulting V/C ratio is then compared to acceptable ranges of V/C values corresponding to the various levels of service for each facility classification, as shown in **Table 2.7**. The corresponding level of service represents an approximation of existing or anticipated future freeway operating conditions in the peak direction of travel during the peak hour.

LOS D or better is used in this study as the threshold for acceptable freeway operations based upon Caltrans and the SANDAG Regional Growth Management Strategy (RGMS) requirements.

TABLE 2.7
CALTRANS DISTRICT 11
FREEWAY SEGMENT LEVEL OF SERVICE DEFINITIONS

LOS	V/C	Congestion/Delay	Traffic Description
Used for freeways, expressways and conventional highways			
"A"	<0.41	None	Free flow.
"B"	0.42-0.62	None	Free to stable flow, light to moderate volumes.
"C"	0.63-0.79	None to minimal	Stable flow, moderate volumes, freedom to maneuver noticeably restricted.
"D"	0.80-0.92	Minimal to substantial	Approaches unstable flow, heavy volumes, very limited freedom to maneuver.
"E"	0.93-1.00	Significant	Extremely unstable flow, maneuverability and psychological comfort extremely poor.
Used for conventional highways			
"F"	>1.00	Considerable	Forced or breakdown flow. Delay measured in average travel speed (MPH). Signalized segments experience delays >60.0 seconds/vehicle.
Used for freeways and expressways			
"F0"	1.01–1.25	Considerable (0-1 hour delay)	Forced flow, heavy congestion, long queues form behind breakdown points, stop and go.
"F1"	1.26-1.35	Severe (1-2 hour delay)	Very heavy congestion, very long queues.
"F2"	1.36-1.45	Very severe (2-3 hour delay)	Extremely heavy congestion, longer queues, more numerous breakdown points, longer stop periods.
"F3"	>1.46	Extremely severe (3+ hours of delay)	Gridlock.

Source: SANTEC/ITE Guidelines for TIS in the San Diego Region

2.7 Determination of Significant Impacts

City of San Diego

The *City of San Diego Significance Determination Thresholds* defines project impact thresholds by facility type. These thresholds are generally based upon an acceptable increase in the Volume / Capacity (V/C) ratio for roadway and freeway segments, and upon increases in vehicle delays for intersections and ramps.

In the City of San Diego, LOS D is considered acceptable for roadway and intersection operations. A project is considered to have a significant impact if it degrades the operations of a roadway or intersection from an acceptable LOS (D or better) to an unacceptable LOS (E or F), or if it adds additional delay to a facility already operating an unacceptable level. **Table 2.8** summarizes the impact significant thresholds as identified by the City of San Diego beyond which mitigation measures are required.

TABLE 2.8
MEASURE OF SIGNIFICANT PROJECT TRAFFIC IMPACTS

Level of Service (LOS) with Project*	Allowable Change Due to Impact**					
	Freeways		Roadway Segments		Intersections	Ramp Metering
	V/C	Speed (mph)	V/C	Speed (mph)	Delay (sec)	Delay (min.)
LOS E (or ramp meter delays > 15 min.)	0.010	1.0	0.02	1.0	2.0	2.0
LOS F (or ramp meter delays > 15 min.)	0.005	0.5	0.01	0.5	1.0	1.0

Source: City of San Diego, Significance Determination Thresholds (January 2011)

* All level of service (LOS) measurements are based upon HCM procedures for peak-hour conditions. However, vehicle to capacity (V/C) ratios for roadway segments may be estimated on an ADT/24-hour traffic volume basis (using Table 2.1 or a similar LOS chart for each jurisdiction). The acceptable LOS for freeways, roadways, and intersections is generally "D" ("C" for undeveloped or not densely developed locations per jurisdiction definitions). For metered freeway ramps, LOS does not apply. However, ramp meter delays above 15 minutes are considered excessive.

** If a proposed project's traffic causes the values shown in the table to be exceeded, the impacts are determined to be significant. These impact changes may be measured from appropriate computer programs or expanded manual spreadsheets. The project applicant shall then identify feasible mitigation (within the Traffic Impact Study report) that will maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see above * note), or if the project adds a significant amount of peak-hour trips to cause any traffic queues to exceed on- or off-ramp storage capacities, the project applicant shall be responsible for mitigating significant impact changes.

Because this is a programmatic-level analysis, the LOS thresholds identified in Table 2.8 are used herein to determine the timing and scope of improvements that will be needed to roadways and intersections within the City of San Diego to maintain acceptable LOS. Because impacts to transportation/traffic associated with buildout of the Central Village Specific Plan (the "Project") were previously evaluated in the OMCPU EIR, for purposes of this analysis, a "new or more severe" impact to the environment would occur if the Project's traffic would result in the need

for roadway and intersection improvements beyond those that are already planned for by the OMCPU and/or beyond those that were identified as needed in the OMCPU EIR.

City of Chula Vista

Within the City of Chula Vista, traffic impacts are defined as either *project-specific impacts* or *cumulative impacts. Project-specific impacts* are those impacts for which the addition of project trips results in an identifiable degradation in Level of Service on freeway segments, roadway segments, or at intersections, triggering the need for specific project-related improvement strategies. *Cumulative impacts* are those in which the project trips incrementally contribute to a poor Level of Service in conjunction with other projects and existing traffic.

The following discussion outlines City of Chula Vista criteria for determining whether a project results in either project-specific or cumulative impacts on roadway segments. The City of Chula Vista maintains different significance standards for short-term and long-term conditions.

Short-Term (Study Horizon Year 0 To 4)

Roadway Segments

If the roadway segment volume to capacity (v/c) ratio indicates LOS C or better, there would be no project-specific or cumulative impact in the short-term. If the roadway segment volume to capacity ratio indicates LOS D, E or F, and the Growth Management Oversight Commission method is utilized, the following significance criteria apply:

- Direct Project specific impacts would occur to roadway segments under short-term conditions in the City of Chula Vista if all of the following conditions were found:
  - The roadway segment is projected to operate at LOS D for more than 2 hours or LOS E/F for 1 hour;
  - The project trips comprise 5% or more of the roadway segment volume; and
  - The project adds more than 800 ADT to the roadway segment.

Cumulative impacts would occur to a roadway segment under short-term conditions only if the roadway segment is projected to operate at LOS D for more than 2 hours or LOS E/F for 1 hour.

Long-Term (Study Horizon Year 5 and Later)

Roadway Segments

Direct Project-specific impacts would occur to roadway segments under long-term conditions in the City of Chula Vista if all of the following conditions are found:

- The roadway is projected to operate at LOS D, LOS E, or LOS F;
- The project trips comprise 5% or more of total segment volume; and
- The project adds more than 800 ADT to the roadway segment.

Cumulative impacts would occur to a roadway segment under long-term conditions if they are projected to operate at LOS D, E or F. However, in cases where roadway segments are projected to operate at LOS D or E under long-term conditions and all intersections along this segment are projected to operate at LOS D or better, the roadway segment impact (project-specific or cumulative) would *not* be significant since intersection analysis is more indicative of actual roadway system operations. However, if a roadway segment is projected to operate at LOS F under long-term conditions, the impact (direct project-specific or cumulative) would be significant regardless of intersection LOS.

Because this is a programmatic-level analysis, the above-described LOS thresholds are used herein to determine the timing and scope of improvements that will be needed to the roadway segment studied within the City of Chula Vista to maintain acceptable LOS. Because impacts to transportation/traffic associated with buildout of the Central Village Specific Plan (the "Project") were previously evaluated in the OMCPU EIR, for purposes of this analysis, a "new or more severe" impact to the environment would occur if the Project's traffic would result in the need for roadway and intersection improvements beyond those that are already planned for by the OMCPU and/or beyond those that were identified as needed in the OMCPU EIR.

3.0 Proposed Project

This section describes the proposed project, including land uses and estimated trip generation, trip distribution, and trip assignment.

3.1 Project Description

The Project site contains the entire Otay Mesa Central Village Specific Plan Area, located within the City of San Diego Otay Mesa Community Planning Area (CPA), as displayed in Figure 1-1. The recently adopted Otay Mesa Community Plan (March 2014) assumes the following land uses within Otay Mesa Central Village Specific Plan Area:

- 5,246 multi-family dwelling units (<20 ac/du)
- 32.7 ksf of community commercial
- 32.3 acres of active park space
- 1 elementary school

However, the Project is proposing to change the land uses within the Otay Mesa Central Village Specific Plan Area to the following:

- 425 multi-family dwelling units (<20 du/ac)
- 4,060 multi-family dwelling units (>20 du/ac)
- 139.7 ksf of community commercial
- 16.1 acres of active park space
- 1 elementary school (K-8)

Project access is proposed via Heritage Road, Cactus Road, Airway Road, and the future Continental Road. **Figure 3-1** displays the site plan for the proposed project.

The following facilities are assumed to be constructed by the Project as a part of project frontage and access improvements. Note that triggers for the improvements described below cannot be determined at this point in time since the phases of construction are unknown, therefore, a trigger analysis for facilities accessing and fronting the project will be conducted at a later time for each project that takes place within the Otay Mesa Central Village.

<u>Roadway Segments</u>

- Airway Road, between Heritage Road (Project Access) and Cactus Road – This segment serves as the project frontage and will be constructed to a 6-lane Prime Arterial, consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).

CONCEPTUAL LAND USE PLAN

STATISTICAL ABSTRACT

PLANNING AREAS	GENERAL PLAN LAND USE	SPECIFIC PLAN LAND USE	TARGET DENSITY	GROSS ACRES	NET ACRES*	DWELLING UNITS	MAX. COMMERCIAL SQUARE FOOTAGE
2, 3, 4, 6, 14	Neighborhood Village (15-44 du/ac)	MH Mixed Use	35-44	40.8	37.1	1,334	98,200
5, 13	Neighborhood Village (15-44 du/ac)	MH Mixed Use	25-40	18.9	17.4	712	41,500
1	Residential - Medium to Medium High (15-44 du/ac)	MH Multi Family	35-44	6.7	6.7	295	--
17	Residential - Medium to Medium High (15-44 du/ac)	MH Multi Family	25-40	6.5	5.7	200	--
7, 8, 9, 15, 16	Residential - Medium (15-29 du/ac)	MD Multi Family	20-29	55.0	50.3	1,444	--
10, 11, 12	Residential - Low Medium to Medium (10-29 du/ac)	LD Multi Family	15-29	29.7	28.3	500	--
18**	Institutional	School/Recreation	--	15.5	13.1	--	--
19, 20, 21, 22	Population-Based Park	Park	--	16.1	16.1	--	--
23, 24, 25, 26	Open Space	Open Space	--	15.9	15.9	--	--
--	Public Roadways	Public Roadways	--	24.1	38.6	--	--
		PROJECT TOTALS	--	229.2	229.2	4,485	139,700

*Net Acreage reflects public roadway dedications.

**Dwelling units within Planning Area 18 only would be constructed in the event that this planning area is not needed as a school site. In the event Planning Area 18 is not developed with a school, Planning Area 18 would be developed with up to 197 dwelling units along with any required population-based parkland. In such a case the total number of dwelling units allowed within the Central Village would increase to 4,682.

Figure 3-1
Project Site Plan

- Airway Road, between Cactus Road and Continental Road – This segment serves as the project frontage and the north side of the roadway (westbound direction) will be improved to 4 lanes (1 eastbound lane and 3 westbound lanes). This roadway is classified as a 6-lane Major Arterial in the currently adopted Otay Mesa Community Plan, which is consistent with the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).
- Cactus Road, between SR-905 and Street "D" - This segment serves as the project frontage and the east side of the roadway (northbound direction) will be improved to 3 lanes (2 northbound lanes and 1 southbound lane). This roadway is classified as a 4-lane Major Arterial in the currently adopted Otay Mesa Community Plan, which is consistent with the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).
- Cactus Road, between Street "D" and Airway Road - This segment serves as the project frontage and will be improved to a 4-lane Major Arterial, consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).
- Cactus Road, between Airway Road and Siempre Viva Road - This segment serves as the project frontage and the west side of the roadway (southbound direction) will be improved to 3 lanes (1 northbound lane and 2 southbound lanes). This roadway is classified as a 4-lane Major Arterial in the currently adopted Otay Mesa Community Plan, which is consistent with the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).

<u>Intersections</u>

12. Heritage Road / Airway Road – Construction of an L-shaped intersection providing movements between the project site and Airway Road, east of the Heritage Road project access.
14. Cactus Road / Airway Road – Construction of the west leg to form a four-legged intersection, and expanding the intersection lane configurations to match up with the roadway cross-sections. This intersection is proposed to be signalized.
33. Street "A" / Airway Road – Construction of a signalized T-intersection.
34. Village Way / Airway Road – Construction of a signalized T-intersection.
35. Cactus Road / Street "D" – Construction of a signalized four-legged intersection.
36. Cactus Road / Central Main Street – Construction of a signalized T-intersection.
37. Cactus Road / Street "C" – Construction of a signalized T-intersection.
38. Park Way / Airway Road – Construction of a side-street stop controlled right-turn in/out only T-intersection.
39. Continental Road / Airway Road – construction of a signalized T-intersection at Airway Road (east and west legs) and Continental Road (north leg).

3.2 Project Trip Generation, Distribution, and Assignment

Internal Capture Trip Generation Reduction

In order to determine the internal trip capture percentage, trip generation reduction analysis was conducted using the methodology recommended in the City of San Diego Traffic Impact Study Manual (TISM), as well as the SANDAG Select Zone Assignment.

The City of San Diego Traffic Impact Study Manual (TISM)

Table 3.1 displays the proposed project trip generation with the transit and mixed-use trip generation reduction as recommended in Table 3 and Table 4 of the City of San Diego TISM.

TABLE 3.1
OTAY MESA CENTRAL VILLAGE SPECIFIC PLAN
PROPOSED PROJECT TRIP GENERATION – CITY OF SD TISM

				AM Peak Hour					PM Peak Hour				
Land Use	Units	Trip Rate	ADT	%	Trips	Split	In	Out	%	Trips	Split	In	Out
Multi-Family (Under 20 DU/acre)	425 DU	8	3,400	8%	272	2:8	54	218	9%	340	7:3	238	102
Multi-Family (Over 20 DU/acre)	4,060 DU	6	24,360	8%	1949	2:8	390	1559	10%	2192	7:3	1535	657
Community Commercial	139.7 KSF	70	9,779	4%	293	6:4	176	117	11%	978	5:5	489	489
Park (Developed)	16.1 Acres	50	805	4%	64	5:5	13	51	8%	81	5:5	56	25
Elementary School	13.1 Acres	136	1,782	31%	552	6:4	331	221	19%	339	4:6	135	204
Total			**40,126**		**3,131**		**964**	**2,167**		**3,929**		**2,453**	**1,476**
Transit Reduction[1]			-1,041		-150		-30	-120		-114		-80	-34
Mixed-Use Reduction[2]			-2,776		-178		-36	-142		-253		-177	-76
Total Transit & Mixed-Use Reduction			-3,817		-328		-66	-262		-367		-257	-110
Total Transit & Mixed-Use Reduction Percentage per TISM			**-9.5%**		**-10.5%**		**-6.8%**	**-12.1%**		**-9.3%**		**-10.5%**	**-7.5%**
External Trips			**36,309**		**2,803**		**898**	**1,905**		**3,562**		**2,196**	**1,366**

Source: Colrich, October 2015; City of San Diego Land Use Code – Trip Generation Manual, May 2003

Notes:

[1] Based on the SANDAG Regional Transportation Plan (RTP) 2050 and the Otay Mesa CPU a bus rapid service would traverse along the project's frontage, with transit station at the intersections of Airway Road / Village Way & Airway Road / Continental Road. Approximately 75% of the proposed project's residential land use would be within 1,500 feet of these transit stations. Therefore, per Table 3 of the TISM a 5% daily (9% AM peak, 6% PM peak) trips reduction was assumed for these residential land use.

[2] Based on Table 4 of the TISM, a 10% daily (8% AM peak, 10% PM peak) trip reduction was assumed for this mixed-use development which includes commercial retail.

As shown in the table, the proposed project would have an internal capture rate of 9.5% of the average daily traffic, when analyze using the recommendation provided in the City of San Diego TISM.

SANDAG Select Zone Assignment

A SANDAG Select Zone Assignment was also conducted. The Select Zone Assignment aggregates all project land uses into two Traffic Analysis Zones (TAZ), and assigns the trips to the transportation network. The model estimates the percent of trips that will be internally captured. The Select Zone Assignment for the proposed project estimated that 9.4% of daily trips would be internally captured within the proposed project, resulting in 90.6% of the project traffic leaving the project site for distribution onto the external (i.e., off-site) roads. Select Zone Assignment results are provided in Appendix B.

As documented above, the City of San Diego TISM yield a 9.5% of internal trip reduction, and the SANDAG Select Zone Assignment indicated a 9.4% internal capture rate. For a more conservative analysis, 9.4% internal capture rate was utilized for this study.

Project Trip Generation

Project trip generation estimates were derived utilizing the trip generation rates outlined in *Table 1* of the *City of San Diego Land Development Code – Trip Generation Manual, May 2003*. **Table 3.2** displays the projected daily, as well as AM and PM peak hour, project trip generation for the proposed land uses.

TABLE 3.2
OTAY MESA CENTRAL VILLAGE SPECIFIC PLAN
TRIP GENERATION

Land Use	Units	Trip Rate	ADT	AM Peak Hour					PM Peak Hour				
				%	Trips	Split	In	Out	%	Trips	Split	In	Out
Multi-Family (Under 20 DU/acre)	425 DU	8	3,400	8%	272	2:8	54	218	10%	340	7:3	238	102
Multi-Family (Over 20 DU/acre)	4,060 DU	6	24,360	8%	1,949	2:8	390	1,559	9%	2,192	7:3	1,535	657
Community Commercial	139.7 KSF	70[a]	9,779	3%	293	6:4	176	117	10%	978	5:5	489	489
Park (Developed)	16.1 Acres	50	805	4%	32	5:5	16	16	8%	64	5:5	32	32
Elementary School	13.1 Acres	136	1,782	31%	552	6:4	331	221	19%	339	4:6	135	204
Total			**40,126**	-	**3,099**	-	**967**	**2,132**	-	**3,913**	-	**2,429**	**1,484**
Internal Trips Capture (9.4%)[b]			**3,772**	**-**	**291**	**-**	**91**	**200**	**-**	**368**	**-**	**228**	**140**
External Trips			**36,354**	**-**	**2,808**	**-**	**876**	**1,931**	**-**	**3,545**	**-**	**2,201**	**1,345**

Source: Colrich, October 2015; City of San Diego Land Development Code – Trip Generation Manual, May 2003

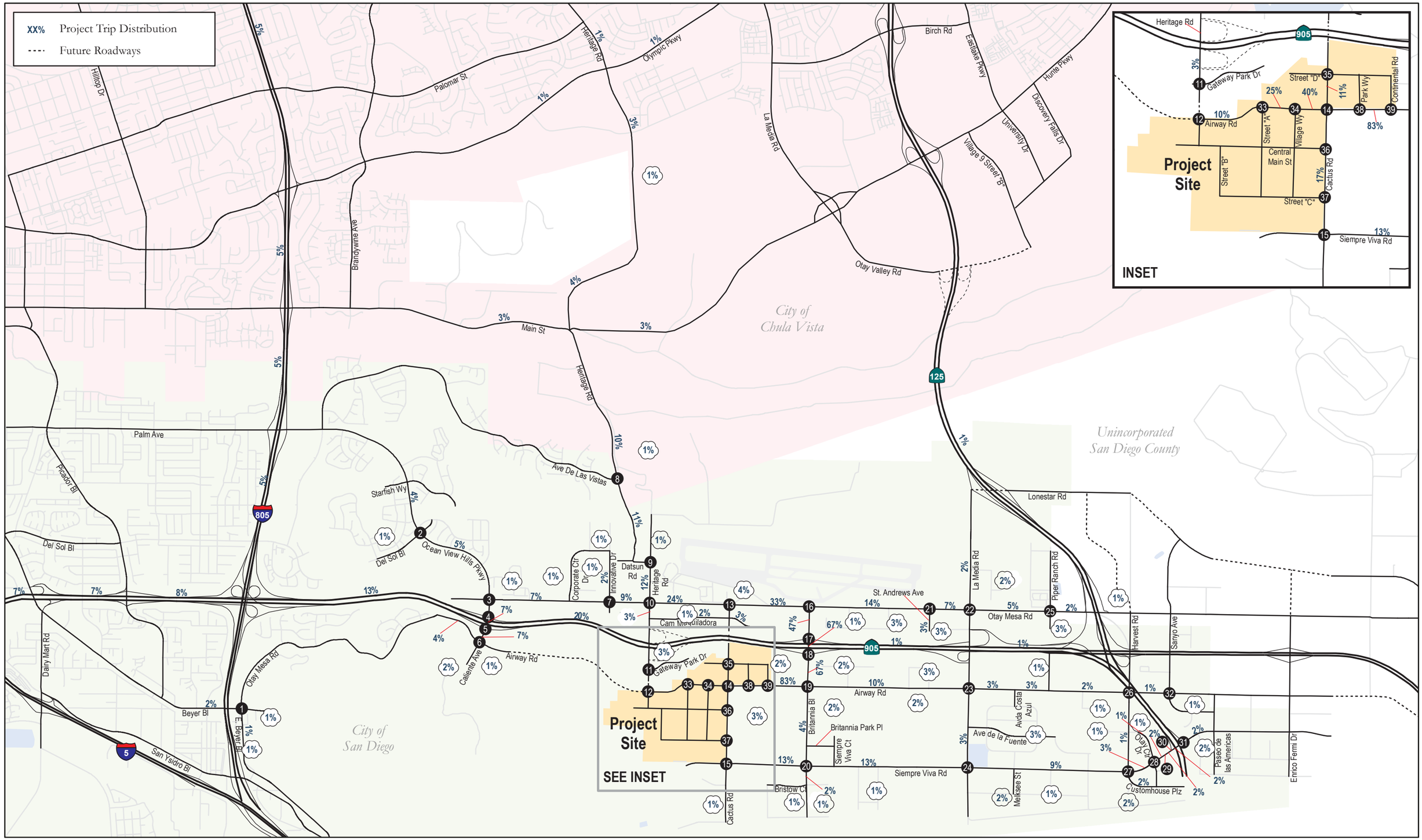
Notes:
a – Trip generation rate used is consistent with the Otay Mesa CPU.
b - Internal Capture derived from SANDAG Select Zone B output.

As shown, the proposed project is anticipated to generate a total of 36,354 external daily trips, including 2, 808 (876-in / 1,931-out) AM peak hour trips and 3,545 (2,201-in / 1,345-out) PM peak hour trips.

In deriving the Project's trip generation, it is necessary to consider that the proposed project includes residential, commercial, school, and recreational uses and, as a result, not all trips generated by the Project would leave the project site given the nature of the project land uses. For example, certain shopping trips would be satisfied by the commercial uses that would be located within the project site, as would many school and recreational trips. Project trips were disaggregated into those that would remain within the project site (internally captured), and those that would leave the project site (external trips). Only external trips were distributed and assigned to the study area roadways.

Project Trip Distribution

The distribution of the external project trips was based upon the computer generated SANDAG Select Zone Assignment as described in the previous section. **Figure 3-2** displays the external project trip distribution patterns associated with the proposed project.



Otay Mesa Central Village Specific Plan

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Figure 3-2
Project Trip Distribution

Project Trip Assignment

Based upon the project trip distribution patterns, the external daily and AM/PM peak hour project trips were assigned to the study area roadway networks. **Figures 3-3** and **3-4** display the assignment of project trips to the roadway network and key study area intersections, respectively.

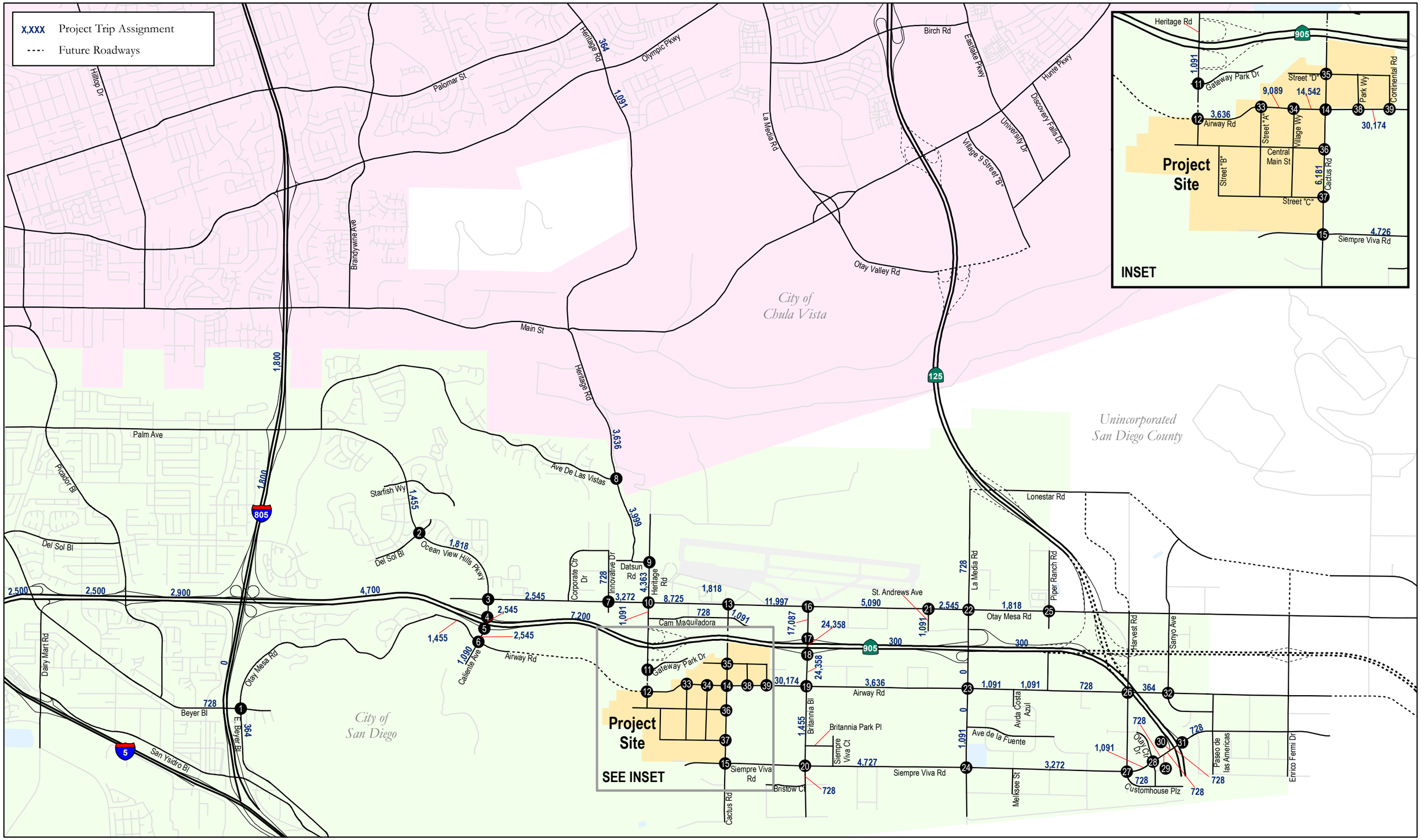

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Figure 3-3
Project Trip Assignment - Roadway Network

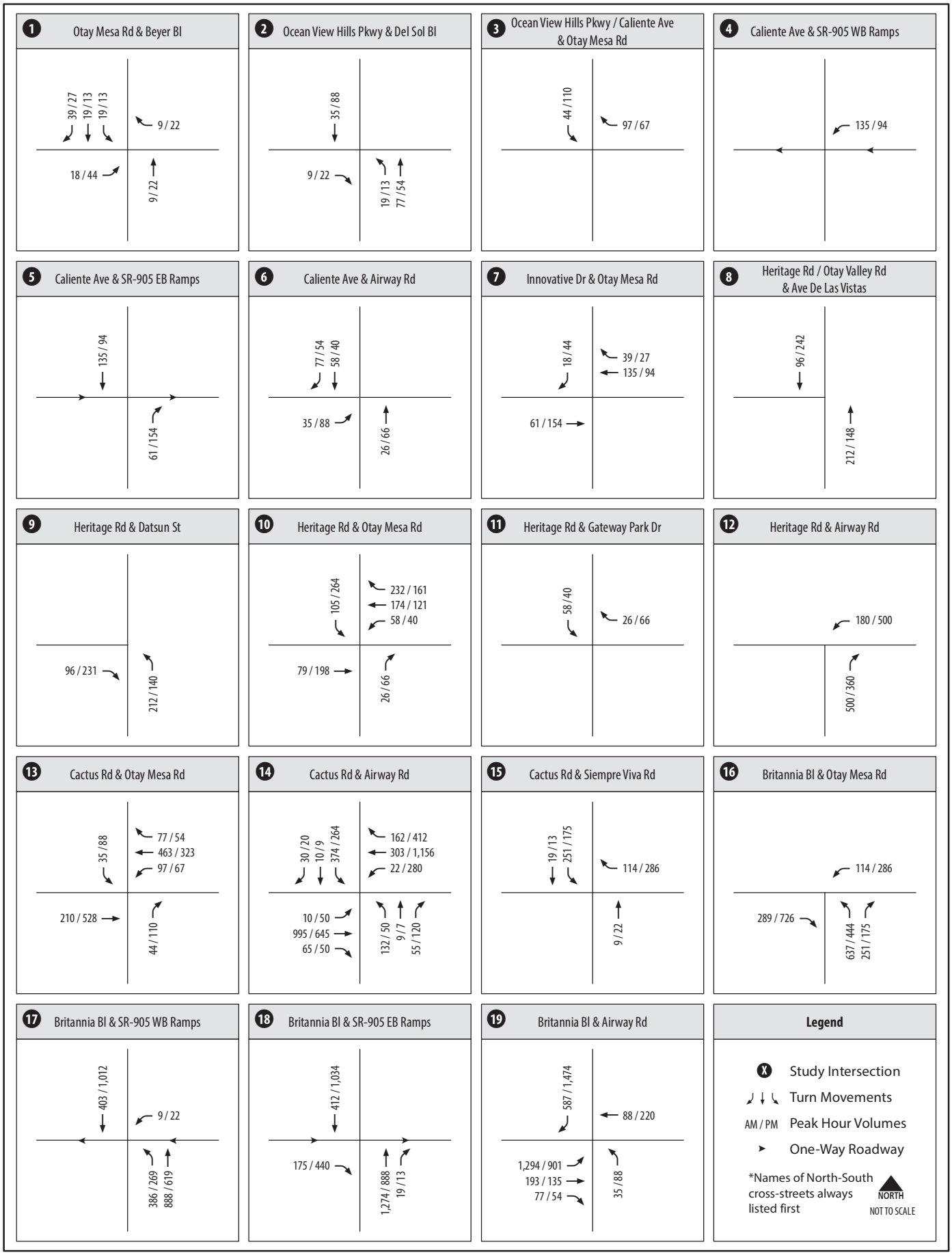

Figure 3-4

Project Trip Assignment - Intersections (Intersections 1-19)

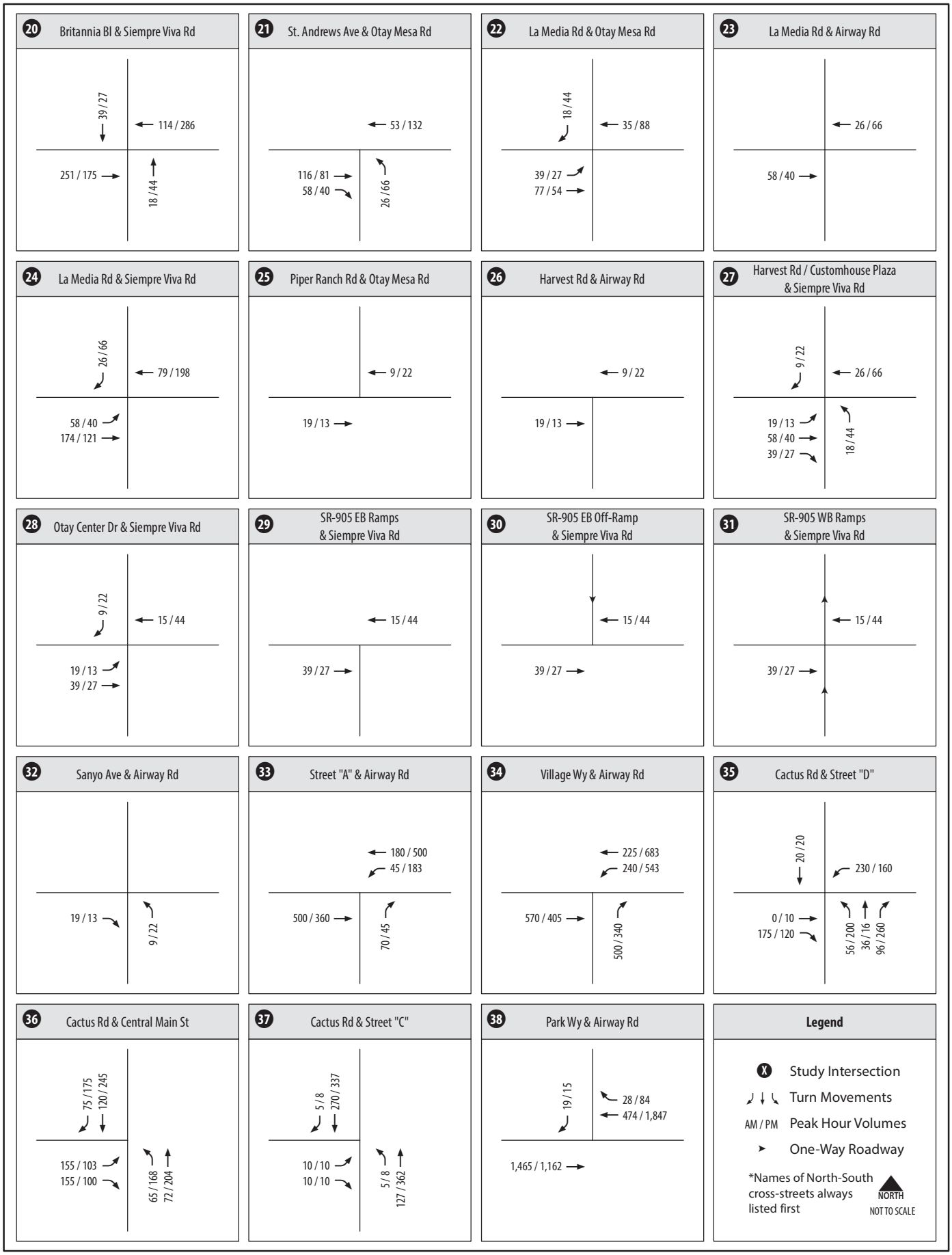

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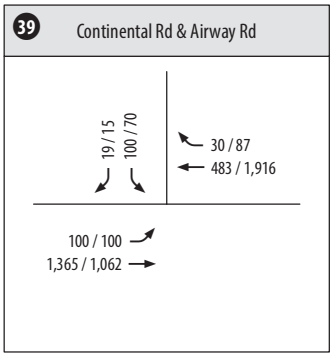
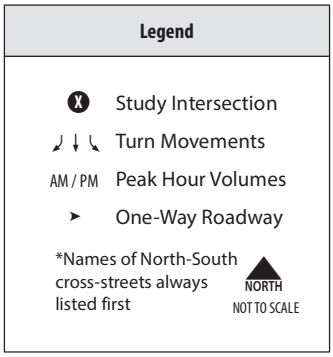
Figure 3-4

Project Trip Assignment - Intersections (Intersections 20-38)





Otay Mesa Central Village Specific Plan

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Figure 3-4
Project Trip Assignment - Intersections
(Intersection 39)

4.0 Plan-to-Plan (Proposed vs. Adopted) Trip Generation - Buildout

This chapter provides a trip generation comparison between the land use assumed in the Otay Mesa Community Plan and the proposed project to determine whether the proposed project would cause additional cumulative impacts, outside of those already identified in the Community Plan.

The recently adopted Otay Mesa Community Plan Update (March 2014) assumes the following land uses within Otay Mesa Central Village Specific Plan Area:

- 5,246 multi-family dwelling units (<20 ac/du)
- 32.7 ksf of community commercial
- 32.3 acres of active park space
- 1 elementary school

However, the project is proposing to change the land uses within the Otay Mesa Central Village Specific Plan Area to the following:

- 425 multi-family dwelling units (<20 du/ac)
- 4,060 multi-family dwelling units (>20 du/ac)
- 139.7 ksf of community commercial
- 16.1 acres of active park space
- 1 elementary school (K-8)

Trip Generation

As stated earlier in this report, project trip generation estimates were derived utilizing the trip generation rates outlined in *Table 1* of the *City of San Diego Land Development Code – Trip Generation Manual, May 2003*. **Table 4.1** and **Table 4.2** displays the projected daily, as well as AM and PM peak hour, project trip generation for the Adopted land uses and the proposed land uses, respectively.

As shown, the Adopted land uses (Table 4.1) for the Otay Mesa Central Village Specific Plan site is anticipated to generate a total of 45,429 external daily trips, including 3,876 (1,038-in / 2,838-out) AM peak hour trips and 4,287 (2,831-in / 1,456-out) PM peak hour trips; while the proposed project is anticipated to generate a total of 36,354 external daily trips, including 2,808 (876-in / 1,931-out) AM peak hour trips and 3,545 (2,201-in / 1,345-out) PM peak hour trips. Thus, traffic under the proposed Project would be reduced by approximately 20% as compared to what was disclosed in the OMCPU EIR.

Since this is a program level analysis and the proposed Project would generate less traffic than what was adopted in the Otay Mesa Community Plan, future year impact analysis was not necessary. All potential impacts associated with buildout of the Otay Mesa Community Plan were disclosed in the OMCPU EIR (State Clearinghouse No. 2004651076). Therefore, this analysis

focuses on the timing of improvements identified by the OMCPU EIR with buildout of the Central Village Specific Plan.

TABLE 4.1
OTAY MESA CENTRAL VILLAGE SPECIFIC PLAN
OTAY MESA CPU TRIP GENERATION

Land Use	Units	Trip Rate	ADT	AM Peak Hour					PM Peak Hour				
				%	Trips	Split	In	Out	%	Trips	Split	In	Out
Multi-Family (Under 20 DU/acre)	5,246 DU	8	41,968	8%	3,357	2:8	671	2,686	9%	3,777	7:3	2,644	1,133
Community Commercial [a]	32.7 KSF	70	2,289	4%	92	6:4	55	37	11%	252	5:5	126	126
Park (Developed)	32.3 Acres	50	1,615	4%	65	5:5	32	33	8%	129	5:5	65	64
Elementary School	13.1 Acres	136	1,782	31%	552	6:4	331	221	19%	339	4:6	135	204
Total			**47,654**		**4,066**		**1,089**	**2,977**		**4,497**		**2,970**	**1,527**
Internal Trips Capture (4.67%)[b]			**2,225**		**190**		**51**	**139**		**210**		**139**	**71**
External Trips			**45,429**		**3,876**		**1,038**	**2,838**		**4,287**		**2,831**	**1,456**

Source: City of San Diego Land Use Code – Trip Generation Manual, May 2003

Notes:
a – consistent with Otay Mesa CPU land use assumption.
b - Internal Capture derived from SANDAG Select Zone A output, included in Appendix B.

TABLE 4.2
OTAY MESA CENTRAL VILLAGE SPECIFIC PLAN
PROPOSED PROJECT TRIP GENERATION – SANDAG MODEL

Land Use	Units	Trip Rate	ADT	AM Peak Hour					PM Peak Hour				
				%	Trips	Split	In	Out	%	Trips	Split	In	Out
Multi-Family (Under 20 DU/acre)	425 DU	8	3,400	8%	272	2:8	54	218	10%	340	7:3	238	102
Multi-Family (Over 20 DU/acre)	4,060 DU	6	24,360	8%	1,949	2:8	390	1,559	9%	2,192	7:3	1,535	657
Community Commercial [a]	139.7 KSF	70	9,779	3%	293	6:4	176	117	10%	978	5:5	489	489
Park (Developed)	16.1 Acres	50	805	4%	32	5:5	16	16	8%	64	5:5	32	32
Elementary School	13.1 Acres	136	1,782	31%	552	6:4	331	221	19%	339	4:6	135	204
Total			**40,126**		**3,098**		**967**	**2,131**		**3,913**		**2,429**	**1,484**
Internal Trips Capture (9.4%) [b]			**3,772**		**291**		**91**	**200**		**368**		**228**	**139**
External Trips			**36,354**		**2,806**		**876**	**1,931**		**3,545**		**2,201**	**1,345**

Source: Colrich, October 2015; City of San Diego Land Use Code – Trip Generation Manual, May 2003

Notes:
a – consistent with Otay Mesa CPU land use assumption.
b - Internal Capture derived from SANDAG Select Zone B output, included in Appendix B.

5.0 Existing Conditions

This section describes key roadway segments and intersections, existing daily roadway and peak hour intersection traffic volume information and LOS analysis results under existing conditions.

5.1 Existing Roadway Network

Several locally significant roadways traverse the study area. Each of the key roadways, as well as the associated key intersections within the study area are discussed below.

North-South Facilities

East Beyer Boulevard is a 2-lane undivided roadway with a posted speed limit of 30 MPH. Sidewalks are provided on both sides of the roadway but bicycle facilities are not present on either side of the roadway. Parallel parking is permitted on both sides of the roadway. East Beyer Boulevard is classified as a 2-lane Collector in the San Ysidro Community Plan Update.

Ocean View Hills Parkway is a 4-lane roadway with a raised median and posted speed limit of 45 MPH between Starfish Way and Del Sol Boulevard. South of Del Sol Boulevard, Ocean View Hills Parkway transitions from a 4-lane roadway with a raised median into a 6-lane roadway with a raised median but the posted speed limit remains at 45 MPH. Sidewalks and Class II bicycle facilities are present. On-street parking is not permitted. Ocean View Hills Parkway is classified as a 4-lane Major Roadway between Starfish Way and Del Sol Boulevard and as a 6-lane Major Arterial between Del Sol Boulevard and Otay Mesa Road in the Otay Mesa Community Plan Update.

Caliente Avenue is recently (in October 2015) improved to a 5-lane roadway with a striped median between the SR-905 EB Ramps and its terminus, south of Airway Road. A raised median is present south of Airway Road. Sidewalks and Class II bicycle facilities are present along both sides of the roadway. On-street parking is only permitted along the west side of the roadway south of Airway Road. Caliente Avenue is classified as a 6-lane Prime Arterial between the SR-905 EB Ramps and Airway Road and as a 6-lane Major Arterial from Airway Road to Beyer Boulevard in the Otay Mesa Community Plan Update.

Innovative Drive is a 2-lane undivided roadway with no posted speed limit between Progressive Avenue and Otay Mesa Road. Sidewalks are present along the west side of the roadway only. Class II bicycle facilities are not present. Parallel on-street parking is permitted. Innovative Drive is classified as a 4-lane Collector between Progressive Avenue and Otay Mesa Road in the Otay Mesa Community Plan Update.

Heritage Road is a 2-lane roadway with a Continuous-Left-Turn-Lane between Main Street, in the City of Chula Vista, and its southern terminus (just south of Gateway Park Drive), except between Otay Mesa Road and Camino Maquiladora, where Heritage Road becomes a 3-lane undivided roadway. A posted speed of 45 MPH is present south of Main Street, and a 40 MPH speed limit is posted near Avenida De Las Vistas. Class II bicycle facilities are generally not present, except

for between approximately 1,790 feet south of Main Street and Avenida De Las Vistas, where bicycle lanes are intermittently present on the west side of the roadway. Sidewalks are present on the west side of the roadway between Main Street and Avenida De Las Vistas, on the east side of the roadway between Otay Mesa Road and Camino Maquiladora, and are intermittently present on both sides of the roadway south of Camino Maquiladora. Parallel on-street parking is permitted between Datsun Street and Otay Mesa Road, and south of Camino Maquiladora. Heritage Road is classified as a 6-lane Prime Arterial in the Otay Mesa Community Plan Update.

Cactus Road is a discontinuous 2-lane undivided roadway, bisected by SR-905. Sidewalks are present north of SR-905, and are intermittently present along the northbound side of the roadway between Airway Road and Siempre Viva Road. Class II bicycle facilities are not present. On-street parallel parking is generally allowed, except for between SR-905 and Airway Road, where shoulder widths only permit intermittent parallel parking. Cactus Road is classified as a 4-lane Major Arterial between Otay Mesa Road and Siempre Viva Road in the Otay Mesa Community Plan Update.

Britannia Boulevard is a 6-lane roadway with a raised median between Otay Mesa Road and the SR-905 EB Ramps. The configuration of the roadway transitions from a 6-lane roadway with a raised median to a 5-lane roadway with a raised median until reaching Airway Road. South of Airway Road, Britannia Boulevard is a 3-lane roadway with a raised median for approximately 600 feet then transition into a 4-lane roadway with a raised median until reaching Siempre Viva Road. South of Siempre Viva Road, Britannia Boulevard becomes a 2-lane undivided roadway. Sidewalks are present on both sides of the roadway along the entire extent of Britannia Boulevard with the exception of approximately 600 feet on the west side of the roadway, south of Airway Road. Class II bicycle facilities are generally present on both sides of the roadway between Otay Mesa Road and Siempre Viva Road, with the exception of the west side of the roadway between Airway Road and Siempre Viva Road. Parking along Britannia Boulevard is generally prohibited on both sides of the roadway, with the exception of the east side of the roadway between Britannia Park Place and Siempre Viva, where parking is permitted. Britannia Boulevard is classified as a 6-lane Prime Arterial between Otay Mesa Road and Airway Road, as a 6-lane Major Roadway between Airway Road and Siempre Viva Road, and as a 4-lane Collector between Siempre Viva Road and its southern terminus, in the Otay Mesa Community Plan Update.

St. Andrews Avenue/Otay Mesa Center Road is a 2-lane roadway with a continuous-left-turn-lane and no posted speed limit. Sidewalks are present along both sides of the roadway. Class II bicycle facilities are only present on the east side of the roadway. Parallel on-street parking is permitted on the east side of the roadway. St. Andrews Avenue/Otay Mesa Center Road is classified as a 4-lane Collector in the Otay Mesa Community Plan Update.

La Media Road is a 2-lane undivided roadway with no posted speed limit between its northern terminus and Otay Mesa Road, then it transitions into a 6-lane roadway south of Otay Mesa Road until reaching the SR-905 EB Ramps. South of the SR-905 EB Ramps La Media Road turns back into a 2-lane undivided roadway until reaching Siempre Viva Road. Sidewalks and Class II bicycle facilities are only present along the northbound side of the roadway north of Otay Mesa Road. On-street parking is prohibited on both sides of the roadway. La Media Road is classified as a 4-

lane Major Arterial between its northern terminus and Otay Mesa Road, as a 6-lane Prime Arterial between Otay Mesa Road and Airway Road, and as a 5-lane Major Arterial between Airway Road and Siempre Viva Road, in the Otay Mesa Community Plan Update.

East-West Facilities

Otay Mesa Road is a 6-lane roadway with a raised median with a 50 MPH posted speed limit. Between Ocean View Hills Parkway and Heritage Road, sidewalks are present along the north side of the roadway. Between Heritage Road and Britannia Boulevard, sidewalks are present on both sides of the roadway. Between Britannia Boulevard and La Media Road, sidewalks are only present on the south side of the roadway. Between La Media Road and Piper Ranch Road, sidewalks are only present on the north side of the roadway. Class II bicycle facilities are generally present along both sides of the roadway, with the exception of the segment between Britannia Boulevard and La Media Road, where Class II bicycle facilities are only present on the south side of the roadway, and between La Media and Piper Ranch Road, where Class II bicycle facilities are only present on the north side of the roadway. On-street parking is prohibited. Otay Mesa Road is classified as a 6-lane Prime Arterial in the Otay Mesa Community Plan Update.

Camino Maquiladora is a 2-lane undivided roadway with no posted speed limit between Heritage Road and its eastern terminus. Sidewalks are present along both sides of the roadway. Class II bicycle facilities are not present. Parallel on-street parking is allowed along both sides of the roadway. Camino Maquiladora is classified as a 2-lane Collector in the Otay Mesa Community Plan Update.

Airway Road is a discontinuous road, with a section between Old Otay Mesa Road and just east of Caliente Avenue, and a section east of Cactus Road. Between Old Otay Mesa Road and Caliente Avenue, Airway Road has four travel lanes with a continuous-left-turn lane. East of Caliente Avenue, Airway Road is a 3-lane roadway with a raised median. Sidewalks and Class II bicycle facilities are present, and on-street parking is prohibited.

Airway Road between Cactus Road and Avenida Costa Azul is a 2-lane undivided roadway and no posted speed limit. East of Avenida Costa Azul, Airway Road becomes a 4-lane roadway with a raised median until reaching Piper Ranch Road. East of Piper Ranch Road, the roadway transitions back to a 2-lane undivided roadway until reaching Sanyo Avenue. Sidewalks are generally not present, except for the roadway segments between La Media Road and Piper Ranch and Harvest Road and Sanyo Avenue, where sidewalks are present on the north side of the roadway. Class II bicycle facilities are generally not present, except between La Media Road and Piper Ranch Road, where a Class II bicycle lane is present on the north side of the roadway. Parallel parking is permitted only between La Media Road and Piper Ranch Road, along the south side of the roadway. Airway Road is classified as a 4-lane Collector between Old Otay Mesa Road and Caliente Avenue, as a 4-lane Major Roadway between Caliente Avenue and Heritage Road, as a 6-lane Prime Arterial between Heritage Road and Cactus Road, as a 6-lane Major Arterial between Cactus and Britannia Boulevard, and as a 4-lane Major Arterial until reaching its eastern terminus at Enrico Fermi Drive, in the Otay Mesa Community Plan Update.

Beyer Boulevard is a 4-lane roadway with a continuous left-turn lane between Park Avenue and Old Otay Mesa Road with a posted speed limit of 35 MPH. East of Old Otay Mesa Road, Beyer Boulevard transitions into a 2-lane undivided roadway with no posted speed limit. Sidewalks are present on both sides of the roadway between Park Avenue and Otay Mesa Road, and on the south side of the roadway east of Otay Mesa Road. Class II bicycle facilities are not present. Parking is permitted on both sides of the roadway between Park Avenue and Old Otay Mesa Road, and on the south side of the roadway east of Old Otay Mesa Road. Beyer Boulevard is classified as a 4-lane Major Arterial in the Otay Mesa Community Plan Update.

Siempre Viva Road is a discontinuous roadway, with a 1,300 feet segment of unpaved road west of La Media Road. Siempre Viva Road is a 2-lane undivided roadway between Cactus Road and 1,300 feet west of La Media Road, and terminate approximately 50 feet west of Cactus Road. Sidewalks are present along both sides of the roadway. There are no Class II bicycle facilities present on either side of the roadway. Parking is permitted along the south side of the roadway between Cactus Road and Britannia Boulevard, and along the north side of the roadway between Britannia Boulevard and 1,300 feet west of La Media Road.

East of La Media Road, Siempre Viva Road is a 6-lane roadway until approximately 700 feet west of Melksee Street. East of Melksee Street, Siempre Viva Road is a 6-lane roadway until reaching Paseo De Las Americas. Sidewalks are generally present on both sides of the road, except between La Media Road and Melksee Street, where sidewalks are only intermittently present on the north side of the roadway. Class II bicycle facilities are generally present on both sides of the roadway, except between La Media Road and Melksee Street, where Class II bicycle facilities are only present on the south side of the roadway. On-street parking is generally prohibited with the exception of the roadway segment between Cactus Road and Siempre Viva Court, where parking is permitted on both sides of the roadway. Siempre Viva Road is classified as a 6-lane Prime Arterial in the Otay Mesa Community Plan Update.

Customhouse Plaza is a 2-lane undivided roadway with no posted speed limit. Sidewalks are present along both sides of the roadway. Class II bicycle facilities are not present. Parallel on-street parking is allowed along both sides of the roadway. Customhouse Plaza is not classified as a mobility element roadway in the Otay Mesa Community Plan Update.

Study Intersections

The following thirty-nine (39) key study area intersections were analyzed in the study:

1. Beyer Boulevard / Otay Mesa Road (Signal)
2. Ocean View Hills Parkway / Del Sol Boulevard (Signal)
3. Ocean View Hills Parkway / Otay Mesa Road (Signal)
4. Caliente Avenue / SR-905 WB Ramps (Signal)
5. Caliente Avenue / SR-905 EB Ramps (Signal)
6. Caliente Avenue / Airway Road (All-Way Stop Controlled)
7. Innovative Drive / Otay Mesa Road (Side-Street Stop Controlled)

8. Heritage Road / Avenida De Las Vistas (All-Way Stop Controlled)
9. Heritage Road / Datsun Street (All-Way Stop Controlled)
10. Heritage Road / Otay Mesa Road (Signal)
11. Heritage Road / Gateway Park Drive (Side-Street Stop Controlled)
12. Heritage Road / Airway Road (Future Signal, Project Access)*
13. Cactus Road / Otay Mesa Road (Signal)
14. Cactus Road / Airway Road (Side-Street Stop Controlled)
15. Cactus Road / Siempre Viva Road (All-Way Stop Controlled)
16. Britannia Boulevard / Otay Mesa Road (Signal)
17. Britannia Boulevard / SR-905 WB Ramps (Signal)
18. Britannia Boulevard / SR-905 EB Ramps (Signal)
19. Britannia Boulevard / Airway Road (Signal)
20. Britannia Boulevard / Siempre Viva Road (All-Way Stop Controlled)
21. St Andrews Avenue / Otay Mesa Road (Signal)
22. La Media Road / Otay Mesa Road (Signal)
23. La Media Road / Airway Road (All-Way Stop Controlled)
24. La Media Road / Siempre Viva Road (All-Way Stop Controlled)
25. Piper Ranch Road / Otay Mesa Road (Signal)
26. Harvest Road / Airway Road (All-Way Stop Controlled)
27. Customhouse Plaza / Siempre Viva Road (Signal)
28. Otay Center Drive / Siempre Viva Road (Signal)
29. SR-905 SB Ramps / Siempre Viva Road (Signal)
30. SR-905 SB Off Ramp / Siempre Viva Road (Side-Street Stop Controlled)
31. SR-905 NB Off Ramp / Siempre Viva Road (Signal)
32. Sanyo Avenue / Airway Road (All-Way Stop Controlled)
33. Street “A” / Airway Road (Future Signal, Project Access)*
34. Village Way / Airway Road (Future Signal, Project Access)*
35. Cactus Road / Street “D” (Future Signal, Project Access)*
36. Cactus Road / Central Main Street (Future Signal, Project Access)*
37. Cactus Road / Street “C” Road (Future Signal, Project Access)*
38. Park Way / Airway Road (Future Side-Street Stop Controlled, right-turn in/out only, Project Access)*
39. Continental Road / Airway Road (Future Signal, Project Access)*

**Intersection provides project access and does not exist, therefore, it is not analyzed under Existing conditions.*

Figure 5-1 displays the existing roadway geometrics while **Figure 5-2** displays the existing intersection lane configurations.

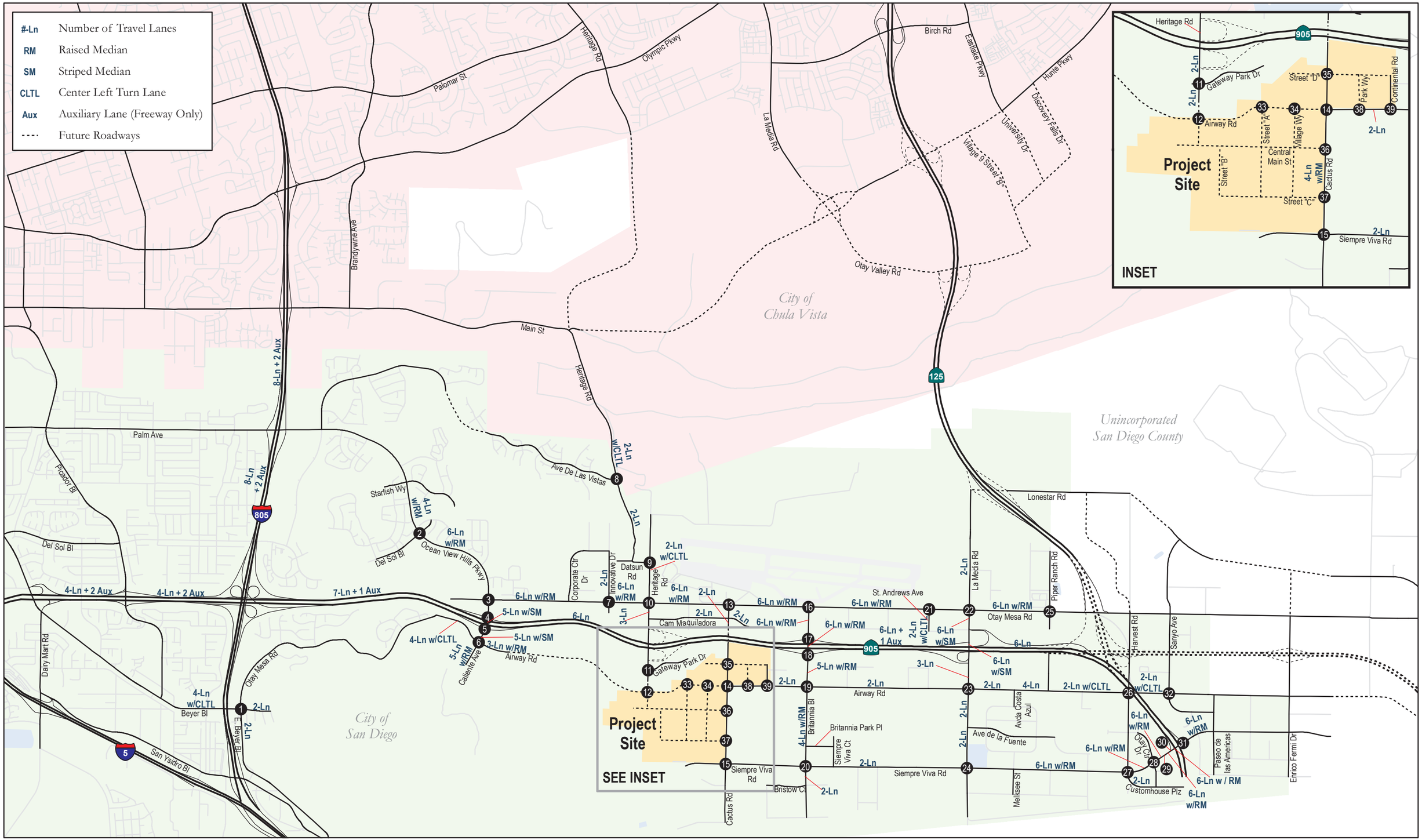

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Figure 5-1
Roadway Geometrics - Existing Conditions

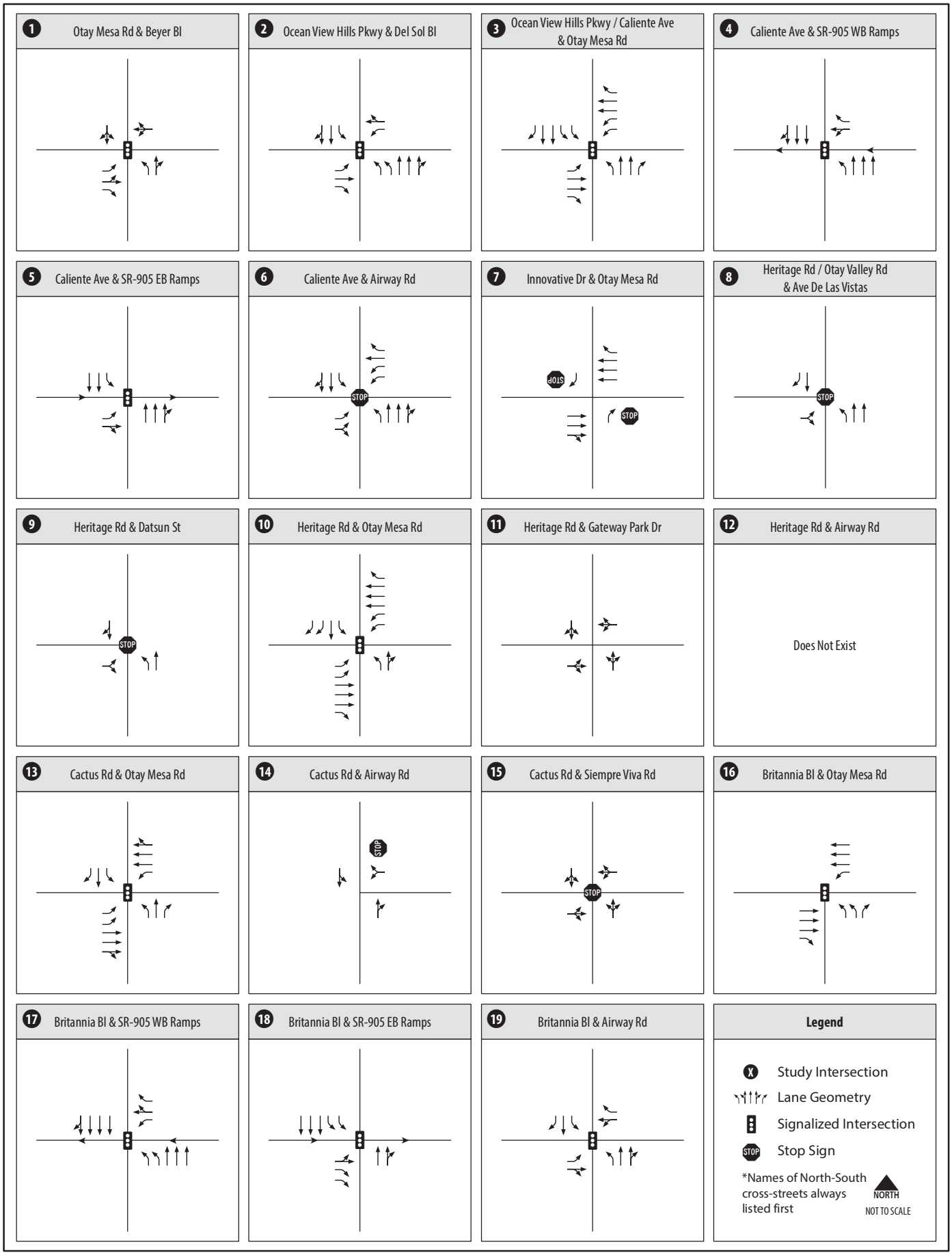

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Figure 5-2
Intersection Geometrics - Existing Conditions (Intersections 1-19)

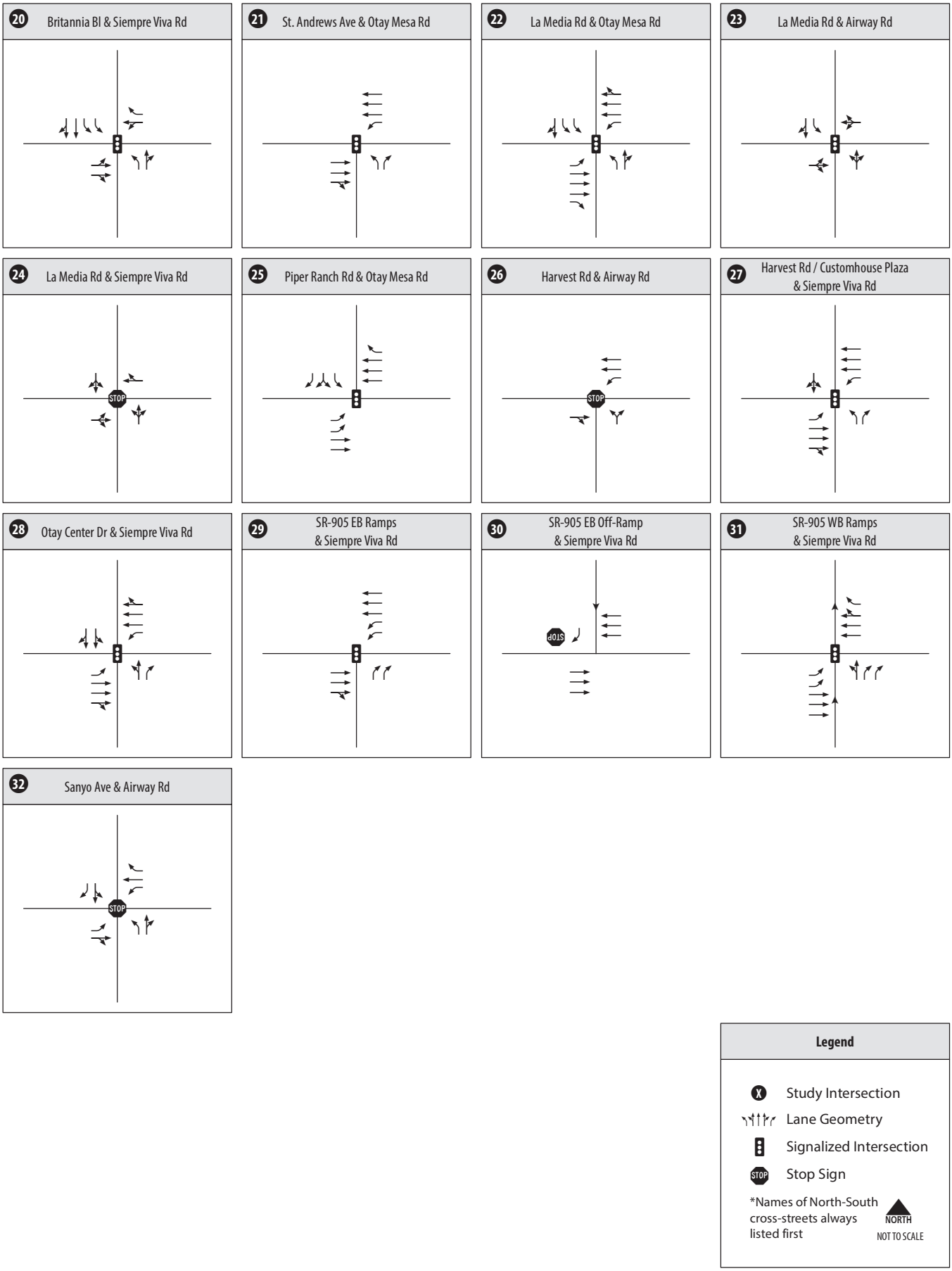

Figure 5-2
Intersection Geometrics - Existing Conditions (Intersections 20-32)

5.2 Existing Intersection and Roadway Volumes

Figure 5-3 displays Average Daily Traffic (ADT) volumes for roadway and freeway segments, while **Figure 5-4** shows existing AM/PM peak hour traffic volumes for the key study area intersections. The roadway segment and study area intersection traffic counts were conducted in October 2015 and are provided in **Appendix C**. The freeway segment counts were obtained from the Caltrans 2014 Traffic Volumes on California State Highway document.

5.3 Existing Level of Service Analysis

Level of service analyses under Existing conditions were conducted using the methodologies described in Chapter 2.0. Roadway segment, intersection, and freeway segment level of service, as well as freeway ramp intersection ILV analysis results are discussed separately below.

Roadway Segment Analysis

Table 5.1 displays the LOS analysis results for key study area roadway segments located in the City of San Diego under Existing conditions.

As shown in the table, all of the key study area roadway segments are currently operating at acceptable LOS D or better, with the exception of the following two (2) roadway segments:

- La Media Road, between Airway Road and Avenida De La Fuente – LOS E; and
- Airway Road, between La Media Road and Avenida Costa Azul – LOS E.

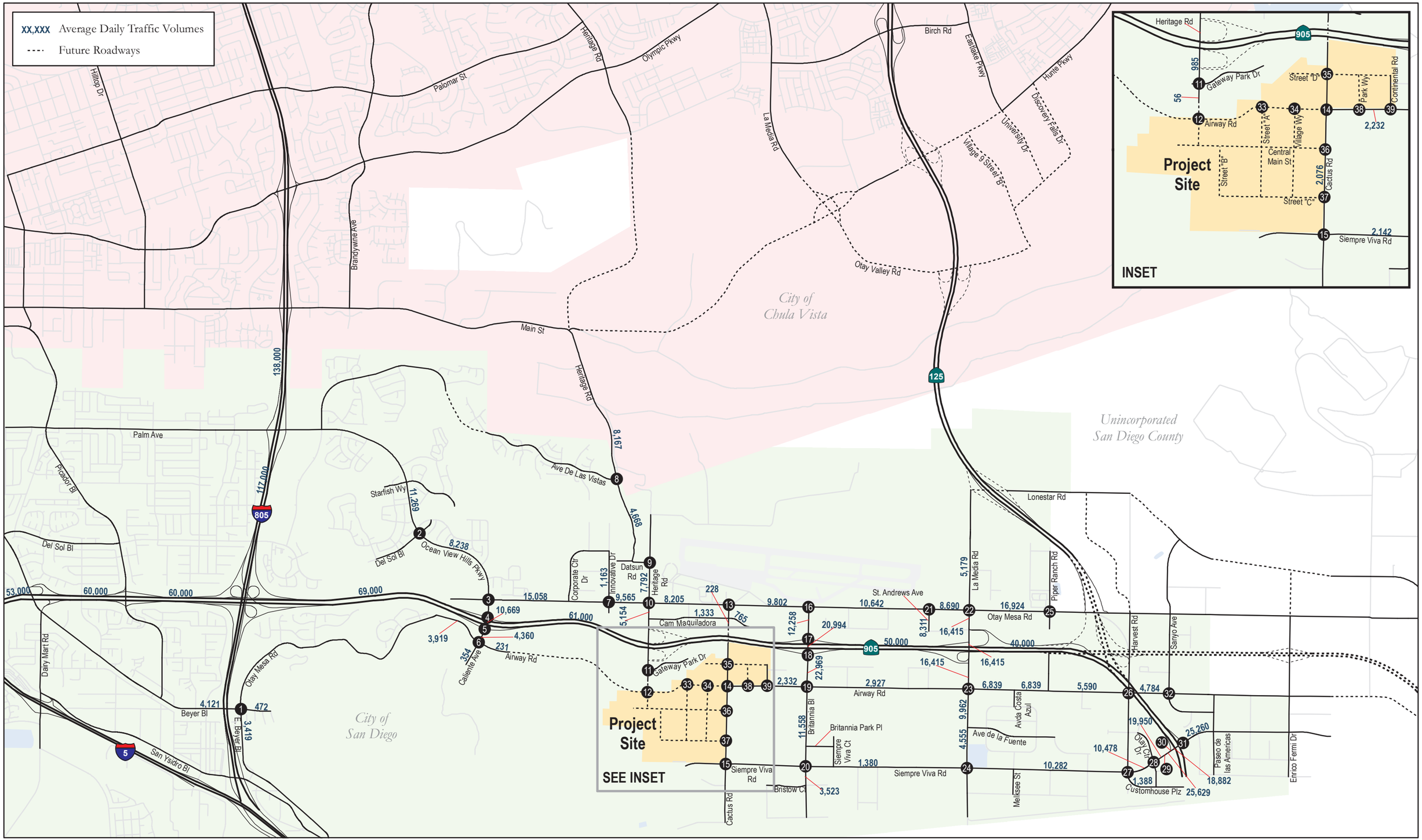

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Figure 5-3

Roadway Average Daily Traffic Volumes - Existing Conditions

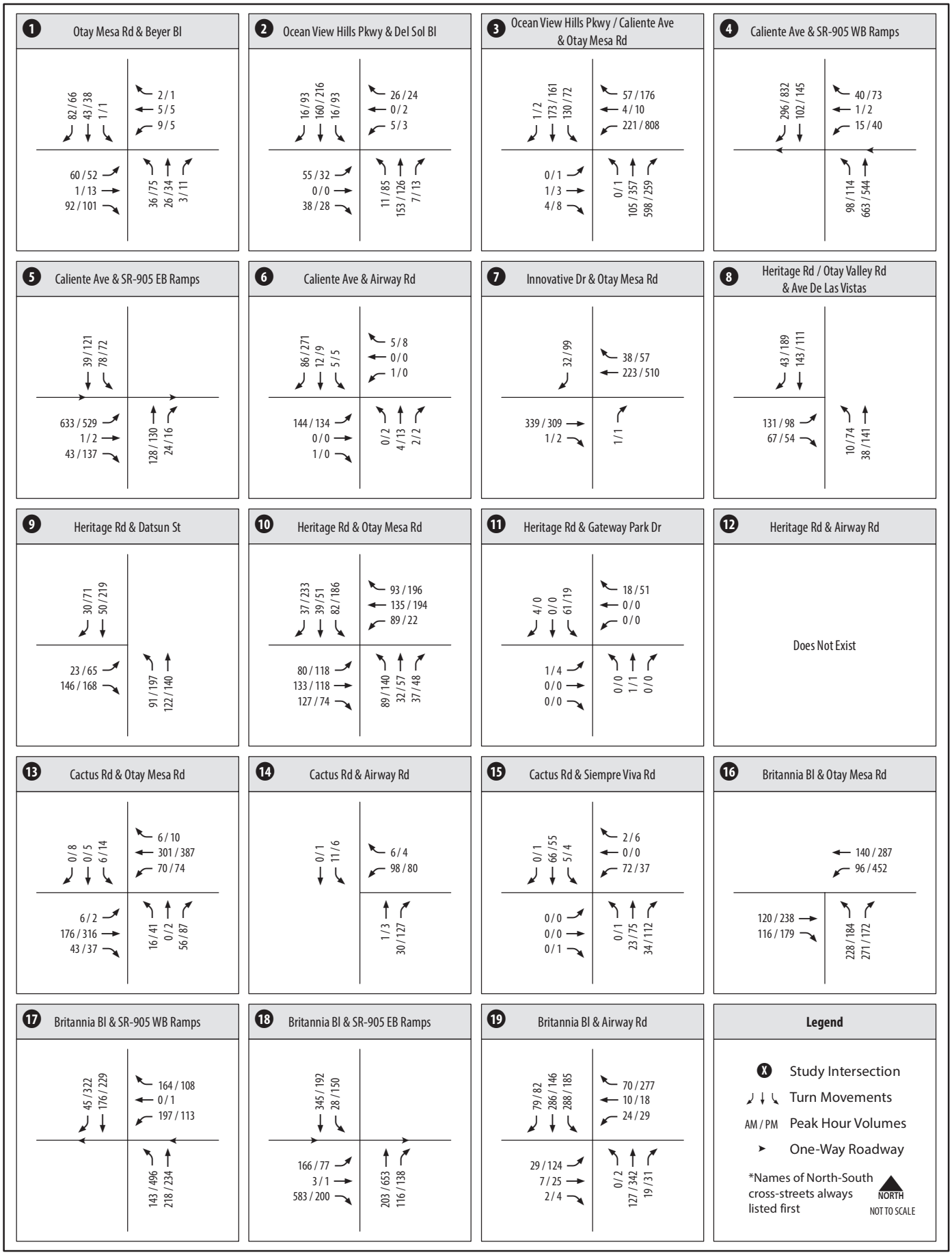
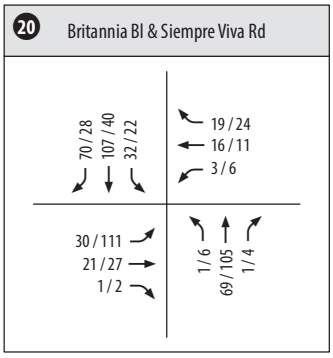
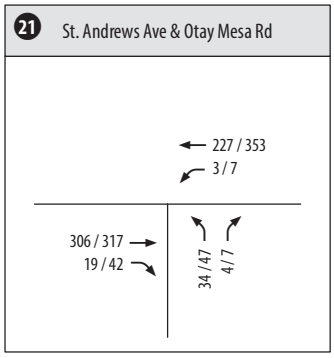
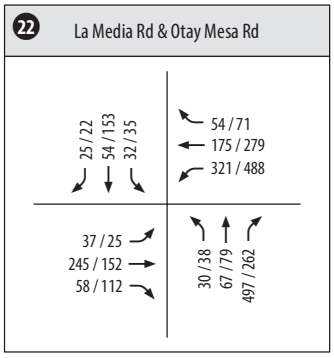


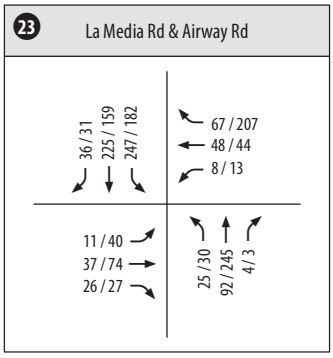
Figure 5-4

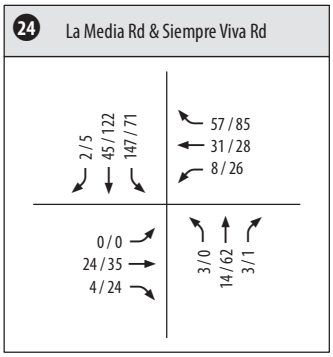
AM/PM Peak Hour Intersection Volumes - Existing Conditions (Intersections 1-19)

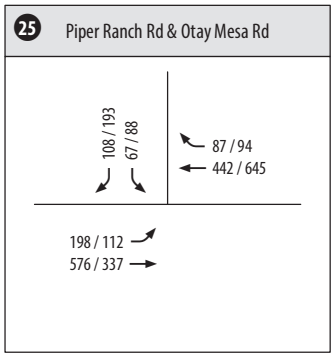


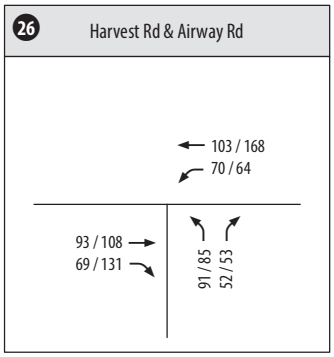


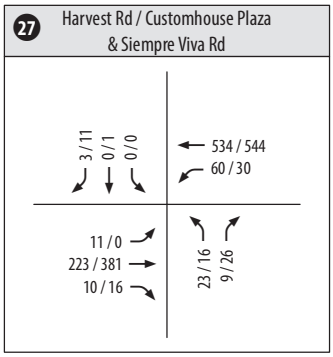


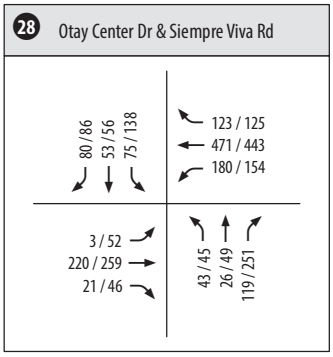


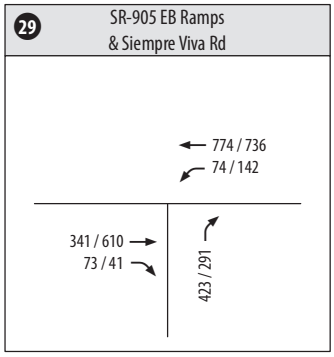


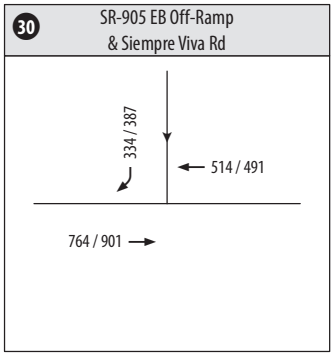


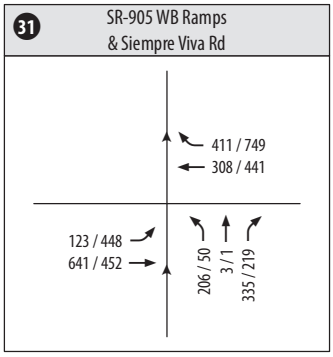


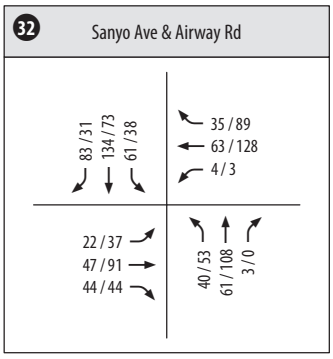












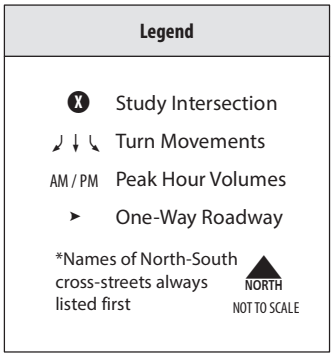


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Figure 5-4

AM/PM Peak Hour Intersection Volumes - Existing Conditions (Intersections 20-32)

TABLE 5.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING CONDITIONS – CITY OF SAN DIEGO

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
East Beyer Boulevard	Beyer Boulevard	South of Beyer Boulevard	2-Ln Collector No Fronting Property	2-Ln	3,419	10,000	0.342	A
Ocean View Hills Parkway	Starfish Way	Del Sol Boulevard	4-Ln Major Arterial	4-Ln w / RM	11,269	40,000	0.282	A
	Del Sol Boulevard	Otay Mesa Road	6-Ln Major Arterial	6-Ln w / RM	8,238	50,000	0.165	A
Caliente Avenue	SR-905 WB Ramps	SR-905 EB Ramps	5-Ln Prime Arterial	5-Ln w / SM (3-NB, 2-SB)	10,669	50,000[1]	0.213	A
	SR-905 EB Ramps	Airway Road	5-Ln Prime Arterial	5-Ln w / SM (3-NB, 2-SB)	4,360	50,000[1]	0.087	A
	Airway Road	Southern Terminus	5-Ln Prime Arterial	5-Ln w / RM (3-NB, 2-SB)	354	50,000[1]	0.007	A
Innovative Drive	Progressive Avenue	Otay Mesa Road	2-Ln Collector w/ Commercial Fronting	2-Ln	1,163	8,000	0.145	A
Heritage Road	Avenida De Las Vistas	Datsun Street	2-Ln Collector No Fronting Property	2-Ln	4,668	10,000	0.467	B
	Datsun Street	Otay Mesa Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	7,792	15,000	0.519	C
	Otay Mesa Road	Camino Maquiladora	3-Ln Collector	3-Ln (1-NB, 2-SB)	5,154	11,250[2]	0.458	B
	Camino Maquiladora	Gateway Park Drive	2-Ln Collector No Fronting Property	2-Ln	985	10,000	0.099	A
	Gateway Park Drive	Southern Terminus	2-Ln Collector No Fronting Property	2-Ln	56	10,000	0.006	A
Cactus Road	Otay Mesa Road	SR-905	2-Ln Collector w/ Commercial Fronting	2-Ln	228	8,000	0.029	A
	SR-905	Airway Road	2-Ln Collector w/ Commercial Fronting	2-Ln	2,076	8,000	0.260	A
	Airway Road	Siempre Viva Road	2-Ln Collector w/ Commercial Fronting	2-Ln	2,076	8,000	0.260	A

TABLE 5.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING CONDITIONS – CITY OF SAN DIEGO

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
Britannia Boulevard	Otay Mesa Road	SR-905 WB Ramps	6-Ln Prime Arterial	6-Ln w/ RM	12,258	60,000	0.204	A
	SR-905 WB Ramps	SR-905 EB Ramps	6-Ln Prime Arterial	6-Ln w/ RM	20,994	60,000	0.350	A
	SR-905 EB Ramps	Airway Road	5-Ln Prime Arterial	5-Ln w/ RM (2-NB, 3-SB)	22,969	50,000[1]	0.459	B
	Airway Road	Siempre Viva Road	4-Ln Major Arterial	4-Ln w/ RM	11,558	40,000	0.289	A
	Siempre Viva Road	Bristow Court	2-Ln Collector w/ Commercial Fronting	2-Ln	3,523	8,000	0.440	C
Saint Andrews Avenue	Otay Mesa Road	Otay Mesa Center Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	8,311	15,000	0.554	C
La Media Road	Northern Terminus	Otay Mesa Road	2-Ln Collector w/ Commercial Fronting	2-Ln	5,179	8,000	0.647	D
	Otay Mesa Road	SR-905 WB Ramps	6-Ln Prime Arterial	6-Ln w/ SM	16,415[4]	60,000	0.274	A
	SR-905 WB Ramps	SR-905 EB Ramps	6-Ln Prime Arterial	6-Ln w/ SM	16,415[4]	60,000	0.274	A
	SR-905 EB Ramps	Airway Road	3-Ln Major Arterial	3-Ln (1-NB, 2-SB)	16,415[4]	30,000[3]	0.547	C
	Airway Road	Avenida De La Fuente	2-Ln Collector No Fronting Property	2-Ln	9,962[5]	10,000	0.996	**E**
	Avenida De La Fuente	Siempre Viva Road	2-Ln Collector No Fronting Property	2-Ln	4,555	10,000	0.456	B
Otay Mesa Road	Ocean View Hills Parkway	Corporate Center Drive	6-Ln Prime Arterial	6-Ln w / RM	15,058	60,000	0.251	A
	Corporate Center Drive	Heritage Road	6-Ln Prime Arterial	6-Ln w / RM	9,565	60,000	0.159	A
	Heritage Road	Cactus Road	6-Ln Prime Arterial	6-Ln w / RM	8,205	60,000	0.137	A

TABLE 5.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING CONDITIONS – CITY OF SAN DIEGO

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
Otay Mesa Road	Cactus Road	Britannia Boulevard	6-Ln Prime Arterial	6-Ln w / RM	9,802	60,000	0.163	A
	Britannia Boulevard	Saint Andrews Avenue	6-Ln Prime Arterial	6-Ln w / RM	10,642	60,000	0.177	A
	Saint Andrews Avenue	La Media Road	6-Ln Prime Arterial	6-Ln w / RM	8,690	60,000	0.145	A
	La Media Road	Piper Ranch Road	6-Ln Prime Arterial	6-Ln w / RM	16,924	60,000	0.282	A
Camino Maquiladora	Heritage Road	Cactus Road	2-Ln Collector w/ Commercial Fronting	2-Ln	1,333	8,000	0.167	A
	Cactus Road	Eastern Terminus	2-Ln Collector w/ Commercial Fronting	2-Ln	765	8,000	0.096	A
Airway Road	Otay Mesa Road	Caliente Avenue	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w / CLTL	3,919	30,000	0.131	A
	Caliente Avenue	Eastern Terminus	3-Ln Major Arterial	3-Ln w / RM (2-EB, 1-WB)	231	30,000[3]	0.008	A
	Cactus Road	Continental Road	2-Ln Collector w/ Commercial Fronting	2-Ln	2,232	8,000	0.279	A
	Continental Road	Britannia Boulevard	2-Ln Collector w/ Commercial Fronting	2-Ln	2,232	8,000	0.292	A
	Britannia Boulevard	La Media Road	2-Ln Collector w/ Commercial Fronting	2-Ln	2,927	8,000	0.366	B
	La Media Road	Avenida Costa Azul	2-Ln Collector w/ Commercial Fronting	2-Ln	6,839	8,000	0.855	**E**
	Avenida Costa Azul	Piper Ranch Road	4-Ln Major Arterial	4-Ln w / RM	6,839	40,000	0.171	A
	Piper Ranch Road	Harvest Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	5,590	15,000	0.373	B
	Harvest Road	Sanyo Avenue	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	4,784	15,000	0.319	B

TABLE 5.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING CONDITIONS – CITY OF SAN DIEGO

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
Beyer Boulevard	Park Avenue	Otay Mesa Road	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w / CLTL	4,121	30,000	0.137	A
	Otay Mesa Road	East of Otay Mesa Road	2-Ln Collector No Fronting Property	2-Ln	472	10,000	0.047	A
Siempre Viva Road	Cactus Road	Britannia Boulevard	2-Ln Collector w/ Commercial Fronting	2-Ln	2,142	8,000	0.268	A
	Britannia Boulevard	La Media Road	2-Ln Collector w/ Commercial Fronting	2-Ln	1,380	8,000	0.173	A
	La Media Road	Customhouse Plaza	6-Ln Prime Arterial	6-Ln w / RM	10,282	60,000	0.171	A
	Customhouse Plaza	Otay Center Drive	6-Ln Prime Arterial	6-Ln w / RM	10,478	60,000	0.175	A
	Otay Center Drive	SR-905 SB Ramps	6-Ln Prime Arterial	6-Ln w / RM	19,950	60,000	0.333	A
	SR-905 SB Ramps	SR-905 SB Off-Ramp	6-Ln Prime Arterial	6-Ln w / RM	25,629	60,000	0.427	B
	SR-905 SB Off-Ramp	SR-905 NB Ramps	6-Ln Prime Arterial	6-Ln w / RM	18,882	60,000	0.315	A
	SR-905 NB Ramps	East of SR-905 Ramps	6-Ln Prime Arterial	6-Ln w / RM	25,260	60,000	0.421	B
Customhouse Plaza	Siempre Viva Road	Southern Terminus	2-Ln Collector w/ Commercial Fronting	2-Ln	1,388	8,000	0.174	A

Source: AVC, Chen Ryan Associates; November2016

Notes:
Bold letter indicates substandard LOS.
V/C = Volume to Capacity Ratio.
RM = Raised Median.
SM = Striped Median.
CLTL = Continuous-Left-Turn Lane.
[1] Based on the Capacity of a 6-Ln Prime Arterial, reduced to exclude a lane. (5/6*60,000 = 50,000)
[2] Based on the capacity of a 4-Ln Collector, reduced to exclude a lane. (3/4*15,000 = 11,250)
[3] Based on the Capacity of a 4-Lane Major Arterial, reduced to exclude a lane. (3/4*40,000 = 30,000)
[4] Volumes obtained from the latest City of San Diego Traffic Counts (2010).
[5] Volumes obtained from the latest City of San Diego Traffic Counts (2013).

Table 5.2 displays LOS analysis results for key study area roadway segments located in the City of Chula Vista under Existing conditions.

TABLE 5.2
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING CONDITIONS – CITY OF CHULA VISTA

Roadway	From	To	Functional Classification	Cross-Section	ADT	LOS Threshold (LOS C)	LOS
Heritage Road	Main Street	Avenida De Las Vistas	Class II Collector	2-Ln w/ CLTL	8,167	15,000	A

Source: AVC, Chen Ryan Associates; April 2016

Note:
CLTL = Continuous Left-Turn Lane.

As shown in the table above, the roadway segment located in the City of Chula Vista operates at acceptable LOS A.

Intersection Analysis

Table 5.3 displays intersection level of service and average vehicle delay results for the key study area intersections located in the City of San Diego under Existing conditions. Level of service calculation worksheets for Existing Conditions are provided in **Appendix D**.

TABLE 5.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
EXISTING CONDITIONS

			AM Peak Hour		PM Peak Hour	
ID	Intersection	Control Type	Avg. Delay (sec.)	LOS	Avg. Delay (sec.)	LOS
1	Beyer Boulevard / Otay Mesa Road	Signalized	10.3	B	11.0	B
2	Ocean View Hills Parkway / Del Sol Boulevard	Signalized	12.3	B	11.4	B
3	Ocean View Hills Parkway / Otay Mesa Road	Signalized	15.8	B	36.6	D
4	Caliente Avenue / SR-905 WB Ramps	Signalized	5.8	A	8.7	A
5	Caliente Avenue / SR-905 EB Ramps	Signalized	23.7	C	15.3	B
6	Caliente Avenue / Airway Road	AWSC	7.8	A	8.7	A
7	Innovative Drive / Otay Mesa Road	SSSC	9.1	A	10.6	B
8	Heritage Road / Avenida De Las Vistas	AWSC	8.5	A	9.2	A
9	Heritage Road / Datsun Street	AWSC	8.9	A	12.4	B
10	Heritage Road / Otay Mesa Road	Signalized	37.4	D	28.8	C
11	Heritage Road / Gateway Park Drive	AWSC	7.5	A	7.1	A
12	Heritage Road / Airway Road	Does Not Exist				
13	Cactus Road / Otay Mesa Road	Signalized	14.1	B	21.8	C

TABLE 5.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
EXISTING CONDITIONS

ID	Intersection	Control Type	AM Peak Hour		PM Peak Hour	
			Avg. Delay (sec.)	LOS	Avg. Delay (sec.)	LOS
14	Cactus Road / Airway Road	SSSC	9.4	A	9.6	A
15	Cactus Road / Siempre Viva Road	AWSC	7.9	A	8.2	A
16	Britannia Boulevard / Otay Mesa Road	Signalized	25.1	C	34.1	C
17	Britannia Boulevard / SR-905 WB Ramps	Signalized	11.5	B	14.0	B
18	Britannia Boulevard / SR-905 EB Ramps	Signalized	9.8	A	13.2	B
19	Britannia Boulevard / Airway Road	Signalized	16.0	B	41.2	D
20	Britannia Boulevard / Siempre Viva Road	Signalized	12.5	B	15.6	B
21	Saint Andrews Avenue / Otay Mesa Road	Signalized	6.3	A	6.9	A
22	La Media Road / Otay Mesa Road	Signalized	52.8	D	52.0	D
23	La Media Road / Airway Road	Signalized	6.5	A	8.4	A
24	La Media Road / Siempre Viva Road	AWSC	9.0	A	9.4	A
25	Piper Ranch Road / Otay Mesa Road	Signalized	9.3	A	10.9	B
26	Harvest Road / Airway Road	AWSC	9.1	A	9.9	A
27	Customhouse Plaza / Siempre Viva Road	Signalized	13.7	B	9.4	A
28	Otay Center Drive / Siempre Viva Road	Signalized	14.1	B	15.9	B
29	SR-905 SB Ramps / Siempre Viva Road	Signalized	3.8	A	4.6	A
30	SR-905 SB Off-Ramp / Siempre Viva Road	SSSC	15.6	C	14.6	B
31	SR-905 NB Off-Ramp / Siempre Viva Road	Signalized	12.3	B	14.4	B
32	Sanyo Avenue / Airway Road	AWSC	9.1	A	9.8	A
33	Street "A" / Airway Road	Does Not Exist				
34	Village Way / Airway Road	Does Not Exist				
35	Cactus Road / Street "D"	Does Not Exist				
36	Cactus Road / Central Main Street	Does Not Exist				
37	Cactus Road / Street "C"	Does Not Exist				
38	Park Way / Airway Road	Does Not Exist				
39	Continental Road / Airway Road	Does Not Exist				

Source: Chen Ryan Associates; November 2016

Notes:
AWSC = All-Way Stop Controlled.
SSSC = Side-Street Stop Controlled, the delay shown is the worst delay experienced by any of the approaches.

As shown in the table, all of the key study area intersections are currently operating at acceptable LOS D or better during both the AM and PM peak hours.

Ramp Intersection Capacity Analysis

Consistent with Caltrans requirements, the signalized ramp intersections were analyzed using ILV procedures, as described in Section 2.4. ILV analysis results are displayed in **Table 5.4** and analysis worksheets for Existing Conditions are provided in Appendix D.

TABLE 5.4
RAMP INTERSECTION CAPACITY ANALYSIS
EXISTING CONDITIONS

Ramp Intersection	Peak Hour	ILV / Hour	Description
Caliente Avenue and SR-905 EB Ramps	AM	778	*Under Capacity*
	PM	804	*Under Capacity*
Caliente Avenue and SR-905 WB Ramps	AM	468	*Under Capacity*
	PM	1,067	*Under Capacity*
Britannia Boulevard and SR-905 EB Ramps	AM	523	*Under Capacity*
	PM	640	*Under Capacity*
Britannia Boulevard and SR-905 WB Ramps	AM	373	*Under Capacity*
	PM	759	*Under Capacity*
Siempre Viva Road and SR-905 NB Ramps	AM	579	*Under Capacity*
	PM	855	*Under Capacity*
Siempre Viva Road and SR-905 SB Ramps	AM	470	*Under Capacity*
	PM	461	*Under Capacity*

Source: Chen Ryan Associates; April 2016

Notes:
Lower than 1,200 ILV/hour = Under Capacity
Between 1,200 and 1,500 ILV/hour = At Capacity
Higher than 1500 ILV/hour = Over Capacity

As shown in the table, all of the study ramp intersections are currently operating at "Under Capacity" conditions.

Freeway Segment Analysis

Table 5.5 displays freeway segment level of service results for the study area freeway mainline facilities under Existing conditions. The freeway segment level of service analysis was performed utilizing the methodology presented in Section 2.6.

As shown in the table, all of the freeway segments within the study area operate at acceptable LOS D or better.

TABLE 5.5
FREEWAY SEGMENT ANALYSIS
EXISTING CONDITIONS

Freeway	Segment	ADT[a]	Direction	# of Lanes	Capacity[b]	D[c]	K[d]	HVF[e]	Peak Hour Volume	V/C	LOS[f]	Peak Hour
I-805	Main Street and Palm Avenue	138,000	NB	4M+1A	10,810	64.6%	5.9%	10.0%	5,500	0.509	B	AM
			SB	4M+1A	10,810	56.7%	8.0%	10.0%	6,600	0.611	B	PM
	Palm Avenue and SR-905	117,000	NB	4M+1A	10,810	64.6%	5.9%	10.0%	4,700	0.435	B	AM
			SB	4M+1A	10,810	56.7%	8.0%	10.0%	5,600	0.518	B	PM
SR-905	Picador Boulevard and I-805	60,000	EB	2M+1A	6,110	64.4%	8.4%	10.0%	3,400	0.556	B	AM
			WB	2M+1A	6,110	64.4%	8.4%	10.0%	3,400	0.556	B	PM
	I-805 and Caliente Avenue	69,000	EB	4M	9,400	53.1%	7.5%	10.0%	2,900	0.309	A	AM
			WB	3M+1A	8,460	59.9%	8.2%	10.0%	3,600	0.426	B	PM
	Caliente Avenue and Heritage Road	61,000	EB	3M	7,050	53.1%	7.5%	10.0%	1,200	0.170	A	AM
			WB	3M	7,050	59.9%	8.2%	10.0%	1,000	0.142	A	PM
	Heritage Road and Britannia Boulevard	61,000	EB	3M	7,050	53.1%	7.5%	10.0%	600	0.085	A	AM
			WB	3M	7,050	59.9%	8.2%	10.0%	600	0.085	A	PM
	Britannia Boulevard and La Media Road	50,000	EB	3M+1A	8,460	53.1%	7.5%	10.0%	300	0.035	A	AM
			WB	3M	7,050	59.9%	8.2%	10.0%	400	0.057	A	PM
	La Media Road and SR-125	40,000	EB	3M	7,050	53.1%	7.5%	10.0%	200	0.028	A	AM
			WB	3M	7,050	59.9%	8.2%	10.0%	200	0.028	A	PM

Source: Chen Ryan Associates; November 2016

Notes:
Bold letter indicated substandard LOS.
M = Mainline. A = Auxiliary Lane.
[a] Traffic volumes provided by Caltrans (2014).
[b] The capacity is calculated as 2,350 ADT per main lane and 1,410 ADT (60% of the main lane capacity) per auxiliary lane.
[c] D = Directional split.| [d] K = Peak hour %. | [e] HV = Heavy vehicle % - consistent with the OMCPU. | [f] LOS during highest directional demand.

6.0 Existing Plus Project Conditions

This section provides an analysis of traffic conditions with the addition of project trips from full buildout of the proposed project. Under this scenario, the proposed project's buildout traffic volumes are added to the existing traffic volumes and roadway configuration, and impacts are assessed. This scenario is regarded by traffic engineers as a hypothetical scenario when used in connection with a long-range development project such as the proposed Otay Mesa Central Village Specific Plan, which is not anticipated to reach full buildout until 10-15 years later or even beyond but assumed at Year 2025 for purposes of this study.

6.1 Existing Plus Project Roadway Network and Traffic Volumes

Roadway and intersection geometrics under Existing Plus Project conditions were assumed to be largely identical to the Existing conditions geometrics, with the following facilities assumed to be constructed by the Project as a part of project frontage and access improvements. Note that triggers for the improvements described below cannot be determined at this point in time since the phases of construction are unknown, therefore, a trigger analysis for facilities accessing and fronting the project will be conducted at a later time for each project that takes place within the Otay Mesa Central Village.

<u>Roadway Segments</u>

- Airway Road, between Heritage Road (Project Access) and Cactus Road – This segment serves as the project frontage and will be constructed to a 6-lane Prime Arterial, consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).
- Airway Road, between Cactus Road and Continental Road – This segment serves as the project frontage and the north side of the roadway (westbound direction) will be improved to 4 lanes (1 eastbound lane and 3 westbound lanes). This roadway is classified as a 6-lane Major Arterial in the currently adopted Otay Mesa Community Plan, which is consistent with the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).
- Cactus Road, between SR-905 and Street “D” - This segment serves as the project frontage and the east side of the roadway (northbound direction) will be improved to 3 lanes (2 northbound lanes and 1 southbound lane). This roadway is classified as a 4-lane Major Arterial in the currently adopted Otay Mesa Community Plan, which is consistent with the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).
- Cactus Road, between Street “D” and Airway Road - This segment serves as the project frontage and will be improved to a 4-lane Major Arterial, consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).
- Cactus Road, between Airway Road and Siempre Viva Road - This segment serves as the project frontage and the west side of the roadway (southbound direction) will be

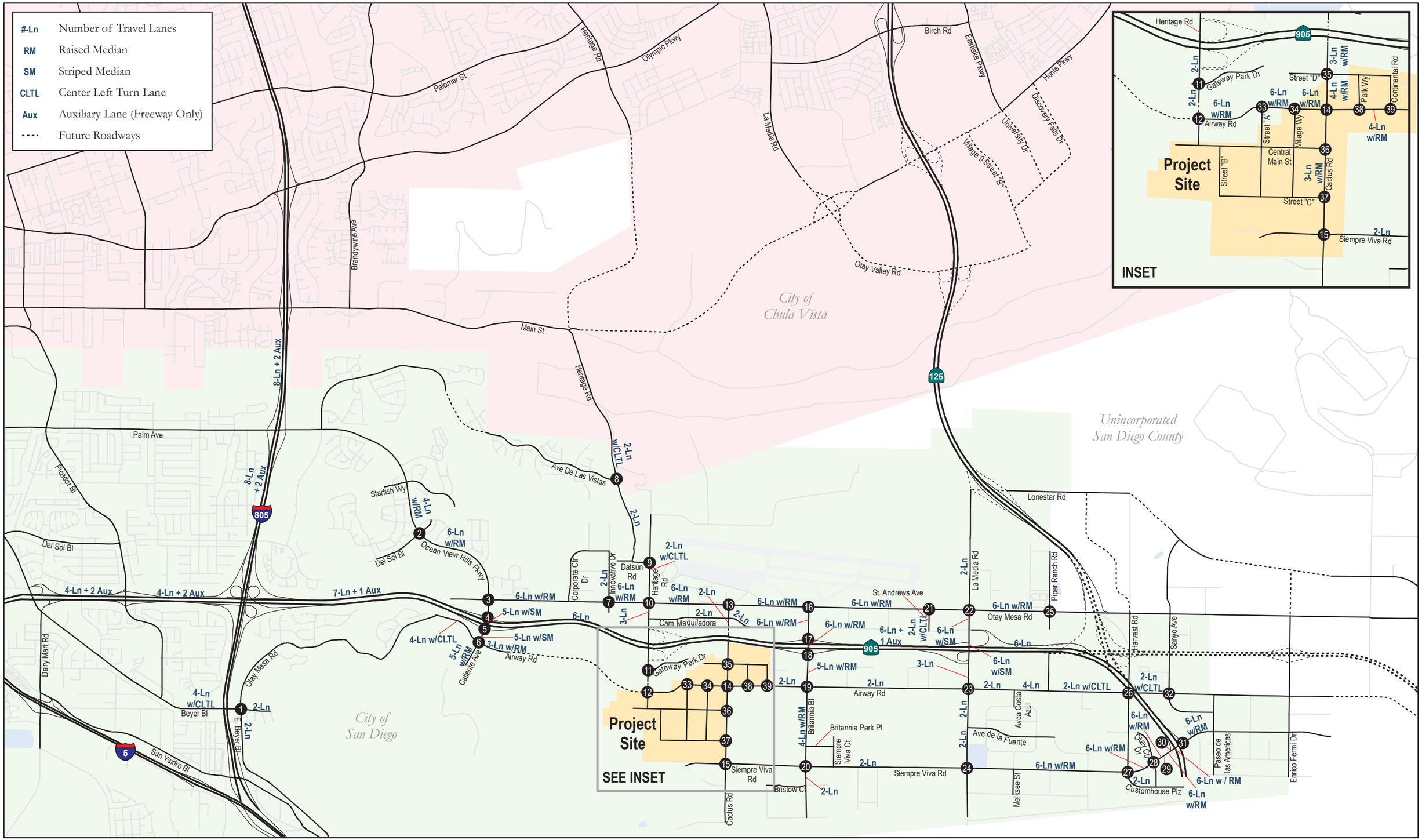
improved to 3 lanes (1 northbound lane and 2 southbound lanes). This roadway is classified as a 4-lane Major Arterial in the currently adopted Otay Mesa Community Plan, which is consistent with the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).

Intersections

12. Heritage Road / Airway Road – Construction of an L-shaped intersection providing movements between the project site and Airway Road, east of the Heritage Road project access.
14. Cactus Road / Airway Road – Construction of the west leg to form a four-legged intersection, and expanding the intersection lane configurations to match up with the roadway cross-sections. This intersection is proposed to be signalized by the project.
33. Street "A" / Airway Road – Construction of a signalized T-intersection.
34. Village Way / Airway Road – Construction of a signalized T-intersection.
35. Cactus Road / Street "D" – Construction of a signalized four-legged intersection.
36. Cactus Road / Central Main Street – Construction of a signalized T-intersection.
37. Cactus Road / Street "C" – Construction of a signalized T-intersection.
38. Park Way / Airway Road – Construction of a side-street stop controlled right-turn in/out only T-intersection.
39. Continental Road / Airway Road – construction of a signalized T-intersection.

Figures 6-1 and **6-2** display roadway geometrics and intersection lane configurations under Existing Plus Project conditions.

Existing Plus Project traffic volumes were derived by combining the existing traffic volumes (displayed in Figures 5-3 and 5-4) and the project trip assignment volumes (displayed in Figures 3-3 and 3-4). Existing Plus Project daily roadway and freeway traffic volumes are displayed in **Figure 6-3,** while **Figure 6-4** displays intersection peak hour traffic volumes.



Otay Mesa Central Village Specific Plan

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Figure 6-1

Roadway Geometrics - Existing Plus Project Conditions

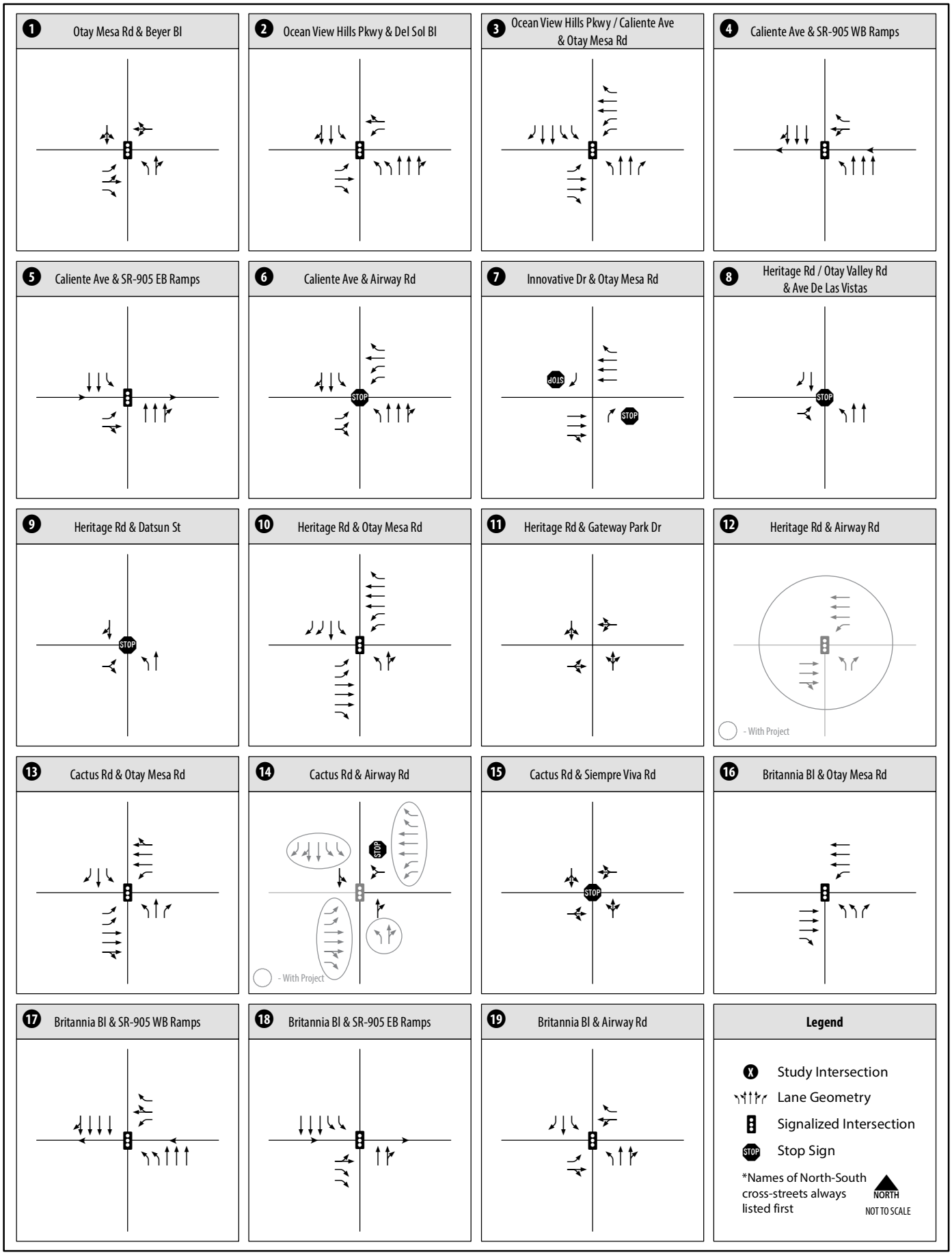
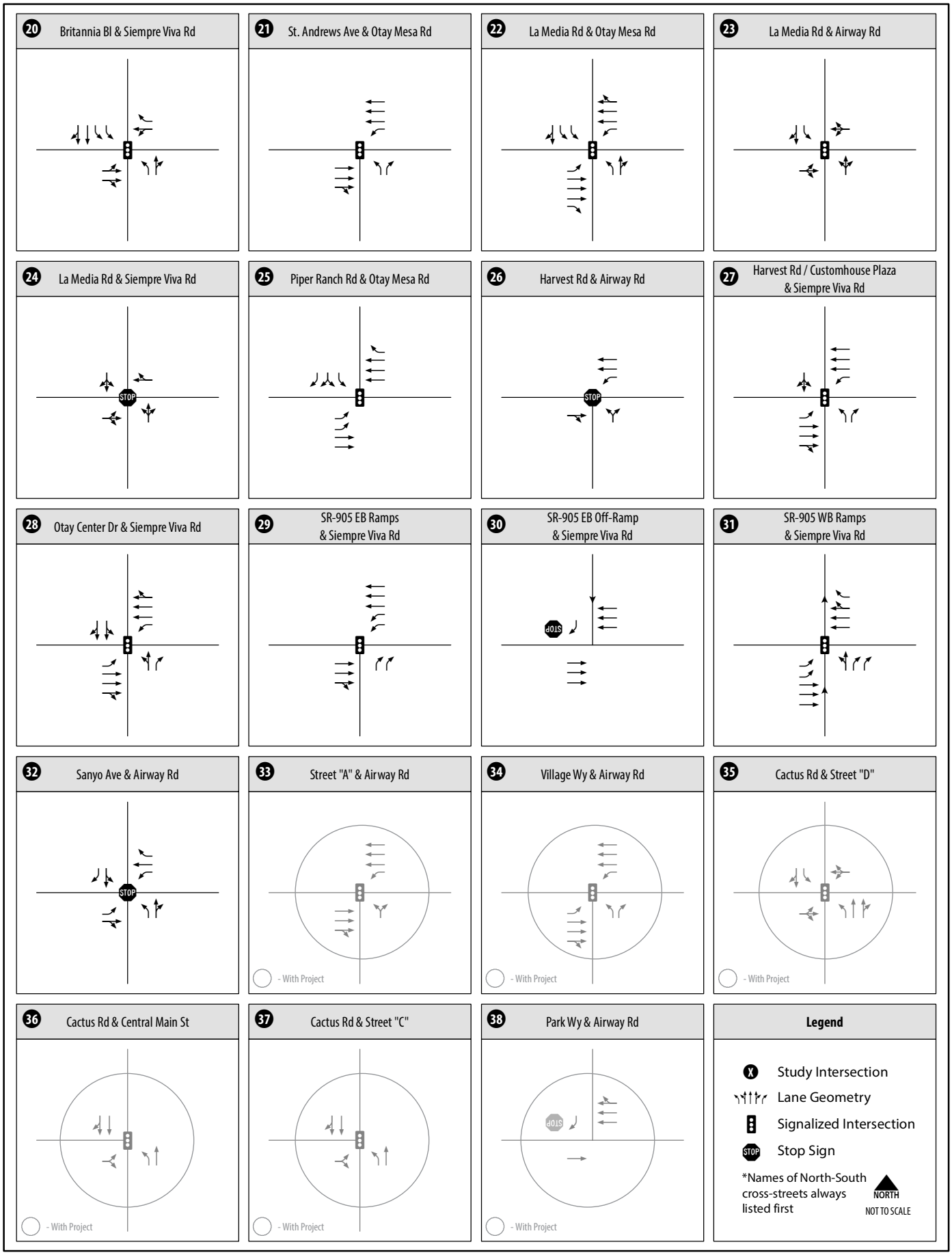


Figure 6-2
Intersection Geometrics - Existing Plus Project Conditions (Intersections 1-19)



Otay Mesa Central Village Specific Plan

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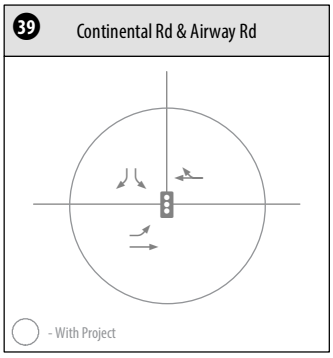
Figure 6-2

Intersection Geometrics - Existing Plus Project Conditions (Intersections 20-38)



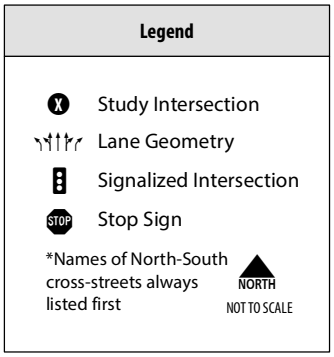


Figure 6-2
Intersection Geometrics -
Existing Plus Project Conditions (Intersection 39)

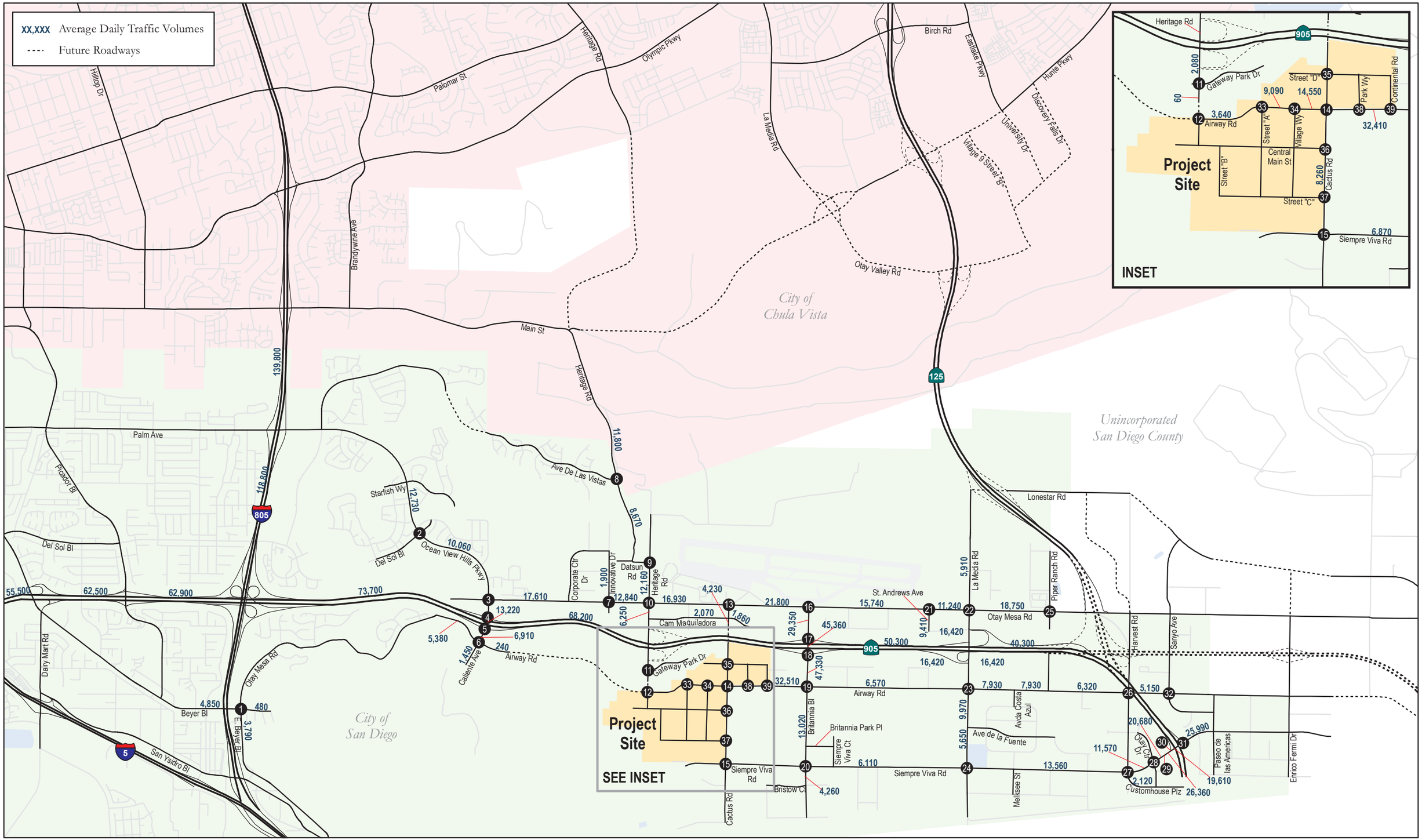


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Figure 6-3

Roadway Average Daily Traffic Volumes - Existing Plus Project Conditions

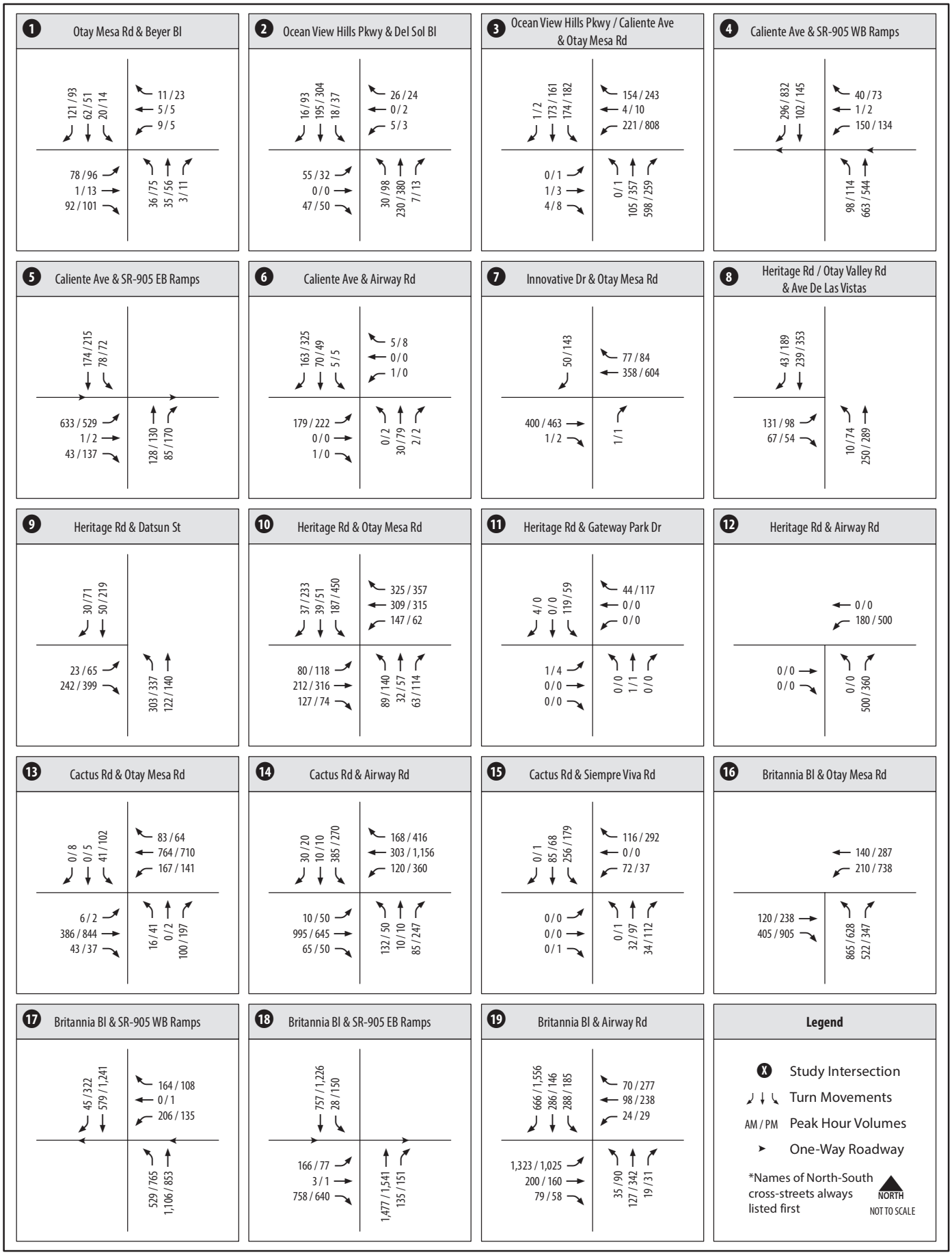


Figure 6-4

AM/PM Peak Hour Intersection Volumes - Existing Plus Project Conditions (Intersections 1-19)

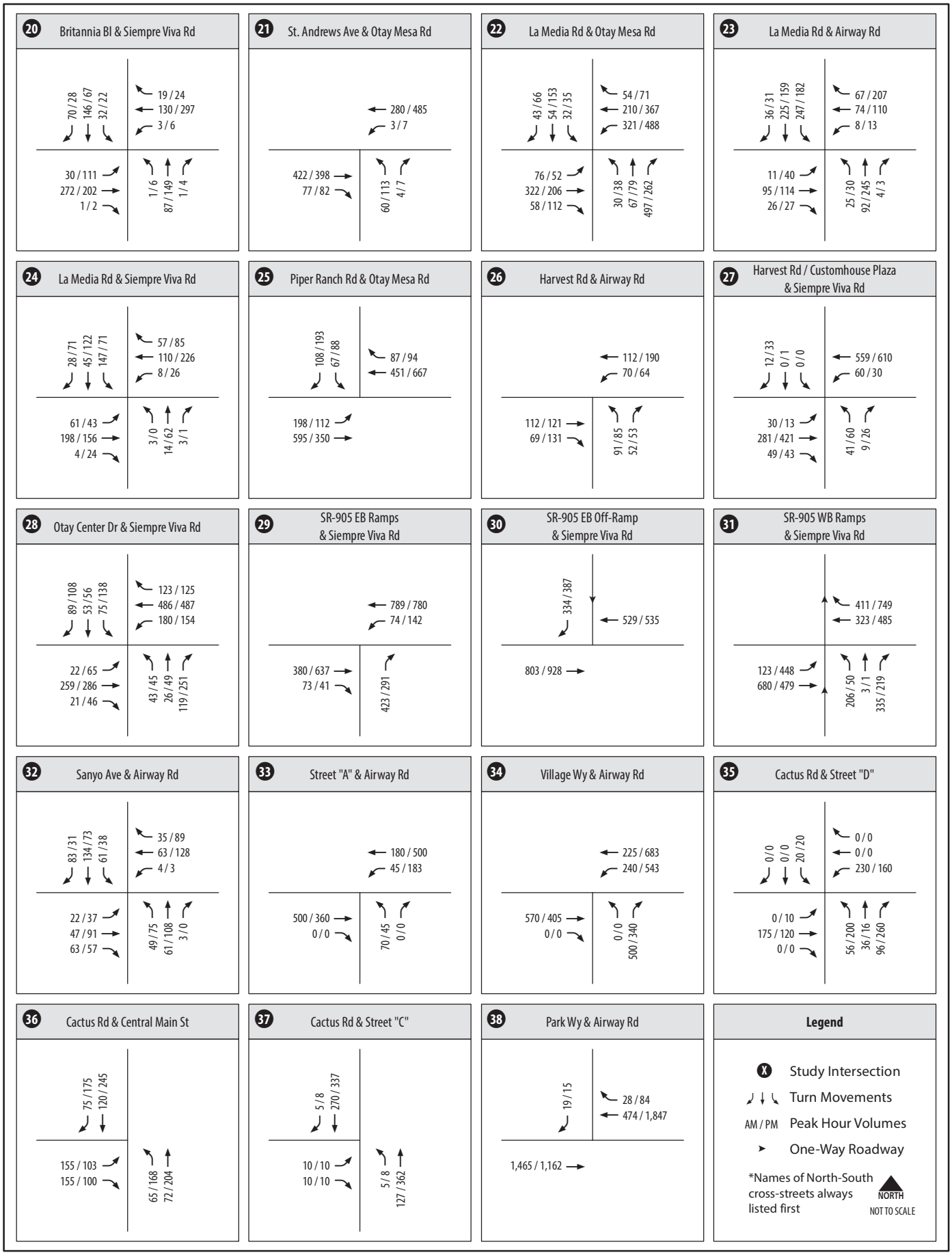
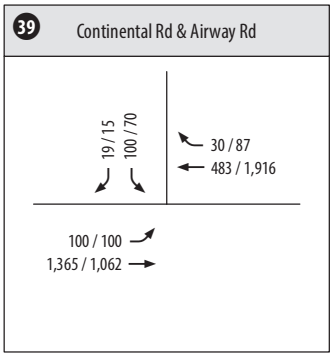


Figure 6-4

AM/PM Peak Hour Intersection Volumes - Existing Plus Project Conditions (Intersections 20-38)



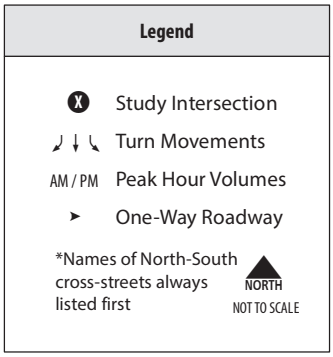


Figure 6-4

AM/PM Peak Hour Intersection Volumes - Existing Plus Project Conditions (Intersection 39)

6.2 Existing Plus Project Traffic Conditions

Analyses were conducted using methodology described in Chapter 2.0. Roadway segment, intersection, and freeway segment level of service, as well as freeway ramp intersection ILV analysis results are discussed separately below.

Roadway Segment Analysis

Table 6.1 displays the level of service analysis results for key roadway segments located in the City of San Diego under Existing Plus Project conditions.

TABLE 6.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT CONDITIONS – CITY OF SAN DIEGO

Roadway	Segment	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	With Project		Without Project		Δ V/C	SI?
						V/C	LOS	V/C	LOS		
East Beyer Boulevard	Beyer Boulevard to South of Beyer Boulevard	2-Ln Collector No Fronting Property	2-Ln	3,790	10,000	0.379	A	0.342	A	0.037	No
Ocean View Hills Parkway	Starfish Way to Del Sol Boulevard	4-Ln Major Arterial	4-Ln w / RM	12,730	40,000	0.318	A	0.282	A	0.037	No
	Del Sol Boulevard to Otay Mesa Road	6-Ln Major Arterial	6-Ln w / RM	10,060	50,000	0.201	A	0.165	A	0.036	No
Caliente Avenue	SR-905 WB Ramps SR-905 EB Ramps	5-Ln Prime Arterial	5-Ln w / SM (3-NB, 2-SB)	13,220	50,000[1]	0.264	A	0.213	A	0.051	No
	SR-905 EB Ramps to Airway Road	5-Ln Prime Arterial	5-Ln w / SM (3-NB, 2-SB)	6,910	50,000[1]	0.138	A	0.087	A	0.051	No
	Airway Road to Southern Terminus	5-Ln Prime Arterial	5-Ln w / RM (3-NB, 2-SB)	1,450	50,000[1]	0.029	A	0.007	A	0.022	No
Innovative Drive	Progressive Avenue to Otay Mesa Road	2-Ln Collector w/ Commercial Fronting	2-Ln	1,900	8,000	0.238	A	0.145	A	0.092	No

TABLE 6.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT CONDITIONS – CITY OF SAN DIEGO

Roadway	Segment	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	With Project		Without Project		Δ V/C	SI?
						V/C	LOS	V/C	LOS		
Heritage Road	Avenida De Las Vistas to Datsun Street	2-Ln Collector No Fronting Property	2-Ln	8,670	10,000	0.867	D	0.467	B	0.400	No
	Datsun Street to Otay Mesa Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	12,160	15,000	0.811	D	0.519	C	0.291	No
	Otay Mesa Road to Camino Maquiladora	3-Ln Collector	3-Ln (1-NB, 2SB)	6,250	11,250[2]	0.556	C	0.458	B	0.097	No
	Camino Maquiladora to Gateway Park Drive	2-Ln Collector No Fronting Property	2-Ln	2,080	10,000	0.208	A	0.099	A	0.110	No
	Gateway Park Drive to Southern Terminus	2-Ln Collector No Fronting Property	2-Ln	60	10,000	0.006	A	0.006	A	0.000	No
Cactus Road	Otay Mesa Road to SR-905	2-Ln Collector w/ Commercial Fronting	2-Ln	2,050	8,000	0.256	A	0.029	A	0.228	No
	SR-905 to Street "D"	3-Ln Major Arterial	3-Ln w / RM (2NB, 1SB)	6,080	30,000	0.203	A	0.260	A	-0.057	No
	Street "D" to Airway Road	4-Ln Major Arterial	4-Ln w / RM	6,080	40,000	0.152	A	0.260	A	-0.108	No
	Airway Road to Siempre Viva Road	3-Ln Major Arterial	3-Ln w / RM (1NB, 2SB)	8,260	30,000	0.275	A	0.260	A	0.015	No
Britannia Boulevard	Otay Mesa Road to SR-905 WB Ramps	6-Ln Prime Arterial	6-Ln w / RM	29,350	60,000	0.489	B	0.204	A	0.285	No
	SR-905 WB Ramps to SR-905 EB Ramps	6-Ln Prime Arterial	6-Ln w / RM	45,360	60,000	0.756	C	0.350	A	0.406	No
	SR-905 EB Ramps to Airway Road	5-Ln Prime Arterial	5-Ln w / RM (2-NB, 3-SB)	47,330	50,000[1]	0.947	**E**	0.459	B	0.487	**Yes**

TABLE 6.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT CONDITIONS – CITY OF SAN DIEGO

Roadway	Segment	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	With Project		Without Project		Δ V/C	SI?
						V/C	LOS	V/C	LOS		
Britannia Boulevard	Airway Road to Siempre Viva Road	4-Ln Major Arterial	4-Ln w / RM	13,020	40,000	0.326	A	0.289	A	0.037	No
	Siempre Viva Road to Bristow Court	2-Ln Collector w/ Commercial Fronting	2-Ln	4,260	8,000	0.533	C	0.440	C	0.092	No
Saint Andrews Avenue	Otay Mesa Road to Otay Mesa Center Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	9,410	15,000	0.627	C	0.554	C	0.073	No
La Media Road	Northern Terminus to Otay Mesa Road	2-Ln Collector w/ Commercial Fronting	2-Ln	5,910	8,000	0.739	D	0.647	D	0.091	No
	Otay Mesa Road to SR-905 WB Ramps	6-Ln Prime Arterial	6-Ln w/ SM	16,420	60,000	0.274	A	0.274	A	0.000	No
	SR-905 WB Ramps and SR-905 EB Ramps	6-Ln Prime Arterial	6-Ln w/ SM	16,420	60,000	0.274	A	0.274	A	0.000	No
	SR-905 EB Ramps and Airway Road	3-Ln Major Arterial	3-Ln (1-NB, 2-SB)	16,420	30,000[3]	0.547	C	0.547	C	0.000	No
	Airway Road and Avenida De La Fuente	2-Ln Collector No Fronting Property	2-Ln	9,960	10,000	0.996	**E**	0.996	**E**	0.000	No
	Avenida De La Fuente to Siempre Viva Road	2-Ln Collector No Fronting Property	2-Ln	5,650	10,000	0.565	C	0.456	B	0.110	No
Otay Mesa Road	Ocean View Hills Parkway to Corporate Center Drive	6-Ln Prime Arterial	6-Ln w / RM	17,610	60,000	0.294	A	0.251	A	0.043	No
	Corporate Center Drive to Heritage Road	6-Ln Prime Arterial	6-Ln w / RM	12,840	60,000	0.214	A	0.159	A	0.055	No

TABLE 6.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT CONDITIONS – CITY OF SAN DIEGO

Roadway	Segment	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	With Project		Without Project		Δ V/C	SI?
						V/C	LOS	V/C	LOS		
Otay Mesa Road	Heritage Road to Cactus Road	6-Ln Prime Arterial	6-Ln w / RM	16,930	60,000	0.282	A	0.137	A	0.145	No
	Cactus Road to Britannia Boulevard	6-Ln Prime Arterial	6-Ln w / RM	21,800	60,000	0.363	A	0.163	A	0.200	No
	Britannia Boulevard to Saint Andrews Avenue	6-Ln Prime Arterial	6-Ln w / RM	15,740	60,000	0.262	A	0.177	A	0.085	No
	Saint Andrews Avenue to La Media Road	6-Ln Prime Arterial	6-Ln w / RM	11,240	60,000	0.187	A	0.145	A	0.043	No
	La Media Road to Piper Ranch Road	6-Ln Prime Arterial	6-Ln w / RM	18,750	60,000	0.313	A	0.282	A	0.030	No
Camino Maquiladora	Pacific Rim Court to Cactus Road	2-Ln Collector w/ Commercial Fronting	2-Ln	2,070	8,000	0.259	A	0.167	A	0.092	No
	Cactus Road to Otay Heights Court	2-Ln Collector w/ Commercial Fronting	2-Ln	1,860	8,000	0.233	A	0.096	A	0.137	No
Airway Road	Otay Mesa Road to Caliente Avenue	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w / CLTL	5,380	30,000	0.179	A	0.131	A	0.049	No
	Caliente Avenue to Eastern Terminus	3-Ln Major Arterial	3-Ln w / RM (2-EB, 1-WB)	240	30,000[3]	0.008	A	0.008	A	0.000	No
	Heritage Road to Street "A"	6-Ln Prime Arterial	6-Ln w / RM	3,640	60,000	0.061	A	Does Not Exist			No

TABLE 6.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT CONDITIONS – CITY OF SAN DIEGO

Roadway	Segment	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	With Project		Without Project		Δ V/C	SI?
						V/C	LOS	V/C	LOS		
Airway Road	Street "A" to Village Way	6-Ln Prime Arterial	6-Ln w / RM	9,090	60,000	0.152	A	Does Not Exist			No
	Village Way to Cactus Road	6-Ln Prime Arterial	6-Ln w / RM	14,550	60,000	0.243	A	Does Not Exist			No
	Cactus Road to Continental Road	4-Ln Major Arterial	4-Ln w / RM (1EB, 3WB)	32,410	33,333[4]	0.972	**E**	0.279	A	0.693	**Yes**
	Continental Road to Britannia Boulevard	2-Ln Collector w/ Commercial Fronting	2-Ln	32,510	8,000	4.064	**F**	0.292	A	3.772	**Yes**
	Britannia Boulevard to La Media Road	2-Ln Collector w/ Commercial Fronting	2-Ln	6,570	8,000	0.821	**E**	0.366	B	0.455	**Yes**
	La Media Road to Avenida Costa Azul	2-Ln Collector w/ Commercial Fronting	2-Ln	7,930	8,000	0.991	**E**	0.855	**E**	0.136	**Yes**
	Avenida Costa Azul to Piper Ranch Road	4-Ln Major Arterial	4-Ln w / RM	7,930	40,000	0.198	A	0.171	A	0.027	No
	Piper Ranch Road to Harvest Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	6,320	15,000	0.421	B	0.373	B	0.049	No
	Harvest Road to Sanyo Avenue	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	5,150	15,000	0.343	B	0.319	B	0.024	No
Beyer Boulevard	Park Avenue to Otay Mesa Road	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w / CLTL	4,850	30,000	0.162	A	0.137	A	0.024	No
	Otay Mesa Road to East of Otay Mesa Road	2-Ln Collector No Fronting Property	2-Ln	480	10,000	0.048	A	0.047	A	0.001	No

TABLE 6.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT CONDITIONS – CITY OF SAN DIEGO

Roadway	Segment	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	With Project		Without Project		Δ V/C	SI?
						V/C	LOS	V/C	LOS		
Siempre Viva Road	Cactus Road to Britannia Boulevard	2-Ln Collector w/ Commercial Fronting	2-Ln	6,870	8,000	0.859	**E**	0.268	A	0.591	**Yes**
	Britannia Boulevard to La Media Road	2-Ln Collector w/ Commercial Fronting	2-Ln	6,110	8,000	0.764	D	0.173	A	0.591	No
	La Media Road to Customhouse Plaza	6-Ln Prime Arterial	6-Ln w / RM	13,560	60,000	0.226	A	0.171	A	0.055	No
	Customhouse Plaza to Otay Center Drive	6-Ln Prime Arterial	6-Ln w / RM	11,570	60,000	0.193	A	0.175	A	0.018	No
	Otay Center Drive to SR-905 SB Ramps	6-Ln Prime Arterial	6-Ln w / RM	20,680	60,000	0.345	A	0.333	A	0.012	No
	SR-905 SB Ramps to SR-905 SB Off-Ramp	6-Ln Prime Arterial	6-Ln w / RM	26,360	60,000	0.439	B	0.427	B	0.012	No
	SR-905 SB Off-Ramp to SR-905 NB Ramps	6-Ln Prime Arterial	6-Ln w / RM	19,610	60,000	0.327	A	0.315	A	0.012	No
	SR-905 NB Ramps to East of SR-905 Ramps	6-Ln Prime Arterial	6-Ln w / RM	25,990	60,000	0.433	B	0.421	B	0.012	No
Customhouse Plaza	Siempre Viva Road to Southern Terminus	2-Ln Collector w/ Commercial Fronting	2-Ln	2,120	8,000	0.265	A	0.174	A	0.092	No

Source: Chen Ryan Associates; November 2016

Notes:
Bold letter indicates substandard LOS.
V/C = Volume to Capacity Ratio.
RM = Raised Median.
SM = Striped Median.
CLTL = Continuous Left-Turn Lane.
[1] Based on the Capacity of a 6-Ln Prime Arterial, reduced to exclude a lane. (5/6*60,000 = 50,000)
[2] Based on the capacity of a 4-Ln Collector, reduced to exclude a lane. (3/4*15,000 = 11,250)
[3] Based on the Capacity of a 4-Lane Major Arterial, reduced to exclude a lane. (3/4*40,000 = 30,000)
[4] Based on the Capacity of a 6-Lane Major Arterial, reduced to exclude two lanes. (4/6*50,000 = 33,333)
Δ = Change in V/C Ratio.
SI? = Significant Impact?

As shown in the Table 6.1, all of the roadway segments located in the City of San Diego are projected to operate at acceptable LOS with the addition of project traffic with the following seven (7) exceptions:

- Britannia Boulevard, between SR-905 EB Ramps and Airway Road is projected to operate at substandard LOS E with the addition of project traffic. The volume to capacity ratio is projected to increase from 0.459 under Existing conditions to 0.947 under Existing Plus Project conditions, resulting in a net increase of 0.487. This increase in volume to capacity ratio causes the roadway segment to transition from an acceptable LOS B to a substandard LOS E.

  Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.
- La Media Road, Airway Road and Avenida De La Fuente, between Airway Road and Avenida De La Fuente is projected to remain at substandard LOS E. The volume to capacity ratio is projected to remain at 0.996 under Existing Plus Project conditions, resulting in a net increase of 0.

  Based upon the significance criteria presented in Section 2.7, facility improvements would not be required at the aforementioned roadway segment.
- Airway Road, between Cactus Road and Continental Road is projected to operate at substandard LOS E with the addition of project traffic. The volume to capacity ratio is projected to increase from 0.279 under Existing conditions to 0.972 under Existing Plus Project conditions, resulting in a net increase of 0.693. This increase in volume to capacity ratio causes the roadway segment to transition from an acceptable LOS A to a substandard LOS E.

  Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment.

- Airway Road, between Continental Road and Britannia Boulevard is projected to operate at substandard LOS F with the addition of project traffic. The volume to capacity ratio is projected to increase from 0.292 under Existing conditions to 4.064 under Existing Plus Project conditions, resulting in a net increase of 3.772. This increase in volume to capacity ratio causes the roadway segment to transition from an acceptable LOS A to a substandard LOS F.

  Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.

- Airway Road, between Britannia Boulevard and La Media Road is projected to operate at substandard LOS E with the addition of project traffic. The volume to capacity ratio is projected to increase from 0.366 under Existing conditions to 0.821 under Existing Plus Project conditions, resulting in a net increase of 0.455. This increase in volume to capacity

ratio causes the roadway segment to transition from an acceptable LOS B to a substandard LOS E.

Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.

- Airway Road, between La Media Road and Avenida Costa Azul is projected to operate at substandard LOS E with the addition of project traffic. The volume to capacity ratio is projected to increase from 0.855 under Existing conditions to 0.991 under Existing Plus Project conditions, resulting in a net increase of 0.136. This increase in volume to capacity ratio is above the allowable 0.02 threshold although the LOS would remain to be LOS E.

  Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.

- Siempre Viva Road, between Cactus Road and Britannia Boulevard is projected to operate at substandard LOS E with the addition of project traffic. The volume to capacity ratio is projected to increase from 0.268 under Existing conditions to 0.859 under Existing Plus Project conditions, resulting in a net increase of 0.591. This increase in volume to capacity ratio causes the roadway segment to transition from an acceptable LOS A to a substandard LOS E.

Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR. **Table 6.2** displays the LOS analysis results for the roadway segment located in the City of Chula Vista under Existing Plus Project conditions. As shown in the table, the roadway segment located in the City of Chula Vista is projected to operate at acceptable LOS C with the addition of project traffic.

TABLE 6.2
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT CONDITIONS – CITY OF CHULA VISTA

Roadway	Segment	Functional Classification	Cross-Section	ADT	LOS Threshold (LOS C)	LOS w/ Project	Project Contribution ≥ 5%?	Project ADT > 800?	Intersection along Segment Operating @ LOS D or Better?	SI?
Heritage Road	Main Street to Avenida De Las Vistas	Class II Collector	2-Ln w/ CLTL	11,810	15,000	C	Yes	Yes	Yes	No

Source: Chen Ryan Associates; April 2016

Notes:
CLTL = Continuous-Left-Turn Lane.
SI? = Significant Impact?

Intersection Analysis

Table 6.3 displays LOS and average vehicle delay results for the intersections under Existing Plus Project conditions. LOS calculation worksheets for the Existing Plus Project conditions are provided in **Appendix E**.

TABLE 6.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT CONDITIONS

ID	Intersection	Control Type	AM Peak Hour		PM Peak Hour		Delay w/o Project (sec) AM/PM	LOS w/o Project AM/PM	Change in Delay (sec)	SI?
			Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS				
1	Beyer Boulevard / Otay Mesa Road	Signalized	11.0	B	12.1	B	10.3 / 11	B / B	0.7 / 1.1	No
2	Ocean View Hills Parkway / Del Sol Boulevard	Signalized	15.2	B	11.5	B	12.3 / 11.4	B / B	2.9 / 0.1	No
3	Ocean View Hills Parkway / Otay Mesa Road	Signalized	16.2	B	37.2	D	15.8 / 36.6	B / D	0.4 / 0.6	No
4	Caliente Avenue / SR-905 WB Ramps	Signalized	9.7	A	10.7	B	5.8 / 8.7	A / A	3.9 / 2.0	No
5	Caliente Avenue / SR-905 EB Ramps	Signalized	24.4	C	15.9	B	23.7 / 15.3	C / B	0.7 / 0.6	No
6	Caliente Avenue / Airway Road	AWSC	9.5	A	11.7	B	7.8 / 8.7	A / A	1.7 / 3.0	No
7	Innovative Drive / Otay Mesa Road	SSSC	9.5	A	11.8	B	9.1 / 10.6	A / B	0.4 / 1.2	No
8	Heritage Road / Avenida De Las Vistas	AWSC	11.7	B	15.1	C	8.5 / 9.2	A / A	3.2 / 5.9	No
9	Heritage Road / Datsun Street	AWSC	15.0	B	32.4	D	8.9 / 12.4	A / B	6.1 / 20.0	No
10	Heritage Road / Otay Mesa Road	Signalized	36.8	D	52.8	D	37.4 / 28.8	D / C	-0.6 / 24	No
11	Heritage Road / Gateway Park Drive	AWSC	8.0	A	8.0	A	7.5 / 7.1	A / A	0.5 / 0.9	No
12	Heritage Road / Airway Road	Signalized	7.2	A	9.8	A	N/A			No
13	Cactus Road / Otay Mesa Road	Signalized	13.5	B	30.4	C	14.1 / 21.8	B / C	-0.6 / 8.6	No
14	Cactus Road / Airway Road	Signalized	22.6	C	29.8	C	9.4 / 9.6	A / A	13.2 / 20.2	No
15	Cactus Road / Siempre Viva Road	AWSC	12.5	B	22.9	C	7.9 / 8.2	A / A	4.6 / 14.7	No

TABLE 6.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT CONDITIONS

ID	Intersection	Control Type	AM Peak Hour		PM Peak Hour		Delay w/o Project (sec) AM/PM	LOS w/o Project AM/PM	Change in Delay (sec)	SI?
			Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS				
16	Britannia Boulevard / Otay Mesa Road	Signalized	53.2	D	344.2	**F**	25.1 / 34.1	C / C	28.1 / 310.1	**Yes**
17	Britannia Boulevard / SR-905 WB Ramps	Signalized	15.3	B	33.6	C	11.5 / 14	B / B	3.8 / 19.6	No
18	Britannia Boulevard / SR-905 EB Ramps	Signalized	47.9	D	50.8	D	9.8 / 13.2	A / B	38.1 / 37.6	No
19	Britannia Boulevard / Airway Road	Signalized	321.6	**F**	492.2	**F**	16.0 / 41.2	B / D	305.6 / 451.0	**Yes**
20	Britannia Boulevard / Siempre Viva Road	Signalized	26.2	C	52.6	D	12.5 / 15.6	B / B	13.7 / 37	No
21	Saint Andrews Avenue / Otay Mesa Road	Signalized	8.3	A	9.7	A	6.3 / 6.9	A / A	2.0 / 2.8	No
22	La Media Road / Otay Mesa Road	Signalized	54.1	D	53.0	D	52.8 / 52	D / D	1.3 / 1.0	No
23	La Media Road / Airway Road	Signalized	7.8	A	13.7	B	6.5 / 8.4	A / A	1.3 / 5.3	No
24	La Media Road / Siempre Viva Road	AWSC	12.1	B	17.5	C	9.0 / 9.4	A / A	3.1 / 8.1	No
25	Piper Ranch Road / Otay Mesa Road	Signalized	9.3	A	10.9	B	9.3 / 10.9	A / B	0.0 / 0.0	No
26	Harvest Road / Airway Road	AWSC	9.2	A	10.2	B	9.1 / 9.9	A / A	0.1 / 0.3	No
27	Customhouse Plaza / Siempre Viva Road	Signalized	8.6	A	12.1	B	13.7 / 9.4	B / A	-5.1 / 2.7	No
28	Otay Center Drive / Siempre Viva Road	Signalized	14.8	B	16.2	B	14.1 / 15.9	B / B	0.7 / 0.3	No
29	SR-905 SB Ramps / Siempre Viva Road	Signalized	3.9	A	4.6	A	3.8 / 4.6	A / A	0.1 / 0.0	No
30	SR-905 SB Off-Ramp / Siempre Viva Road	SSSC	15.8	C	15.1	C	15.6 / 14.6	C / B	0.2 / 0.5	No
31	SR-905 NB Off-Ramp / Siempre Viva Road	Signalized	12.3	B	14.5	B	12.3 / 14.4	B / B	0.0 / 0.1	No
32	Sanyo Avenue / Airway Road	AWSC	9.2	A	10.1	B	9.1 / 9.8	A / A	0.1 / 0.3	No
33	Street "A" / Airway Road	Signalized	6.3	A	6.1	A	N/A			No
34	Village Way / Airway Road	Signalized	25.2	C	13.6	B	N/A			No

TABLE 6.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT CONDITIONS

ID	Intersection	Control Type	AM Peak Hour		PM Peak Hour		Delay w/o Project (sec) AM/PM	LOS w/o Project AM/PM	Change in Delay (sec)	SI?
			Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS				
35	Cactus Road / Street "D"	Signalized	13.8	B	12.7	B	N/A			No
36	Cactus Road / Central Main Street	Signalized	11.7	B	12.3	B	N/A			No
37	Cactus Road / Street "C"	Signalized	3.9	A	3.3	A	N/A			No
38	Park Way / Airway Road	SSSC	9.5	A	15.1	C	N/A			No
39	Continental Road / Airway Road	Signalized	33.6	C	197.1	**F**	N/A			**Yes**

Source: Chen Ryan Associates; November 2016

Notes:
Bold letter indicated substandard LOS.
AWSC = All-Way Stop Controlled.
SSSC = Side-Street Stop Controlled, the delay shown is the worst delay experienced by any of the approaches.
N/A = Not analyzed under this scenario.
SI? = Significant Impact?

As shown in the table, all of the study area intersections will continue to operate at acceptable LOS D or better during both the AM and PM peak hours with the addition of project traffic, with the following three (3) exceptions:

16. Britannia Boulevard / Otay Mesa Road (LOS F during the PM peak hour) - the intersection of Britannia Boulevard and Otay Mesa Road is projected to operate at LOS F during the PM peak hour under Existing Plus Project conditions. The overall intersection delay is projected to increase from 34.1 seconds of delay under Existing conditions to 344.2 seconds of delay under Existing Plus Project conditions, resulting in a net increase of 310.1 seconds of overall delay. This increase in overall delay caused the PM peak hour traffic operations to degrade from LOS C to a substandard LOS F.

    Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned intersection. The required improvements are consistent with the improvements stated in the OMCPU EIR.

19. Britannia Boulevard / Airway Road (LOS E during the PM peak hour) - the intersection of Britannia Boulevard and Airway Road is projected to operate at LOS F during the AM and PM peak hour under Existing Plus Project conditions. The overall intersection delay during the AM peak hour is projected to increase from 16.0 seconds of delay under Existing conditions to 321.6 seconds of delay under Existing Plus Project conditions, resulting in a net increase of 305.6 seconds of overall delay. The overall intersection delay during the PM peak hour is projected to increase from 41.2 seconds of delay under Existing

conditions to 488.5 seconds of delay under Existing Plus Project conditions, resulting in a net increase of 447.3 seconds of overall delay. This increase in overall delay caused the AM and PM peak hour traffic operations to degrade from LOS B and D, respectively, to a substandard LOS F.

Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned intersection. The required improvements are consistent with the improvements stated in the OMCPU EIR.

39. Continental Road / Airway Road (LOS F during both AM and PM peak hours) - the intersection of Continental Road and Airway Road is projected to operate at LOS F during the PM peak hour under Existing Plus Project conditions. The overall intersection delay during the PM peak hour is projected to be 197.1 seconds under Existing Plus Project conditions.

    Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned intersection.

Ramp Intersection Capacity Analysis

Consistent with Caltrans requirements, the signalized ramp intersections of SR-905 were analyzed using ILV procedures, as described in Section 2.4. ILV analysis results are displayed in **Table 6.4** and analysis worksheets for the Existing Plus Project conditions are provided in Appendix E.

TABLE 6.4
RAMP INTERSECTION CAPACITY ANALYSIS
EXISTING PLUS PROJECT CONDITIONS

Ramp Intersection	Peak Hour	ILV / Hour	Description
Caliente Avenue and SR-905 EB Ramps	AM	839	*Under Capacity*
	PM	814	*Under Capacity*
Caliente Avenue and SR-905 WB Ramps	AM	579	*Under Capacity*
	PM	1,130	*Under Capacity*
Britannia Boulevard and SR-905 EB Ramps	AM	1,267	*At Capacity*
	PM	1,317	*At Capacity*
Britannia Boulevard and SR-905 WB Ramps	AM	709	*Under Capacity*
	PM	1,253	*At Capacity*
Siempre Viva Road and SR-905 NB Ramps	AM	584	*Under Capacity*
	PM	870	*Under Capacity*
Siempre Viva Road and SR-905 SB Ramps	AM	449	*Under Capacity*
	PM	470	*Under Capacity*

Source: Chen Ryan Associates; April 2016

Notes:
Lower than 1,200 ILV/hour = Under Capacity
Between 1,200 and 1,500 ILV/hour = At Capacity
Higher than 1500 ILV/hour = Over Capacity

As shown, all of the study ramp intersections would operate at “At Capacity” or better conditions with the addition of project traffic.

Freeway Segment Analysis

Table 6.5 displays freeway segment level of service results for the study area freeway mainline facilities under Existing Plus Project conditions. The freeway segment level of service analysis was performed utilizing the methodology presented in Section 2.6.

As shown in Table 6.5, all of the freeway segments are projected to operate at acceptable LOS D or better under Existing Plus Project conditions.

TABLE 6.5
FREEWAY SEGMENT ANALYSIS
EXISTING PLUS PROJECT CONDITIONS

Freeway	Segment	ADT	Direction	# of Lanes	Capacity[a]	D[b]	K[c]	HVF[d]	Peak Hour Volume	V/C	LOS[f]	Peak Hour	Without Project		Δ V/C Ratio	SI?
													V/C	LOS		
I-805	Main Street and Palm Avenue	139,600	NB	4M+1A	10,810	64.6%	5.9%	10.0%	5,590	0.517	B	AM	0.511	B	0.006	No
			SB	4M+1A	10,810	56.7%	8.0%	10.0%	6,680	0.618	B	PM	0.611	B	0.007	No
	Palm Avenue and SR-905	118,800	NB	4M+1A	10,810	64.6%	5.9%	10.0%	4,760	0.440	B	AM	0.433	B	0.007	No
			SB	4M+1A	10,810	56.7%	8.0%	10.0%	5,680	0.525	B	PM	0.518	B	0.007	No
SR-905	Picador Boulevard and I-805	62,900	NB	2M+1A	6,110	64.4%	8.4%	10.0%	3,590	0.588	B	AM	0.561	B	0.027	No
			SB	2M+1A	6,110	64.4%	8.4%	10.0%	3,590	0.588	B	PM	0.560	B	0.028	No
	I-805 and Caliente Avenue	73,700	NB	4M	9,400	53.1%	7.5%	10.0%	3,070	0.327	A	AM	0.306	A	0.021	No
			SB	3M+1A	8,460	59.9%	8.2%	10.0%	3,810	0.450	B	PM	0.422	B	0.028	No
	Caliente Avenue and Heritage Road	68,200	NB	3M	7,050	53.1%	7.5%	10.0%	1,390	0.197	A	AM	0.176	A	0.021	No
			SB	3M	7,050	59.9%	8.2%	10.0%	1,140	0.162	A	PM	0.145	A	0.017	No
	Heritage Road and Britannia Boulevard	68,200	NB	3M	7,050	53.1%	7.5%	10.0%	680	0.096	A	AM	0.087	A	0.009	No
			SB	3M	7,050	59.9%	8.2%	10.0%	680	0.096	A	PM	0.087	A	0.009	No
	Britannia Boulevard and La Media Road	50,300	NB	3M+1A	8,460	53.1%	7.5%	10.0%	330	0.039	A	AM	0.039	A	0.000	No
			SB	3M	7,050	59.9%	8.2%	10.0%	360	0.051	A	PM	0.050	A	0.001	No
	La Media Road and SR-125	40,300	NB	3M	7,050	53.1%	7.5%	10.0%	200	0.028	A	AM	0.028	A	0.000	No
			SB	3M	7,050	59.9%	8.2%	10.0%	220	0.031	A	PM	0.031	A	0.000	No

Source: Chen Ryan Associates; November 2016

Notes:
Bold letter indicated substandard LOS.
SI? = Significant Impact?
M = Mainline. A = Auxiliary Lane.
[a] The capacity is calculated as 2,350 ADT per main lane and 1,410 ADT (60% of the main lane capacity) per auxiliary lane.
[b] D = Directional split.| [c] K = Peak hour %. | [d] HV = Heavy vehicle % - consistent with the OMCPU. | [(f)] LOS during highest directional demand.

6.3 Recommended Improvements

This section identifies required improvements for roadway, intersection, and freeway facilities that are associated with buildout of the Otay Mesa Central Village Specific Plan under Existing Plus Project conditions. Procedure for determining the ADT threshold, facility improvements trigger identification, as well as associated worksheets are provided in **Appendix F**. **Figure 6-5** illustrates the recommended study area roadway segment and intersection improvements under the Existing Plus Project conditions.

Roadway Segments

- *Britannia Boulevard, between SR-905 Eastbound Ramps and Airway Road* – The Project shall widen this roadway from a 5-lane roadway (2 NB & 3 SB) to a 6-lane Prime Arterial prior to the project's **total trip generation** of 37,678 ADT. This cross-section along Britannia Boulevard is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this roadway segment would operate at LOS F with buildout of the OMCPU. As shown in Table 6.6, this segment would operate at LOS C with the recommended improvements under Existing Plus Project conditions. It is important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.
- *Airway Road, between Cactus Road and Continental Road* – The Project shall widen this roadway segment from a 4-lane roadway (1 EB & 3 WB) to a 6-lane Major Arterial prior to the project's **total trip generation** of 36,926 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this roadway segment would operate at LOS D with buildout of the OMCPU. As shown in Table 6.6, this segment would operate at LOS C with the recommended improvements under Existing Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be

phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.

- *Airway Road, between Continental Road and Britannia Boulevard* – The Project shall widen this roadway segment from a 2-lane roadway to a 6-lane Major Arterial prior to the project's **total trip generation** of 5,543 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this roadway segment would operate at LOS D with buildout of the OMCPU. As shown in Table 6.6, this segment would operate at LOS C with the recommended improvements under Existing Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.
- *Airway Road, between Britannia Boulevard and La Media Road* - The Project shall widen this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 39,437 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this roadway segment would operate at LOS D with buildout of the OMCPU. As shown in Table 6.6, this segment would operate at LOS A with the recommended improvements under Existing Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.

- *Airway Road, between La Media Road and Avenida Costa Azul* – The Project shall widen this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 5,886 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this roadway segment would operate at LOS D with buildout of the OMCPU. As shown in Table 6.6, this segment would operate at LOS A with the recommended improvements under Existing Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.

- *Siempre Viva Road, between Cactus Road and Britannia Boulevard* – The Project shall widen this roadway segment from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 37,001 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this roadway segment would operate at LOS C with buildout of the OMCPU. As shown in Table 6.6, this segment would operate at LOS A with the recommended improvements under Existing Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.

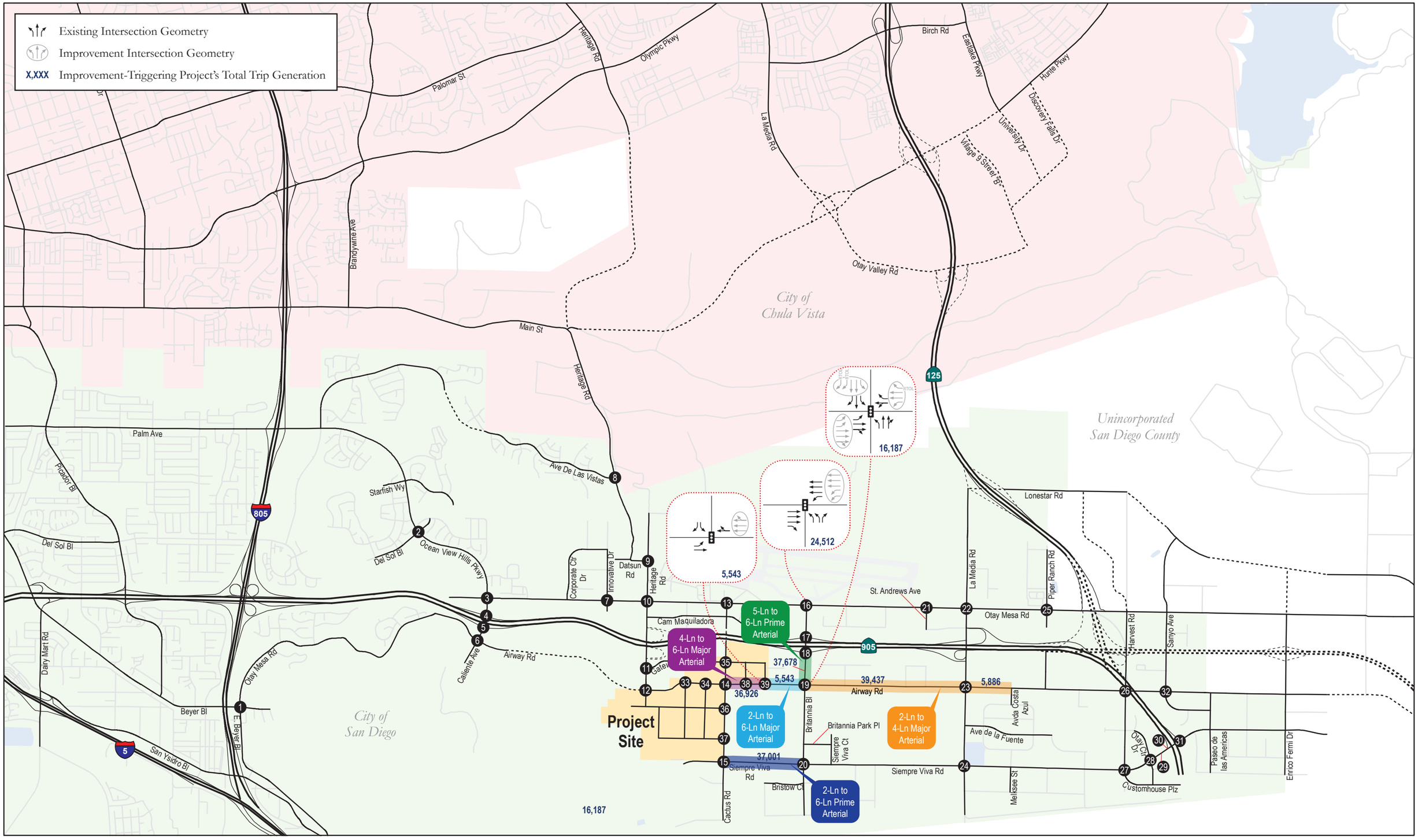


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Figure 6-5

Geometrics with Recommended Improvements - Existing Plus Project Conditions

Table 6.6 displays level of service analysis results both before and after implementation of the recommended improvements at the deficient roadway segments under Existing Plus Project conditions.

TABLE 6.6
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT CONDITIONS – WITH IMPROVEMENTS

		Before Improvements			After Improvements		
Roadway	Segment	ADT	Cross Section	LOS	ADT	Cross Section	LOS
Britannia Boulevard	SR-905 EB Ramps to Airway Road	47,330	5-Ln w / RM (2-NB, 3-SB)	**E**	47,330	6-Ln w / RM (Prime Arterial)	C
Airway Road	Cactus Road to Continental Road	32,410	4-Ln w / RM (1-EB, 3-WB)	**E**	32,410	6-Ln w / RM (Major Arterial)	C
	Continental Road to Britannia Boulevard	32,510	2-Ln	**F**	32,510	6-Ln w/ RM (Major Arterial)	C
	Britannia Boulevard to La Media Road	6,570	2-Ln	**F**	6,570	4-Ln w/ RM (Major Arterial)	A
	La Media Road to Avenida Costa Azul	7,930	2-Ln	**F**	7,930	4-Ln w/ RM (Major Arterial)	A
Siempre Viva Road	Cactus Road to Britannia Boulevard	6,870	2-Ln	**E**	6,870	6-Ln w/ RM (Major Arterial)	A

Source: Chen Ryan Associates; November 2016

Notes:
Bold letter indicates substandard LOS.
RM = Raised Median.

Intersections

Facility improvements associated with buildout of the Otay Mesa Central Village Specific Plan would be required at the following three (3) intersections:

16. *Britannia Boulevard / Otay Mesa Road* – The Project shall restripe an additional exclusive left-turn lane at the westbound approach of the intersection of Britannia Boulevard / Otay Mesa Road prior to the project's **total trip generation** of 24,512 ADT. This recommended additional westbound left-turn lane is within the intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS E in the AM peak hour and LOS D in the PM peak hour with buildout of the OMCPU. As shown in Table 6.7, this intersection would operate at LOS D during both peak hours with the recommended improvements under Existing Plus Project conditions. It is important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.

19. *Britannia Boulevard / Airway Road* – The Project shall widen the eastbound approach (Airway Road) of this intersection to accommodate dual left-turn lanes, two through lanes, and a through-right-turn shared lane, restripe the westbound approach (Airway Road) to accommodate an exclusive left-turn lane, two through lanes, and an exclusive right-turn lane with right-turn overlap phasing, and widen the southbound approach (Britannia Boulevard) to accommodate an exclusive left-turn lane, two through lanes, and two exclusive right-turn lanes with right-turn overlap phasing, prior to the project's **total trip generation** of 16,187 ADT. These recommended improvements are within the intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F during both peak hours with buildout of the OMCPU. As shown in Table 6.7, this intersection would operate at LOS D during both peak hours with the recommended improvements under Existing Plus Project conditions. It is important to note that interim improvement with fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.

39. *Continental Road / Airway Road* – As described earlier in this section under "Roadway Segments", Airway Road between Continental Road and Britannia Boulevard shall be widened from a 2-lane roadway to a 6-lane Major Arterial prior to the project's **total trip generation** of 5,543 ADT by the project applicant. This improvement will improve traffic

operations at this intersection. As shown in Table 6.7, this intersection would operate at LOS D during the AM peak hour and LOS B during the PM peak hour with the recommended improvements under Existing Plus Project conditions. It is important to note that this improvement and identified trigger have been identified at the program level, only. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement and identified trigger have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements on a project-by-project basis.

Table 6.7 displays level of service analysis results both the before and after implementation of the recommended improvements at the deficient intersections under Existing Plus Project conditions.

TABLE 6.7
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT CONDITIONS – WITH IMPROVEMENTS

			Before Improvements				After Improvements			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
ID	Intersection	Control	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS
16	Britannia Boulevard / Otay Mesa Road	Signalized	53.2	D	344.2	**F**	42.1	D	48.8	D
19	Britannia Boulevard / Airway Road	Signalized	321.6	**F**	492.2	**F**	51.5	D	46.1	D
39	Continental Road / Airway Road	Signalized	33.6	C	197.1	**F**	36.5	D	13.9	B

Source: Chen Ryan Associates; November 2016

Note:
Bold letter indicated substandard LOS.

As shown in the table above, the recommended improvements would improve the traffic operations at the intersections impacted by the addition of the proposed project's traffic.

Freeway Segments

No freeway facilities would be significantly impacted with the addition of project traffic within the project study area, therefore, no freeway improvements are recommended under Existing Plus Project conditions.

7.0 Year 2025 Cumulative Traffic Conditions

This section provides an analysis of the expected year 2025 cumulative traffic conditions without the Otay Mesa Central Village Specific Plan project. The scenario analyzed in this section is:

- Year 2025 Cumulative (Existing Plus Cumulative Projects);

7.1 Description of Cumulative Projects

Cumulative projects include those that are approved or pending in the East Otay Mesa area (both in the City and County of San Diego). Due to the proposed project's close proximity to the City of Chula Vista, cumulative growth within the City of Chula Vista was also taken into account when developing the cumulative traffic volumes.

The Cumulative model forecast was based on the recent City of Chula Vista and County of San Diego approved model (developed for the Otay Ranch Resort Village 13 project). Note that some of the cumulative projects have been constructed and occupied when traffic counts were collected (October 2015) for this Project, however, based on further review together with City staff, it was determined that the Cumulative model forecast used for the analyses of this Project represents a more conservative assessment and the worst-case scenario. Year 2025 Cumulative traffic model land use assumptions as well as the list of cumulative projects included in the model are provided in **Appendix G.**

7.2 Year 2025 Cumulative (Existing Plus Cumulative Projects) Conditions Roadway Network and Traffic Volumes

The Year 2025 Cumulative roadway network was assumed to be largely identical to the Existing conditions network, with the inclusion of the following Capital Improvement Projects (CIP) and other known funded improvements:

- Heritage Road, between Olympic Parkway and Main Street – this facility is included as a 6-lane Prime Arterial under the Year 2025 Cumulative traffic conditions. As indicated in the City of Chula Vista's currently adopted General Plan Circulation Element, the ultimate classification for this section of the Heritage Road is a 6-lane Prime Arterial. This improvement project (STM374, OR836G, and OR837G) also includes the signalization of the intersection of Heritage Road / Main Street. Heritage Road connection is identified as a Mitigation Measure for multiple projects within the City of Chula Vista including the Village Two Comprehensive SPA Amendment (SCH #2003091012) and the University Villages Project (identified as MM TCA-4 in the University Villages FEIR, SCH # 2013071077). It is also a Chula Vista Transportation Development Impact Fee (TDIF) facility (STM 364 – Facility #57), and identified as a 6-lane Prime Arterial in the Chula Vista General Plan Circulation Plan – East. Heritage Road will be constructed by the two respective developers fronting this facility and the northern section of this road has been constructed to partial width in order to provide

access for Village Two. The University Villages FEIR identifies this project to be built by the year 2025. For additional information, see **Appendix H**.

- Heritage Road, south of Main Street to Chula Vista city limit – this facility is included as a 6-lane Prime Arterial under the Year 2025 Cumulative traffic conditions. As indicated in the City of Chula Vista's currently adopted General Plan Circulation Element, the ultimate classification designation for Heritage Road south of Main Street is a 6-lane Prime Arterial. This improvement project (STM364 - Heritage Road Bridge Replacement) is included in the Chula Vista adopted FY 2014-2015 through FY 2016-17 Capital Improvement Program (CIP) and will be funded by a mix of the Highway Bridge Program, Transportation Development Impact Fees, and other miscellaneous transportation grants. As of November 2016, the design is at approximately 35% and waiting on NEPA approval to finish design. The City of Chula Vista is expecting to start construction in late 2018 and complete in late 2020. For additional information, see Appendix H.

- Construction of Main Street, between Heritage Road and La Media Road, as a 6-lane Prime Arterial, including construction of Main Street Bridge. The construction of this segment of Main Street is included within the City's TDIF program and the first phase of the construction is included in the City's CIP Program for 2016-2017 (STM357). For additional information, see Appendix H.

Roadway geometrics under the Year 2025 Cumulative (Existing Plus Cumulative Projects) traffic conditions are displayed in **Figures 7-1**. Intersection geometrics under Year 2025 Cumulative Scenario are identical to existing conditions, as seen in Figure 5-2. **Figure 7-2** displays daily roadway and freeway traffic volumes, while **Figure 7-3** displays intersection peak hour traffic volumes. Traffic volumes for the Year 2025 Cumulative (Existing Plus Cumulative Projects) traffic conditions were derived based upon the most recent and the City of Chula Vista and County of San Diego approved model (developed for the Otay Ranch Resort Village 13 project), as described in Section 7.1.

7.3 Year 2025 Cumulative (Existing Plus Cumulative Projects) Traffic Conditions

LOS analyses for the Year 2025 Cumulative traffic conditions were conducted using the methodologies described in Chapter 2.0. Roadway segment, intersection, and freeway segment level of service, as well as freeway ramp intersection ILV analysis results for Cumulative traffic conditions are discussed separately below.

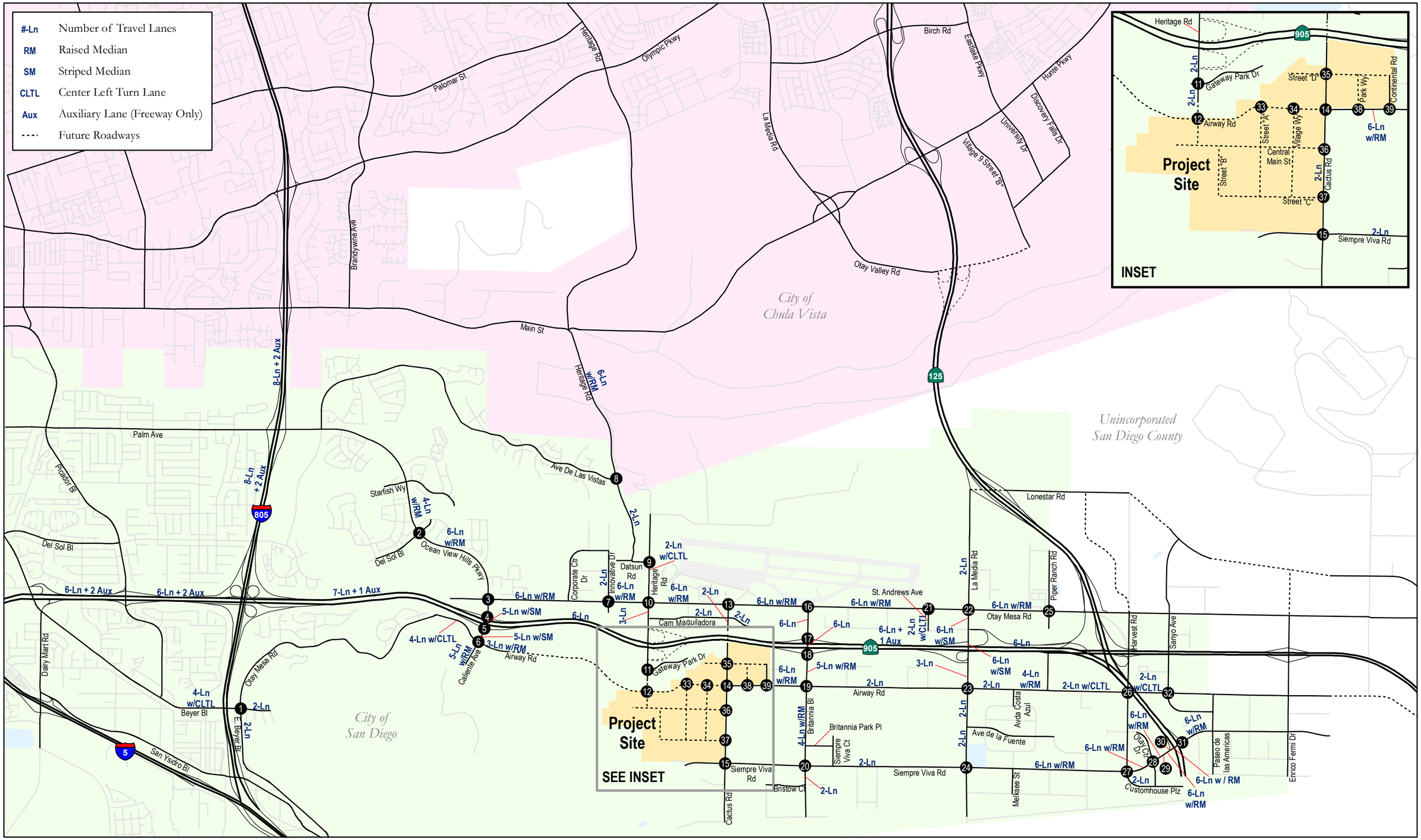

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Figure 7-1

Roadway Geometrics - Year 2025 Cumulative Traffic Conditions

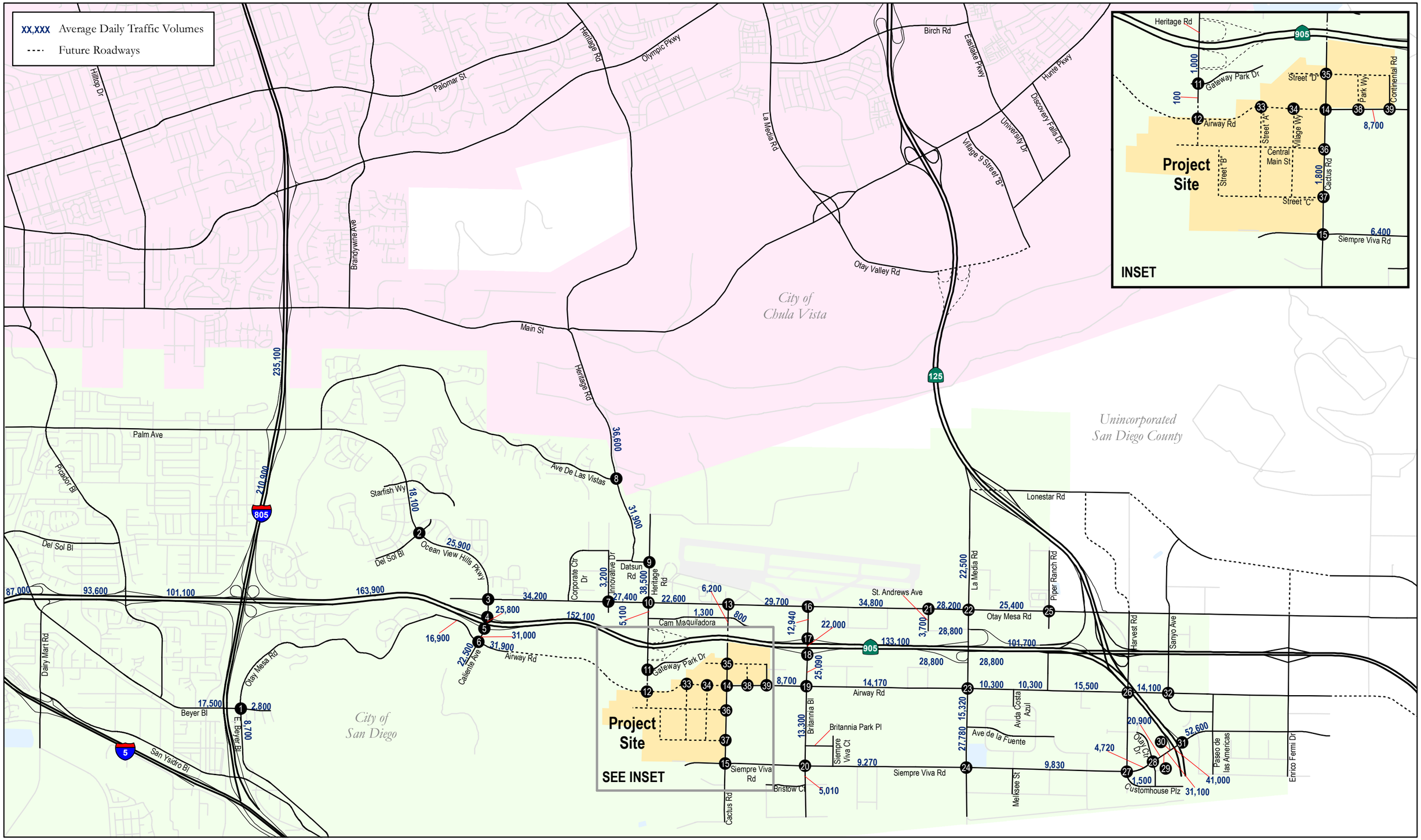

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Figure 7-2

Roadway Average Daily Traffic Volumes - Year 2025 Cumulative Traffic Conditions

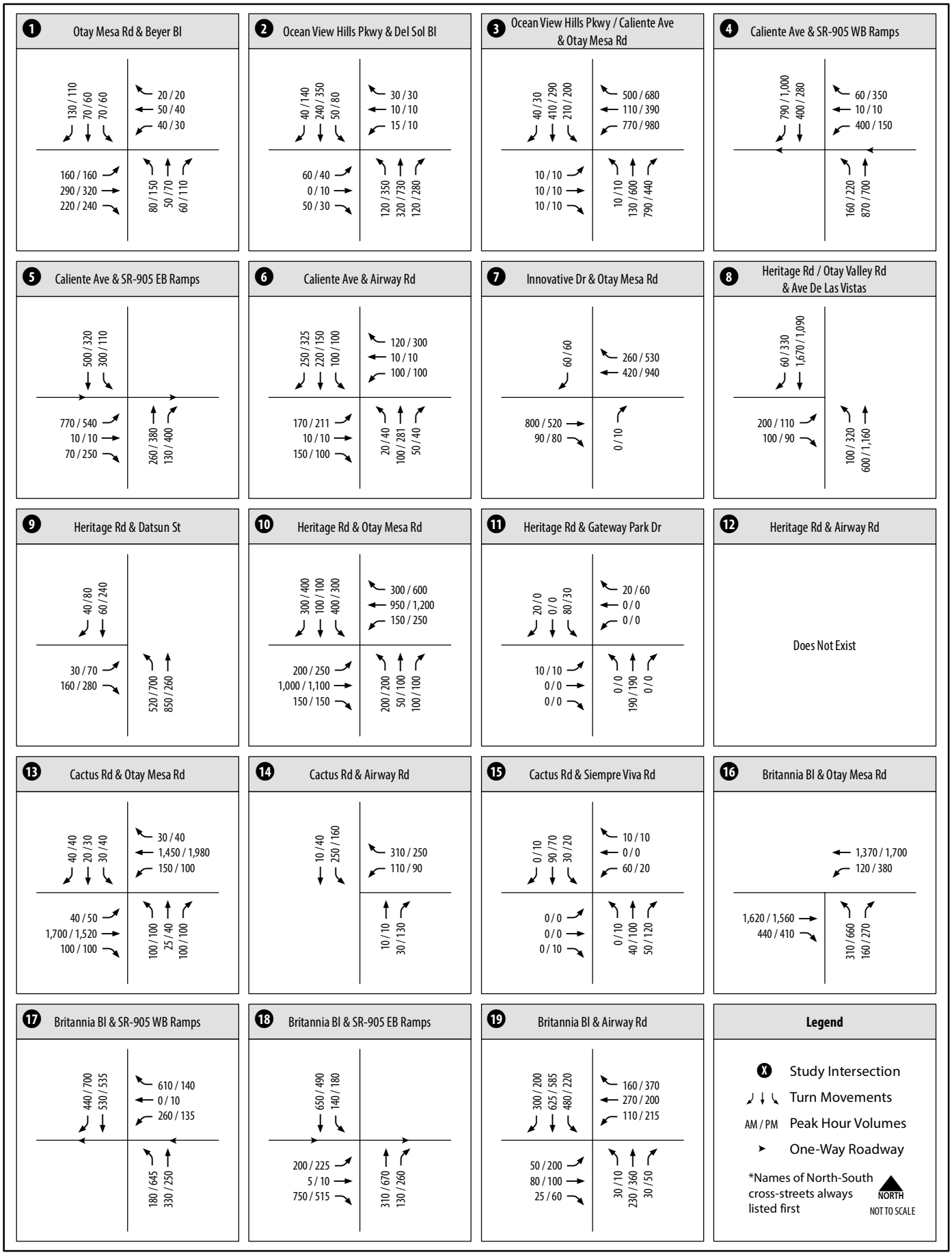

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Figure 7-3

AM/PM Peak Hour Intersection Volumes - Year 2025 Cumulative Traffic Conditions (Intersections 1-19)

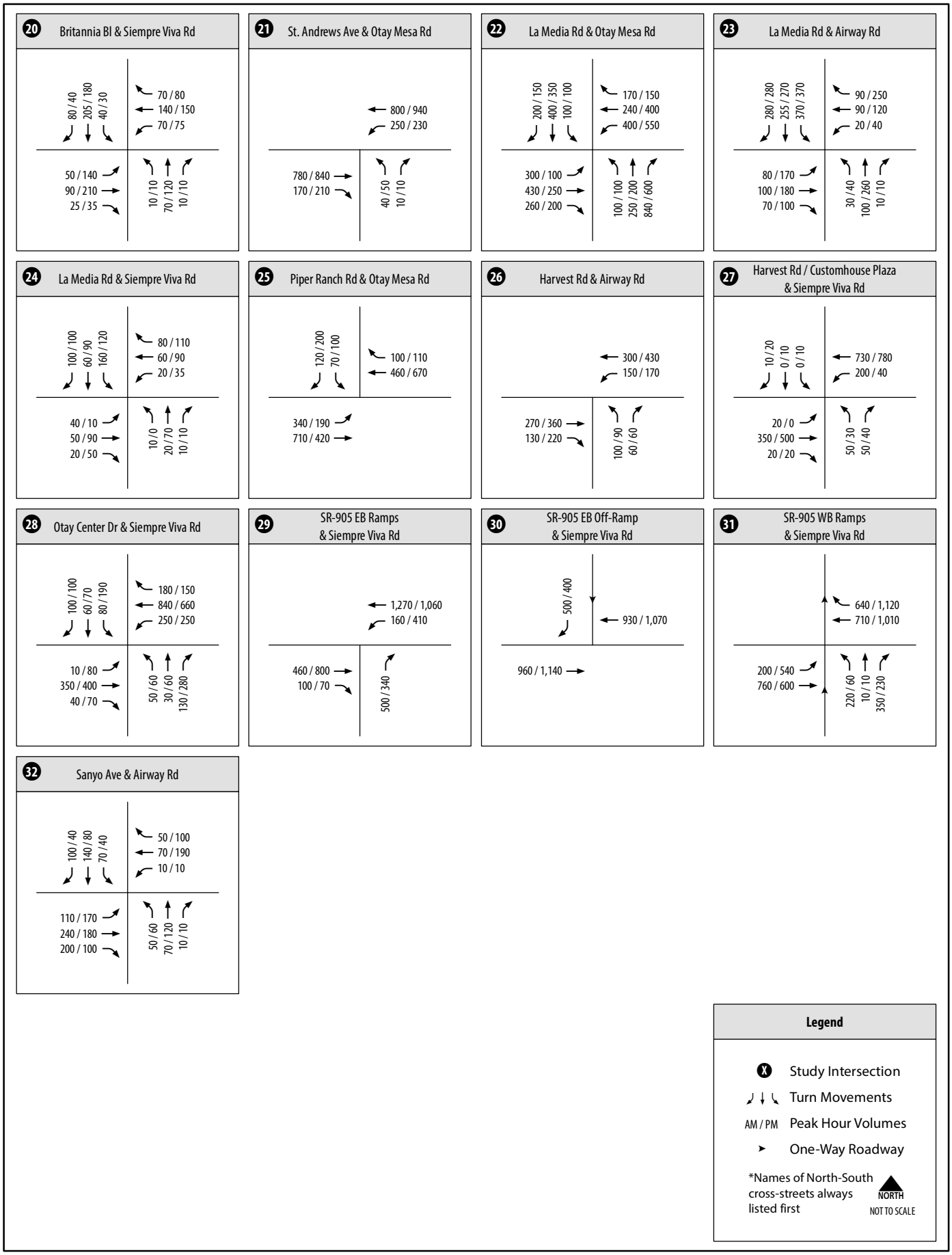

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Figure 7-3

AM/PM Peak Hour Intersection Volumes - Year 2025 Cumulative Traffic Conditions (Intersections 20-32)

Roadway Segment Analysis

Table 7.1 displays the Level of Service analysis results for key roadway segments located in the City of San Diego under the Cumulative traffic conditions.

TABLE 7.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE CONDITIONS – CITY OF SAN DIEGO

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
East Beyer Boulevard	Beyer Boulevard	South of Beyer Boulevard	2-Ln Collector No Fronting Property	2-Ln	8,700	10,000	0.870	D
Ocean View Hills Parkway	Starfish Way	Del Sol Boulevard	4-Ln Major Arterial	4-Ln w / RM	18,100	40,000	0.453	B
	Del Sol Boulevard	Otay Mesa Road	6-Ln Major Arterial	6-Ln w / RM	25,900	50,000	0.518	B
Caliente Avenue	SR-905 WB Ramps	SR-905 EB Ramps	5-Ln Prime Arterial	5-Ln w / SM (3-NB, 2-SB)	25,800	50,000[1]	0.516	B
	SR-905 EB Ramps	Airway Road	5-Ln Prime Arterial	5-Ln w / SM (3-NB, 2-SB)	31,000	50,000[1]	0.620	C
	Airway Road	Southern Terminus	5-Ln Prime Arterial	5-Ln w / RM (3-NB, 2-SB)	22,500	50,000[1]	0.450	B
Innovative Drive	Progressive Avenue	Otay Mesa Road	2-Ln Collector w/ Commercial Fronting	2-Ln	3,200	8,000	0.400	B
Heritage Road	Avenida De Las Vistas	Datsun Street	2-Ln Collector No Fronting Property	2-Ln	31,900	10,000	3.190	**F**
	Datsun Street	Otay Mesa Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	38,500	15,000	2.567	**F**
	Otay Mesa Road	Camino Maquiladora	3-Ln Collector	3-Ln (1-NB, 2-SB)	5,100	11,250[2]	0.453	B

TABLE 7.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE CONDITIONS – CITY OF SAN DIEGO

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
Heritage Road	Camino Maquiladora	Gateway Park Drive	2-Ln Collector No Fronting Property	2-Ln	1,000	10,000	0.100	A
	Gateway Park Drive	Southern Terminus	2-Ln Collector No Fronting Property	2-Ln	100	10,000	0.010	A
Cactus Road	Otay Mesa Road	SR-905	2-Ln Collector w/ Commercial Fronting	2-Ln	6,200	8,000	0.775	D
	SR-905	Airway Road	2-Ln Collector w/ Commercial Fronting	2-Ln	1,800	8,000	0.225	A
	Airway Road	Siempre Viva Road	2-Ln Collector w/ Commercial Fronting	2-Ln	1,800	8,000	0.225	A
Britannia Boulevard	Otay Mesa Road	SR-905 WB Ramps	6-Ln Prime Arterial	6-Ln w/ RM	12,940	60,000	0.216	A
	SR-905 WB Ramps	SR-905 EB Ramps	6-Ln Prime Arterial	6-Ln w/ RM	22,000	60,000	0.367	A
	SR-905 EB Ramps	Airway Road	5-Ln Prime Arterial	5-Ln w/ RM (2-NB, 3-SB)	25,090	50,000[1]	0.502	B
	Airway Road	Siempre Viva Road	4-Ln Major Arterial	4-Ln w/ RM	13,300	40,000	0.333	A
	Siempre Viva Road	Bristow Court	2-Ln Collector w/ Commercial Fronting	2-Ln	5,010	8,000	0.626	D
Saint Andrews Avenue	Otay Mesa Road	Otay Mesa Center Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	3,700	15,000	0.247	A
La Media Road	northern terminus	Otay Mesa Road	2-Ln Collector w/ Commercial Fronting	2-Ln	22,500	8,000	2.813	**F**
	Otay Mesa Road	SR-905 WB Ramps	6-Ln Prime Arterial	6-Ln w/ SM	28,800	60,000	0.480	B
	SR-905 WB Ramps	SR-905 EB Ramps	6-Ln Prime Arterial	6-Ln w/ SM	19,100	60,000	0.318	A

TABLE 7.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE CONDITIONS – CITY OF SAN DIEGO

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
La Media Road	SR-905 EB Ramps	Airway Road	3-Ln Major Arterial	3-Ln (1-NB, 2-SB)	24,330	30,000[3]	0.811	D
	Airway Road	Avenida De La Fuente	2-Ln Collector No Fronting Property	2-Ln	15,320	10,000	1.532	**F**
	Avenida De La Fuente	Siempre Viva Road	2-Ln Collector No Fronting Property	2-Ln	27,780	10,000	2.778	**F**
Otay Mesa Road	Ocean View Hills Parkway	Corporate Center Drive	6-Ln Prime Arterial	6-Ln w / RM	34,200	60,000	0.570	B
	Corporate Center Drive	Heritage Road	6-Ln Prime Arterial	6-Ln w / RM	27,400	60,000	0.457	B
	Heritage Road	Cactus Road	6-Ln Prime Arterial	6-Ln w / RM	22,600	60,000	0.377	A
	Cactus Road	Britannia Boulevard	6-Ln Prime Arterial	6-Ln w / RM	29,700	60,000	0.495	B
	Britannia Boulevard	Saint Andrews Avenue	6-Ln Prime Arterial	6-Ln w / RM	34,800	60,000	0.580	B
	Saint Andrews Avenue	La Media Road	6-Ln Prime Arterial	6-Ln w / RM	28,200	60,000	0.470	B
	La Media Road	Piper Ranch Road	6-Ln Prime Arterial	6-Ln w / RM	25,400	60,000	0.423	B
Camino Maquiladora	Pacific Rim Court	Cactus Road	2-Ln Collector w/ Commercial Fronting	2-Ln	1,300	8,000	0.163	A
	Cactus Road	Otay Heights Court	2-Ln Collector w/ Commercial Fronting	2-Ln	800	8,000	0.100	A
Airway Road	Otay Mesa Road	Caliente Avenue	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w / CLTL	16,900	30,000	0.563	C
	Caliente Avenue	eastern terminus	3-Ln Major Arterial	3-Ln w / RM (2-EB, 1WB)	31,900	30,000[3]	1.063	**F**
	Cactus Road	Continental Road	2-Ln Collector w/ Commercial Fronting	2-Ln	8,700	8,000	1.088	**F**

TABLE 7.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE CONDITIONS – CITY OF SAN DIEGO

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
Airway Road	Continental Road	Britannia Boulevard	2-Ln Collector w/ Commercial Fronting	2-Ln	8,700	8,000	1.088	**F**
	Britannia Boulevard	La Media Road	2-Ln Collector w/ Commercial Fronting	2-Ln	14,170	8,000	1.771	**F**
	La Media Road	Avenida Costa Azul	2-Ln Collector w/ Commercial Fronting	2-Ln	10,300	8,000	1.288	**F**
	Avenida Costa Azul	Piper Ranch Road	4-Ln Major Arterial	4-Ln w / RM	10,300	40,000	0.258	A
	Piper Ranch Road	Harvest Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	15,500	15,000	1.033	**F**
	Harvest Road	Sanyo Avenue	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	14,100	15,000	0.940	**E**
Beyer Boulevard	Park Avenue	Otay Mesa Road	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w / CLTL	17,500	30,000	0.583	C
	Otay Mesa Road	East of Otay Mesa Road	2-Ln Collector No Fronting Property	2-Ln	2,800	10,000	0.280	A
Siempre Viva Road	Cactus Road	Britannia Boulevard	2-Ln Collector w/ Commercial Fronting	2-Ln	6,400	8,000	0.800	D
	Britannia Boulevard	La Media Road	2-Ln Collector w/ Commercial Fronting	2-Ln	9,270	8,000	1.159	**F**
	La Media Road	Customhouse Plaza	6-Ln Prime Arterial	6-Ln w / RM	9,830	60,000	0.164	A
	Customhouse Plaza	Otay Center Drive	6-Ln Prime Arterial	6-Ln w / RM	4,720	60,000	0.079	A
	Otay Center Drive	SR-905 SB Ramps	6-Ln Prime Arterial	6-Ln w / RM	20,900	60,000	0.348	A
	SR-905 SB Ramps	SR-905 SB Off-Ramp	6-Ln Prime Arterial	6-Ln w / RM	31,100	60,000	0.518	B

TABLE 7.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE CONDITIONS – CITY OF SAN DIEGO

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
Siempre Viva Road	SR-905 SB Off-Ramp	SR-905 NB Ramps	6-Ln Prime Arterial	6-Ln w / RM	41,000	60,000	0.683	C
	SR-905 NB Ramps	East of SR-905 Ramps	6-Ln Prime Arterial	6-Ln w / RM	52,600	60,000	0.877	D
Customhouse Plaza	Siempre Viva Road	southern terminus	2-Ln Collector w/ Commercial Fronting	2-Ln	1,500	8,000	0.188	A

Source: Chen Ryan Associates; November 2016

Notes:
Bold letter indicates substandard LOS.
V/C = Volume to Capacity Ratio.
RM = Raised Median.
SM = Striped Median.
CLTL = Continuous-Left-Turn Lane.
[1] Based on the Capacity of a 6-Ln Prime Arterial, reduced to exclude a lane. (5/6*60,000 = 50,000)
[2] Based on the capacity of a 4-Ln Collector, reduced to exclude a lane. (3/4*15,000 = 11,250)
[3] Based on the Capacity of a 4-Lane Major Arterial, reduced to exclude a lane. (3/4*40,000 = 30,000)

As shown in the table, all of the roadway segments located in the City of San Diego are projected to operate at acceptable LOS D or better under the Year 2025 Cumulative traffic conditions, with the following thirteen (13) exceptions:

- Heritage Road, between Avenida De Las Vistas and Datsun Street – LOS F;
- Heritage Road, between Datsun Street and Otay Mesa Road – LOS F;
- La Media Road, between northern terminus and Otay Mesa Road – LOS F;
- La Media Road, between Airway Road and Avenida De La Fuente – LOS F;
- La Media Road, between Avenida De La Fuente and Siempre Viva Road – LOS F;
- Airway Road, between Caliente Avenue and eastern terminus – LOS F;
- Airway Road, between Cactus Road and Continental Road – LOS F;
- Airway Road, between Continental Road and Britannia Boulevard – LOS F;
- Airway Road, between Britannia Boulevard and La Media Road – LOS F;
- Airway Road, between La Media Road and Avenida Costa Azul – LOS F;
- Airway Road, between Piper Ranch Road and Harvest Road – LOS F;
- Airway Road, between Harvest Road and Sanyo Avenue – LOS F; and
- Siempre Viva Road, between Britannia Boulevard and La Media Road.

Table 7.2 displays the LOS analysis results for the key roadway segment located in the City of Chula Vista under the Year 2025 Cumulative traffic conditions.

TABLE 7.2
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE CONDITIONS – CITY OF CHULA VISTA

Roadway	From	To	Functional Classification	Cross-Section	ADT	LOS Threshold (LOS C)	LOS
Heritage Road	Main Street	Avenida De Las Vistas	Prime Arterial	6-Ln w / RM	36,600	50,000	A

Source: Chen Ryan Associates; April 2016

Notes:
Bold letter indicates substandard LOS.
RM = Raised Median.

As shown in the table above, the roadway segment located in the City of Chula Vista is projected to operate at acceptable LOS A under the Year 2025 Cumulative traffic conditions.

Intersection Analysis

Table 7.3 displays LOS and average vehicle delay results for intersections under Year 2025 Cumulative conditions. LOS calculation worksheets for the Year 2025 Cumulative conditions are provided in **Appendix I**.

TABLE 7.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE CONDITIONS

			AM Peak Hour		PM Peak Hour	
ID	Intersection	Control Type	Avg. Delay (sec.)	LOS	Avg. Delay (sec.)	LOS
1	Beyer Boulevard / Otay Mesa Road	Signalized	17.9	B	16.7	B
2	Ocean View Hills Parkway / Del Sol Boulevard	Signalized	13.1	B	22.0	C
3	Ocean View Hills Parkway / Otay Mesa Road	Signalized	39.9	D	35.4	D
4	Caliente Avenue / SR-905 WB Ramps	Signalized	18.2	B	17.3	B
5	Caliente Avenue / SR-905 EB Ramps	Signalized	45.7	D	20.9	C
6	Caliente Avenue / Airway Road	AWSC	24.9	C	47.2	**E**
7	Innovative Drive / Otay Mesa Road	SSSC	9.7	A	11.4	B
8	Heritage Road / Avenida De Las Vistas	AWSC	N/A[1]	**F**	448.6	**F**
9	Heritage Road / Datsun Street	AWSC	119.6	**F**	119.8	**F**
10	Heritage Road / Otay Mesa Road	Signalized	41.3	D	44.2	D
11	Heritage Road / Gateway Park Drive	AWSC	8.4	A	8.3	A
12	Heritage Road / Airway Road	Does Not Exist				
13	Cactus Road / Otay Mesa Road	Signalized	26.7	C	23.9	C
14	Cactus Road / Airway Road	SSSC	9.6	A	7.3	A
15	Cactus Road / Siempre Viva Road	AWSC	8.0	A	8.3	A
16	Britannia Boulevard / Otay Mesa Road	Signalized	14.6	B	38.3	D
17	Britannia Boulevard / SR-905 WB Ramps	Signalized	13.9	B	39.9	D
18	Britannia Boulevard / SR-905 EB Ramps	Signalized	13.2	B	16.4	B
19	Britannia Boulevard / Airway Road	Signalized	51.3	D	54.5	D
20	Britannia Boulevard / Siempre Viva Road	Signalized	132.9	**F**	203.2	**F**
21	St Andrews Avenue / Otay Mesa Road	Signalized	21.2	C	17.7	B
22	La Media Road / Otay Mesa Road	Signalized	172.2	**F**	119.9	**F**
23	La Media Road / Airway Road	Signalized	13.7	B	34.9	C
24	La Media Road / Siempre Viva Road	AWSC	10.7	B	11.7	B
25	Piper Ranch Road / Otay Mesa Road	Signalized	12.7	B	11.1	B
26	Harvest Road / Airway Road	AWSC	13.9	B	30.4	D

TABLE 7.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE CONDITIONS

ID	Intersection	Control Type	AM Peak Hour		PM Peak Hour	
			Avg. Delay (sec.)	LOS	Avg. Delay (sec.)	LOS
27	Customhouse Plaza / Siempre Viva Road	Signalized	13.0	B	6.3	A
28	Otay Center Drive / Siempre Viva Road	Signalized	16.1	B	21.3	C
29	SR-905 SB Ramps / Siempre Viva Road	Signalized	3.8	A	6.1	A
30	SR-905 SB Off-Ramp / Siempre Viva Road	SSSC	89.8	**F**	29.6	D
31	SR-905 NB Off-Ramp / Siempre Viva Road	Signalized	15.9	B	24.8	C
32	Sanyo Avenue / Airway Road	AWSC	18.2	C	13.5	B
33	Street "A" / Airway Road	Does Not Exist				
34	Village Way / Airway Road	Does Not Exist				
35	Cactus Road / Street "D"	Does Not Exist				
36	Cactus Road / Central Main Street	Does Not Exist				
37	Cactus Road / Street "C"	Does Not Exist				
38	Park Way / Airway Road	Does Not Exist				
39	Continental Road / Airway Road	Does Not Exist				

Source: Chen Ryan Associates; November 2016

Notes:
Bold letter indicated substandard LOS.
AWSC = All-Way Stop Controlled.
SSSC = Side-Street Stop Controlled, the delay shown is the worst delay experienced by any of the approaches.
[1]Exceeds maximum reasonable calculable delay of 600 seconds per Synchro 9.0 traffic analysis software.

As shown in the table above, all of the study area intersections are projected to operate at acceptable LOS D or better during both the AM and PM peak hours under the Year 2025 Cumulative traffic conditions, with the following six (6) exceptions:

6. Caliente Avenue / Airway Road – LOS E during PM peak hour;
8. Heritage Road / Avenida De Las Vistas – LOS F during both the AM and PM peak hour;
9. Heritage Road / Datsun Street – LOS F during both the AM and PM peak hour;
20. Britannia Boulevard / Siempre Viva Road – LOS E during AM peak hour and LOS F during PM peak hour; and
22. La Media Road / Otay Mesa Road – LOS F during both the AM peak hour and PM peak hour.
30. SR-905 SB Off-Ramp / Siempre Viva Road – LOS F during the AM peak hour.

Ramp Intersection Capacity Analysis

Consistent with Caltrans requirements, the signalized ramp intersections were analyzed using ILV procedures, as described in Section 2.4. ILV analysis results are displayed in **Table 7.4** and analysis worksheets for Year 2025 Cumulative conditions are provided in Appendix I.

TABLE 7.4
RAMP INTERSECTION CAPACITY ANALYSIS
YEAR 2025 CUMULATIVE CONDITIONS

Ramp Intersection	Peak Hour	ILV / Hour	Description
Caliente Avenue and SR-905 EB Ramps	AM	1,287	*At Capacity*
	PM	1,177	*Under Capacity*
Caliente Avenue and SR-905 WB Ramps	AM	1,493	*At Capacity*
	PM	1,663	*Over Capacity*
Britannia Boulevard and SR-905 EB Ramps	AM	705	*Under Capacity*
	PM	908	*Under Capacity*
Britannia Boulevard and SR-905 WB Ramps	AM	1,008	*Under Capacity*
	PM	1,316	*At Capacity*
Siempre Viva Road and SR-905 NB Ramps	AM	887	*Under Capacity*
	PM	1,282	*At Capacity*
Siempre Viva Road and SR-905 SB Ramps	AM	673	*Under Capacity*
	PM	712	*Under Capacity*

Source: Chen Ryan Associates; April 2016

Notes:
Lower than 1,200 ILV/hour = Under Capacity
Between 1,200 and 1,500 ILV/hour = At Capacity
Higher than 1500 ILV/hour = Over Capacity

As shown in the table, all of the study ramp intersections are projected to operate at "At Capacity" or better during both the AM and PM peak hours under the Year 2025 Cumulative traffic conditions, with the exception of the following ramp intersection:

- Caliente Avenue and SR-905 WB Ramps – "Over Capacity" during the PM peak hour.

Freeway Segment Analysis

Table 7.5 displays freeway segment level of service results for the study area freeway mainline facilities under the Cumulative traffic conditions. The freeway segment level of service analysis was performed utilizing the methodology presented in Section 2.6.

As shown in the table, the following three (3) freeway segments would operate at substandard LOS E or F under the Year 2025 Cumulative traffic conditions:

- I-805, between Main Street and Palm Avenue – LOS F in the SB direction;
- I-805, between Palm Avenue and SR-905 – LOS E in the SB direction; and
- SR-905, between I-805 and Caliente Avenue – LOS F in the WB direction.

TABLE 7.5
FREEWAY SEGMENT ANALYSIS
YEAR 2025 CUMULATIVE CONDITIONS

Freeway	Segment	ADT	Direction	# of Lanes	Capacity[a]	D[b]	K[c]	HVF[d]	Peak Hour Volume	V/C	LOS[f]	Peak Hour
I-805	Main Street and Palm Avenue	235,100	NB	4M+1A	10,810	5.9%	64.6%	10.0%	9,420	0.871	D	AM
			SB	4M+1A	10,810	8.0%	56.7%	10.0%	11,250	1.041	**F**	PM
	Palm Avenue and SR-905	210,900	NB	4M+1A	10,810	5.9%	64.6%	10.0%	8,450	0.782	C	AM
			SB	4M+1A	10,810	8.0%	56.7%	10.0%	10,090	0.933	**E**	PM
SR-905	Picador Boulevard and I-805	101,100	EB	3M+1A	8,460	8.4%	64.4%	10.0%	5,780	0.683	C	AM
			WB	3M+1A	8,460	8.4%	64.4%	10.0%	5,770	0.682	C	PM
	I-805 and Caliente Avenue	163,900	EB	4M	9,400	7.5%	53.1%	10.0%	6,840	0.728	C	AM
			WB	3M+1A	8,460	8.2%	59.9%	10.0%	8,480	1.002	**F**	PM
	Caliente Avenue and Heritage Road	152,100	EB	3M	7,050	7.5%	53.1%	10.0%	3,090	0.438	B	AM
			WB	3M	7,050	8.2%	59.9%	10.0%	2,540	0.360	A	PM
	Heritage Road and Britannia Boulevard	144,460	EB	3M	7,050	7.5%	53.1%	10.0%	1,450	0.206	A	AM
			WB	3M	7,050	8.2%	59.9%	10.0%	1,440	0.204	A	PM
	Britannia Boulevard and La Media Road	133,100	EB	3M+1A	8,460	7.5%	53.1%	10.0%	890	0.105	A	AM
			WB	3M	7,050	8.2%	59.9%	10.0%	950	0.135	A	PM
	La Media Road and SR-125	101,700	EB	3M	7,050	7.5%	53.1%	10.0%	510	0.072	A	AM
			WB	3M	7,050	8.2%	59.9%	10.0%	560	0.079	A	PM

Source: Chen Ryan Associates; April 2016

Notes:
Bold letter indicated substandard LOS.
M = Mainline. A = Auxiliary Lane.
[a] The capacity is calculated as 2,350 ADT per main lane and 1,410 ADT (60% of the main lane capacity) per auxiliary lane.
[b] D = Directional split. | [c] K = Peak hour %. | [d] HV = Heavy vehicle
% - consistent with the OMCPU. | [(f)] LOS during highest directional demand

8.0 Year 2025 Cumulative Plus Project Roadway Network and Traffic Volumes

Roadway and intersection geometrics under Cumulative Plus Project conditions were assumed to be largely identical to the Year 2025 Cumulative traffic conditions geometrics, as shown in Figure 7-1, with the following facilities assumed to be constructed by the Project as a part of frontage and access improvements:

Roadway Segments

- Airway Road, between Heritage Road (Project Access) and Cactus Road – This segment serves as the project frontage and should be constructed to a 6-lane Prime Arterial, consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).
- Airway Road, between Cactus Road and Continental Road – The north side of this roadway segment (westbound direction) serves as the project frontage and should be improved to a 4-lane street (1 lane eastbound – 3 lanes westbound). This roadway segment is classified as a 6-lane Major Arterial in the currently adopted Otay Mesa Community Plan. Triggers for the full construction of this facility up to a 6-lanes with a raised median are discussed later in this report.
- Cactus Road, between SR-905 and Street "D" - The east side of this roadway segment (northbound direction) serves as the project frontage and should be improved to a 3-lane street (2 lanes northbound – 1 lane southbound).
- Cactus Road, between Street "D" and Airway Road - This segment serves as the project frontage and should be improved to a 4-lane Major Arterial, consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).
- Cactus Road, between Airway Road and Siempre Viva Road - The west side of this roadway segment (southbound direction) serves as the project frontage and should be improved to a 3-lane street (1 lane northbound – 2 lanes southbound).

The triggers for the improvements described above cannot be determined at this point in time since the phases of construction are unknown, therefore, a trigger analysis for facilities fronting the project will be conducted for each project that takes place within the Otay Mesa Central Village.

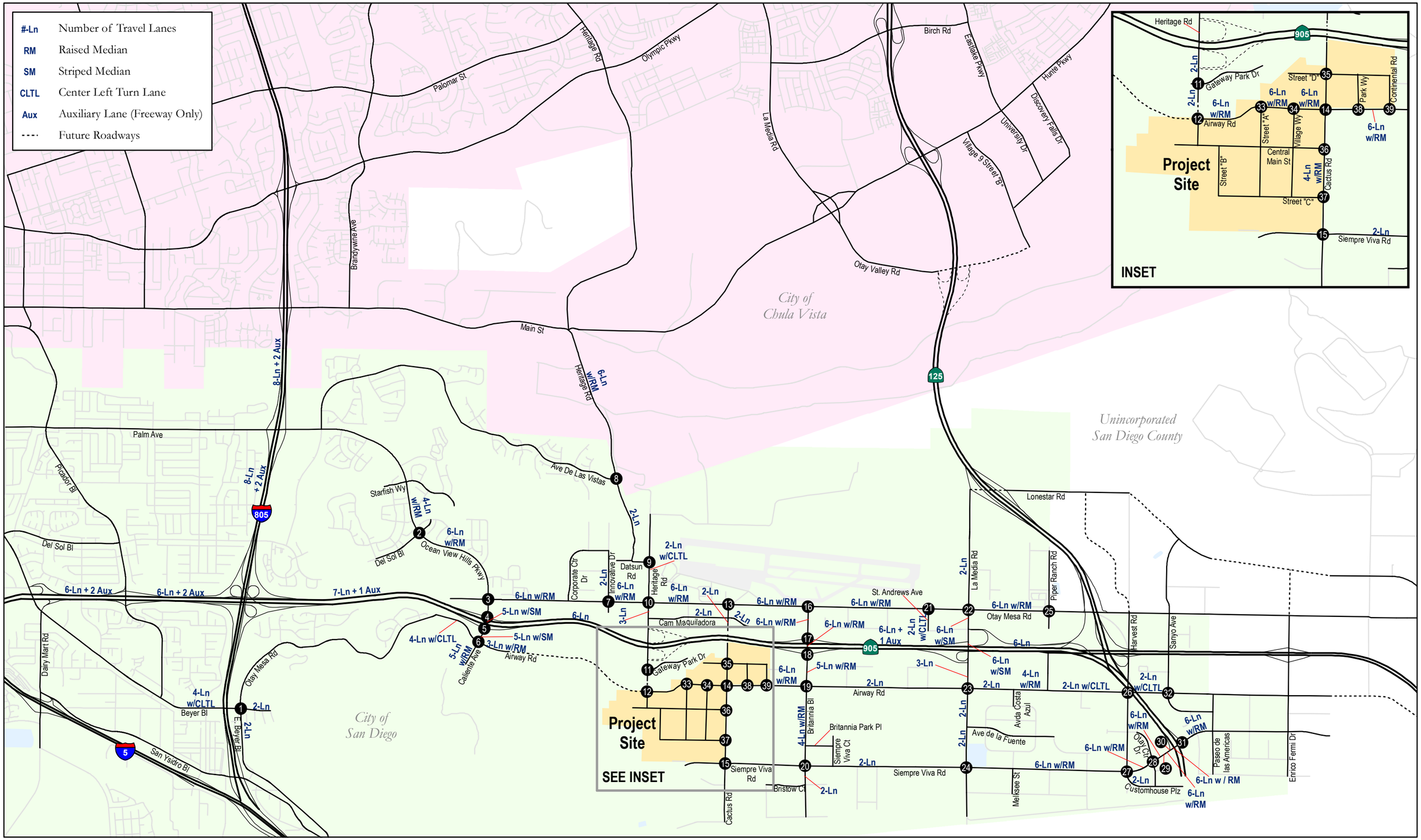
Intersections

12. Heritage Road / Airway Road – Construction of an L-shaped intersection providing movements between the project site and Airway Road, east of the Heritage Road project access.
14. Cactus Road / Airway Road – Construction of the west leg to form a four-legged intersection, and expanding the intersection lane configurations to match up with the roadway cross-sections. This intersection is proposed to be signalized by the project.
33. Street "A" / Airway Road – Construction of a signalized T-intersection.
34. Village Way / Airway Road – Construction of a signalized T-intersection.
35. Cactus Road / Street "D" – Construction of a signalized four-legged intersection.
36. Cactus Road / Central Main Street – Construction of a signalized T-intersection.
37. Cactus Road / Street "C" – Construction of a signalized T-intersection.
38. Park Way / Airway Road – Construction of a side-street stop controlled right-turn in/out only T-intersection.
39. Continental Road / Airway Road – construction of a signalized T-intersection.

Roadway and intersection geometrics under the Year 2025 Cumulative Plus Project conditions are displayed in **Figures 8-1** and **8-2**, respectively. Year 2025 Cumulative Plus Project traffic volumes were derived by combining the Year 2025 Cumulative traffic volumes (displayed in Figures 7-3 and 7-4) and the project trip assignment volumes (displayed in Figures 3-3 and 3-4). Daily roadway volumes for this scenario are displayed in **Figure 8-3** while **Figure 8-4** displays intersection peak hour traffic volumes.

8.1 Year 2025 Cumulative Plus Project Traffic Conditions

Analyses were conducted using the methodologies described in Chapter 2.0. Roadway segment, intersection, and freeway segment level of service, as well as freeway ramp intersection ILV analysis results are discussed in the following sections.



Otay Mesa Central Village Specific Plan

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Figure 8-1

Roadway Geometrics - Year 2025 Cumulative Plus Project Conditions

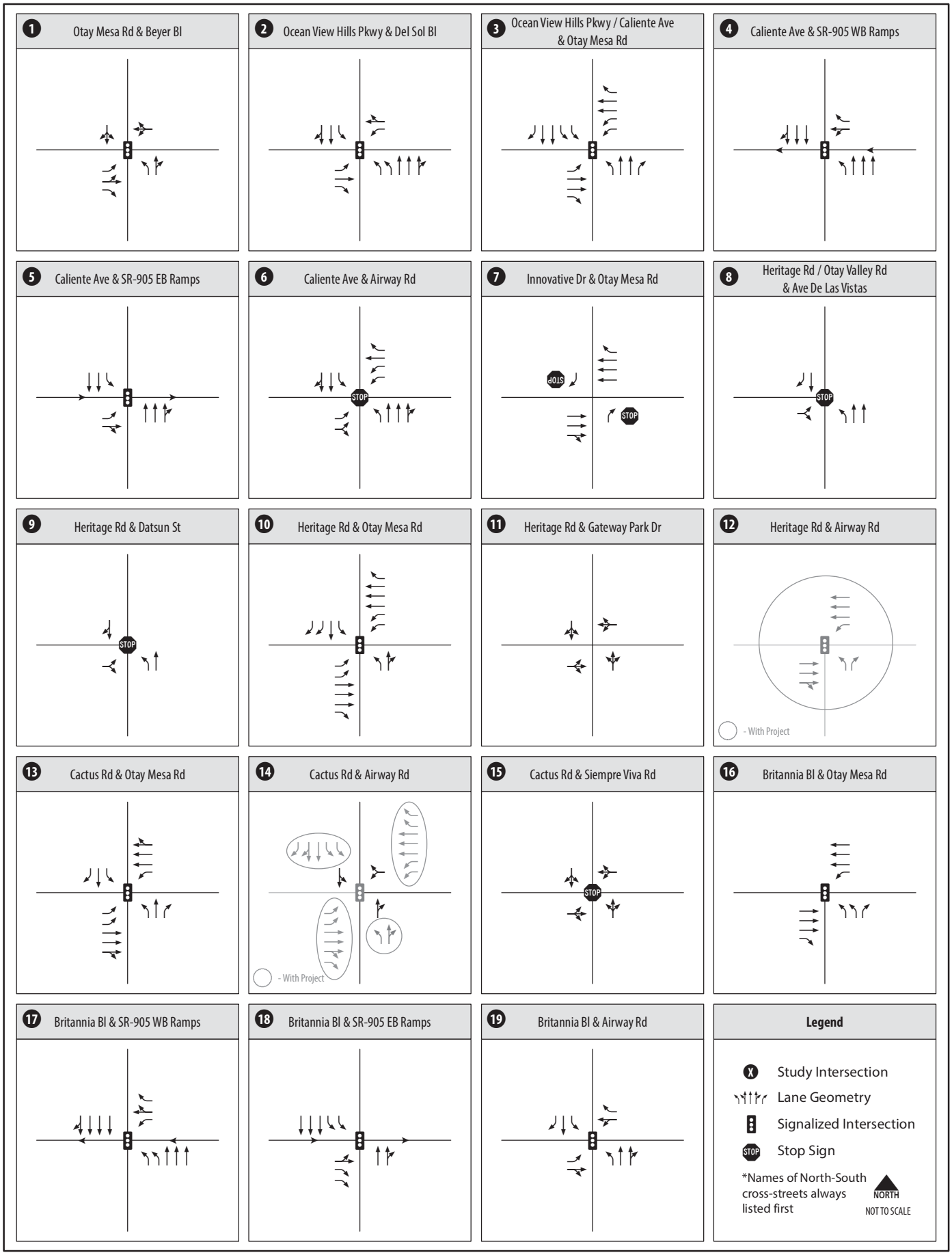

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Figure 8-2

Intersection Geometrics - Year 2025 Cumulative Plus Project Conditions (Intersections 1-19)

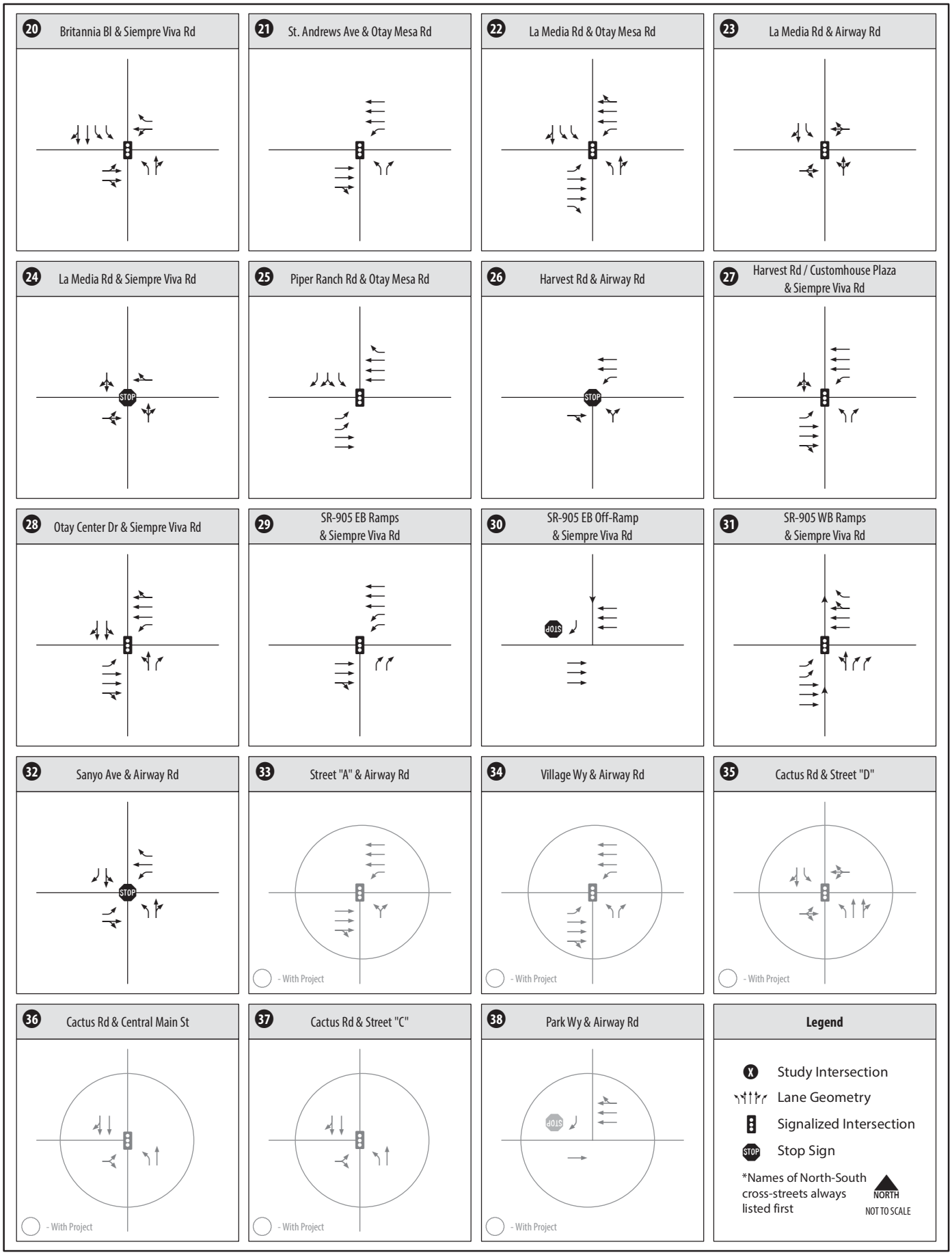

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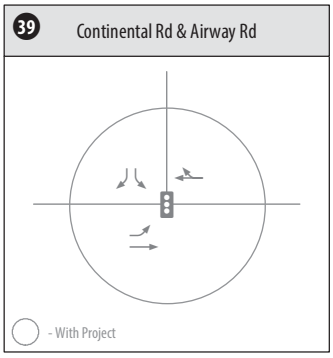
Figure 8-2

Intersection Geometrics -

Year 2025 Cumulative Plus Project Conditions (Intersections 20-38)



Legend

- Study Intersection
- Lane Geometry
- Signalized Intersection
- Stop Sign

*Names of North-South cross-streets always listed first

NORTH
NOT TO SCALE

Figure 8-2
Intersection Geometrics -
Year 2025 Cumulative Plus Project Conditions (Intersection 39)

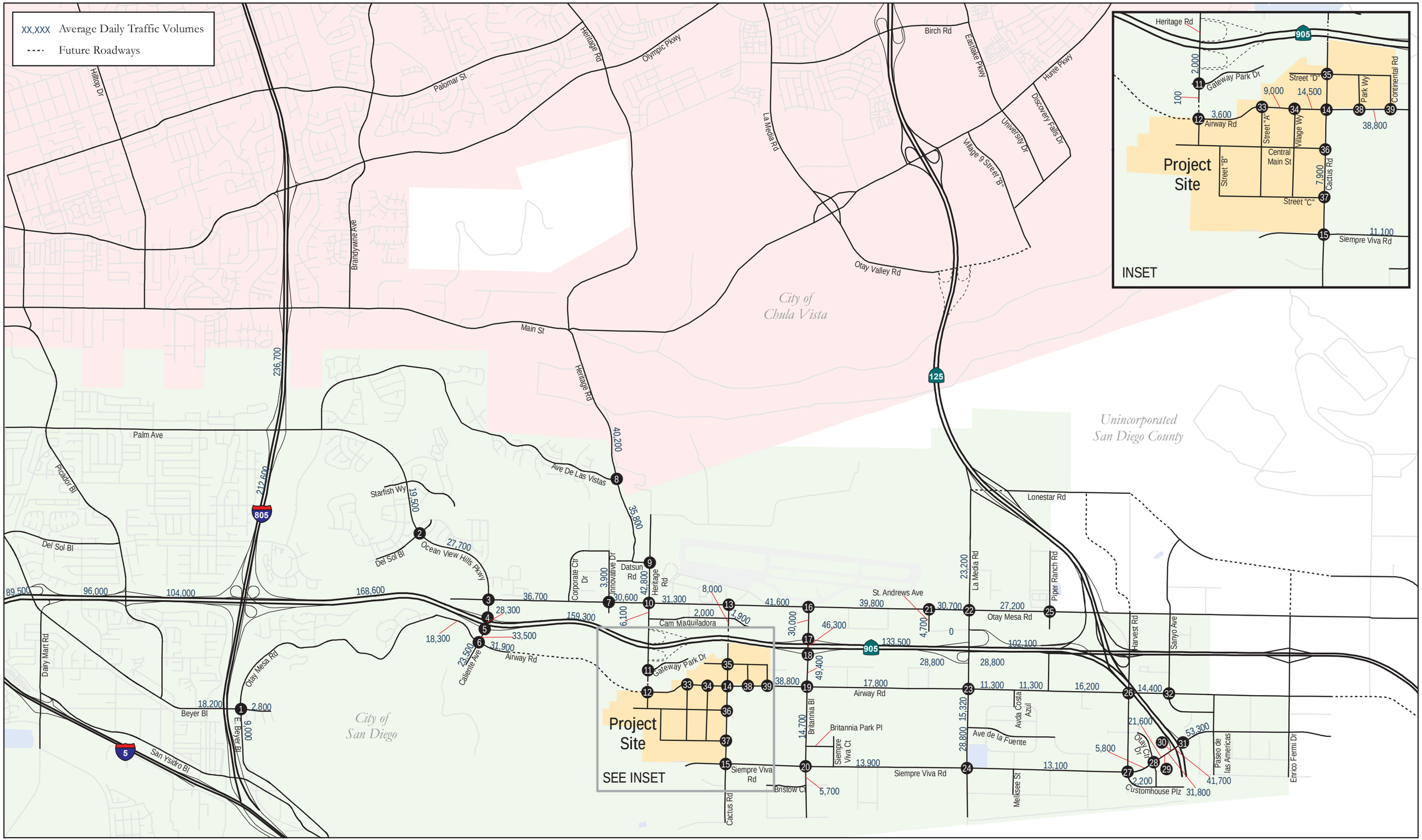


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Figure 8-3

Roadway Average Daily Traffic Volumes - Year 2025 Cumulative Plus Project Conditions

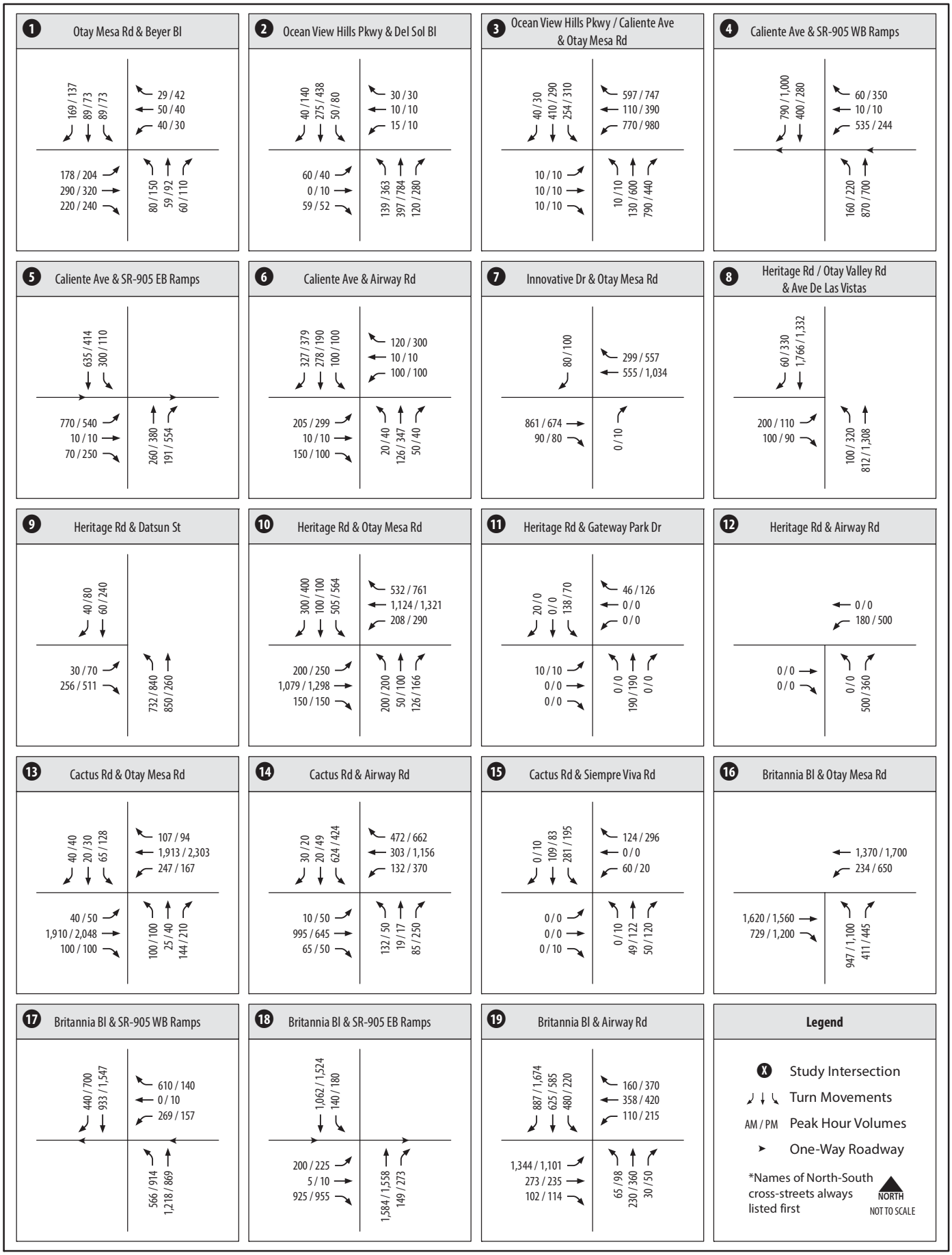

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Figure 8-4

AM/PM Peak Hour Intersection Volumes - Year 2025 Cumulative Plus Project Conditions (Intersections 1-19)

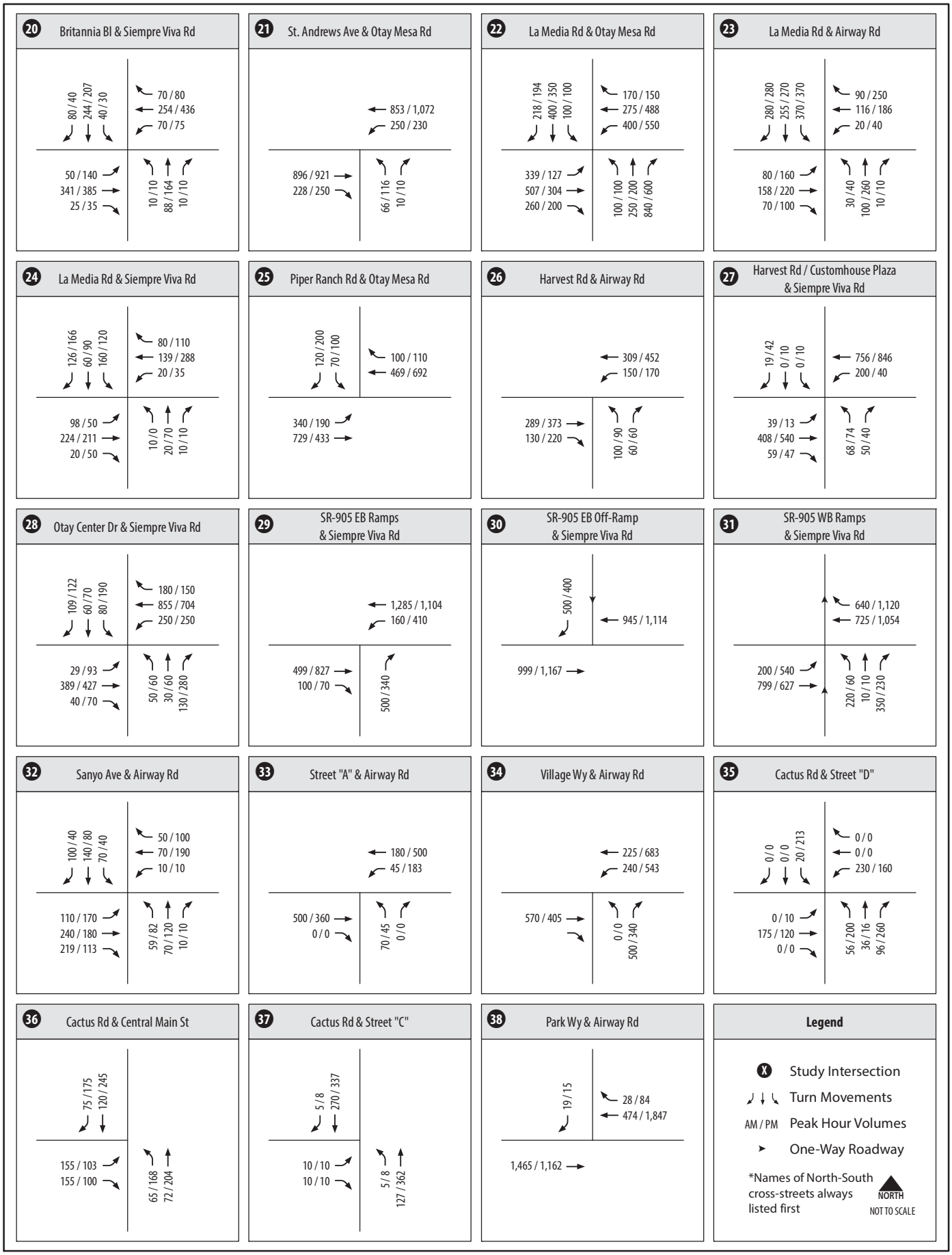
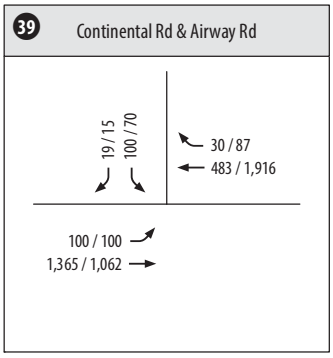


Figure 8-4

AM/PM Peak Hour Intersection Volumes - Year 2025 Cumulative Plus Project Conditions (Intersections 20-38)



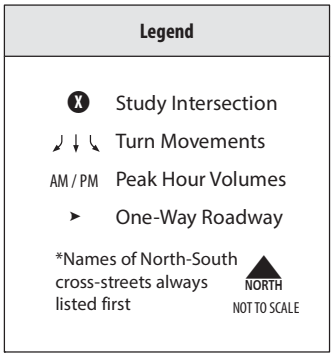


Figure 8-4

AM/PM Peak Hour Intersection Volumes - Year 2025 Cumulative Plus Project Conditions (Intersection 39)

Roadway Segment Analysis

Table 8.1 displays the Level of Service analysis results for key roadway segments located in the City of San Diego under Year 2025 Cumulative Plus Project conditions.

TABLE 8.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE PLUS PROJECT CONDITIONS – CITY OF SAN DIEGO

Roadway	Segment	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	With Project		Without Project		Δ V/C	SI?
						V/C	LOS	V/C	LOS		
East Beyer Boulevard	Beyer Boulevard to South of Beyer Boulevard	2-Ln Collector No Fronting Property	2-Ln	9,000	10,000	0.900	D	0.870	D	0.030	No
Ocean View Hills Parkway	Starfish Way to Del Sol Boulevard	4-Ln Major Arterial	4-Ln w / RM	19,500	40,000	0.488	B	0.453	B	0.035	No
	Del Sol Boulevard to Otay Mesa Road	6-Ln Major Arterial	6-Ln w / RM	27,700	50,000	0.554	B	0.518	B	0.036	No
Caliente Avenue	SR-905 WB Ramps to SR-905 EB Ramps	5-Ln Prime Arterial	5-Ln w / SM (3-NB, 2-SB)	28,300	50,000[1]	0.566	B	0.516	B	0.050	No
	SR-905 EB Ramps to Airway Road	5-Ln Prime Arterial	5-Ln w / SM (3-NB, 2-SB)	33,500	50,000[1]	0.670	C	0.620	C	0.050	No
	Airway Road to Southern Terminus	5-Ln Prime Arterial	5-Ln w / RM (3-NB, 2-SB)	23,500	50,000[1]	0.470	B	0.450	B	0.020	No
Innovative Drive	Progressive Avenue to Otay Mesa Road	2-Ln Collector w/ Commercial Fronting	2-Ln	3,900	8,000	0.488	C	0.400	B	0.088	No
Heritage Road	Avenida De Las Vistas to Datsun Street	2-Ln Collector No Fronting Property	2-Ln	35,800	10,000	3.580	**F**	3.190	**F**	0.390	**Yes**
	Datsun Street to Otay Mesa Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	42,800	15,000	2.853	**F**	2.567	**F**	0.287	**Yes**
	Otay Mesa Road to Camino Maquiladora	3-Ln Collector	3-Ln (1-NB, 2-SB)	6,100	11,250[2]	0.542	C	0.453	B	0.089	No

TABLE 8.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE PLUS PROJECT CONDITIONS – CITY OF SAN DIEGO

Roadway	Segment	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	With Project		Without Project		Δ V/C	SI?
						V/C	LOS	V/C	LOS		
Heritage Road	Camino Maquiladora to Gateway Park Drive	2-Ln Collector No Fronting Property	2-Ln	2,000	10,000	0.200	A	0.100	A	0.100	No
	Gateway Park Drive to Southern Terminus	2-Ln Collector No Fronting Property	2-Ln	100	10,000	0.010	A	0.010	A	0.000	No
Cactus Road	Otay Mesa Road to SR-905	2-Ln Collector w/ Commercial Fronting	2-Ln	8,000	8,000	1.000	**E**	0.775	D	0.225	**Yes**
	SR-905 to Street "D"	3-Ln Major Arterial	3-Ln w / RM (2NB-1SB)	5,700	30,000	0.190	A	0.225	A	-0.035	No
	Street "D" to Airway Road	4-Ln Major Arterial	4-Ln w / RM	5,700	40,000	0.143	A	0.225	A	-0.083	No
	Airway Road to Siempre Viva Road	3-Ln Major Arterial	3-Ln w / RM (2NB-1SB)	7,900	30,000	0.263	A	0.225	A	0.038	No
Britannia Boulevard	Otay Mesa Road to SR-905 WB Ramps	6-Ln Prime Arterial	6-Ln w / RM	30,000	60,000	0.500	B	0.216	A	0.284	No
	SR-905 WB Ramps to SR-905 EB Ramps	6-Ln Prime Arterial	6-Ln w / RM	46,300	60,000	0.772	C	0.367	A	0.405	No
	SR-905 EB Ramps to Airway Road	5-Ln Prime Arterial	5-Ln w / RM (2-NB, 3-SB)	49,400	50,000[1]	0.988	**E**	0.502	B	0.486	**Yes**
	Airway Road to Siempre Viva Road	4-Ln Major Arterial	4-Ln w / RM	14,700	40,000	0.368	A	0.333	A	0.035	No
	Siempre Viva Road to Bristow Court	2-Ln Collector w/ Commercial Fronting	2-Ln	5,700	8,000	0.713	D	0.626	C	0.086	No
Saint Andrews Avenue	Otay Mesa Road to Otay Mesa Center Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	4,700	15,000	0.313	A	0.247	A	0.067	No

TABLE 8.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE PLUS PROJECT CONDITIONS – CITY OF SAN DIEGO

Roadway	Segment	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	With Project		Without Project		Δ V/C	SI?
						V/C	LOS	V/C	LOS		
La Media Road	Northern Terminus to Otay Mesa Road	2-Ln Collector w/ Commercial Fronting	2-Ln	23,200	8,000	2.900	**F**	2.813	**F**	0.087	**Yes**
	Otay Mesa Road to SR-905 WB Ramps	6-Ln Prime Arterial	6-Ln w/ SM	28,800	60,000	0.480	B	0.480	B	0.000	No
	SR-905 WB Ramps to SR-905 EB Ramps	6-Ln Prime Arterial	6-Ln w/ SM	19,100	60,000	0.318	A	0.318	A	0.000	No
	SR-905 WB Ramps to Airway Road	3-Ln Major Arterial	3-Ln (1-NB, 2-SB)	24,330	30,000[3]	0.811	D	0.811	D	0.000	No
	Airway Road to Avenida De La Fuente	2-Ln Collector No Fronting Property	2-Ln	15,320	10,000	1.532	**F**	1.532	**F**	0.000	No
	Avenida De La Fuente to Siempre Viva Road	2-Ln Collector No Fronting Property	2-Ln	28,800	10,000	2.880	**F**	2.778	**F**	0.102	**Yes**
Otay Mesa Road	Ocean View Hills Parkway to Corporate Center Drive	6-Ln Prime Arterial	6-Ln w / RM	36,700	60,000	0.612	C	0.570	B	0.042	No
	Corporate Center Drive to Heritage Road	6-Ln Prime Arterial	6-Ln w / RM	30,600	60,000	0.510	B	0.457	B	0.053	No
	Heritage Road to Cactus Road	6-Ln Prime Arterial	6-Ln w / RM	31,300	60,000	0.522	B	0.377	A	0.145	No
	Cactus Road to Britannia Boulevard	6-Ln Prime Arterial	6-Ln w / RM	41,600	60,000	0.693	C	0.495	B	0.198	No
	Britannia Boulevard to Saint Andrews Avenue	6-Ln Prime Arterial	6-Ln w / RM	39,800	60,000	0.663	C	0.580	B	0.083	No
	Saint Andrews Avenue to La Media Road	6-Ln Prime Arterial	6-Ln w / RM	30,700	60,000	0.512	B	0.470	B	0.042	No

TABLE 8.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE PLUS PROJECT CONDITIONS – CITY OF SAN DIEGO

Roadway	Segment	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	With Project		Without Project		Δ V/C	SI?
						V/C	LOS	V/C	LOS		
Otay Mesa Road	La Media Road to Piper Ranch Road	6-Ln Prime Arterial	6-Ln w / RM	27,200	60,000	0.453	B	0.423	B	0.030	No
Camino Maquiladora	Pacific Rim Court to Cactus Road	2-Ln Collector w/ Commercial Fronting	2-Ln	2,000	8,000	0.250	A	0.163	A	0.088	No
	Cactus Road to Otay Heights Court	2-Ln Collector w/ Commercial Fronting	2-Ln	1,900	8,000	0.238	A	0.100	A	0.138	No
Airway Road	Otay Mesa Road to Caliente Avenue	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w / CLTL	18,300	30,000	0.610	C	0.563	C	0.047	No
	Caliente Avenue to Eastern Terminus	3-Ln Major Arterial	3-Ln w / RM (2-EB, 1-WB)	31,900	30,000[3]	1.063	**F**	1.063	**F**	0.000	No
	Heritage Road to Street "A"	6-Ln Prime Arterial	6-Ln w / RM	3,600	60,000	0.060	A	Does Not Exist		0.00	No
	Street "A" to Village Way	6-Ln Prime Arterial	6-Ln w / RM	9,000	60,000	0.150	A	Does Not Exist		0.00	No
	Village Way to Cactus Road	6-Ln Prime Arterial	6- Ln w / RM	14,500	60,000	0.242	A	Does Not Exist		0.00	No
	Cactus Road to Continental Road	4-Ln Prime Arterial	4-Ln w / RM	38,800	33,333[4]	1.164	**F**	1.088	**F**	0.077	**Yes**
	Continental Road to Britannia Boulevard	2-Ln Collector w/ Commercial Fronting	2-Ln	38,800	8,000	4.850	**F**	1.088	**F**	3.763	**Yes**
	Britannia Boulevard to La Media Road	2-Ln Collector w/ Commercial Fronting	2-Ln	17,800	8,000	2.225	**F**	1.771	**F**	0.454	**Yes**
	La Media Road to Avenida Costa Azul	2-Ln Collector w/ Commercial Fronting	2-Ln	11,300	8,000	1.413	**F**	1.288	**F**	0.125	**Yes**

TABLE 8.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE PLUS PROJECT CONDITIONS – CITY OF SAN DIEGO

Roadway	Segment	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	With Project		Without Project		Δ V/C	SI?
						V/C	LOS	V/C	LOS		
Airway Road	Avenida Costa Azul to Piper Ranch Road	4-Ln Major Arterial	4-Ln w / RM	11,300	40,000	0.283	A	0.258	A	0.025	No
	Piper Ranch Road to Harvest Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	16,200	15,000	1.080	**F**	1.033	**F**	0.047	**Yes**
	Harvest Road to Sanyo Avenue	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	14,400	15,000	0.960	**E**	0.940	**E**	0.020	**Yes**
Beyer Boulevard	Park Avenue to Otay Mesa Road	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w / CLTL	18,200	30,000	0.607	C	0.583	C	0.023	No
	Otay Mesa Road to East of Otay Mesa Road	2-Ln Collector No Fronting Property	2-Ln	2,800	10,000	0.280	A	0.280	A	0.000	No
Siempre Viva Road	Cactus Road to Britannia Boulevard	2-Ln Collector w/ Commercial Fronting	2-Ln	11,100	8,000	1.388	**F**	0.800	D	0.588	**Yes**
	Britannia Boulevard to La Media Road	2-Ln Collector w/ Commercial Fronting	2-Ln	13,900	8,000	1.738	**F**	1.159	**F**	0.579	**Yes**
	La Media Road to Customhouse Plaza	6-Ln Prime Arterial	6-Ln w / RM	13,100	60,000	0.218	A	0.164	A	0.055	No
	Customhouse Plaza to Otay Center Drive	6-Ln Prime Arterial	6-Ln w / RM	5,800	60,000	0.097	A	0.079	A	0.018	No
	Otay Center Drive to SR-905 SB Ramps	6-Ln Prime Arterial	6-Ln w / RM	21,600	60,000	0.360	A	0.348	A	0.012	No
	SR-905 SB Ramps to SR-905 SB Off-Ramp	6-Ln Prime Arterial	6-Ln w / RM	31,800	60,000	0.530	B	0.518	B	0.012	No
	SR-905 SB Off-Ramp to SR-905 NB Ramps	6-Ln Prime Arterial	6-Ln w / RM	41,700	60,000	0.695	C	0.683	C	0.012	No
	SR-905 NB Ramps to East of SR-905 Ramps	6-Ln Prime Arterial	6-Ln w / RM	53,300	60,000	0.888	D	0.877	D	0.012	No

TABLE 8.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE PLUS PROJECT CONDITIONS – CITY OF SAN DIEGO

Roadway	Segment	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	With Project		Without Project		Δ V/C	SI?
						V/C	LOS	V/C	LOS		
Customhouse Plaza	Siempre Viva Road to Southern Terminus	2-Ln Collector w/ Commercial Fronting	2-Ln	2,200	8,000	0.275	A	0.188	A	0.088	No

Source: Chen Ryan Associates; November 2016

Notes:
Bold letter indicates substandard LOS.
V/C = Volume to Capacity Ratio.
RM = Raised Median.
CLTL = Continuous Left-Turn Lane.
Δ = Change in V/C Ratio
SI? = Significant Impact?
[1] Based on the Capacity of a 6-Ln Prime Arterial, reduced to exclude a lane. (5/6*60,000 = 50,000)
[2] Based on the capacity of a 4-Ln Collector, reduced to exclude a lane. (3/4*15,000 = 11,250)
[3] Based on the Capacity of a 4-Lane Major Arterial, reduced to exclude a lane. (3/4*40,000 = 30,000)
[4] Based on the Capacity of a 6-Lane Major Arterial, reduced to exclude two lanes. (4/6*50,000 = 33,333)

As shown in Table 8.1, all of the study area roadway segments located in the City of San Diego are projected to continue operating at acceptable LOS D or better under Year 2025 Cumulative Plus Project conditions, with the following sixteen (16) exceptions:

- Heritage Road, between Avenida De Las Vistas to Datsun Street is projected to operate at substandard LOS F with the addition of project traffic. The volume to capacity ratio is projected to increase from 3.190 under Year 2025 Cumulative conditions to 3.580 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.390.

  Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.

- Heritage Road, between Datsun Street and Otay Mesa Road is projected to operate at substandard LOS F with the addition of project traffic. The volume to capacity ratio is projected to increase from 2.567 under Year 2025 Cumulative conditions to 2.853 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.287. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

  Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.

- Cactus Road, between Otay Mesa Road and SR-905 is projected to operate at substandard LOS E with the addition of project traffic. The volume to capacity ratio is projected to increase from 0.775 under Year 2025 Cumulative conditions to 1.000 under Year 2025

Cumulative Plus Project conditions, resulting in a net increase of 0.225. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.

- Britannia Boulevard, between SR-905 EB Ramps to Airway Road is projected to operate at substandard LOS F with the addition of project traffic. The volume to capacity ratio is projected to increase from 0.502 under Year 2025 Cumulative conditions to 0.988 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.486. This increase in volume to capacity ratio causes the roadway segment to transition from an acceptable LOS B to a substandard LOS E.

  Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.

- La Media Road, between northern terminus and Otay Mesa Road is projected to operate at substandard LOS F with the addition of project traffic. The volume to capacity ratio is projected to increase from 2.813 under Year 2025 Cumulative conditions to 2.900 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.087. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

  Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.

- La Media Road, between Airway Road and Avenida De La Fuente is projected to continue operating at substandard LOS F with the addition of project traffic. The volume to capacity ratio is projected to remain at 1.532 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.

  Based upon the significance criteria presented in Section 2.7, facility improvements would not be required at the aforementioned roadway segment.

- La Media Road, between Avenida De La Fuente and Siempre Viva Road is projected to operate at substandard LOS F with the addition of project traffic. The volume to capacity ratio is projected to increase from 2.778 under Year 2025 Cumulative conditions to 2.880 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.102. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

  Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.

- Airway Road, between Caliente Avenue and eastern terminus is projected to operate at substandard LOS F with the addition of project traffic. The volume to capacity ratio is

projected remain at 1.063 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.

Based upon the significance criteria presented in Section 2.7, facility improvements would not be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.

- Airway Road, between Cactus Road and Continental Road is projected to operate at substandard LOS F with the addition of project traffic. The volume to capacity ratio is projected to increase from 1.088 under Year 2025 Cumulative conditions to 1.164 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.077. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

  Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment.

- Airway Road, between Continental Road and Britannia Boulevard is projected to operate at substandard LOS F with the addition of project traffic. The volume to capacity ratio is projected to increase from 1.088 under Year 2025 Cumulative conditions to 4.850 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 3.763. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

  Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.

- Airway Road, between Britannia Boulevard and La Media Road is projected to operate at substandard LOS F with the addition of project traffic. The volume to capacity ratio is projected to increase from 1.771 under Year 2025 Cumulative conditions to 2.225 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.454. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

  Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.

- Airway Road, between La Media Road and Avenida Costa Azul is projected to operate at substandard LOS F with the addition of project traffic. The volume to capacity ratio is projected to increase from 1.288 under Year 2025 Cumulative conditions to 1.413 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.125. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

  Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.

- Airway Road, between Piper Ranch Road and Harvest Road is projected to operate at substandard LOS F with the addition of project traffic. The volume to capacity ratio is

projected to increase from 1.033 under Year 2025 Cumulative conditions to 1.080 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.047. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.

- Airway Road, between Harvest Road and Sanyo Avenue is projected to operate at substandard LOS E with the addition of project traffic. The volume to capacity ratio is projected to increase from 0.940 under Year 2025 Cumulative conditions to 0.960 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.020. This increase in volume to capacity ratio is the allowable 0.02 threshold.

  Based upon the significance criteria presented in Section 2.7, facility improvements would not be required at the aforementioned roadway segment.

- Siempre Viva Road, between Cactus Road and Britannia Boulevard is projected to operate at substandard LOS F with the addition of project traffic. The volume to capacity ratio is projected to increase from 0.800 under Year 2025 Cumulative conditions to 1.388 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.588. This increase in volume to capacity ratio causes the roadway segment to transition from an acceptable LOS D to a substandard LOS F.

  Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.

- Siempre Viva Road, between Britannia Boulevard and La Media Road is projected to operate at substandard LOS F with the addition of project traffic. The volume to capacity ratio is projected to increase from 1.159 under Cumulative conditions to 1.738 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.579. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

  Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned roadway segment. The required improvements are consistent with the improvements stated in the OMCPU EIR.

Table 8.2 displays the Level of Service analysis results for key roadway segments located in the City of Chula Vista under Cumulative Plus Project conditions.

TABLE 8.2
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE PLUS PROJECT CONDITIONS – CITY OF CHULA VISTA

Roadway	Segment	Functional Classification	Cross-Section	ADT	LOS Threshold (LOS C)	LOS w/ Project	Project Contribution ≥ 5%?	Project ADT > 800?	Intersection along Segment Operating @ LOS D or Better?	SI?
Heritage Road	Main Street to Avenida De Las Vistas	Prime Arterial	6-Ln w / RM	40,200	50,000	B	Yes	Yes	Yes	No

Source: Chen Ryan Associates; April 2016

Notes:
Bold letter indicates substandard LOS.
RM = Raised Median.
SI? = Significant Impact?

As shown in the Table 8.2, the study area roadway segment located in the City of Chula Vista is projected to continue operating at acceptable LOS B under Year 2025 Cumulative Plus Project conditions.

Intersection Analysis

Table 8.3 displays Level of Service and average vehicle delay results for study area intersections under Year 2025 Cumulative Plus Project conditions. Level of Service calculation worksheets for the Year 2025 Cumulative Plus Project conditions are provided in **Appendix J**.

TABLE 8.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE PLUS PROJECT CONDITIONS

ID	Intersection	Control Type	AM Peak Hour		PM Peak Hour		Delay w/o Project (sec) AM/PM	LOS w/o Project AM/PM	Change in Delay (sec)	SI?
			Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS				
1	Beyer Boulevard / Otay Mesa Road	Signalized	19.4	B	18.2	B	17.9 / 16.7	B / B	1.5 / 1.5	No
2	Ocean View Hills Parkway / Del Sol Boulevard	Signalized	13.2	B	26.3	C	13.1 / 22	B / C	0.1 / 4.3	No
3	Ocean View Hills Parkway / Otay Mesa Road	Signalized	40.2	D	38.7	D	39.9 / 35.4	D / D	0.3 / 3.3	No
4	Caliente Avenue / SR-905 WB Ramps	Signalized	24.5	C	18.5	B	18.2 / 17.3	B / B	6.3 / 1.2	No
5	Caliente Avenue / SR-905 EB Ramps	Signalized	46.3	D	22.1	C	45.7 / 20.9	D / C	0.6 / 1.2	No
6	Caliente Avenue / Airway Road	AWSC	64.7	**F**	97.5	**F**	24.9 / 47.2	C / **E**	39.8 / 50.3	**Yes**
7	Innovative Drive / Otay Mesa Road	SSSC	10.3	B	12.4	B	9.7 / 11.4	A / B	0.6 / 1.0	No
8	Heritage Road / Avenida De Las Vistas	AWSC	N/A[1]	**F**	N/A[1]	**F**	N/A[1] / 448.6	**F / F**	over threshold / 153.4	**Yes**
9	Heritage Road / Datsun Street	AWSC	183.2	**F**	231.8	**F**	119.6 / 119.8	**F / F**	63.6 / 112.0	**Yes**
10	Heritage Road / Otay Mesa Road	Signalized	55.1	**E**	99.0	**F**	41.3 / 44.2	D / D	13.8 / 54.8	**Yes**
11	Heritage Road / Gateway Park Drive	AWSC	8.7	A	8.6	A	8.4 / 8.3	A / A	0.3 / 0.3	No
12	Heritage Road / Airway Road	Signalized	7.2	A	9.8	A	N / A	N / A	N / A	No
13	Cactus Road / Otay Mesa Road	Signalized	35.9	D	40.7	D	26.7 / 23.9	C / C	9.2 / 16.8	No
14	Cactus Road / Airway Road	Signalized	26.9	C	27.3	C	9.6 / 7.3	A / A	17.3 / 20.0	No
15	Cactus Road / Siempre Viva Road	AWSC	12.3	B	12.8	B	8.0 / 8.3	A / A	4.3 / 4.5	No

TABLE 8.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE PLUS PROJECT CONDITIONS

ID	Intersection	Control Type	AM Peak Hour		PM Peak Hour		Delay w/o Project (sec) AM/PM	LOS w/o Project AM/PM	Change in Delay (sec)	SI?
			Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS				
16	Britannia Boulevard / Otay Mesa Road	Signalized	42.3	D	174.5	**F**	14.6 / 38.3	B / D	27.7 / 136.2	**Yes**
17	Britannia Boulevard / SR-905 WB Ramps	Signalized	22.1	C	38.7	D	13.9 / 39.9	B / D	8.2 / -1.2	No
18	Britannia Boulevard / SR-905 EB Ramps	Signalized	71.4	**E**	93.0	**F**	13.2 / 16.4	B / B	58.2 / 76.6	**Yes**
19	Britannia Boulevard / Airway Road	Signalized	472.8	**F**	N/A[1]	**F**	51.3 / 54.5	D / D	421.5 / over threshold	**Yes**
20	Britannia Boulevard / Siempre Viva Road	Signalized	318.5	**F**	N/A[1]	**F**	132.9 / 203.2	**F / F**	185.6 / over threshold	**Yes**
21	St Andrews Avenue / Otay Mesa Road	Signalized	15.3	B	26.9	C	21.2 / 17.7	C / B	-5.9 / 9.2	No
22	La Media Road / Otay Mesa Road	Signalized	181.5	**F**	121.7	**F**	172.2 / 119.9	**F / F**	9.3 / 1.8	**Yes**
23	La Media Road / Airway Road	Signalized	15.4	B	51.2	D	13.7 / 34.9	B / C	1.7 / 16.3	No
24	La Media Road / Siempre Viva Road	AWSC	16.4	C	29.8	D	10.7 / 11.7	B / B	5.7 / 18.1	No
25	Piper Ranch Road / Otay Mesa Road	Signalized	12.7	B	11.1	B	12.7 / 11.1	B / B	0.0 / 0.0	No
26	Harvest Road / Airway Road	AWSC	14.6	B	34.2	D	13.9 / 30.4	B / D	0.7 / 3.8	No
27	Customhouse Plaza / Siempre Viva Road	Signalized	12.7	B	10.1	B	13 / 6.3	B / A	-0.3 / 3.8	No
28	Otay Center Drive / Siempre Viva Road	Signalized	17.2	B	21.9	C	16.1 / 21.3	B / C	1.1 / 0.6	No
29	SR-905 SB Ramps / Siempre Viva Road	Signalized	4.1	A	6.4	A	3.8 / 6.1	A / A	0.3 / 0.3	No
30	SR-905 SB Off-Ramp / Siempre Viva Road	SSSC	93.2	**F**	31.9	D	89.8 / 29.6	**F** / D	3.4 / 2.3	**Yes**
31	SR-905 NB Off-Ramp / Siempre Viva Road	Signalized	15.7	B	23.3	C	15.9 / 24.8	B / C	-0.2 / -1.5	No
32	Sanyo Avenue / Airway Road	AWSC	20.1	C	14.0	B	18.2 / 13.5	C / B	1.9 / 0.5	No
33	Street "A" / Airway Road	Signalized	6.4	A	6.1	A	N/A			No
34	Village Way / Airway Road	Signalized	25.2	C	13.6	B	N/A			No

TABLE 8.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE PLUS PROJECT CONDITIONS

ID	Intersection	Control Type	AM Peak Hour		PM Peak Hour		Delay w/o Project (sec) AM/PM	LOS w/o Project AM/PM	Change in Delay (sec)	SI?
			Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS				
35	Cactus Road / Street "D"	Signalized	13.8	B	13.5	B	N/A			No
36	Cactus Road / Central Main Street	Signalized	11.7	B	12.3	B	N/A			No
37	Cactus Road / Street "C"	Signalized	3.9	A	3.3	A	N/A			No
38	Park Way / Airway Road	SSSC	9.5	A	15.1	C	N/A			No
39	Continental Road / Airway Road	Signalized	33.6	C	197.1	**F**	N/A			**Yes**

Source: Chen Ryan Associates; November 2016

Notes:
Bold letter indicates substandard LOS.
SI? = Significant Impact?
AWSC = All Way Stop Control.
SSSC = Side-Street Stop Controlled, the delay shown is the worst delay experienced by any of the approaches.
NA = Not analyzed under this scenario.
[1]Exceeds maximum reasonable calculable delay of 600 seconds per Synchro 9.0 traffic analysis software.

As shown in the table above, all of the study area intersections located in the City of San Diego are projected to operate at acceptable LOS D or better during both the AM and PM peak hours under Year 2025 Cumulative Plus Project conditions, with the following eleven (11) exceptions:

6. The intersection of Caliente Avenue / Airway Road is projected to operate at LOS F under Year 2025 Cumulative Plus Project conditions, during the AM and PM peak hour. During the AM peak hour, the overall intersection delay is projected to increase from 24.4 seconds of delay under Year 2025 Cumulative conditions to 64.9 seconds of delay under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 40.5 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 47.2 seconds of delay under Year 2025 Cumulative conditions to 97.4 seconds of delay under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 50.2 seconds of overall delay. The delay increase during the AM peak hour caused the intersection to transition from an acceptable LOS C to a substandard LOS F during the AM peak hour and from LOS E to LOS F during the PM peak hour. The delay increase during both the AM and PM peak hours exceeded the allowable thresholds.

   Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned intersection. The required improvements are consistent with the improvements stated in the OMCPU EIR.

8. The intersection of Heritage Road / Avenida De Las Vistas is projected to operate at LOS F under Year 2025 Cumulative Plus Project conditions, during the AM and PM peak hour. During the AM peak hour, the overall intersection delay is projected to exceed the allowable delay increase threshold of 1.0 second. During the PM peak hour, the overall intersection delay is projected to increase from 448.6 seconds of delay under Year 2025 Cumulative conditions to 602.0 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 153.4 seconds of delay. The delay increase during both the AM and PM peak hours exceeded the allowable thresholds.

   Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned intersection. The required improvements are consistent with the improvements stated in the OMCPU EIR.

9. The intersection of Heritage Road / Datsun Street is projected to operate at LOS F under Year 2025 Cumulative Plus Project conditions, during the AM and PM peak hour. During the AM peak hour, the overall intersection delay is projected to increase from 119.6 seconds of delay under Year 2025 Cumulative conditions to 183.2 seconds of delay under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 63.6 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 119.8 seconds of delay under Year 2025 Cumulative conditions to 231.8 seconds of delay under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 112.0 seconds of overall delay. The delay increase during both the AM and PM peak hours exceeded the allowable thresholds.

   Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned intersection. The required improvements are consistent with the improvements stated in the OMCPU EIR.

10. The intersection of Heritage Road / Otay Mesa Road is projected to operate at LOS E under Year 2025 Cumulative Plus Project conditions, during the AM peak hour and LOS F during the PM peak hour. During the AM peak hour, the overall intersection delay is projected to increase from 41.3 seconds of delay under Year 2025 Cumulative conditions to 55.1 seconds of delay under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 13.8 seconds of overall delay. This increase in delay caused the intersection to transition from an acceptable LOS D to a substandard LOS E. During the PM peak hour, the overall intersection delay is projected to increase from 44.2 seconds of delay under Year 2025 Cumulative conditions to 99.0 seconds of delay under Year 2025 Cumulative Plus Project conditions resulting in a net increase of 54.8 seconds of overall delay. This increase in delay caused the intersection to transition from an acceptable LOS D to a substandard LOS F.

    Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned intersection. The required improvements are consistent with the improvements stated in the OMCPU EIR.

16. The intersection of Britannia Boulevard / Otay Mesa Road is projected to operate at LOS F under Year 2025 Cumulative Plus Project conditions, during the PM peak hour. The overall intersection delay is projected to increase from 38.3 seconds of delay under Year 2025 Cumulative Plus conditions to 174.5 seconds of delay under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 136.2 seconds of overall delay. This increase in delay caused the intersection to transition from an acceptable LOS D to a substandard LOS F.

    Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned intersection. The required improvements are consistent with the improvements stated in the OMCPU EIR.

18. The intersection of Britannia Boulevard / SR-905 EB Ramps is projected to operate at LOS E under Year 2025 Cumulative Plus Project conditions, during the AM peak hour and LOS F during the PM peak hour. During the AM peak hour, the overall intersection delay is projected to increase from 13.2 seconds of delay under Year 2025 Cumulative conditions to 71.4 seconds of delay under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 58.2 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 16.4 under Year 2025 Cumulative conditions to 93.0 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 76.6 seconds of overall delay. The delay increase during both the AM and PM peak hour caused the intersection to transition from an acceptable LOS B to a substandard LOS E/F.

    Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned intersection. The required improvements are consistent with the improvements stated in the OMCPU EIR.

19. The intersection of Britannia Boulevard / Airway Road is projected to operate at LOS F under Year 2025 Cumulative Plus Project conditions, during the AM and PM peak hour. During the AM peak hour, the overall intersection delay is projected to increase from 51.3 seconds of delay under Year 2025 Cumulative conditions to 472.8 seconds of delay under Cumulative Plus Project conditions, resulting in a net increase of 421.5 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to exceed the allowable delay increase threshold of 1.0 second. The delay increase during both the AM and PM peak hour caused the intersection to transition from an acceptable LOS D to a substandard LOS F.

    Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned intersection. The required improvements are consistent with the improvements stated in the OMCPU EIR.

20. The intersection of Britannia Boulevard / Siempre Viva Road is projected to operate at LOS F under Cumulative Plus Project conditions, during the AM and PM peak hour. During the AM peak hour, the overall intersection delay is projected to increase from 132.9 seconds of delay under Cumulative conditions to 318.5 seconds of delay under Year 2025

Cumulative Plus Project conditions, resulting in a net increase of 185.6 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to exceed the allowable delay increase threshold of 1.0 second. The delay increase during both the AM and PM peak hours exceeded the allowable thresholds.

Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned intersection. The required improvements are consistent with the improvements stated in the OMCPU EIR.

22. The intersection of La Media Road / Otay Mesa Road is projected to operate at LOS F under Cumulative Plus Project conditions, during both the AM and PM peak hour. During the AM peak hour, the overall intersection delay is projected to increase from 172.2 seconds of delay under Year 2025 Cumulative conditions to 181.5 seconds of delay under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 9.3 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 119.9 under Year 2025 Cumulative conditions to 121.7 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 1.8 seconds of overall delay. The delay increase during both the AM and PM peak hours exceeded the allowable thresholds.

    Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned intersection. The required improvements are consistent with the improvements stated in the OMCPU EIR.

30. The intersection of SR-905 SB Off-Ramp / Siempre Viva Road is projected to operate at LOS F under Cumulative Plus Project conditions, during both the AM and PM peak hour. During the AM peak hour, the overall intersection delay is projected to increase from 89.8 seconds of delay under Year 2025 Cumulative conditions to 93.2 seconds of delay under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 3.4 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 29.6 under Year 2025 Cumulative conditions to 31.9 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 2.4 seconds of overall delay. The delay increase during both the AM peak hour exceeded the allowable threshold.

    Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned intersection. The required improvements are consistent with the improvements stated in the OMCPU EIR.

39. Continental Road / Airway Road (LOS F during both AM and PM peak hours) - the intersection of Continental Road and Airway Road is projected to operate at LOS F during the PM peak hour under Existing Plus Project conditions. The overall intersection delay during the PM peak hour is projected to be 197.1 seconds under Existing Plus Project conditions.

    Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned intersection.

Ramp Intersection Capacity Analysis

Consistent with Caltrans requirements, the signalized ramp intersections were analyzed using ILV procedures, as described in Section 2.4. ILV analysis results are displayed in **Table 8.4** and analysis worksheets for the Year 2025 Cumulative Plus Project conditions are provided in Appendix J.

TABLE 8.4
RAMP INTERSECTION CAPACITY ANALYSIS
YEAR 2025 CUMULATIVE PLUS PROJECT CONDITIONS

Ramp Intersection	Peak Hour	ILV / Hour	Description
Caliente Avenue and SR-905 EB Ramps	AM	1,348	*At Capacity*
	PM	1,331	*At Capacity*
Caliente Avenue and SR-905 WB Ramps	AM	1,628	*Over Capacity*
	PM	1,663	*Over Capacity*
Britannia Boulevard and SR-905 EB Ramps	AM	1,474	*At Capacity*
	PM	1,620	*Over Capacity*
Britannia Boulevard and SR-905 WB Ramps	AM	1,303	*At Capacity*
	PM	1,830	*Over Capacity*
Siempre Viva Road and SR-905 NB Ramps	AM	892	*Under Capacity*
	PM	1,296	*At Capacity*
Siempre Viva Road and SR-905 SB Ramps	AM	678	*Under Capacity*
	PM	721	*Under Capacity*

Source: Chen Ryan Associates; April 2016

Notes:
Lower than 1,200 ILV/hour = Under Capacity
Between 1,200 and 1,500 ILV/hour = At Capacity
Higher than 1500 ILV/hour = Over Capacity

As shown in the table above, all of the study ramp intersections would continue to operate at "At Capacity" or better conditions during both the AM and PM peak hours under Year 2025 Cumulative Plus Project conditions, with the exception of the following:

- Caliente Avenue and SR-905 WB Ramps – operates at "Over Capacity" during the AM and PM peak hours;
- Britannia Boulevard and SR-905 EB Ramps – operates at "Over Capacity" during the PM peak hour; and
- Britannia Boulevard and SR-905 WB Ramps – operates at "Over Capacity" during the PM peak hour.

As previously discussed in Section 2.4, neither Caltrans nor the City uses ILV results in determining significance of project impacts, but the analyses are included for informational purposes.

Freeway Segment Analysis

Table 8.5 displays freeway segment level of service results for the study area freeway mainline facilities under Year 2025 Cumulative Plus Project conditions. The freeway segment level of service analysis was performed utilizing the methodology presented in Section 2.6.

As shown in the Table 8.5, all of the freeway segments operate at acceptable LOS D or better with the exception of the following:

- I-805, between Main Street and Palm Avenue (LOS F in the NB direction) - The addition of the proposed project traffic would cause the volume to capacity ratio to increase from 1.041 under Year 2025 Cumulative conditions to 1.046 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.005. This increase in volume to capacity ratio does not exceed the allowable 0.005 threshold.

  Based upon the significance criteria presented in Section 2.7, facility improvements would not be required at the aforementioned freeway segment.

- I-805, between Palm Avenue and SR-905 (LOS E in the SB direction) - The addition of the proposed project traffic would cause the volume to capacity ratio to increase from 0.933 under Year 2025 Cumulative conditions to 0.942 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.009. This increase in volume to capacity ratio does not exceed the allowable 0.010 threshold.

  Based upon the significance criteria presented in Section 2.7, facility improvements would not be required at the aforementioned freeway segment.

- SR-905, between I-805 and Caliente Avenue (LOS F in the WB direction) - The addition of the proposed project traffic would cause the volume to capacity ratio to increase from 1.002 under Year 2025 Cumulative conditions to 1.032 under Year 2025 Cumulative Plus Project conditions, resulting in a net increase of 0.030. This increase in volume to capacity ratio exceeds the allowable 0.010 threshold.

  Based upon the significance criteria presented in Section 2.7, facility improvements would be required at the aforementioned freeway segment to achieve acceptable LOS. However, this facility is under the purview of Caltrans, and no current plans exist to widen this freeway segment; thus this freeway segment would continue to operate at LOS F with the addition of Project traffic. It should be noted that the OMCPU EIR disclosed that this segment of SR-905 would operate at a deficient LOS F, and disclosed impacts to this freeway segment as a significant and unavoidable impact of the OMCPU. The proposed Project, which would produce approximately 20% less traffic than accounted for by the OMCPU EIR, is consistent with the findings and conclusions of the OMCPU EIR with respect to this freeway segment.

TABLE 8.5
FREEWAY SEGMENT ANALYSIS
YEAR 2025 CUMULATIVE PLUS PROJECT CONDITIONS

Freeway	Segment	ADT	Direction	# of Lanes	Capacity[a]	D[b]	K[c]	HVF[d]	Peak Hour Volume	V/C	LOS[f]	Peak Hour	Without Project V/C	Without Project LOS	Δ V/C Ratio	SI?
I-805	Main Street and Palm Avenue	236,700	NB	4M+1A	10,810	5.9%	64.6%	10.0%	9,480	0.877	D	AM	0.871	D	0.006	No
			SB	4M+1A	10,810	8.0%	56.7%	10.0%	11,310	1.046	**F**	PM	1.041	**F**	0.005	No
	Palm Avenue and SR-905	212,600	NB	4M+1A	10,810	5.9%	64.6%	10.0%	8,520	0.788	C	AM	0.782	C	0.007	No
			SB	4M+1A	10,810	8.0%	56.7%	10.0%	10,180	0.942	**E**	PM	0.933	**E**	0.009	No
SR-905	Picador Boulevard and I-805	104,000	EB	3M+1A	8,460	8.4%	64.4%	10.0%	5,940	0.702	C	AM	0.683	C	0.019	No
			WB	3M+1A	8,460	8.4%	64.4%	10.0%	5,940	0.702	C	PM	0.682	C	0.020	No
	I-805 and Caliente Avenue	168,600	EB	4M	9,400	7.5%	53.1%	10.0%	7,040	0.749	C	AM	0.728	C	0.021	No
			WB	3M+1A	8,460	8.2%	59.9%	10.0%	8,730	1.032	**F**	PM	1.002	**F**	0.030	**Yes**
	Caliente Avenue and Heritage Road	159,300	EB	3M	7,050	7.5%	53.1%	10.0%	3,240	0.460	B	AM	0.438	B	0.021	No
			WB	3M	7,050	8.2%	59.9%	10.0%	2,660	0.377	A	PM	0.360	A	0.017	No
	Heritage Road and Britannia Boulevard	151,700	EB	3M	7,050	7.5%	53.1%	10.0%	1,530	0.217	A	AM	0.206	A	0.011	No
			WB	3M	7,050	8.2%	59.9%	10.0%	1,510	0.214	A	PM	0.204	A	0.010	No
	Britannia Boulevard and La Media Road	133,500	EB	3M+1A	8,460	7.5%	53.1%	10.0%	890	0.105	A	AM	0.105	A	0.000	No
			WB	3M	7,050	8.2%	59.9%	10.0%	950	0.135	A	PM	0.135	A	0.000	No
	La Media Road and SR-125	102,100	EB	3M	7,050	7.5%	53.1%	10.0%	510	0.072	A	AM	0.072	A	0.000	No
			WB	3M	7,050	8.2%	59.9%	10.0%	570	0.081	A	PM	0.079	A	0.001	No

Source: Chen Ryan Associates; November2016

Notes:
Bold letter indicated substandard LOS.
SI? = Significant Impact?
M = Mainline. A = Auxiliary Lane.
[a] The capacity is calculated as 2,350 ADT per main lane and 1,410 ADT (60% of the main lane capacity) per auxiliary lane.
[b] D = Directional split.| [c] K = Peak hour %. | [d] HV = Heavy vehicle % - consistent with the OMCPU. | [(f)] LOS during highest directional demand

8.2 Recommended Improvements

This section identifies required improvements for roadway, intersection, and freeway facilities that are associated with buildout of the Otay Mesa Central Village Specific Plan under Year 2025 Cumulative Plus Project conditions. Procedure for determining the ADT threshold, facility improvements trigger identification, as well as associated worksheets are provided in **Appendix K**.

Table 8.6 displays level of service analysis results both before and after implementation of the recommended improvements at the deficient roadway segments under Year 2025 Cumulative Plus Project conditions.

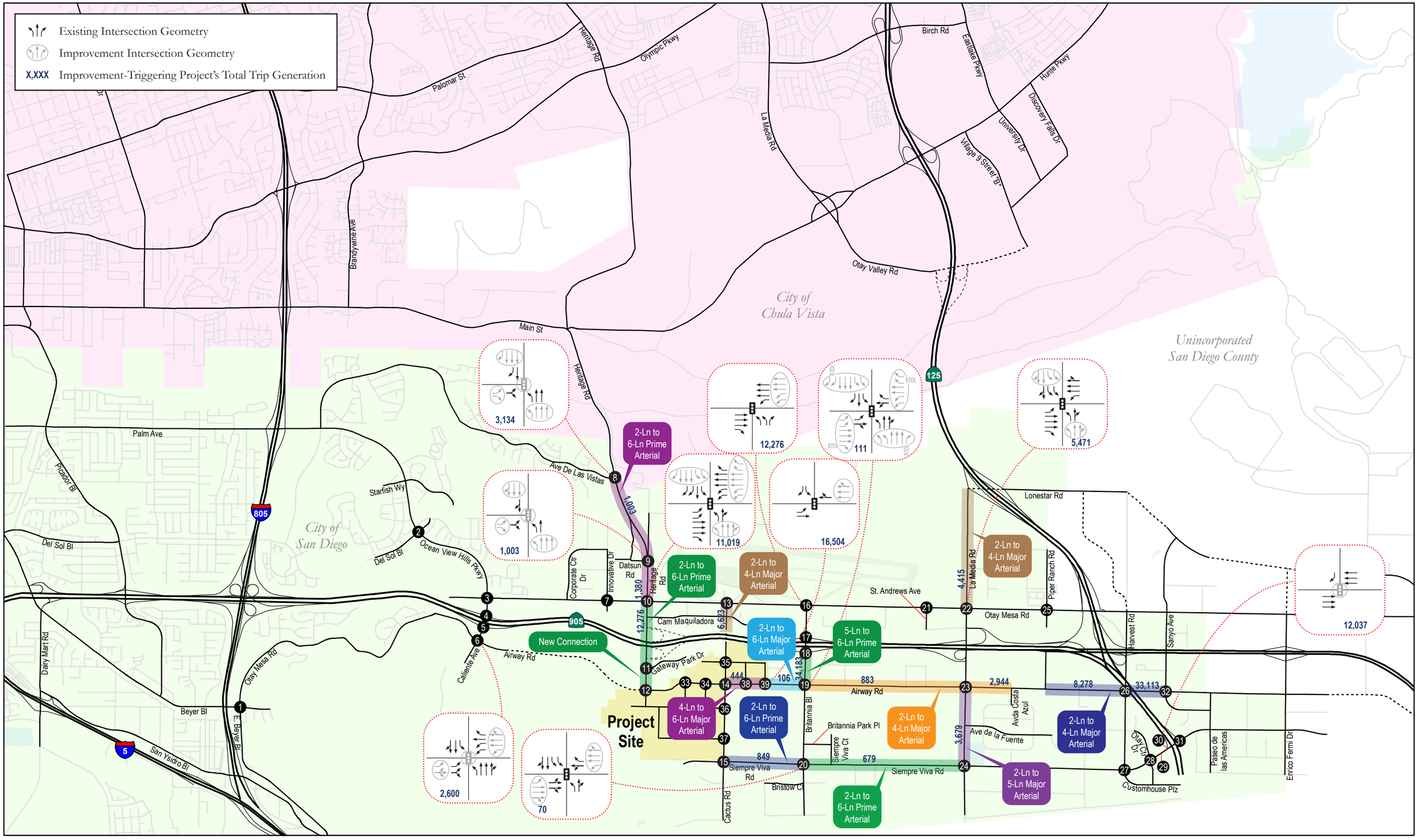
Figure 8-5 illustrates the recommended study area roadway segments and intersections improvements under Year 2025 Cumulative Plus Project conditions.

Roadway Segments

- *Heritage Road*, between Avenida De Las Vistas and Datsun Street – The Project shall pay a 13% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 1,003 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS F with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS C with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.
- *Heritage Road, between Datsun Street and Otay Mesa Road* – The Project shall pay a 12% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 1,380 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent

with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS C with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS C with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Cactus Road, between Otay Mesa Road and SR-905* – The Project shall pay a 23% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 6,623 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS D with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS A with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.



Otay Mesa Central Village Specific Plan

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Figure 8-5

Geometrics with Recommended Improvements - Year 2025 Cumulative Plus Project Conditions

- *Britannia Boulevard, between SR-905 EB Ramps and Airway Road* - The Project shall pay a 92% fair share contribution towards the widening of this roadway from a 5-lane roadway (2 NB & 3 SB) to a 6-lane Prime Arterial prior to the project's **total trip generation** of 34,183 ADT. This cross-section along Britannia Boulevard is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this roadway segment would operate at LOS F with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS C with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. However, this improvement was also identified under the Existing Plus Project scenario and the project will be expected to construct this improvement. It is important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.
- *La Media Road, between northern terminus and Otay Mesa Road* – The Project shall pay a 4% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 4,415 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS C with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at an acceptable LOS C with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.
- *La Media Road, between Avenida De La Fuente and Siempre Viva Road* – The Project shall pay a 4% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 5-lane Major Arterial prior to the project's **total trip**

generation of 3,679 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS C with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at an acceptable LOS B with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Airway Road, between Cactus Road and Continental Road* – The Project shall pay an 83% fair share contribution towards the widening of this roadway segment from a 4-lane roadway (1 EB & 3 WB) to a 6-lane Major Arterial prior to the project's **total trip generation** of 444 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS F with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS C with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. However, this improvement was also identified under the Existing Plus Project scenario and the project will be expected to construct this improvement. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Airway Road, between Continental Road and Britannia Boulevard* – The Project shall pay an 83% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 6-lane Major Arterial prior to the project's **total trip generation** of 106 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS F with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS C with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. However, this improvement was also identified under the Existing Plus Project scenario and the project will be expected to construct this improvement. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.
- *Airway Road, between Britannia Boulevard and La Media Road* – The Project shall pay a 24% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 883 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS D with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS B with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. However, this improvement was also identified under the Existing Plus Project scenario and the project will be expected to construct this improvement. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the

program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Airway Road, between La Media Road and Avenida Costa Azul* – The Project shall pay a 24% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 2,944 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS D with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS A with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. However, this improvement was also identified under the Existing Plus Project scenario and the project will be expected to construct this improvement. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.
- *Airway Road, between Piper Ranch Road and Harvest Road* – The Project shall pay a 7% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 8,278 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS D with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS B with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum

improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Airway Road, between Harvest Road and Sanyo Avenue* – The Project shall pay a 4% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 33,113 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS C with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS A with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.
- *Siempre Viva Road, between Cactus Road and Britannia Boulevard* – The Project shall pay a 53% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 849 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS C with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS A with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. However, this improvement was also identified under the Existing Plus Project scenario and the project will be expected to construct this improvement. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-

specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

- *Siempre Viva Road, between Britannia Boulevard and La Media Road* – The Project shall pay a 26% fair share contribution towards the widening of this roadway segment from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 679 ADT. This cross-section is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this segment would operate at LOS C with buildout of the OMCPU. As shown in Table 8.6, this segment would operate at LOS A with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

TABLE 8.6
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE PLUS PROJECT CONDITIONS – WITH IMPROVEMENTS

		Before Improvements			After Improvements		
Roadway	Segment	ADT	Cross Section	LOS	ADT	Functional Classification	LOS
Heritage Road	Avenida De Las Vistas to Datsun Street	35,800	2-Ln	**F**	35,800	6-Ln Prime Arterial	C
	Datsun Street to Otay Mesa Road	42,800	2-Ln	**F**	42,800	6-Ln Prime Arterial	C
	Otay Mesa Road to Camino Maquiladora	6,100	3-Ln (1-NB, 2-SB)	C	18,100[1]	6-Ln Prime Arterial	A
	Camino Maquiladora to Gateway Park Drive	2,000	2-Ln	A	14,000[1]	6-Ln Prime Arterial	A
	Gateway Park Drive to Airway Road	100	2-Ln	A	12,100[1]	6-Ln Prime Arterial	A
Cactus Road	Otay Mesa Road to SR-905	8,000	2-Ln	**E**	8,000	4-Ln Major Arterial	A
Britannia Boulevard	SR-905 EB Ramps to Airway Road	49,400	5-Ln w / RM (2-NB, 3-SB)	**E**	49,400	6-Ln Prime Arterial	C
La Media Road	Northern terminus to Otay Mesa Road	23,200	2-Ln	**F**	23,200	4-Ln Major Arterial	C
	Avenida De La Fuente and Siempre Viva Road	28,800	2-Ln	**F**	28,800	5-Ln Major Arterial	B
Airway Road	Cactus Road to Continental Road	38,800	4-Ln w / RM (1-EB, 3-WB)	**F**	38,800	6-Ln Major Arterial	C
	Continental Road to Britannia Boulevard	38,800	2-Ln	**F**	38,800	6-Ln Major Arterial	C
	Britannia Boulevard to La Media Road	17,800	2-Ln	**F**	17,800	4-Ln Major Arterial	B
	La Media Road to Avenida Costa Azul	11,300	2-Ln	**F**	11,300	4-Ln Major Arterial	A
	Piper Ranch to Harvest Road	16,200	2-Ln w / CLTL	**F**	16,200	4-Ln Major Arterial	B
	Harvest Road to Sanyo Avenue	14,400	2-Ln w / CLTL	**E**	14,400	4-Ln Major Arterial	A
Siempre Viva Road	Cactus Road to Britannia Boulevard	11,100	2-Ln	**F**	11,100	6-Ln Prime Arterial	A
	Britannia Boulevard to La Media Road	13,900	2-Ln	**F**	13,900	6-Ln Prime Arterial	A

Source: Chen Ryan Associates; November 2016

Notes:
Bold letter indicates substandard LOS.
RM = Raised Median.
[1]Approximately 1/3 (33%) of the project traffic would reroute from Britannia Boulevard to the Heritage Road connection.

Intersections

Facility improvements associated with buildout of the Otay Mesa Central Village Specific Plan would be required at the following intersections:

6. *Caliente Avenue / Airway Road* – The Project shall pay a 17% fair share contribution towards the installation of the traffic signal at this intersection prior to the project's **total trip generation** of 2,600 ADT. The recommended traffic signal is consistent with the assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F during both peak hours with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS C during both peak hours with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. Signal warrant analysis worksheets are provided in Appendix K. It is important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

8 *Heritage Road / Avenida De Las Vistas* – The Project shall pay a 12% fair share contribution towards the installation of the traffic signal at this intersection prior the project's **total trip generation** of 3,134 ADT. The recommended traffic signal is consistent with the assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F during both peak hours with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS B during both peak hours with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. Signal warrant analysis worksheets are provided in Appendix K. It is important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

9 *Heritage Road / Datsun Street* - The Project shall pay a 20% fair share contribution towards the installation of the traffic signal at this intersection prior to the project's **total trip generation** of 1,003 ADT. The recommended traffic signal is consistent with the assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F during both peak hours with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS B in the AM peak hour and LOS C during the PM peak hour with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. Signal warrant analysis worksheets are provided in Appendix K. It is important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village

Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

10 *Heritage Road / Otay Mesa Road* – The project shall pay a 20% fair share contribution towards the restriping of Otay Mesa Road to include an additional exclusive right-turn lane at the westbound approach of the intersection of Heritage Road / Otay Mesa Road prior to the project's **total trip generation** of 11,019 ADT. This recommended improvement is within the intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F during both peak hours with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS C during the AM peak hour and LOS D during the PM peak hour with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

16. Britannia Boulevard / Otay Mesa Road – The Project shall pay a 100% contribution towards the restriping of Otay Mesa Road to add an additional exclusive left-turn lane at the westbound approach and the extension of Heritage Road southerly to connect to Airway Road (Intersection #12) and widen Heritage Road between Otay Mesa Road and Airway Road, from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 12,276 ADT. This recommended improvement is within the intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. Furthermore, the construction of the Heritage Road connection alleviate congestion at Britannia Boulevard / Otay Mesa Road intersection due to the rerouting of approximately 1/3 (33%) of the project trips. This recommended improvement is consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS E in the AM peak hour and LOS D in the PM peak hour with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS B during the AM peak hour and LOS C during the PM peak hour with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village

will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

18. *Britannia Boulevard / SR-905 EB Ramps* - The Project shall pay a 100% contribution towards the extension of Heritage Road southerly to connect to Airway Road (Intersection #12) and widen Heritage Road between Otay Mesa Road and Airway Road, from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 27,225 ADT. The construction of this roadway connection would alleviate congestion at Britannia Boulevard / SR-905 EB Ramps intersection due to the rerouting of approximately 1/3 (33%) of the project trips. The recommended improvements are consistent with the classification identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and these improvements are consistent with the OMCPU EIR at buildout of the OMCPU; thus, the required improvements are within the scope of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F in the AM peak hour and LOS E in the PM peak hour with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS C during the AM peak hour and LOS D in the PM peak hour with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

19. *Britannia Boulevard / Airway Road* - The Project shall pay a 69% fair share contribution towards the widening of the eastbound approach (Airway Road) of this intersection to accommodate dual left-turn lanes, three through lanes, and an exclusive right-turn lane with right-turn overlap phasing, widen the westbound approach (Airway Road) to accommodate exclusive dual left-turn lanes, two through lanes, and exclusive dual right-turn lane with right-turn overlap phasing, widen the southbound approach (Britannia Boulevard) to accommodate exclusive dual left-turn lanes, three through lanes, and two exclusive right-turn lanes with right-turn overlap phasing, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes, and an exclusive right-turn lane with right-turn overlap phasing, prior to the project's **total trip generation** of 111 ADT. These recommended improvements are consistent with the intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F during both peak hours with buildout of the OMCPU. As shown in Table 6.7, this intersection would operate at

LOS D during both peak hours with the recommended improvements under Year 2025 Cumulative Plus Project conditions. It is important to note that interim improvement with fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

20. *Britannia Boulevard / Siempre Viva Road* - The Project shall pay a 43% fair share contribution towards the widening of the westbound approach (Siempre Viva Road) to accommodate two through lanes and an exclusive left-turn lane, and widen the eastbound approach to accommodate two through lanes and an exclusive left-turn-lane, prior to the project's **total trip generation** of 70 ADT. The recommended improvements are within the intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F during both peak hours with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS C during the AM peak hour and LOS D during the PM peak hour with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that interim improvement with fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

22. *La Media Road / Otay Mesa Road* – The Project shall pay a 7% fair share contribution towards the widening of the northbound approach (La Media Road) to accommodate two through lanes and an exclusive left turn lane, and widen the southbound approach (La Media Road) to accommodate an additional through lane, prior the project's **total trip generation** of 5,471 ADT. The recommended improvements are within the intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. The OMCPU EIR disclosed that this intersection would operate at LOS F during both peak hours with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS D during both peak hours with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. It is important to note that interim improvement with fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this

improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

30. *SR-905 SB Off-Ramp / Siempre Viva Road* – The Project shall pay a 6% fair share contribution towards the installation of the traffic signal at this intersection prior to the project's **total trip generation** of 12,037 ADT. The recommended traffic signal is consistent with the assumption of the OMCPU EIR's analysis of traffic. The OMCPU EIR disclosed that this intersection would operate at LOS F during the AM peak hour with buildout of the OMCPU. As shown in Table 8.7, this intersection would operate at LOS B during both peak hours with the recommended improvements under Year 2025 Cumulative Traffic Plus Project conditions. Signal warrant analysis worksheets are provided in Appendix K. It is important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

39. *Continental Road / Airway Road* – As described earlier in this section under "Roadway Segments", Airway Road between Continental Road and Britannia Boulevard shall be widened from a 2-lane roadway to a 6-lane Major Arterial prior to the project's **total trip generation** of 106 ADT by the project applicant. This improvement will improve traffic operations at this intersection. As shown in Table 8.7, this intersection would operate at LOS D during the AM peak hour and LOS B during the PM peak hour with the recommended improvements under Year 2025 Cumulative Plus Project conditions. It is important to note that the recommended improvement reflects the ultimate Community Plan designated-classification for this roadway; however, interim improvement to a lesser roadway width or fewer lanes could provide sufficient capacity. The Central Village Specific Plan requires that site-specific traffic studies must be prepared in conjunction with implementing development, and these studies will determine the minimum improvements needed to maintain acceptable LOS. It is also important to note that this improvement, identified trigger, and fair share contribution percentage have been identified at the program level, only. As it is unknown how buildout of the Central Village will be phased, the project-level traffic studies that are required by the Central Village Specific Plan will update and refine the required improvements and fair-share amounts on a project-by-project basis.

Table 8.7 displays level of service analysis results both the before and after implementation of the recommended improvements at the deficient intersections under Year 2025 Cumulative Plus Project conditions.

TABLE 8.7
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
YEAR 2025 CUMULATIVE PLUS PROJECT CONDITIONS – WITH IMPROVEMENTS

			Before Improvements				After Improvements			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
ID	Intersection	Control Type	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS
6	Caliente Avenue / Airway Road	Signalized	64.7	**F**	97.5	**F**	20.2	C	23.0	C
8	Heritage Road / Avenida De Las Vistas	Signalized	N/A[1]	**F**	N/A[1]	**F**	14.2	B	13.5	B
9	Heritage Road / Datsun Street	Signalized	183.2	**F**	231.8	**F**	10.7	B	29.3	C
10	Heritage Road / Otay Mesa Road	Signalized	55.1	**E**	99.0	**F**	33.8	C	54.2	D
16	Britannia Boulevard / Otay Mesa Road	Signalized	42.3	D	174.5	**F**	18.6	B	34.1	C
18	Britannia Boulevard / SR-905 EB Ramps	Signalized	71.4	**E**	93.0	**F**	32.2	C	48.0	D
19	Britannia Boulevard / Airway Road	Signalized	472.8	**F**	N/A[1]	**F**	49.5	D	53.8	D
20	Britannia Boulevard / Siempre Viva Road	Signalized	318.5	**F**	N/A[1]	**F**	31.1	C	39.0	D
22	La Media Road / Otay Mesa Road	Signalized	181.5	**F**	121.7	**F**	53.7	D	54.1	D
30	SR-905 SB Off-Ramp / Siempre Viva Road	Signalized	93.2	**F**	31.9	D	19.6	B	13.2	B
39	Continental Road / Airway Road	Signalized	33.6	C	197.1	**F**	36.5	D	13.8	B

Source: Chen Ryan Associates; November 2016

Notes:
Bold letter indicates substandard LOS.
[1]Exceeds maximum reasonable calculable delay of 600 seconds per Synchro 9.0 traffic analysis software.

Freeway Segments

The following freeway segment would be impacted by the proposed project under Year 2025 Cumulative Plus Project conditions:

- *SR-905, between I-805 and Caliente Avenue – LOS F in the WB direction.*

Neither Caltrans nor SANDAG have plans to construct additional lanes on State Route 905, nor is there a plan or program in place into which the project applicant could pay its fair-share towards the cost of such improvements. Therefore, improvements are considered infeasible and the impacts along SR-905 would remain significant and unavoidable. This recommendation is consistent with the conclusion of the OMCPU EIR.

9.0 Alternative Transportation and Transportation Demand Management

This chapter focuses on alternative modes of travel (walking, bicycling and transit) to/from and within the project site. It also outlines a proposed Transportation Demand Management (TDM) Plan to help reduce vehicular traffic and parking demand associated with the proposed project.

9.1 Alternative Transportation Facilities and Connectivity

The proposed project will contain a comprehensive, interconnected non-vehicular mobility system that connects residents and visitors to homes, retail establishments, parks, trails, and the school. The mobility system will be comprised of future transit stations along Airway Road, bicycle facilities, and pedestrians connections including sidewalks, pedestrian paseos, pedestrian nodes, and a trail located parallel to Cactus Road (south of Central Main Street) and along the southern boundary of Central Village.

Bicycle Facilities

Bicycle facilities will be provided along most of the roadways within the proposed project. Two types of bicycle facilities are planned within Central Village:

Class I bike paths are separated from vehicular traffic by a curb-adjacent clear zone or tree-lined parkway and accommodate two lanes (one bike lane in each direction). Class I bike paths are proposed along the south side of Airway Road and on one side of the road along Central Main Street and Park Way.

Class II bike lanes are on-street, six-foot wide lanes that are generally bordered by a landscaped parkway adjacent to a sidewalk. Class II lanes are provided along both sides of the streets along the following streets:

- Airway Road
- Heritage Road
- Cactus Road
- Central Village Entry streets

Class II bike lanes along Village Entry roads are bordered by on-street parking.

Pedestrian Facilities

In addition to traditional sidewalks, pedestrian connections in the Central Village include paseos, pedestrian nodes, and trails, which connect pedestrians to parks and other destinations within the Central Village. This pedestrian system encourages walking throughout the village by providing a safe and pleasant pedestrian environment that is separated from vehicular traffic along major backbone roadways.

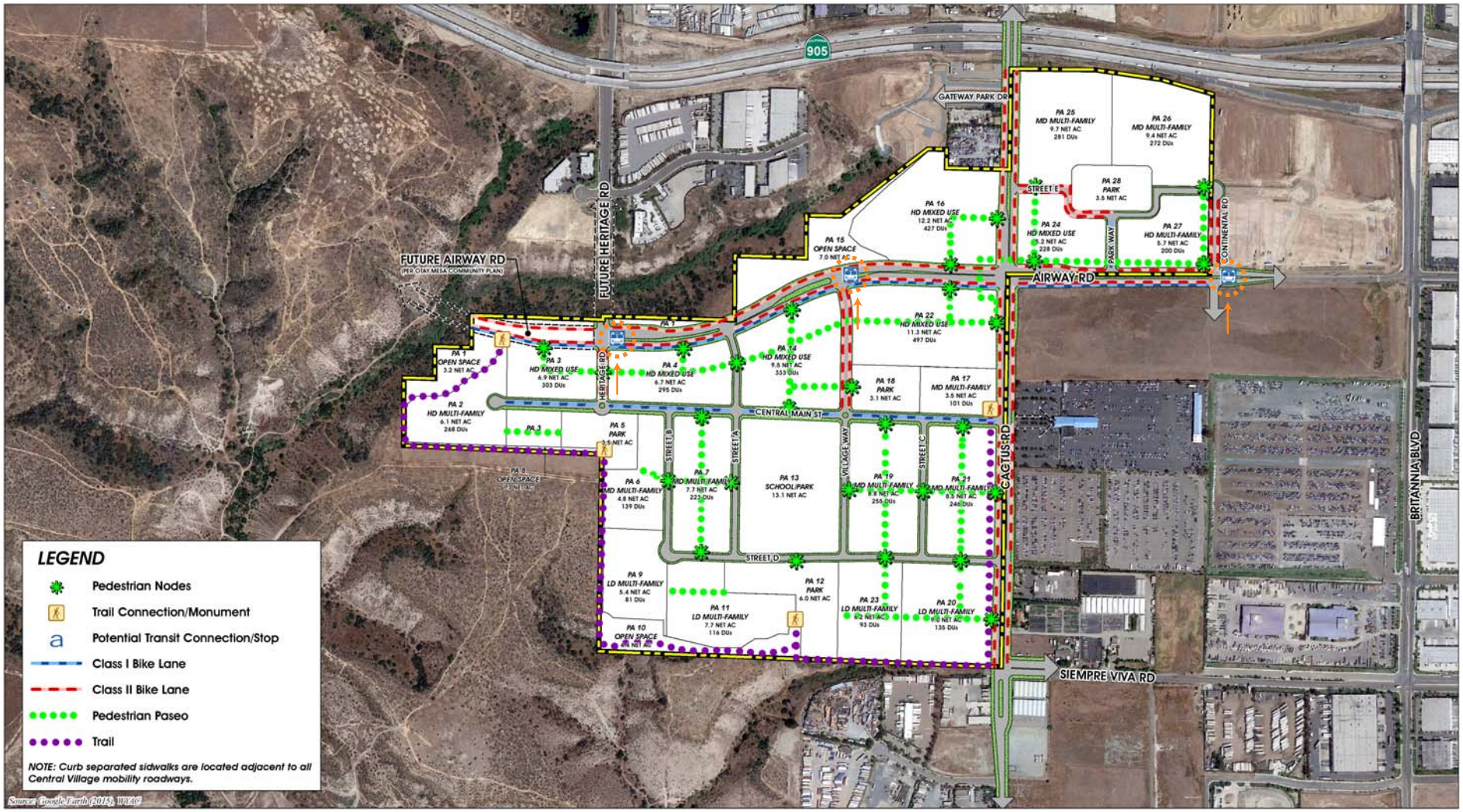
Transit Facilities

The Central Village Specific Plan area is currently served by Metropolitan Transit System (MTS) express Routes 905, 905A, and 950. Route 905 generally runs along Otay Mesa Road and the SR-905. Route 905A takes a similar route as Route 905, but provides local service to industrial uses located south of Airway Road and Britannia Boulevard. Route 950 is an express route with limited stops. All three of these routes provide service between the SR-905 Point of Entry in the east and the Iris Avenue transfer station in the west.

San Diego Forward: The Regional Plan Revenue Constrained scenario identifies several public transit service improvements within the Otay Mesa community, and each of the service improvements are summarized below, including frequency changes, new routes, and anticipated implementation years:

- Rapid Bus, Route 225 – Otay Mesa to Down Town San Diego, including the Otay Mesa International Travel Center (ITC). This route will operate at 15-minute headways during the peak and 30-minute headway during the off-peak periods. According to the 2050 RTP, the route will be implemented by 2020.
- Rapid Bus, Route 905 – Extending the rapid bus services from the current terminus at the Iris Trolley Station to the Otay Mesa East Port of Entry (POE). This route will operate at 10-minute headways during both the peak and off-peak periods. According to the 2050 RTP, the route will be implemented by 2020.
- Rapid Bus, Route 638 – Otay Mesa to Iris Trolley Station via Otay Mesa Road, Airway Road, and the SR-905 corridor. This route will operate at 10-minute headways during both the peak and off-peak periods. According to the 2050 RTP, the route will be implemented by 2035.
- Rapid Bus, Route 689 – Otay Mesa POE to UTC/Torrey Pines via Otay Ranch / Millennia. This route will operate at 15-minute headways during the peak periods only. According to the 2050 RTP, the route will be implemented by 2035.

In the vicinity of the Otay Mesa Central Village Specific Plan site, there are two (2) planned transit stops along Airway Road at Continental Road, Village Way, and Heritage Road. Potential transit priority treatment is also planned on Airway Road. **Figure 9-1** displays the proposed transit stops for the project.



Otay Mesa Central Village Specific Plan

Figure 9-1
Planned Transit Stops

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9.2 Transportation Demand Management Plan

To reduce single occupant vehicle trips to the extent feasible, the Specific Plan should consider the implementation of a Transportation Demand Management (TDM) program to reduce vehicle trips in favor of alternative modes of transportation. The TDM program will facilitate increased opportunities for transit, bicycling, and pedestrian travel. The project applicant shall incorporate the following measures as part of the project design and development, consistent with the identified triggers, to the satisfaction of the City Engineer:

- Participate in car sharing and bike sharing programs through HOA noticing, should such programs become available.
- Promote available websites providing transportation options for residents and businesses.
- Create and distribute a "new resident" information packet addressing alternative modes of transportation.
- Where transit is available on-site, participate in providing the necessary transit facilities, such as bus pads, shelters, signs, lighting, and trash receptacles.

10.0 On-Site Circulation and Parking

This chapter presents access to the project site and recommends functional classifications for internal roadways to the Project.

10.1 Project Access

The project site proposes eight (8) access points at the following locations:

12. Heritage Road / Airway Road – Construction of an L-shaped intersection providing movements between the project site and Airway Road, east of the Heritage Road project access.
33. Street "A" / Airway Road – Construction of a signalized T-intersection.
34. Village Way / Airway Road – Construction of a signalized T-intersection.
35. Cactus Road / Street "D" – Construction of a signalized four-legged intersection.
36. Cactus Road / Central Main Street – Construction of a signalized T-intersection.
37. Cactus Road / Street "C" – Construction of a signalized T-intersection.
38. Park Way / Airway Road – Construction of a side-street stop controlled right-turn in/out only T-intersection.
39. Continental Road / Airway Road – construction of a signalized T-intersection.

The traffic operations at these access points are provided in Chapters 5.0 and 6.0, and all eight assess points would operate at acceptable LOS assuming traffic generated from the full build-out of the proposed project.

10.2 Internal Circulation

Based upon buildout of the proposed project land uses and trip generation as shown previously, ADT volumes were estimated for the internal roadway segments within Central Village. Project trips were distributed and assigned to the internal roadway system based on the location and characteristics of the proposed land uses.

Table 10.1 displays recommended roadway classifications and resulting Level of Service for the Central Village internal roadway segments. LOS D is considered acceptable for internal roadways within the Central Village.

TABLE 10.1
OTAY MESA CENTRAL VILLAGE SPECIFIC PLAN
INTERNAL STREET SIZING AND LOS ANALYSIS

Internal Roadway	Segment	Estimated ADT	Recommended Classification	Capacity Threshold LOS E	LOS
Street "D"	from Cactus Road to Park Way	5,100	2-lane Collector w/ Raised Median & Turn Pocket	<15,000	B
	from Park Way to Continental Road	600	2-lane Collector (multi-family)	<8,000	A
Central Main Street	from Heritage Road to Street "B"	6,700	2-lane Collector w/ Raised Median & Turn Pocket	<15,000	B
	from Street "B" to Street "A"	5,700	2-lane Collector w/ Raised Median & Turn Pocket	<15,000	B
	from Street "A" to Village Way	4,700	2-lane Collector w/ Raised Median & Turn Pocket	<15,000	A
	from Village Way to Cactus Road	7,500	2-lane Collector w/ Raised Median & Turn Pocket	<15,000	C
Street “C”	from Street “B” to Street “A”	2,000	2-lane Collector (multi-family)	<8,000	A
	from Street “A” to Village Way	1,900	2-lane Collector (multi-family)	<8,000	A
	from Village Way to Cactus Road	2,900	2-lane Collector (multi-family)	<8,000	B
Heritage Road	from Airway Road to Central Main Street	9,300	2-lane Collector w/ Striped Median & Turn Pocket	<15,000	C
Street “B”	from Central Main Street to Street “C”	8,100	2-lane Collector (no fronting property)	<10,000	D
Street “A”	from Airway Road to Central Main Street	1,400	2-lane Collector (multi-family)	<8,000	A
	from Central Main Street to Street “C”	3,000	2-lane Collector (multi-family)	<8,000	B
Village Way	from Airway Road to Central Main Street	8,400	2-lane Collector w/ Raised Median & Turn Pocket	<15,000	C
	from Central Main Street to Street "C"	2,700	2-lane Collector (multi-family)	<8,000	B
Park Way	from Street "D" to Airway Road	3,500	2-lane Collector (multi-family)	<8,000	B
Continental Road	Street "D" to Airway Road	12,000*	2-lane Collector w/ Continuous left-turn lane	<15,000	D

Source: Chen Ryan Associates; April 2016

Note:
*Continental Road would serve two parcels, one to the west is a part of the Central Village Specific Plan while the undeveloped parcel to the east belongs to another property owner and specific land use information is unknown. To be consistent with the Otay Mesa Community Plan, the forecast roadway ADT for Continental Road was obtained from the Otay Mesa Community Plan Update FEIR, Appendix J - Figure 7-1.

10.3 Parking

Since this TIS is being prepared for a program level, the project specific details related to parking within Central Village are not known at the moment. Additionally, the location of individual parking facilities, the specific uses in which they will serve and the total number of parking spaces they will include are also not known at this time. Therefore, a project specific parking analysis could not be performed. As the Central Village develops, individual projects will need to perform project specific parking studies to ensure that they are in compliance with the current City of San Diego municipal code (Article 2, Division 5 Parking Regulations).

11.0 Findings and Recommendations

This chapter provides a summary of the key findings and study recommendations, including the Level of Service results and traffic improvements requirements, associated with the various analysis scenarios. Specific recommendations related to improvements of the proposed project traffic impacts on intersection, roadway and freeway/state highway segments are also summarized.

Summary of Roadway Segment Analyses

Table 11.1 and **Table 11.2** display the roadway segment Level of Service results for each of the study scenarios analyzed.

TABLE 11.1
SUMMARY OF ROADWAY SEGMENT LOS RESULTS – CITY OF SAN DIEGO

Roadway	From	To	Existing	Existing Plus Project	Year 2025 Cumulative	Year 2025 Cumulative Plus Project
East Beyer Boulevard	Beyer Boulevard	South of Beyer Boulevard	A	A	D	D
Ocean View Hills Parkway	Starfish Way	Del Sol Boulevard	A	A	B	B
	Del Sol Boulevard	Otay Mesa Road	A	A	B	B
Caliente Avenue	SR-905 WB Ramps	SR-905 EB Ramps	A	A	B	B
	SR-905 EB Ramps	Airway Road	A	A	C	C
	Airway Road	Southern Terminus	A	A	B	B
Innovative Drive	Progressive Avenue	Otay Mesa Road	A	A	B	C
Heritage Road	Avenida De Las Vistas	Datsun Street	B	D	**F**	**F**/C
	Datsun Street	Otay Mesa Road	C	D	**F**	**F**/C
	Otay Mesa Road	Camino Maquiladora	B	C	B	C
	Camino Maquiladora	Gateway Park Drive	A	A	A	A
	Gateway Park Drive	Southern Terminus	A	A	A	A
Cactus Road	Otay Mesa Road	SR-905	A	A	D	**E**/A
	SR-905	Street "D"	A	A	A	A
	Street "D"	Airway Road	A	A	A	A
	Airway Road	Siempre Viva Road	A	A	A	A
Britannia	Otay Mesa Road	SR-905 WB Ramps	A	B	A	B

TABLE 11.1
SUMMARY OF ROADWAY SEGMENT LOS RESULTS – CITY OF SAN DIEGO

Roadway	From	To	Existing	Existing Plus Project	Year 2025 Cumulative	Year 2025 Cumulative Plus Project
Boulevard	SR-905 WB Ramps	SR-905 EB Ramps	A	C	A	C
	SR-905 EB Ramps	Airway Road	B	**E** / C	B	**E**/C
Britannia Boulevard	Airway Road	Siempre Viva Road	A	A	A	A
	Siempre Viva Road	Bristow Court	C	C	D	D
Saint Andrews Avenue	Otay Mesa Road	Otay Mesa Center Road	C	C	A	A
La Media Road	Northern Terminus	Otay Mesa Road	D	D	**F**	**F**/C
	Otay Mesa Road	SR-905 WB Ramps	A	A	B	B
	SR-905 WB Ramps	SR-905 EB Ramps	A	A	A	A
	SR-905 EB Ramps	Airway Road	C	C	D	D
	Airway Road	Avenida De La Fuente	**E**	**E**	**F**	**F**
	Avenida De La Fuente	Siempre Viva Road	B	C	**F**	**F**/B
Otay Mesa Road	Ocean View Hills Parkway	Corporate Center Drive	A	A	B	C
	Corporate Center Drive	Heritage Road	A	A	B	B
	Heritage Road	Cactus Road	A	A	A	B
	Cactus Road	Britannia Boulevard	A	A	B	C
	Britannia Boulevard	Saint Andrews Avenue	A	A	B	C
	Saint Andrews Avenue	La Media Road	A	A	B	B
	La Media Road	Piper Ranch Road	A	A	B	B
Camino Maquiladora	Heritage Road	Cactus Road	A	A	A	A
	Cactus Road	Eastern Terminus	A	A	A	A
Airway Road	Otay Mesa Road	Caliente Avenue	A	A	C	C
	Caliente Avenue	Eastern Terminus	A	A	**F**	**F**
	Heritage	Street "A"	DNE	A	DNE	A
	Street "A"	Village Way	DNE	A	DNE	A
	Village Way	Cactus Road	DNE	A	DNE	A
	Cactus Road	Continental Road	A	**E**/C	**F**	**F**/C
	Continental Road	Britannia Boulevard	A	**F**	**F**	**F**/C
Airway Road	Britannia Boulevard	La Media Road	B	**E**	**F**	**F**/B

TABLE 11.1
SUMMARY OF ROADWAY SEGMENT LOS RESULTS – CITY OF SAN DIEGO

Roadway	From	To	Existing	Existing Plus Project	Year 2025 Cumulative	Year 2025 Cumulative Plus Project
	La Media Road	Avenida Costa Azul	**E**	**E**	**F**	**F**/A
	Avenida Costa Azul	Piper Ranch Road	A	A	A	A
	Piper Ranch Road	Harvest Road	B	B	**F**	**F**/B
	Harvest Road	Sanyo Avenue	B	B	**E**	**E**/A
Beyer Boulevard	Park Avenue	Otay Mesa Road	A	A	C	C
	Otay Mesa Road	East of Otay Mesa Road	A	A	A	A
Siempre Viva Road	Cactus Road	Britannia Boulevard	A	**E**	D	**F**/A
	Britannia Boulevard	La Media Road	A	D	**F**	**F**/A
	La Media Road	Customhouse Plaza	A	A	A	A
	Customhouse Plaza	Otay Center Drive	A	A	A	A
	Otay Center Drive	SR-905 SB Ramps	A	A	A	A
	SR-905 SB Ramps	SR-905 SB Off-Ramp	B	B	B	B
	SR-905 SB Off-Ramp	SR-905 NB Ramps	A	A	C	C
	SR-905 NB Ramps	East of SR-905 Ramps	B	B	D	D
Customhouse Plaza	Siempre Viva Road	Southern Terminus	A	A	A	A

Source: Chen Ryan Associates; November 2016

Note:
Bold letter indicates substandard LOS.
X / Y = Before Recommended Improvements / After Recommended Improvements.

Based upon the significance criteria presented in Section 2.7, and consistent with the conclusions of the OMCPU EIR, facility improvements would be required at the following roadway segments:

<u>Existing Plus Project</u>

- Britannia Boulevard, between SR-905 EB Ramps and Airway Road;
- Airway Road, between Cactus Road and Continental Road;
- Airway Road, between Continental Road and Britannia Boulevard;
- Airway Road, between Britannia Boulevard and La Media Road;
- Airway Road, between La Media Road and Avenida Costa Azul; and
- Siempre Viva Road, between Cactus Road and Britannia Boulevard.

Year 2025 Cumulative Plus Project

- Heritage Road, between Avenida De Las Vistas to Datsun Street;
- Heritage Road, between Datsun Street and Otay Mesa Road;
- Cactus Road, between Otay Mesa Road and SR-905;
- Britannia Boulevard, between SR-905 EB Ramps to Airway Road;
- La Media Road, between northern terminus and Otay Mesa Road;
- La Media Road, between Avenida De La Fuente and Siempre Viva Road;
- Airway Road, between Cactus Road and Continental Road;
- Airway Road, between Continental Road and Britannia Boulevard;
- Airway Road, between Britannia Boulevard and La Media Road;
- Airway Road, between La Media Road and Avenida Costa Azul;
- Airway Road, between Piper Ranch Road and Harvest Road;
- Airway Road, between Harvest Road and Sanyo Avenue;
- Siempre Viva Road, between Cactus Road and Britannia Boulevard; and
- Siempre Viva Road, between Britannia Boulevard and La Media Road.

TABLE 11.2
SUMMARY OF ROADWAY SEGMENT LOS RESULTS – CITY OF CHULA VISTA

Roadway	From	To	Existing	Existing Plus Project	Year 2025 Cumulative	Year 2025 Cumulative Plus Project
Heritage Road	Main Street	Avenida De Las Vistas	A	C	A	B

Source: Chen Ryan Associates; February 2016

Note:
Bold letter indicates substandard LOS.

Summary of Intersection Analyses

Table 11.3 and **Table 11.4** display the intersection Level of Service results for each of the study scenarios analyzed.

TABLE 11.3
SUMMARY OF INTERSECTION LOS RESULTS

		Existing		Existing Plus Project		Year 2025 Cumulative		Year 2025 Cumulative Plus Project	
ID	Intersection	AM	PM	AM	PM	AM	PM	AM	PM
1	Beyer Boulevard / Otay Mesa Road	B	B	B	B	B	B	B	B
2	Ocean View Hills Parkway / Del Sol Boulevard	B	B	B	B	B	C	B	C
3	Ocean View Hills Parkway / Otay Mesa Road	B	D	B	D	D	D	D	D
4	Caliente Avenue / SR-905 WB Ramps	A	A	A	B	B	B	C	B
5	Caliente Avenue / SR-905 EB Ramps	C	B	C	B	D	C	D	C

TABLE 11.3
SUMMARY OF INTERSECTION LOS RESULTS

		Existing		Existing Plus Project		Year 2025 Cumulative		Year 2025 Cumulative Plus Project	
ID	Intersection	AM	PM	AM	PM	AM	PM	AM	PM
6	Caliente Avenue / Airway Road	A	A	A	B	C	**E**	**F**/C	**F**/C
7	Innovative Drive / Otay Mesa Road	A	B	A	B	A	B	B	B
8	Heritage Road / Avenida De Las Vistas	A	A	B	C	**F**	**F**	**F**/B	**F**/B
9	Heritage Road / Datsun Street	A	B	B	D	**F**	**F**	**F**/B	**F**/C
10	Heritage Road / Otay Mesa Road	D	C	D	D	D	D	**E**/C	**F**/D
11	Heritage Road / Gateway Park Drive	A	A	A	A	A	A	A	A
12	Heritage Road / Airway Road	Does Not Exist		A	A	Does Not Exist		A	A
13	Cactus Road / Otay Mesa Road	B	C	B	C	C	C	D	D
14	Cactus Road / Airway Road	A	A	C	C	A	A	C	C
15	Cactus Road / Siempre Viva Road	A	A	B	C	A	A	B	B
16	Britannia Boulevard / Otay Mesa Road	C	C	D/D	**F**/D	B	D	D/B	**F**/C
17	Britannia Boulevard / SR-905 WB Ramps	B	B	B	C	B	D	C	D
18	Britannia Boulevard / SR-905 EB Ramps	A	B	D	D	B	B	**E**/C	**F**/D
19	Britannia Boulevard / Airway Road	B	D	**F**/D	**F**/D	D	D	**F**/D	**F**/D
20	Britannia Boulevard / Siempre Viva Road	B	B	C	D	**F**	**F**	**F**/C	**F**/D
21	Saint Andrews Avenue / Otay Mesa Road	A	A	A	A	C	B	B	C
22	La Media Road / Otay Mesa Road	D	D	D	D	**F**	**F**	**F**/D	**F**/D
23	La Media Road / Airway Road	A	A	A	B	B	C	B	D
24	La Media Road / Siempre Viva Road	A	A	B	C	B	B	C	D
25	Piper Ranch Road / Otay Mesa Road	A	B	A	B	B	B	B	B
26	Harvest Road / Airway Road	A	A	A	B	B	D	B	D
27	Customhouse Plaza / Siempre Viva Road	B	A	A	B	B	A	B	B
28	Otay Center Drive / Siempre Viva Road	B	B	B	B	B	C	B	C
29	SR-905 SB Ramps / Siempre Viva Road	A	A	A	A	A	A	A	A
30	SR-905 SB Off-Ramp / Siempre Viva Road	C	B	C	C	**F**	D	**F**/B	D/B
31	SR-905 NB Off-Ramp / Siempre Viva Road	B	B	B	B	B	C	B	C
32	Sanyo Avenue / Airway Road	A	A	A	B	C	B	C	B
33	Street "A" / Airway Road	Does Not Exist		A	A	Does Not Exist		A	A

TABLE 11.3
SUMMARY OF INTERSECTION LOS RESULTS

		Existing		Existing Plus Project		Year 2025 Cumulative		Year 2025 Cumulative Plus Project	
ID	Intersection	AM	PM	AM	PM	AM	PM	AM	PM
34	Village Way / Airway Road	Does Not Exist		C	B	Does Not Exist		C	B
35	Cactus Road / Street "D"	Does Not Exist		B	B	Does Not Exist		B	B
36	Cactus Road / Central Main Street	Does Not Exist		B	B	Does Not Exist		B	B
37	Cactus Road / Street "C"	Does Not Exist		A	A	Does Not Exist		A	A
38	Park Way / Airway Road	Does Not Exist		A	C	Does Not Exist		A	C
39	Continental Road / Airway Road	Does Not Exist		C/D	**F**/B	Does Not Exist		C/D	**F**/B

Source: Chen Ryan Associates; November 2016

Note:
Bold letter indicates substandard LOS.
X / Y = Before Recommended Improvements / After Recommended Improvements.

Based upon the significance criteria presented in Section 2.7, and consistent with the conclusions of the OMCPU EIR, facility improvements would be required at the following intersections:

<u>Existing Plus Project</u>

16. *Britannia* Boulevard / Otay Mesa Road;
19. Britannia Boulevard / Airway Road;
39. Continental Road / Airway Road.

<u>Year 2025 Cumulative Plus Project</u>

6. Caliente Avenue / Airway Road;
8. Heritage Road / Avenida De Las Vistas;
9. Heritage Road / Datsun Street;
10. Heritage Road / Otay Mesa Road;
16. Britannia Boulevard / Otay Mesa Road;
18. Britannia Boulevard / SR-905 EB Ramps;
19. Britannia Boulevard / Airway Road;
20. Britannia Boulevard / Siempre Viva Road;
22. La Media Road / Otay Mesa Road;
30. SR-905 SB Off-Ramp / Siempre Viva Road; and
39. Continental Road / Airway Road.

Summary of Ramp Intersection Analyses

Table 11.4 displays ramp intersection results for each of the analyzed scenarios. As previously noted previously in Section 2.4, neither Caltrans nor the City uses ILV results in determining significance of project impacts, but the analyses are included for informational purposes.

TABLE 11.4
SUMMARY OF RAMP INTERSECTION RESULTS

Ramp Intersection	Existing	Existing Plus Project	Year 2025 Cumulative	Year 2025 Cumulative Plus Project
Caliente Avenue and SR-905 EB Ramps	Under Capacity	Under Capacity	At Capacity	At Capacity
	Under Capacity	Under Capacity	Under Capacity	At Capacity
Caliente Avenue and SR-905 WB Ramps	Under Capacity	Under Capacity	At Capacity	**Over Capacity**
	Under Capacity	Under Capacity	**Over Capacity**	**Over Capacity**
Britannia Boulevard and SR-905 EB Ramps	Under Capacity	At Capacity	Under Capacity	At Capacity
	Under Capacity	At Capacity	Under Capacity	**Over Capacity**
Britannia Boulevard and SR-905 WB Ramps	Under Capacity	Under Capacity	Under Capacity	At Capacity
	Under Capacity	At Capacity	At Capacity	**Over Capacity**
Siempre Viva Road and SR-905 NB Ramps	Under Capacity	Under Capacity	Under Capacity	Under Capacity
	Under Capacity	Under Capacity	At Capacity	At Capacity
Siempre Viva Road and SR-905 SB Ramps	Under Capacity	Under Capacity	Under Capacity	Under Capacity
	Under Capacity	Under Capacity	Under Capacity	Under Capacity

Source: Chen Ryan Associates; February 2016

Summary of Freeway Segment Analyses

Table 11.5 displays freeway Level of Service results for each of the analyzed scenarios.

TABLE 11.5
SUMMARY OF FREEWAY SEGMENT LOS RESULTS

Freeway	Segment	Direction	Existing	Existing Plus Project	Year 2025 Cumulative	Year 2025 Cumulative Plus Project
I-805	Main Street and Palm Avenue	NB	B	B	D	D
		SB	B	B	**F**	**F**
	Palm Avenue and SR-905	NB	B	B	C	C
		SB	B	B	**E**	**E**
SR-905	Picador Boulevard and I-805	EB	B	B	C	C
		WB	B	B	C	C
	I-805 and Caliente Avenue	EB	A	A	C	C
		WB	B	B	**F**	**F**
	Caliente Avenue and Heritage Road	EB	A	A	B	B
		WB	A	A	A	A

TABLE 11.5
SUMMARY OF FREEWAY SEGMENT LOS RESULTS

Freeway	Segment	Direction	Existing	Existing Plus Project	Year 2025 Cumulative	Year 2025 Cumulative Plus Project
SR-905	Heritage Road and Britannia Boulevard	EB	A	A	A	A
		WB	A	A	A	A
	Britannia Boulevard and La Media Road	EB	A	A	A	A
		WB	A	A	A	A
	La Media Road and SR-125	EB	A	A	A	A
		WB	A	A	A	A

Source: Chen Ryan Associates; February 2016

Note:
Bold letter indicates substandard LOS.

Based upon the significance criteria presented in Section 2.7, and consistent with the conclusions of the OMCPU EIR, facility improvements would be required at the following freeway segment:

<u>Year 2025 Cumulative Plus Project</u>

- SR-905, between I-805 and Caliente Avenue – WB direction.

However, neither Caltrans nor SANDAG have plans to construct additional lanes on State Route 905, nor is there a plan or program in place into which the project applicant could pay its fair-share towards the cost of such improvements. Therefore, improvements are considered infeasible and the impacts along SR-905 would remain significant and unavoidable. This finding is consistent with the conclusion of the OMCPU EIR.

Summary of Improvement Recommendations

Table 11.6 summarizes the recommended improvements to roadway segments, intersections, and freeway segments under each of the scenarios analyzed associated with buildout of the Otay Mesa Central Village Specific Plan.

TABLE 11.6
SUMMARY OF IMPROVEMENTS RECOMMENDATIONS

Location	Existing Plus Project	Year 2025 Cumulative Plus Project
Roadway Segment		
Britannia Boulevard, between SR-905 Eastbound Ramps and Airway Road	Widen this roadway from a 5-lane roadway (2 NB & 3 SB) to a 6-lane Prime Arterial prior to the project's **total trip generation** of 37,678 ADT.	Widen this roadway from a 5-lane roadway (2 NB & 3 SB) to a 6-lane Prime Arterial prior to the project's **total trip generation** of 34,183 ADT
Airway Road, between Cactus Road and Continental Road	Widen this roadway segment from a 4-lane roadway (1 EB & 3 WB) to a 6-lane Major Arterial prior to the project's **total trip generation** of 36,926 ADT.	Widen this roadway segment from a 4-lane roadway (1 EB & 3 WB) to a 6-lane Major Arterial prior to the project's **total trip generation** of 444 ADT.
Airway Road, between Continental Road and Britannia Boulevard	Widen this roadway segment from a 2-lane roadway to a 6-lane Major Arterial prior to the project's **total trip generation** of 5,543 ADT	Widen this roadway segment from a 2-lane roadway to a 6-lane Major Arterial prior to the project's **total trip generation** of 106 ADT.
Airway Road, between Britannia Boulevard and La Media Road	Widen this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 39,437 ADT	Widen this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 883 ADT.
Airway Road, between La Media Road and Avenida Costa Azul	Widen this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 5,886 ADT.	Widen this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 2,944 ADT.
Siempre Viva Road, between Cactus Road and Britannia Boulevard	Widen this roadway segment from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 37,001 ADT.	Widen this roadway segment from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 849 ADT.
Heritage Road, between Avenida De Las Vistas and Datsun Street	N/A	Widen this roadway segment from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 1,003 ADT.
Heritage Road, between Datsun Street and Otay Mesa Road	N/A	Widen this roadway segment from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 1,380 ADT.
Cactus Road, between Otay Mesa Road and SR-905	N/A	Widen this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 6,623 ADT.

TABLE 11.6
SUMMARY OF IMPROVEMENTS RECOMMENDATIONS

Location	Existing Plus Project	Year 2025 Cumulative Plus Project
La Media Road, between northern terminus and Otay Mesa Road	N/A	Widen this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 4,415 ADT.
La Media Road, between Avenida De La Fuente and Siempre Viva Road	N/A	Widen this roadway segment from a 2-lane roadway to a 5-lane Major Arterial prior to the project's **total trip generation** of 3,679 ADT.
Airway Road, between Piper Ranch Road and Harvest Road	N/A	Widen this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 8,278 ADT.
Airway Road, between Harvest Road and Sanyo Avenue	N/A	Widen this roadway segment from a 2-lane roadway to a 4-lane Major Arterial prior to the project's **total trip generation** of 33,113 ADT.
Siempre Viva Road, between Cactus Road and Britannia Boulevard	N/A	Widen this roadway segment from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 849 ADT.
Siempre Viva Road, between Britannia Boulevard and La Media Road	N/A	Widen this roadway segment from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 679 ADT.
Intersection		
6. Caliente Avenue / Airway Road	N/A	Signalize prior to the project's **total trip generation** of 2,600 ADT and widen the westbound approach to accommodate three through lanes with a shared right-turn lane and an exclusive left-turn lane – see Figure 8-5 for intersection geometrics

TABLE 11.6
SUMMARY OF IMPROVEMENTS RECOMMENDATIONS

Location	Existing Plus Project	Year 2025 Cumulative Plus Project
8. Heritage Road / Avenida De Las Vistas	N/A	Signalize prior to the project's **total trip generation** of 3,134 ADT and widen Heritage Road to its ultimate classification to accommodate three through lanes and an exclusive left-turn lane in the northbound direction, three through lanes with an exclusive right-turn lane in the southbound direction, and an exclusive left-turn lane and exclusive right-turn lane in the eastbound direction – see Figure 8-5 for intersection geometrics
9. Heritage Road / Datsun Street	N/A	Signalize prior to the project's **total trip generation** of 1,003 ADT and widen Heritage Road to its ultimate classification to accommodate three through lanes and an exclusive left-turn lane in the northbound direction, three through lanes with a shared right lane in the southbound direction, and an exclusive left-turn lane and exclusive right-turn lane in the eastbound direction – see Figure 8-5 for intersection geometrics
10. Heritage Road / Otay Mesa Road	N/A	Widen the westbound approach of Otay Mesa Road to construct an additional exclusive right-turn lane and widen Heritage Road from a 2-lane roadway to a 6-lane Prime Arterial between Otay Mesa Road and Airway Road to accommodate three through lanes with a shared right-turn lane and an exclusive left-turn lane in the northbound direction, as well as, three through lanes, dual left-turns and an exclusive right-turn lane in the southbound direction prior to the project's **total trip generation** of 11,019 ADT – see Figure 8-5 for intersection geometrics
16. Britannia Boulevard / Otay Mesa Road	Restripe an additional exclusive left-turn lane at the westbound approach of the intersection of Britannia Boulevard / Otay Mesa Road prior to the project's **total trip generation** of 24,512 ADT	Restripe Otay Mesa Road to add an additional exclusive left-turn lane at the westbound approach and the extension of Heritage Road southerly to connect to Airway Road (Intersection #12) and widen Heritage Road between Otay Mesa Road and Airway Road, from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 12,276 ADT.

TABLE 11.6
SUMMARY OF IMPROVEMENTS RECOMMENDATIONS

Location	Existing Plus Project	Year 2025 Cumulative Plus Project
18. Britannia Boulevard / SR-905 Eastbound Ramps	N/A	Extend Heritage Road southerly to connect to Airway Road (Intersection #12) and widen Heritage Road between Otay Mesa Road and Airway Road, from a 2-lane roadway to a 6-lane Prime Arterial prior to the project's **total trip generation** of 27,225 ADT.
19. Britannia Boulevard / Airway Road	Widen the eastbound approach (Airway Road) of this intersection to accommodate dual left-turn lanes, two through lanes, and a through-right-turn shared lane, widen the westbound approach (Airway Road) to construct an exclusive left-turn lane, two through lanes, and an exclusive right-turn lane with right-turn overlap phasing, and widen the southbound approach (Britannia Boulevard) to accommodate an exclusive left-turn lane, two through lanes, and two exclusive right-turn lanes with right-turn overlap phasing, prior to the project's **total trip generation** of 16,187 ADT.	Widen the eastbound approach (Airway Road) of this intersection to accommodate dual left-turn lanes, three through lanes, and an exclusive right-turn lane with right-turn overlap phasing, widen the westbound approach (Airway Road) to accommodate exclusive dual left-turn lanes, two through lanes, and exclusive dual right-turn lane with right-turn overlap phasing, widen the southbound approach (Britannia Boulevard) to accommodate exclusive dual left-turn lanes, three through lanes, and two exclusive right-turn lanes with right-turn overlap phasing, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes, and an exclusive right-turn lane with right-turn overlap phasing, prior to the project's **total trip generation** of 111 ADT.- see Figure 8-5 for intersection geometrics
20. Britannia Boulevard / Siempre Viva Road	N/A	Widen the westbound approach (Siempre Viva Road) to accommodate two through lanes and an exclusive left-turn lane, and widen the eastbound approach to accommodate two through lanes and an exclusive left-turn-lane, prior to the project's **total trip generation** of 70 ADT. - see Figure 8-5 for intersection geometrics

TABLE 11.6
SUMMARY OF IMPROVEMENTS RECOMMENDATIONS

Location	Existing Plus Project	Year 2025 Cumulative Plus Project
22. La Media Road / Otay Mesa Road	N/A	Widen the northbound approach (La Media Road) to accommodate two through lanes with a shared right-turn lane and an exclusive left turn lane, and widen the southbound approach (La Media Road) to accommodate an additional through lane, prior the project's **total trip generation** of 5,471 ADT- see Figure 8-5 for intersection geometrics
23. La Media Road / Airway Road	N/A	Widen the western leg of Airway Road to accommodate two through lanes and exclusive left-turn lane in the eastbound and westbound direction, prior to the project's **total trip generation** of 883 ADT - see Figure 8-5 for intersection geometrics
24. La Media Road / Siempre Viva Road	N/A	Widen the western leg of Siempre Viva Road to accommodate three through lanes and an exclusive left-turn lane in the eastbound direction, prior to the project's **total trip generation** of 679 ADT - see Figure 8-5 for intersection geometrics
26. Harvest Road / Airway Road	N/A	Widen the western leg of the intersection to accommodate two through lanes with a shared right-turn lane in the eastbound direction, prior to the project's **total trip generation** of 8,278 ADT. - see Figure 8-5 for intersection geometrics
30. SR-905 SB Off-Ramp / Siempre Viva Road	N/A	Signalize prior to the project's **total trip generation** of 12,037 ADT – see Figure 8-5 for intersection geometrics
39. Continental Road / Airway Road	Widen Airway Road between Continental Road and Britannia Boulevard from a 2-lane roadway to a 6-lane Major Arterial prior to the project's **total trip generation** of 5,543 ADT.	Widen Airway Road between Continental Road and Britannia Boulevard from a 2-lane roadway to a 6-lane Major Arterial prior to the project's **total trip generation** of 106 ADT.

TABLE 11.6
SUMMARY OF IMPROVEMENTS RECOMMENDATIONS

Location	Existing Plus Project	Year 2025 Cumulative Plus Project
Freeway Segment		
SR-905, between I-805 and Caliente Avenue – WB direction	N/A	Caltrans Facility – Significant and Unavoidable Impact. Consistent with the conclusion of the OMCPU EIR.

Source: Chen Ryan Associates; April 2016

Otay Mesa Central Village Specific Plan

Transportation Facilities Trigger Analysis

Final Appendices | January 2017

Prepared For:

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Prepared By:

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San Diego, CA 92103

Appendix A
Signal Timing Plans

INTE ECTION: BEYER BL / E BEYER BL / OTAY MESA RD

#1

2 rogram.

Group Assignment:
Field Master Assignment: None

N/S Street Na Otay Mesa Rd/E Beyer Bl
E/W Street Name: E Beyer Bl/Beyer Bl

Last Change: 06/26/02
Timing Sheet By: DRH
Approved By:

Drawing Number: 883-1-D
System Ref. Number:
Timing implemented on: 03/15/00

Row	Column # -->	E. Beyer	Beyer		Otay Mesa				Otay Mesa
	Phase # -->	1	2	3	4	5	6	7	8
	N								
0	Ped Walk	7	7		7				7
1	Ped FDW	11	12		21				10
2	Min Green	4	7		7				7
3	Type 3 Limit								
4	Add/Veh				①				
5	Veh Extn	2.9	2.9		4.5 ~~3.7~~				3.8
6	Max Gap	2.9	2.9		4.5 ~~3.7~~				3.8
7	Min Gap	0.2	0.2		0.2				0.2
8	Max Limit	30	50		40				40
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By	0.1	0.1		0.1				0.1
D	Every	① 1.1	1.1		0.9				0.8
E	Yellow	3.9 ~~3.7~~	3.9 ~~3.7~~		4.2				3.9
F	Red Clear	1.0	1.0		1.0				1.0

Phase Timing - Bank 1
F + Phase + Row

<F Page>

Row		E
	RR-1 Delay	
	RR-1 Clear	
	EV-A Delay	
	EV-A Clear	0
	EV-B Delay	
	EV-B Clear	0
	EV-C Delay	
	EV-C Clear	0
	EV-D Delay	
	EV-D Clear	0
	RR-2 Delay	
	RR-2 Clear	
	View EV Delay	---
	View EV Clear	---
	View RR Delay	---
	View RR Clear	---

Preempt Timing
F + E + Row

Row		F
0	Permit	12_4___8
1	Red Lock	
2	Yellow Lock	
3	Min Recall	_2_____
4	Ped Recall	
5	Peds (View)	
6	Rest In Walk	
7	Red Rest	
8	Dbl Entry	___4___8
9	Max Recall	
A	Soft Recall	
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	___4___8
F	1st Phases	1_____

Phase Functions
F + F + Row

<F Page>

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number		C + 0 + 0
Zone Number		C + 0 + 1
Area Number		C + 0 + 2
Area Address		C + 0 + 3
QuicNet Channel		(QuicNet)

Communication Addresses

Row		9	C	D	0
		Green Clear	Yellow Change	Red Clear	Load-Switch #
A	Overlap A				
B	Overlap B				
C	Overlap C				
D	Overlap D				

Overlap Timing <F Page> <D Page>
F + COLOR + D + 0 + OVERLAP

Manual Plan	14	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset 0
= Automatic
1 = Offset A
2 = Offset B
3 = Offset C

C + F + O
Free Lag

F	Row
_2_4___8	0

Lag Phases <C Page>

Downtime Flash	255 (minutes)

Downtime Before Auto Manual Flash
F + 0 + 8

Disable Ports	234

Disable Communications Ports
D + D + 9

INTERSECTION: BEYER BL / E BEYER BL / OTAY MESA RD

223 Program

#1

Row	Time	Function	Day of Week	Column F Phases/Bits
0	0745	E	23456	2
1	0830	E	23456	
2	1400	E	23456	2
3	~~1500~~ 1530	E	23456	
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function

7 + ROW

<D Page>

D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	1
7	Ped 4P	4
8	Ped 8P	8
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration

E + F + ROW

<E Page>

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2
B	EV-B Phases	4
C	EV-C Phases	1
D	EV-D Phases	8
E	Extra 1 Config. Bits	1_345
F	IC Select (Interconnect)	2

Configuration

For access, set F + 9 + E = 1

E + E + ROW

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Day of Week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

Time and Date

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0

D+B+0

Dial-Up Telephone Communications

(If set to a non-zero value, parity will be disabled)

(This parameter is NOT downloaded)

Program Information

C + C + 0 = program
C + C + F = version

Remote Download

C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

#1

Row	1 Delay	3 Carry-over
0		
1		1.8
2	10.0	
3		
4		
5		
6		
7		1.8
8		
9		
A		
B		
C		1.8
D		
E		---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
	2I2U	1
	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	16
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Row	2 Delay	4 Carry-over
0		
1		
2		
3		
4		
5		
6		
7		1.8
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 – – – –	1234
C	13 14 15 16 17 18 19 20	12345678
D	– – – – 21 22 23 24	5678
E	– – – – – – – –	1234
F	– 25 26 27 28 – – –	2345

Active Detectors <D Page>

Row		0 Detector #
0		
1	System Det. # 1	0
2	System Det. # 2	0
3	System Det. # 3	0
4	System Det. # 4	0
5	System Det. # 5	0
6	System Det. # 6	0
7	System Det. # 7	0
8	System Det. # 8	0

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	0	F+C+1
Time Before Yellow	0.0	F+C+3

Advance Warning Beacon - Sign 1

Phase Number	0	F+D+1
Time Before Yellow	0.0	F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

(These parameters are NOT downloaded.)

INTERSECTION: BEYER BL & E. BEYER BL / OTAY MESA RD

223 Program

#1

N	Column # ---->	E. Beyer	Beyer		Otay Mesa				Otay Mesa
	Phase # ---->	Phase							
Row		1	2	3	4	5	6	7	8
0	Ped Walk	15	15		15				15
1	Ped FDW	11	12		21				10
2	Min Green	4	7		7				7
3	Type 3 Limit								
4	Added Initial								
5	Veh Extension	2.9	2.9		① 4.5 ~~3.7~~				4.5 ~~3.8~~
6	Max Gap	2.9	2.9		4.5 ~~3.7~~				4.5 3.8
7	Min Gap	0.2	0.2		0.2				0.2
8	Max Limit	25	35		40 ~~30~~				40 ~~30~~
9	Max Limit 2								
A	Bus Advance								
B	Call To Phase								
C	Reduce By	0.1	0.1		0.1				0.1
D	Reduce Every	1.1	1.1		0.9				0.8
E	Yellow Change	3.9 ~~3.7~~	3.9 ~~3.7~~		4.2				3.9
F	Red Clear	1.0	1.0		1.0				1.0

① SEG 12/14/01

<F Page>

Phase Timing - Bank 2

F + Phase + Location

Break[illegible] Wy / Del Sol Bl @ Ocean View Hills Py

223 Pr[illegible]am #2

Group Assignment:
Field Master Assignment: None

N/S Street Name: Ocean View Hills Py
E/W Street Name: Del Sol Bl

Last Change:
Timing Sheet By: rej
Approved By:

Drawing Number: 30853-2-D
System Ref. Number:
Timing Implemented on: Nov 28, 2001

19/08 MCL

Row	Column # →	1	2	3	4	5	6	7	8
		Ocean View Hills Py			Breakers Wy		Ocean view Hills Py		Del Sol Bl
	Phase # →	1	2	3	4	5	6	7	8
0	Ped Walk		7		7		7		7
1	Ped FDW		19 ~~18~~		27		10		29 ~~28~~
2	Min Green	4	10	4	7	4	10	4	7
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	5.4	2.0	2.0	2.0	5.4	2.0	5.6
6	Max Gap	2.0	5.4	2.0	2.0	2.0	5.4	2.0	5.6
7	Min Gap	2.0	0.2	2.0	2.0	2.0	0.2	2.0	0.2
8	Max Limit	30	60	30	40	30	60	30	40
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs			2				6	
C	Reduce By		0.1				0.1		0.1
D	Every		0.6				0.6		0.6
E	Yellow	3.4 ~~3.0~~	4.4 ~~5.0~~	3.4 ~~3.0~~	3.9 ~~3.0~~	3.4 ~~3.0~~	4.6 ~~5.0~~	3.4 ~~3.0~~	3.9 ~~4.3~~
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Phase Timing - Bank 1
F + Phase + Row

<F Page>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing
F + E + Row

Row		F
0	Permit	12345678
1	Red Lock	
2	Yellow Lock	
3	Min Recall	
4	Ped Recall	
5	Peds (View)	
6	Rest In Walk	
7	Red Rest	
8	Dbl Entry	
9	Max Recall	
A	Soft Recall	2 6
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	2 6
F	1st Phases	4 8

Phase Functions <F Page>
F + F + Row

Max Initial		F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number	4	C + 0 + 0
Zone Number	4	C + 0 + 1
Area Number	7	C + 0 + 2
Area Address	74	C + 0 + 3
QuicNet Channel	Com34	(QuicNet)

Communication Addresses

Row		Green Clear	Yellow Change	Red Clear	Load-Switch #
A	Overlap A				
B	Overlap B				
C	Overlap C				
D	Overlap D				

Overlap Timing <F Page> <D Page>
F + COLOR + D + 0 + OVERLAP

Manual Plan	14	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset 0
= Automatic
1 = Offset A
2 = Offset B
3 = Offset C

C + F + O

Free Lag	Row
2 4 6 8	1

Lag Phases <C Page>

Downtime Flash	255	(minutes)

Downtime Before Auto Manual Flash
F + 0 + 8

Disable Ports	234

Disable Communications Ports
D + D + 9

PHASE 3 TO 4 AND 7 TO 8 ARE HARDWIRED WITH A DIRECTIONAL DIODE

Breakers Wy / Del Sol Bl @ Ocean View Hills Py

223 Program

#2

Row	Time	Function	Day of Week	Column F Phases/Bits
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function

7 + ROW

<D Page>

D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	6
7	Ped 4P	4
8	Ped 8P	8
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration

E + F + ROW

<E Page>

Day of Week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	3 7
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4 7
C	EV-C Phases	1 6
D	EV-D Phases	3 8
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Configuration

For access, set F + 9 + E = 1

E + E + ROW

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Preimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

Time and Date

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0

D+B+0

Dial-Up Telephone Communications
(If set to a non-zero value, parity will be disabled)

(This parameter is NOT downloaded)

Program Information

C + C + 0 = program
C + C + F = version

Remote Download

C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

#2

Row	1 Delay	3 Carry-over
0		
1		1.8
2		1.8
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
	2I2U	1
	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	16
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Row	2 Delay	4 Carry-over
0		
1		1.8
2		1.8
3		
4		
5		
6		
7		1.8
8		
9		
A	10.0	
B		
C		
D		
E	---	---
F	---	---

Detector Delay & Carryover <D Page>

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 – – – –	1234
C	13 14 15 16 17 18 19 20	12345678
D	– – – – 21 22 23 24	5678
E	– – – – – – – –	1234
F	– 25 26 27 28 – – –	2345

Active Detectors <D Page>

Row		0 Detector #
0		
1	System Det. # 1	0
2	System Det. # 2	0
3	System Det. # 3	0
4	System Det. # 4	0
5	System Det. # 5	0
6	System Det. # 6	0
7	System Det. # 7	0
8	System Det. # 8	0

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	0	F+C+1
Time Before Yellow	0.0	F+C+3

Advance Warning Beacon - Sign 1

Phase Number	0	F+D+1
Time Before Yellow	0.0	F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

(These parameters are NOT downloaded.)

LOCATION: RTE 905 @ CALIENTE AVE./OCEAN VIEW HILLS PARKWAY

CALTRANS C8 Version 3 DATE: 3/3/15

F PAGE

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9
0	WALK	1	1	1	7	1	7	1	7	CLK RST
1	DONT WALK	1	1	1	39	1	45	1	42	
2	MIN GREEN	11	11	11	11	11	11	11	11	
3	TYPE 3 DET	0	0	0	0	0	0	0	0	
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	PASSAGE	2.0	3.0	3.0	2.0	2.0	3.0	2.0	2.0	
6	MAX GAP	2.0	3.0	3.0	2.0	2.0	3.0	2.0	2.0	
7	MIN GAP	2.0	3.0	3.0	2.0	2.0	3.0	2.0	2.0	
8	MAX EXT	20	35	20	25	15	35	20	25	
9	MAX 2			35						YR
A	MAX 3									MO
B										DAY
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR
E	YELLOW	3.7	4.8	3.7	4.1	3.7	4.8	3.7	5.2	MIN
F	RED	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	SEC
3.5'	PED XING FT				137'		156'		146'	
	BIKE XING FT	132'	158'	113'	146'	131'	161'	136'	147'	

NOTES:

PRE-EMPTION E	
EV SEL	0
RR1 CLR	5
EVA DLY	0
EVA CLR	5
EVB DLY	0
EVB CLR	5
EVC DLY	0
EVC CLR	5
EVD DLY	0
EVD CLR	5
MAX EV	255
RR2 CLR	5

F FLAGS	1	2	3	4	5	6	7	8	
PERMIT	1	2	3	4	5	6	7	8	0
RED LOCK									1
YEL LOCK									2
V RECALL		2				6			3
P RECALL									4
PED PHASES				4		6		8	5
RT OLA									6
RT OLB									7
DBL ENTRY									8
MAX 2 PHASES			3						9
LAG PHASES	READ ONLY								A
RED REST									B
REST-IN-WALK									C
MAX 3 PHASES									D
YEL START UP				4				8	E
FIRST PHASE		2				6			F
	1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	0
FOF	5

FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FD0 TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

LOCATION: RTE 905 @ CALIENTE AVE./OCEAN VIEW HILLS PARKWAY

CALTRANS C8 Version 3 DATE: 12/13/2012

C PAGE

#3

		CONTROL PLANS									Y-COORD			LAG PHASE	FLAGS								
		1	2	3	4	5	6	7	8	9		C	D	E	F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH														LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR													GAPOUT CP1	LAG FZ CP 1									1
2														GAPOUT CP2	LAG FZ CP 2									2
3	FZ3 GRN FCTR													GAPOUT CP3	LAG FZ CP 3									3
4	FZ4 GRN FCTR										PERM TIME			GAPOUT CP4	LAG FZ CP 4									4
5	FZ5 GRN FCTR										LAG OFFSET			GAPOUT CP5	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	LAG FZ CP 6									6
7	FZ7 GRN FCTR										LONG GRN			GAPOUT CP7	LAG FZ CP 7									7
8	FZ8 GRN FCTR										NO GREEN			GAPOUT CP8	LAG FZ CP 8									8
9	MULTI CYCLE													GAPOUT CP9	LAG FZ CP 9									9
A	OFFSET A										OFFSET				LAG C COORD									A
B	OFFSET B														LAG D COORD									B
C	OFFSET C														COORD FAZES		2				6			C
D	FZ 3 EXT																							D
E	FZ 7 EXT																							E
F	OFFSET INTRPT																							F
																1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

SYSTEM MASTER:
EB @ Caliente Ave

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1		1
2		2
3	4	
4	8	
5	16	
6	32	
7		
8		

COO = 3

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: RTE 905 @ CALIENTE AVE./OCEAN VIEW HILLS PARKWAY

CALTRANS C8 Version 3 DATE: 12/13/12

#3

D PAGE

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1									CP 1								
2	CP 2									CP 2									CP 2								
3	CP 3									CP 3									CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		2							5
6										6 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E

MINUTE = D-B-E

DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES

(CALL ACTIVE LIGHTS)

RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES

(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F

MINUTE = D-B-F

DAY = D-C-F

D-E-E = C8 VERSION NUMBER

D-E-F = LITHIUM BATTERY CONDITION

84 = BAD

85 = GOOD

LOCATION: RTE 905 @ CALIENTE AVE./OCEAN VIEW HILLS PARKWAY

CALTRANS C8 Version 3 DATE: 12/13/12

#3

7 PAGE

TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
	HR	MIN	ACT	ON/ OFF	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0	15	00	2	ON		2	3	4	5	6	
1	17	30	2	OFF		2	3	4	5	6	
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

9 PAGE CO9 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	905	R9.5/R15.0	667C	857

Enrique P Bernal 08-28-09
REGISTERED ELECTRICAL ENGINEER DATE

10-20-08
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER E.P.BERNAL No. 15675 Exp. 6-30-10 ELECTRICAL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

#3

Caltrans Metric

NOTE:

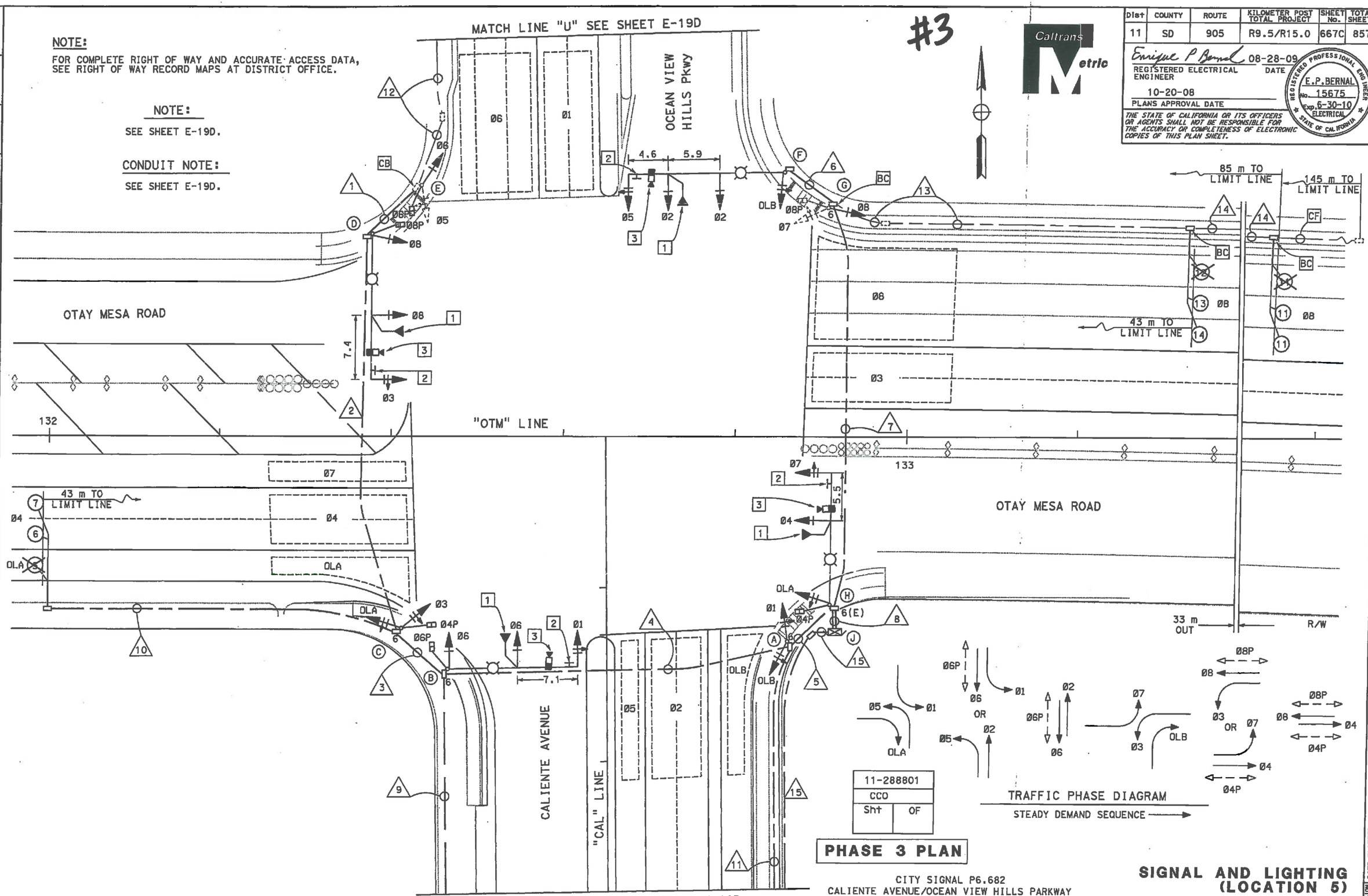
FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.

NOTE:

SEE SHEET E-19D.

CONDUIT NOTE:

SEE SHEET E-19D.



11-288801	
CCO	
Sht	OF

PHASE 3 PLAN

CITY SIGNAL P6.682
CALIENTE AVENUE/OCEAN VIEW HILLS PARKWAY
AND OTAY MESA ROAD

SIGNAL AND LIGHTING (LOCATION 5)

SCALE 1:200

E-19C

THIS PLAN SHEET ACCURATE FOR ELECTRICAL WORK ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans TRAFFIC ELECTRICAL

FUNCTIONAL SUPERVISOR: DALE WILSON
CALCULATED-DESIGNED BY: H. SAWAYA
CHECKED BY: ENRIQUE BERNAL
REVISED BY / DATE REVISED

LAST REVISION / DATE PLOTTED => 15-MAR-2011

LOCATION: **905 WB @ Caliente Ave**
CALTRANS C8 Version 3
F PAGE

3/4/15

4

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9
0	WALK	1	7	1	1	1	7	1	1	CLK RST
1	DONT WALK	1	14	1	1	1	18	1	1	
2	MIN GREEN	1	7	1	1	5	7	1	5	
3	TYPE 3 DET	0	0	0	0	0	0	0	0	
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	PASSAGE	0.9	3.0	0.9	0.9	2.0	3.0	0.9	3.0	
6	MAX GAP	0.9	3.0	0.9	0.9	2.0	3.0	0.9	3.0	
7	MIN. GAP	0.9	3.0	0.9	0.9	2.0	3.0	0.9	3.0	
8	MAX EXT	9	30	9	9	25	30	9	30	
9	MAX 2									YR
A	MAX 3									MO
B										DAY
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR
E	YELLOW	3.0	4.1	3.0	3.0	3.7	4.1	3.0	4.1	MIN
F	RED	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	SEC
3.5'	PED XING FT		50'				50'			
	BIKE XING FT		57'				81'			

PRE-EMPTION E	
EV SEL	0
RR1 CLR	15
EVA DLY	0
EVA CLR	5
EVB DLY	0
EVB CLR	5
EVC DLY	0
EVC CLR	5
EVD DLY	0
EVD CLR	5
MAX EV	255
RR2 CLR	15

F FLAGS	1	2	3	4	5	6	7	8	
PERMIT		2			5	6		8	0
RED LOCK									1
YEL LOCK									2
V RECALL		2				6			3
P RECALL									4
PED PHASES		2				6			5
RT OLA									6
RT OLB									7
DBL ENTRY									8
MAX 2 PHASES									9
LAG PHASES	READ ONLY								A
RED REST									B
REST-IN-WALK									C
MAX 3 PHASES									D
YEL START UP		2				6			E
FIRST PHASE								8	F
	1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	30
FOF	5

FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FD0 TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

C05 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

LOCATION: **905 WB @ Caliente Ave**
CALTRANS C8 Version 3 8/15/12 PAGE 2
C PAGE

		CONTROL PLANS									Y-COORD			LAG PHASE	FLAGS									
		1	2	3	4	5	6	7	8	9		C	D	E	F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH														LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR													GAPOUT CP1	LAG FZ CP 1									1
2														GAPOUT CP2	LAG FZ CP 2									2
3	FZ3 GRN FCTR													GAPOUT CP3	LAG FZ CP 3									3
4	FZ4 GRN FCTR										PERM TIME			GAPOUT CP4	LAG FZ CP 4									4
5	FZ5 GRN FCTR										LAG OFFSET			GAPOUT CP5	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	LAG FZ CP 6									6
7	FZ7 GRN FCTR										LONG GRN			GAPOUT CP7	LAG FZ CP 7									7
8	FZ8 GRN FCTR										NO GREEN			GAPOUT CP8	LAG FZ CP 8									8
9	MULTI CYCLE													GAPOUT CP9	LAG FZ CP 9									9
A	OFFSET A										OFFSET				LAG C COORD									A
B	OFFSET B														LAG D COORD									B
C	OFFSET C														COORD FAZES		2				6			C
D	FZ 3 EXT																							D
E	FZ 7 EXT																							E
F	OFFSET INTRPT																							F
																1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

System Master:
EB @ Caliente Ave

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1		
2		2
3		
4		
5		
6		
7		
8		

COO = 2

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: 905 WB @ Caliente Ave
CALTRANS C8 Version 3
D PAGE

7/12/12

#9

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1									CP 1								
2	CP 2									CP 2									CP 2								
3	CP 3									CP 3									CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		2							5
6										3 PED						6			6
7										4 PED				4					7
8										5 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E
MINUTE = D-B-E
DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES
(CALL ACTIVE LIGHTS)
RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES
(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F
MINUTE = D-B-F
DAY = D-C-F

D-E-E = C8 VERSION NUMBER
D-E-F = LITHIUM BATTERY CONDITION
84 = BAD
85 = GOOD

LOCATION: 905 WB @ Caliente Ave
CALTRANS C8 Version 3
7 PAGE

7/12/12

TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
	HR	MIN	ACT	ON/ OFF	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

9 PAGE CO9 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

#4

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	905	R9.5/R15.0	667	857

Enrique P Bernal 08-28-09
REGISTERED ELECTRICAL ENGINEER — DATE

10-20-08
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER E.P. BERNAL No. 15675 Exp. 6-30-10 ELECTRICAL STATE OF CALIFORNIA

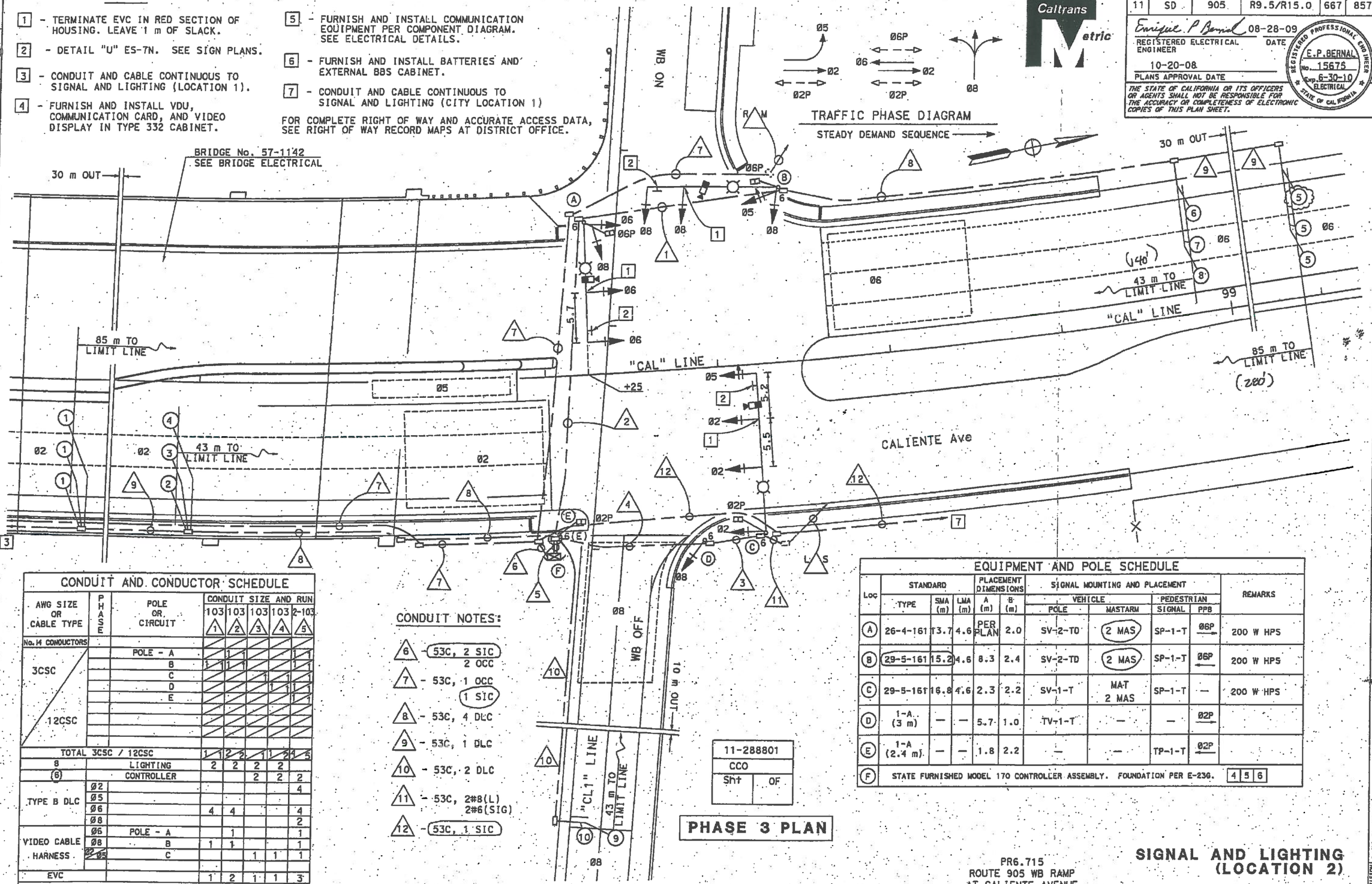
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Caltrans Metric

NOTES:

1. TERMINATE EVC IN RED SECTION OF HOUSING. LEAVE 1 m OF SLACK.
2. DETAIL "U" ES-7N. SEE SIGN PLANS.
3. CONDUIT AND CABLE CONTINUOUS TO SIGNAL AND LIGHTING (LOCATION 1).
4. FURNISH AND INSTALL VDU, COMMUNICATION CARD, AND VIDEO DISPLAY IN TYPE 332 CABINET.
5. FURNISH AND INSTALL COMMUNICATION EQUIPMENT PER COMPONENT DIAGRAM. SEE ELECTRICAL DETAILS.
6. FURNISH AND INSTALL BATTERIES AND EXTERNAL BBS CABINET.
7. CONDUIT AND CABLE CONTINUOUS TO SIGNAL AND LIGHTING (CITY LOCATION 1)

FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.



CONDUIT AND CONDUCTOR SCHEDULE

AWG SIZE OR CABLE TYPE	PHASE	POLE OR CIRCUIT	CONDUIT SIZE AND RUN 103 (1)	103 (2)	103 (3)	103 (4)	2-103 (5)
No. 14 CONDUCTORS							
3CSC		POLE - A		1	1		1 1
		B	1	1	1		1 1
		C				1	1 1
		D				1	1 1
		E					1 1
12CSC							
TOTAL 3CSC / 12CSC			1	1 2	2	1 1	2 4 5
8		LIGHTING	2	2	2	2	
(6)		CONTROLLER			2	2	2
TYPE B DLC	Ø2						4
	Ø5						
	Ø6		4	4			4
	Ø8						2
VIDEO CABLE HARNESS	Ø6	POLE - A		1			1
	Ø8	B	1	1			1
	Ø2 Ø5	C			1	1	1
EVC			1	2	1	1	3
TOTAL CONDUCTORS / CABLES			10	14	7	9	27

CONDUIT NOTES:

6 - 53C, 2 SIC, 2 OCC
7 - 53C, 1 OCC, 1 SIC
8 - 53C, 4 DLC
9 - 53C, 1 DLC
10 - 53C, 2 DLC
11 - 53C, 2#8(L) 2#6(SIG)
12 - 53C, 1 SIC

EQUIPMENT AND POLE SCHEDULE

Loc	STANDARD TYPE	SMA (m)	LMA (m)	PLACEMENT DIMENSIONS A (m)	B (m)	SIGNAL MOUNTING AND PLACEMENT VEHICLE POLE	VEHICLE MASTARM	PEDESTRIAN SIGNAL	PEDESTRIAN PPB	REMARKS
A	26-4-161	13.7	4.6	PER PLAN	2.0	SV-2-TD	2 MAS	SP-1-T	Ø6P	200 W HPS
B	29-5-161	15.2	4.6	8.3	2.4	SV-2-TD	2 MAS	SP-1-T	Ø6P	200 W HPS
C	29-5-161	16.8	4.6	2.3	2.2	SV-1-T	MAT 2 MAS	SP-1-T	—	200 W HPS
D	1-A (3 m)	—	—	5.7	1.0	TV-1-T	—	—	Ø2P	
E	1-A (2.4 m)	—	—	1.8	2.2	—	—	TP-1-T	Ø2P	
F	STATE FURNISHED MODEL 170 CONTROLLER ASSEMBLY. FOUNDATION PER E-23G.									4 5 6

11-288801	
CCO	
Sht	OF

PHASE 3 PLAN

PR6.715
ROUTE 905 WB RAMP
AT CALIENTE AVENUE

SIGNAL AND LIGHTING (LOCATION 2)

SCALE 1:200

E-19

THIS PLAN SHEET ACCURATE FOR ELECTRICAL WORK ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans TRAFFIC ELECTRICAL

FUNCTIONAL SUPERVISOR: DALE WILSON
CALCULATED-DESIGNED BY: H. SAWAYA
CHECKED BY: ENRIQUE BERNAL
REVISED BY / DATE REVISED

LAST REVISION DATE PLOTTED = 9-26-2011

LOCATION: **905 EB @ Caliente Ave**
CALTRANS C8 Version 3
F PAGE

3/4/15

 #5

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9
0	WALK	1	7	1	1	1	7	1	1	CLK RST
1	DONT WALK	1	14	1	1	1	14	1	1	
2	MIN GREEN	5	7	1	5	1	7	1	1	
3	TYPE 3 DET	0	0	0	0	0	0	0	0	
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	PASSAGE	2.0	3.0	0.9	3.0	0.9	3.0	0.9	0.9	
6	MAX GAP	2.0	3.0	0.9	3.0	0.9	3.0	0.9	0.9	
7	MIN GAP	2.0	3.0	0.9	3.0	0.9	3.0	0.9	0.9	
8	MAX EXT	15	30	9	30	9	30	9	9	
9	MAX 2									YR
A	MAX 3									MO
B										DAY
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR
E	YELLOW	3.7	4.1	3.0	4.1	3.0	4.1	3.0	3.0	MIN
F	RED	1.0	1.0	0.0	1.0	0.0	1.0	0.0	0.0	SEC
3.5'	PED XING FT		48'				48'			
	BIKE XING FT		67'				60'			

PRE-EMPTION E	
EV SEL	0
RR1 CLR	15
EVA DLY	0
EVA CLR	5
EVB DLY	0
EVB CLR	5
EVC DLY	0
EVC CLR	5
EVD DLY	0
EVD CLR	5
MAX EV	255
RR2 CLR	15

F FLAGS	1	2	3	4	5	6	7	8	
PERMIT	1	2		4		6			0
RED LOCK									1
YEL LOCK									2
V RECALL		2				6			3
P RECALL									4
PED PHASES		2				6			5
RT OLA									6
RT OLB									7
DBL ENTRY									8
MAX 2 PHASES									9
LAG PHASES	READ ONLY								A
RED REST									B
REST-IN-WALK									C
MAX 3 PHASES									D
YEL START UP		2				6			E
FIRST PHASE				4					F
	1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	30
FOF	5

FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FDO TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

LOCATION: **905 EB @ Caliente Ave**

CALTRANS C8 Version 3 8/15/12 PAGE 2

C PAGE

		CONTROL PLANS									Y-COORD			LAG PHASE		FLAGS									
		1	2	3	4	5	6	7	8	9		C	D	E		F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH															LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR													GAPOUT CP1		LAG FZ CP 1									1
2														GAPOUT CP2		LAG FZ CP 2									2
3	FZ3 GRN FCTR													GAPOUT CP3		LAG FZ CP 3									3
4	FZ4 GRN FCTR										PERM TIME			GAPOUT CP4		LAG FZ CP 4									4
5	FZ5 GRN FCTR										LAG OFFSET			GAPOUT CP5		LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6		LAG FZ CP 6									6
7	FZ7 GRN FCTR										LONG GRN			GAPOUT CP7		LAG FZ CP 7									7
8	FZ8 GRN FCTR										NO GREEN			GAPOUT CP8		LAG FZ CP 8									8
9	MULTI CYCLE													GAPOUT CP9		LAG FZ CP 9									9
A	OFFSET A										OFFSET					LAG C COORD									A
B	OFFSET B															LAG D COORD									B
C	OFFSET C															COORD FAZES		2				6			C
D	FZ 3 EXT																								D
E	FZ 7 EXT																								E
F	OFFSET INTRPT																								F
																	1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

System Master:
EB @ Caliente Ave

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1		1
2		
3		
4		
5		
6		
7		
8		

COO = 1

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: 905 EB @ Caliente Ave
CALTRANS C8 Version 3
D PAGE

7/18/12

#5

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1									CP 1								
2	CP 2									CP 2									CP 2								
3	CP 3									CP 3									CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		2							5
6										3 PED						6			6
7										4 PED				4					7
8										5 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E
MINUTE = D-B-E
DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES
(CALL ACTIVE LIGHTS)
RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES
(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F
MINUTE = D-B-F
DAY = D-C-F

D-E-E = C8 VERSION NUMBER
D-E-F = LITHIUM BATTERY CONDITION
84 = BAD
85 = GOOD

LOCATION: 905 EB @ Caliente Ave
CALTRANS C8 Version 3
7 PAGE

7/18/12

TIME OF DAY ACTIVITY TABLE										
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS										
	HR	MIN	ACT	ON/ OFF	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY										
9+EVENT+HR+MIN+CP+OS+E+DOW										
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

9 PAGE CO9 = 2

CONTROL PLAN TIME OF DAY										
9+EVENT+HR+MIN+CP+OS+E+DOW										
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

#2

#5

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	905	R9.5/R15.0	666	857

Enrique P Bernal 08-28-09
REGISTERED ELECTRICAL ENGINEER DATE

10-20-08
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER E.P.BERNAL No. 15675 Exp. 6-30-10 ELECTRICAL STATE OF CALIFORNIA

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Caltrans Metric

CONDUIT AND CONDUCTOR SCHEDULE

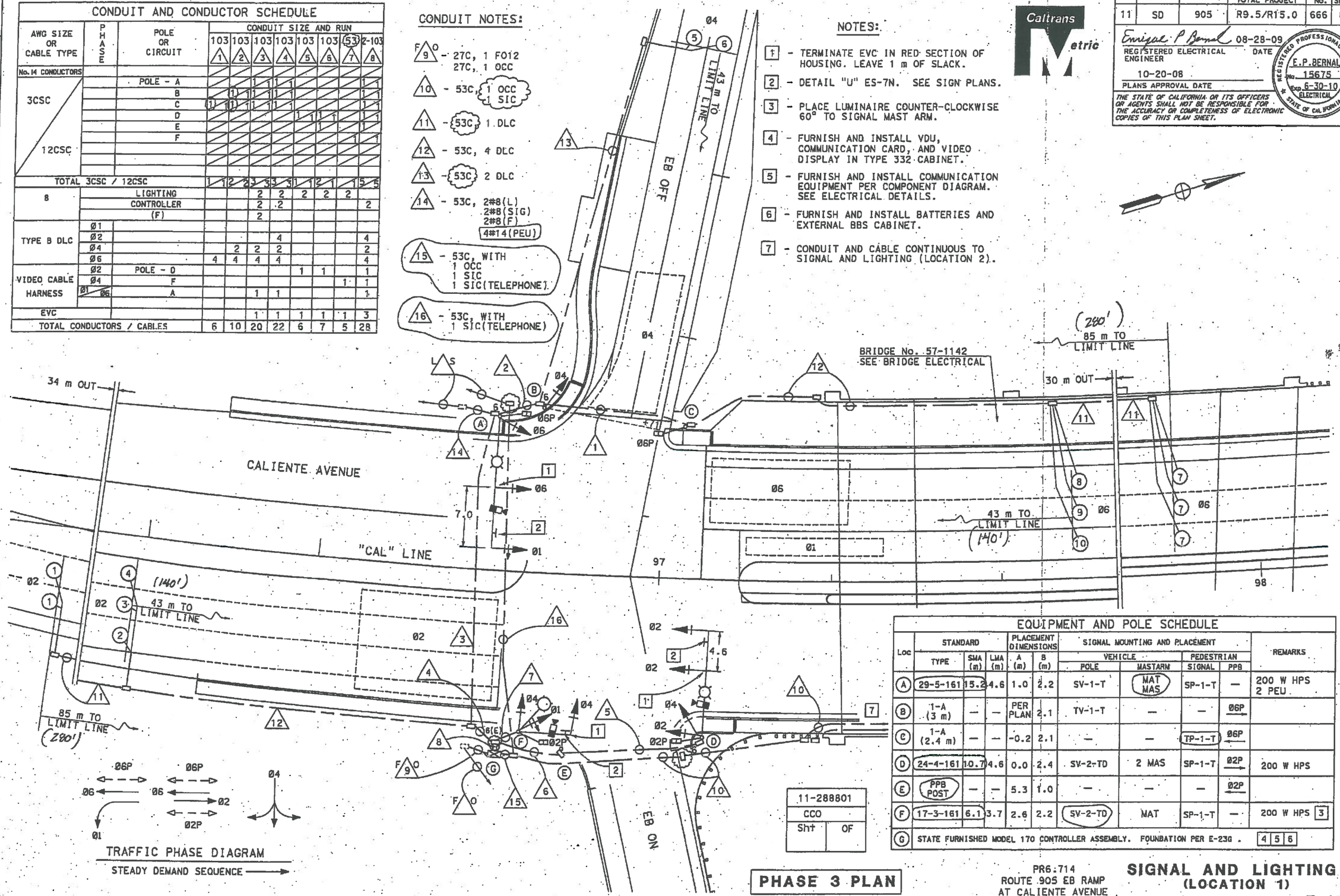
AWG SIZE OR CABLE TYPE	PHASE	POLE OR CIRCUIT	CONDUIT SIZE AND RUN 103 (1)	103 (2)	103 (3)	103 (4)	103 (5)	103 (6)	53 (7)	2-103 (8)
No. 14 CONDUCTORS										
3CSC / 12CSC		POLE - A			1	1	1			1 1
		B		1	1	1	1			1 1
		C	1	1	1	1	1			1 1
		D					1	1	1	1 1
		E						1		1 1
		F							1	1 1
TOTAL 3CSC / 12CSC			1	1 2	2 3	3 3	1	1 2	1	1 5 5
8		LIGHTING			2	2	2	2	2	
		CONTROLLER			2	2				2
		(F)			2					
TYPE B DLC	Ø1									
	Ø2					4				4
	Ø4			2	2	2				2
	Ø6		4	4	4	4				4
VIDEO CABLE HARNESS	Ø2	POLE - D					1	1		1
	Ø4	F							1	1
	Ø1 / Ø6	A			1	1				1
EVC					1	1	1	1	1	3
TOTAL CONDUCTORS / CABLES			6	10	20	22	6	7	5	28

CONDUIT NOTES:

- F9 O - 27C, 1 FO12; 27C, 1 OCC
- 10 - 53C, 1 OCC, 1 SIC
- 11 - 53C, 1 DLC
- 12 - 53C, 4 DLC
- 13 - 53C, 2 DLC
- 14 - 53C, 2#8(L), 2#8(SIG), 2#8(F), 4#14(PEU)
- 15 - 53C, WITH 1 OCC, 1 SIC, 1 SIC(TELEPHONE)
- 16 - 53C, WITH 1 SIC(TELEPHONE)

NOTES:

1. TERMINATE EVC IN RED SECTION OF HOUSING. LEAVE 1 m OF SLACK.
2. DETAIL "U" ES-7N. SEE SIGN PLANS.
3. PLACE LUMINAIRE COUNTER-CLOCKWISE 60° TO SIGNAL MAST ARM.
4. FURNISH AND INSTALL VDU, COMMUNICATION CARD, AND VIDEO DISPLAY IN TYPE 332 CABINET.
5. FURNISH AND INSTALL COMMUNICATION EQUIPMENT PER COMPONENT DIAGRAM. SEE ELECTRICAL DETAILS.
6. FURNISH AND INSTALL BATTERIES AND EXTERNAL BBS CABINET.
7. CONDUIT AND CABLE CONTINUOUS TO SIGNAL AND LIGHTING (LOCATION 2).



TRAFFIC PHASE DIAGRAM
STEADY DEMAND SEQUENCE

EQUIPMENT AND POLE SCHEDULE

Loc	STANDARD TYPE	SMA (m)	LMA (m)	PLACEMENT DIMENSIONS A (m)	B (m)	SIGNAL MOUNTING AND PLACEMENT VEHICLE POLE	VEHICLE MASTARM	PEDESTRIAN SIGNAL	PEDESTRIAN PPB	REMARKS
A	29-5-161	15.2	4.6	1.0	2.2	SV-1-T	MAT MAS	SP-1-T	—	200 W HPS 2 PEU
B	1-A (3 m)	—	—	PER PLAN	2.1	TV-1-T	—	—	Ø6P	
C	1-A (2.4 m)	—	—	-0.2	2.1	—	—	TP-1-T	Ø6P	
D	24-4-161	10.7	4.6	0.0	2.4	SV-2-TD	2 MAS	SP-1-T	Ø2P	200 W HPS
E	PPB POST	—	—	5.3	1.0	—	—	—	Ø2P	
F	17-3-161	6.1	3.7	2.6	2.2	SV-2-TD	MAT	SP-1-T	—	200 W HPS 3
G	STATE FURNISHED MODEL 170 CONTROLLER ASSEMBLY. FOUNDATION PER E-23G.									4 5 6

11-288801	
CCO	
Sht	OF

PHASE 3 PLAN

PR6:714
ROUTE 905 EB RAMP
AT CALIENTE AVENUE

SIGNAL AND LIGHTING (LOCATION 1)

SCALE 1:200

E-18

THIS PLAN SHEET ACCURATE FOR ELECTRICAL WORK ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
TRAFFIC ELECTRICAL

FUNCTIONAL SUPERVISOR: DALE WILSON
CALCULATED-DESIGNED BY: H. SAWAYA
CHECKED BY: ENRIQUE BERNAL
REVISED BY
DATE REVISED

LAST REVISION
DATE PLOTTED = 29-DEC-2011

OTAY MESA RD HERITAGE RD OTAY MESA RD HERITAGE RD

200 SA 1.e

#12

PHASE TIMING

INTERVAL		1	2	3	4	5	6	7	8
WALK	0		7				7		5
FLASH D/W	1		19 ~~17~~				24 ~~25~~		36
MIN GREEN	2	4	10 ~~25~~	4	7	4	10 ~~25~~	4	7 ~~10~~
TYPE 3 DET	3								
ADD PER VEH	4								
VEH EXTN *	5	2.0	4.1	2.0	3.7	2.0	4.5	2.0	4.3
MAX GAP *	6	2.0	4.1	2.0	3.7	2.0	4.5	2.0	4.3
MIN GAP *	7	2.0	0.2	2.0	0.2	2.0	0.2	2.0	0.2
MAX EXTN	8	30	60	30	40	30	60	30	40
MAX 2	9								
BUS LEAD	A								
CALL TO PHS	B								
REDUCE BY	C		0.1		0.1		0.1		0.1
EVERY	D		0.8		0.9		0.7		0.7
YELLOW	E	3.0	5.4 ~~5.3~~	3.0	3.9	3.0	5.1 ~~4.8~~	3.0	3.9
RED CLEAR	F	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0

F + PHASE + LOCATION

EFF. 3/29/00

EFF 3/29/00

* Must be the same for non-density operation

PREEMPT		
	E	
RR 1 DELAY		0
RR 1 CLEAR		1
EVA DELAY	0	2
EVA CLEAR	0	3
EVB DELAY	0	4
EVB CLEAR	0	5
EVC DELAY	0	6
EVC CLEAR	0	7
EVD DELAY	0	8
EVD CLEAR	0	9
RR2 DELAY		A
RR 2 CLEAR		B
EV CLR TMR		C
EV DLY TMR		D
RR CLR TMR		E
RR DLY TMR		F

MAX INITIAL (F-0-E) 0 RED REVERT (F-0-F) 5.0 ALL-RED START (F-C-0) 0.0

PHASE FUNCTION FLAGS

		1	2	3	4	5	6	7	8
PERMIT	0	X	X	X	X	X	X	X	X
RED LOCK	1								
YELLOW LOCK	2								
VEHICLE RECALL	3								X
PED RECALL	4		X						
PEDS (VIEW)	5								
REST IN WALK	6								
RED REST	7								
DOUBLE ENTRY	8								
MAX RECALL	9								
SOFT RECALL	A		X				X		
MAX 2	B								
COND SERVICE	C								
	D								
START-UP	E		X				X		
FIRST PHASES	F			X				X	

F + F + FUNCTION

OVERLAP TIMING

	LOAD SWITCH	GREEN 9	YELLOW C	RED D
OLAP A				
OLAP B				
OLAP C				
OLAP D				

D + 0 + OVERLAP

F + COLOR +

PHASE SEQUENCE

	PHASE 1	2	3	4	5	6	7	8
LAG 0 (FREE)		X		X		X		X

C + F + 0

MANUAL (C-A-1) 0

ADDRESS (C-0-0) 2

~~TURN-ON DATE: 01-04-2000~~

TIME:

DRAWING NO. D- 28063-86

LAST CHANGE:

BY: REJ

LOCATION HERITAGE RD & OTAY MESA RD

#12

DETECTOR TIMES

Y \ X	1 SET DELAY	2 SET DELAY	3 SET CARRY	4 SET CARRY	5 OBS COUNT	6 OBS COUNT	7 OBS DELAY	8 OBS DELAY	9 OBS CARRY	A OBS CARRY
0	1I1	5J1	1I1	5J1	1I1	5J1	1I1	5J1	1I1	5J1
1	2I2U	6J2U	2I2U 1.8	6J2U 1.8	2I2U	6J2U	2I2U	6J2U	2I2U	6J2U
2	2I2L	6J2L	2I2L	6J2L	2I2L	6J2L	2I2L	6J2L	2I2L	6J2L
3	2I3U	6J3U	2I3U	6J3U	2I3U	6J3U	2I3U	6J3U	2I3U	6J3U
4	2I3L	6J3L	2I3L	6J3L	2I3L	6J3L	2I3L	6J3L	2I3L	6J3L
5	2I4	6J4	2I4	6J4	2I4	6J4	2I4	6J4	2I4	6J4
6	3I5	7J5	3I5	7J5	3I5	7J5	3I5	7J5	3I5	7J5
7	4I6U	8J6U	4I6U 1.8	8J6U 1.8	4I6U	8J6U	4I6U	8J6U	4I6U	8J6U
8	4I6L	8J6L	4I6L	8J6L	4I6L	8J6L	4I6L	8J6L	4I6L	8J6L
9	4I7U	8J7U	4I7U	8J7U	4I7U	8J7U	4I7U	8J7U	4I7U	8J7U
A	4I7L	8J7L	4I7L	8J7L	4I7L	8J7L	4I7L	8J7L	4I7L	8J7L
B	4I8	8J8	4I8	8J8	4I8	8J8	4I8	8J8	4I8	8J8
C	1I9U	5J9U	1I9U	5J9U	1I9U	5J9U	1I9U	5J9U	1I9U	5J9U
D	3I9L	7J9L	3I9L	7J9L	3I9L	7J9L	3I9L	7J9L	3I9L	7J9L

D + X (ACROSS) + Y (DOWN)

TO ACCESS CONFIGURATION DATA, SET F-9-E = 1

TIME OF DAY FEATURES

EVENT	TIME	FUNC	DAY OF WEEK S 1	M 2	T 3	W 4	T 5	F 6	S 7
0									
1									
2									
3									
4									
5									
6									
7									
8									
9									

7 + EVENT #

PHASE OR FUNCTION

EVENT	1	2	3	4	5	6	7	8
0								
1								
2								
3								
4								
5								
6								
7								
8								
9								

D + F + EVENT

TIME OF DAY FUNCTION CODES

- 0-PERMIT
- 1-RED LOCK
- 2-YELLOW LOCK
- 3-VEH RECALL
- 4-PED RECALL
- 5-(RESERVED)
- 6-REST IN WALK
- 7-RED REST
- 8-DBL ENTRY
- 9-VEH MAX RCL
- A-SOFT RCL
- B-MAX 2 EXT
- C-COND SERV
- D-TOD LAG PHS

- E-1-LOCAL OVERRIDE
- 2-PHASE BANK 2
- 3-PHASE BANK 3
- 7-DET COUNT
- 8-SPLIT MONITOR

- F - TOD OUTPUTS
- 1- TOD OUTPUT 1
- 2- TOD OUTPUT 2
- 3- TOD OUTPUT 3
- 4- TOD OUTPUT 4

TIME AND DATE

8 - 0 HOUR, MINUTE, DAY-OF-WEEK
8 - 1 DAY-OF-MONTH, YEAR, MONTH
8 - F SECONDS

CONFIGURATION DATA

		PHASE 1	2	3	4	5	6	7	8
EXCLUSIVE	0								
RR1 GN CLR	1								
RR2 GRN CLR	2								
RR2 LTD SRV	3								
PRO/PERM	4								
OLA GN OMIT	5								
OLB GN OMIT	6								
OLC GN OMIT	7								
OLD GN OMIT	8								
OV FL YELLOW	9								
EMVEH A	A		X			X			
EMVEH B	B				X			X	
EMVEH C	C	X					X		
EMVEH D	D			X					X
EXTRA	E	X		X	X				
IC SELECT	F		X						

E + E + INTERVAL

EXTRA (E+E+E)
- 1-TBC TYPE 1
- 2-NEMA COORD
- 3-DAYLIGHT
- 4-EV ADVANCE
- 5-REMOTE EVP
- 6-SPECIAL EVENT
- 7-PRETIMED
- 8-SPLIT RING

OUT

ICSELECT (E+E+F)
- 1-SIMPLEX IN
- 2-2 WAY MODEM
- 3-7 WIRE IN
- 4-FLH/FREE
- 5-SIMPLEX OUT
- 6-7 WIRE OUT

ASSIGN5 (E+F+F)
- 1-RT OVERLAP
- 2-TOD OUTPUTS
- 3-STEADY EV BEACON
- 4-FLASH EV BEACON

CONFIGURATION DATA

		PHASE 1	2	3	4	5	6	7	8
	0								
RR OLAP A	1								
RR OLAP B	2								
RR OLAP C	3								
RR OLAP D	4								
PED 2P	5		X						
PED 6P	6						X		
PED 4P	7								
PED 8P	8								X
FLH YELLOW	9								
OVERLAP A	A								
OVERLAP B	B				X	X			
OVERLAP C	C								
OVERLAP D	D								
RESTRICT	E								
ASSIGN5	F	X							

E + F + INTERVAL

LOCATION HERITAGE RD & OTAY MESA RD

#12

200 SA 1.e

COORDINATION PARAMETERS

FEATURE		PLAN 1	2	3	4	5	6	7	8	9
CYCLE	0	140	140	120						
FORCE 1	1	88	88	75	--					
FORCE 2	2	--	--	--						
FORCE 3	3	27	27	22						
FORCE 4	4	60	60	51						
FORCE 5	5	88	88	75						
FORCE 6	6	--	--	--						
FORCE 7	7	27	27	22						
FORCE 8	8	60	60	51						
RING OFFSET	9									
OFFSET A	A	0	0	7						
OFFSET B	B									
OFFSET C	C									
PERMISSIVE	D	14	14	12						
HOLD RELEASE	E	255	255	255						
ZONE OFFSET	F									

C + PLAN + FEATURE

TRANSITION TYPE
C - D - D = 0

SHORTWAY = 0
DWELL > 0

PEDESTRIAN FORCEOFF SHIFT
C - D - F = 12

FOR OBSERVATION ONLY

MASTER PLAN	C - A - 2
CURRENT PLAN	C - A - 3
T.O.D. PLAN	C - A - 5
MASTER CYCLE	C - A - 0
RING A CYCLE	C - B - 0
RING B CYCLE	C - D - 0
MINIMUM CYCLE	C - A - E
MAXIMUM CYCLE	C - B - E

PLAN TIMETABLE

EVENT	TIME	PLAN	OFFSET	DAY OF WEEK S	M	T	W	T	F	S
0	0600	1	A		X	X	X	X	X	
1	1400	2	A		X	X	X	X	X	
2	2000	E	A		X	X	X	X	X	
3	0900	3	A	X						X
4	1800	E	A	X						X
5										
6										
7										
8										
9										
A										
B										
C										
D										
E										
F										

9 + EVENT

SYNC PHASES

		PHASE 1	2	3	4	5	6	7	8
	0								
SYNC 1	1		X				X		
SYNC 2	2		X				X		
SYNC 3	3		X				X		
SYNC 4	4								
SYNC 5	5								
SYNC 6	6								
SYNC 7	7								
SYNC 8	8								
SYNC 9	9								
CPEDRCL	A								
NEMA HLD	B								
SCANMEM	C								
BADPROM	D								
TODFN E	E								
TODFN F	F								

C + E + FUNCTION

PHASE SEQUENCES

		PHASE 1	2	3	4	5	6	7	8
	0								
LAG 1	1		X		X		X		X
LAG 2	2		X		X		X		X
LAG 3	3		X		X		X		X
LAG 4	4								
LAG 5	5								
LAG 6	6								
LAG 7	7								
LAG 8	8								
LAG 9	9								
COOR MAX RCL	A								
COOR LAG RCL	B								
SYNC PHASES	C								
HOLD	D								
NEXT PHASE	E								
FORCE OFF	F								

C + F + FUNCTION

LOCATION Heritage Rd & Otay Mesa Rd

Date: 01/05/2000

#15

TRAFFIC SIGNAL TIMING - PROGRAM 2009

PHASE TIMING

INTERVAL		1 (OTAY MESA ↓)	2 (OTAY MESA ↔)	3	4	5	6 (←)	7	8 (CACTUS ↑↓)
WALK	0		7						7
FLASH D/W	1		17						22
MIN GREEN	2	4	10				10		4
TYPE 3 DET	3								
ADD/VEH	4								
VEH EXTEN *	5	2.0	5.3				5.3		2.0
MAX GAP *	6	2.0	5.3				5.3		2.0
MIN GAP *	7	2.0	0.2				0.2		2.0
MAX EXTEN	8	30	60				60		30
MAX 2	9								
	A								
CALL TO PHASE	B								
REDUCE BY	C		0.1				0.1		
REDUCE EVERY	D		0.6				0.6		
YELLOW	E	3.0	5.5				5.5		3.0
RED CLEAR	F	1.0	1.0				1.0		1.0

PREEMPT

	E	
RR1 DELAY		0
RR1 CLEAR		1
EVA DELAY	0	2
EVA CLEAR	3	3
EVB DELAY		4
EVB CLEAR		5
EVC DELAY	0	6
EVC CLEAR	3	7
EVD DELAY	0	8
EVD CLEAR	3	9
RR2 DELAY		A
RR2 CLEAR		B
EV CLR TMR		C
EV DLY TMR		D
RR CLR TMR		E
RR DLY TMR		F

MAX INITIAL (F-0-E) = 0 KEYSTROKES: F + PHASE + LOCATION

RED REVERT (F-0-F) = 5

ALL RED START (F-C-0) = 0

* MUST BE SAME FOR NON-DENSITY OPERATION

PHASE FUNCTION FLAGS

KEYSTROKES: F+F+FUNCTION#

FUNCTION		1	2	3	4	5	6	7	8
PERMIT	0	X	X				X		X
RED LOCK	1								
YELLOW LOCK	2								
VEH RECALL	3								
PED RECALL	4								
PEDS	5								
REST IN WALK	6								
RED REST	7								
DOUBLE ENTRY	8								
MAX RECALL	9								
SOFT RECALL	A		X				X		
MAX 2	B								
COND SERVE	C								
RESERVED	D								
STARTUP	E		X				X		
FIRST PHASES	F								X

OVERLAP TIMING

KEYSTROKE: F+ COLOR CODE+OVERLAP

	9 GREEN	C YELLO	D RED
OVERLAP A			
OVERLAP B			
OVERLAP C			
OVERLAP D			

PHASE SEQUENCES (CFG)

	1	2	3	4	5	6	7	8
LAG 0 (FREE)		X				X		X

D.G. 26466-17-D

LOC: Cactus Road @ OTAY Mesa Road

DATE: 9/9/93 1025

PAGE 1 OF 3

#15

DETECTOR TIMES (332 CABINET)

X → SET DELAY | SET CARRY | OBS COUNT | OBS DELAY | OBS CARRY

Y ↓

Y	1	2	3	4	5	6	7	8	9	A
0	111	5J1	111	5J1	111	5J1	111	5J1	111	5J1
1	212L	6J2L	212L	6J2L	212U	6J2U	212U	6J2U	212U	6J2U
			1.8	1.8						
2	212L	6J2L	212L	6J2L	212L	6J2L	212L	6J2L	212L	6J2L
3	213U	6J3U	213U	6J3U	213U	6J3U	213U	6J3U	213U	6J3U
				1.8						
4	213L	6J3L	214	6J3L			213L	6J3L	213L	6J3L
			1.8	1.8						
5	214	6J4	214	6J4			214	6J4	214	6J4
6	315	7J5	315	7J5	315	7J5	315	7J5	315	7J5
7	416U	8J6U	416U	8J6U	416U	8J6U	416U	8J6U	416U	8J6U
	10									
8	416L	8J6L	416L	8J6L	416L	8J6L	416L	8J6L	416L	8J6L
9	417U	8J7U	417U	8J7U	417U	8J7U	417U	8J7U	417U	8J7U
	10									
A	417L	8J7L	417L	8J7L			417L	8J7L	417L	8J7L
B	418	8J8	418	8J8			418	8J8	418	8J8
C	119U	5J9U	119U	5J9U	119U	5J9U	119U	5J9U	119U	5J9U
D	119L	7J9L	119L	7J9L	319L	7J9L	319L	7J9L	319L	7J9L
E										
F										

KEYSTROKES: D + X + Y

TIME OF DAY FEATURES

EVENT	TIME	FUNCT	DAY OF WEEK S	M	T	W	T	F	S
0									
1									
2									
3									
4									
5									
6									
7									
8									
9									
A									
B									
C									
D									
E									
F									

KEYSTROKES: 7+EVENT#

FUNCTION BY PHASE

	1	2	3	4	5	6	7	8

KEYSTROKES: D-F-EVENT #

TIME OF DAY LOCAL FUNCTION CODES

0 - PERMIT
1 - RED LOCK
2 - YELLOW LOCK
3 - VEH RECALL
4 - PED RECALL
5 - RESERVED
6 - REST IN WALK
7 - RED REST
8 - DBL ENTRY
9 - VEH MAX RCL
A - SOFT RECALL
B - MAX II EXT
C - COND SERVE
D - TOD LAC D
E - 1 - LOCAL OVERIDE
2 - PHASE BANK 2
3 - PHASE BANK 3
7 - DET COUNT
8 - SPLIT MONITOR
F - TOD OUTPUTS
1 - TOD OUT 1
2 - TOD OUT 2
3 - TOD OUT 3
4 - TOD OUT 4

CURRENT TIME AND DATE

B-0 HOUR MINUTE, DAY OF WEEK
B-1 DAY OF MONTH, YEAR, MONTH
B-F SECONDS

CONFIGURATION DATA

NOTE "E" KEY ENABLED (F-9-E = 0)

KEYSTROKES: E+E+INTERVAL

INTERVAL		PHASE 1	2	3	4	5	6	7	8
0	EXCLU PK								
1	RR1 GRN								
2	RR2 GRN								
3	RR2 LTD								
4									
5	OLA COMIT								
6	OLB COMIT								
7	OLC COMIT								
8	OLD COMIT								
9	OV FL VEH								
A	EMVEH A		X						
B	EMVEH B								
C	EMVEH C	X				X			
D	EMVEH D							X	
E	EXTRA	X		X	X				
F	TC SELECT		X						

EXTRA. (E+E+E)
1-TBC TYPE 1
2-NEMA COOD
3-DAYLIGHT SAV
4-EV ADVANCE
6-SPECIAL EVENT
7-PRETIMED
8-SPLIT RING

TCSEL: (E+E+F)
1-SIMPLEX IN
2-2-WAY MODEM
3-7 WIRE IN
4-FLH/FREE
5-SIMPLEX OUT
7-7 WIRE OUT

ASSIGNS (E+F+F)
1-ART OVERLAP
2-TOD OUTPUTS
3-STEADY EV BEAC
4-FLASH EV BEAC

KEYSTROKES: E+F+INTERVAL

INTERVAL		PHASE 1	2	3	4	5	6	7	8
0									
1	RR OLAP H								
2	RR OLAP E								
3	RR OLAP C								
4	RR OLAP D								
5	PED2P		X						
6	PED6P								
7	PED4P								
8	PEDSP						X		X
9	FLH YELO								
A	OVERLAP A								
B	OVERLAP B								
C	OVERLAP C								
D	OVERLAP D								
E	RESTRICT								
F	ASSIGNS								

#15

200SA

COORDINATION TIMING

KEYSTROKES: C+PLAN+FEATURE

FEATURE		PLAN 1	2	3	4	5	6	7	8	9	
CYCLE	0	90	100	80	~~128~~	140 VAC 11/18/96					0
FORCE1	1	38	38	37	58						1
FORCE2	2	—	—	—	—						2
FORCE3	3										3
FORCE4	4										4
FORCE5	5										5
FORCE6	6	—	—	—	—						6
FORCE7	7										7
FORCE8	8	20	20	22	33						8
RING OFFSET	9										9
OFFSET A	A	~~33~~	71	56	48						A
OFFSET B	B	50									B
OFFSET C	C	9/23/94	45								C
PERMISSIVE	D	10	10	10	20						D
HOLD RELEASE	E	255	255	255	110						E
ZONE OFFSET	F	0	0	0	0						F

ADDRESS (C-D-0)= 0

MANUAL PLAN: (C-A-1)= 0

AUTO = 0
PLAN = 1-9
FREE = 14
FLASH = 15

TRANSITION TYPE (C-D-D)= 0

SHORTWAY = 0
DWELL > 0

FORCEOFF SHIFT FOR PEDESTRIAN (C-D-F) 13

FOR OBSERVATION ONLY

MASTER PLAN (C-A-2)
CURRENT PLAN (C-A-3)
TOD PLAN (C-A-5)
MASTER CYCLE (C-A-0)
RING A CYCLE (C-B-0)
RING B CYCLE (C-D-0)
MINIMUM CYCLE (C-A-E)
MAXIMUM CYCLE (C-B-E)

TIME BASE COORDINATION

KEYSTROKES: 9+EVENT#

EVENT	TIME	PLAN	OFFSET	DAY OF WEEK S	M	T	W	T	F	S
0	0630	1	A		X	X	X	X	X	
1	0630	3	A	X						X
2	1400	~~2~~ 4	A		X	X	X	X	X	
3	~~1830~~	E	A	X	X	X	X	X	X	X
4	1730									
5										
6										
7										
8										
9										
A										
B										
C										
D										
E										
F										

5/94

PLAN = 1...9 (DIAL)
E (FREE)
F (FLASH)

OFFSET = A...C

SYNCHRONIZED PHASES

KEYSTROKES: C+E+PLAN

PLAN		PHASE 1	2	3	4	5	6	7	8
0									
1	SYNC 1		X				X		
2	SYNC 2		X				X		
3	SYNC 3		X				X		
4	SYNC 4		X				X		
5	SYNC 5								
6	SYNC 6								
7	SYNC 7								
8	SYNC 8								
9	SYNC 9								
A	CPEDRCL								
B	NEMA HLD								
C	SCANMEM								
D	BADPROM								
E	TODFN E								
F	TODFN F								

PHASE SEQUENCES

KEYSTROKES: C+F+FUNCTION#

FUNCTION		PHASE 1	2	3	4	5	6	7	8
0	LAG 0 (FREE)		X				X		X
1	LAG 1		X				X		X
2	LAG 2		X				X		X
3	LAG 3		X				X		X
4	LAG 4		X				X		X
5	LAG 5								
6	LAG 6								
7	LAG 7								
8	LAG 8								
9	LAG 9								
A	COOR MAX RECALL								
B	COOR LAG RECALL								
C	SYNC PHASES								
D	HOLD								
E	NEXT PHASE								
F	FORCE OFF								

INTERSECTION: CACTUS RD at OTAY MESA RD

by: DLS Date: 9/30/93

(COORDINATION ONLY)

#18

TRAFFIC SIGNAL TIMING - BITS 152

N

PHASE TIMING

OTAY MESA — BRITANNIA

PHASE # →		1	2	3	4	5	6	7	8
WALK	0		7						7
FLASH D/W	1		17						17
MIN GREEN	2	4	10				10		4
TYPE 3 DET	3								
ADD/VEH	4								
VEH EXTEN	5	2.0	4.8				4.8		2.0
MAX GAP	6	2.0	4.8				4.8		2.0
MIN GAP	7	2.0	0.2				0.2		2.0
MAX EXTEN	8	30	60				60		40
MAX 2	9								
	A								
	B								
REDUCE BY	C		0.1				0.1		
REDUCE EVERY	D		0.7				0.7		
YELLOW	E	3.0	5.0				5.0		3.0
RED CLEAR	F	1.0	~~1.0~~ 1.5 ~~2.0~~				~~1.0~~ 1.5 ~~2.0~~		1.0

LOCATION

PREEMPT

	E	
RRI DELAY		0
RR1 CLEAR		1
EV A DELAY	0	2
EV A CLEAR	3	3
EV B DELAY	0	4
EV B CLEAR	3	5
EV C DELAY	0	6
EV C CLEAR	3	7
EV D DELAY		8
EV D CLEAR		9
RR2 DELAY		A
RR2 CLEAR		B
EV CLR TMR		C
EV DLY TMR		D
RR CLR TMR		E
RR DLY TMR		F

MAX INITIAL (F–O–E) = DLS 1/15/92 KEYSTROKES: F + PHASE + LOCATION RED REVERT (F–O–F) = _____

PHASE FUNCTION FLAGS

		PHASE 1	2	3	4	5	6	7	8
PERMIT	0	X	X				X		X
RED LOCK	1								
YELLOW LOCK	2								
VEH RECALL	3		X				X		
PED RECALL	4								
PEDS	5								
REST IN WALK	6								
RED REST	7								
DOUBLE ENTRY	8								
MAX RECALL	9								
OVERLAP A	A								
OVERLAP B	B								
OVERLAP C	C								
OVERLAP D	D								
STARTUP	E		X				X		
(RESERVED)	F								

KEYSTROKES: F + F + FUNCTION #

PHASE SEQUENCES

		PHASE 1	2	3	4	5	6	7	8
LAG 0 (FREE)	0		X				X		X
LAG 1 9/23/94	1	X					X		X
LAG 2 DLS	2		X				X		X
LAG 3	3		X				X		X
LAG 4	4		X				X		X
LAG 5	5								
LAG 6	6								
LAG 7	7								
LAG 8	8								
LAG 9	9								
COOR MAX RECALL	A								
COOR LAG RECALL	B								
SYNC PHASES	C								
HOLD	D								
NEXT PHASE	E								
FORCE OFF	F								

KEYSTROKES: C + F + FUNCTION #

REMARKS:

LOC: BRITANNIA BL. / OTAY MESA Rd

T.O 1145 EM

DATE: 13 JUN 89

DETECTOR TIMES (332 CABINET)

X → SET DELAY, SET CARRY, OBS COUNT, OBS DELAY, OBS CARRY

Y ↓

Y	1	2	3	4	5	6	7	8	9	A
0	1I1	5J1	1I1	5J1						
1	2I2U	6J2U	2I2U 1.8	6J2U 1.8						
2	2I2L	6J2L	2I2L	6J2L						
3	2I3U	6J3U	2I3U	6J3U						
4	2I3L	6J3L	2I3L	6J3L						
5	2I4	6J4	2I4	6J4						
6	3I5	7J5	3I5	7J5						
7	4I6U	8J6U	4I6U	8J6U						
8	4I6L	8J6L 10	4I6L	8J6L						
9	4I7U	8J7U	4I7U	8J7U						
A	4I7L	8J7L 10	4I7L	8J7L						
B	4I8	8J8	4I8	8J8						
C	1I9U	5J9U	1I9U	5J9U						
D	3I9L	7J9L	3I9L	7J9L						
E										
F										

4/28/97 TRM

KEYSTROKES: D + X + Y

TIME OF DAY FUNCTION

	TIME (24 HOUR)	FUN	DAY OF WEEK 1	2	3	4	5	6	7
0									
1									
2									
3									
4									
5									
6									
7									
8									
9									
A									
B									
C									
D									
E									
F									

KEYSTROKES: 7 + EVENT NUMBER

PEDESTRIAN ASSIGNMENTS

LOC	SWITCH-PACK	INPUT CI PIN	PHASE 1	2	3	4	5	6	7	8
EF5	2P	67		X						
EF6	6P	68								
EF7	4P	69								
EF8	8P	70								X

EMERGENCY VEHICLE PREEMPT ASSIGNMENTS

LOC	PREEM	INPUT CI PIN	PHASE 1	2	3	4	5	6	7	8
EEA	EVA	71		X			X			
EEB	EVB	72								X
EEC	EVC	73	X					X		
EED	EVD	74								

RAILROAD PREEMPTION ASSIGNMENTS

LOC	PHASE	1	2	3	4	5	6	7	8
EE1	RR1 CLEAR								
EE2	RR2 CLEAR								
EE3	RR2 LMT SVC								

CONDITIONAL SERVICE D-F-O _____

LONG POWER FAIL CORRECTION F-O-6 _____

SHORT POWER FAIL CORRECTION F-O-7 _____

CURRENT TIME AND DATE

8-0 HOUR, MINUTE, DAY OF WEEK

8-1 DAY OF MONTH, YEAR, MONTH

C-4-9 SECONDS

TRAFFIC SIGNAL TIMING BITS 15

COORDINATION PARAMETERS

1st LOCATION CODE X

2ND LOCATION CODE Y	0	1	2	3	4	5	6	7	8	9	A	B
0		CYCLE 90	CYCLE 100	CYCLE 80	CYCLE ~~128~~	CYCLE 140	CYCLE ~~146~~ 118	CYCLE 96	CYCLE	CYCLE	CYCLE	CYCLE
1	MANUAL C	FORCE 1 34	FORCE 1 34	FORCE 1 37	FORCE 1 55	FORCE 1	FORCE 1	FORCE 1	FORCE 1	FORCE 1	FORCE 1	
2		FORCE 2 ~~20~~	FORCE 2 —	FORCE 2 —	FORCE 2 —	FORCE 2	FORCE 2	FORCE 2	FORCE 2	FORCE 2	FORCE 2	
3	CURRENT PLAN	FORCE 3 /	FORCE 3 /	FORCE 3 /	FORCE 3 \	FORCE 3	FORCE 3	FORCE 3	FORCE 3	FORCE 3	FORCE 3	
4		FORCE 4 /	FORCE 4 /	FORCE 4 /	FORCE 4 \	FORCE 4	FORCE 4	FORCE 4	FORCE 4	FORCE 4	FORCE 4	
5	2ND PLAN	FORCE 5 /	FORCE 5 /	FORCE 5 /	FORCE 5 \	FORCE 5	FORCE 5	FORCE 5	FORCE 5	FORCE 5	FORCE 5	
6		FORCE 6 —	FORCE 6 —	FORCE 6 —	FORCE 6 —	FORCE 6	FORCE 6	FORCE 6	FORCE 6	FORCE 6	FORCE 6	
7		FORCE 7 /	FORCE 7 /	FORCE 7 /	FORCE 7 \	FORCE 7	FORCE 7	FORCE 7	FORCE 7	FORCE 7	FORCE 7	
8		FORCE 8 ~~18~~	FORCE 8 18	FORCE 8 22	FORCE 8 30	FORCE 8	FORCE 8	FORCE 8	FORCE 8	FORCE 8	FORCE 8	
9		40										REWOFF
A		OFFSET ~~88~~	OFFSET 32	OFFSET 18	OFFSET 102	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET		CURR OFFSET
B		15	DLS									
C			9/22	1st								
D	HOLDON 1	PERM 10	PERM 10	PERM 10	PERM 20	PERM	PERM	PERM	PERM	PERM	CURR PERM	138
E											MINCY 70	MAXCY ~~142~~
F											LMASTR	LLOCAL

KEYSTROKE C + X + Y

TIME OF DAY PLAN #18

	TIME (24 HOUR)	PLAN	DAY OF WEEK 1	2	3	4	5	6	7
0	0630	1		X	X	X	X	X	
1	0630	3	X						X
2	1400	~~4~~		X	X	X	X	X	
3	~~1830~~	E	X	X	X	X	X	X	X
4	1730								
5									
6									
7									
8									
9									
A									
B									
C									
D									
E									
F									

KEYSTROKES: 9 + EVENT NUMBER

SYNCHRONIZED PHASES

PLAN #	PHASE 1	2	3	4	5	6	7	8
1		X				X		
2		X				X		
3		X				X		
4		X				X		
5								
6								
7								
8								
9								

KEYSTROKES: D + F + PLAN #

LAGS

Plan 1 1, 6, 8

Plans 2-4 2, 6, 8

LOC: BRITANNIA BL & OTAY MESA RD

DATE:

ED-75

LOCATION: 905 WB @ Britannia Blvd
CALTRANS C8 Version 3
F PAGE

2/24/2015

#19

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9
0	WALK	1	7	1	1	1	7	1	1	CLK RST
1	DONT WALK	1	17	1	1	1	17	1	1	
2	MIN GREEN	1	5	1	1	5	5	1	5	
3	TYPE 3 DET	0	0	0	0	0	0	0	0	
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	PASSAGE	0.9	3.0	0.9	0.9	3.0	3.0	0.9	3.0	
6	MAX GAP	0.9	3.0	0.9	0.9	3.0	3.0	0.9	3.0	
7	MIN GAP	0.9	3.0	0.9	0.9	3.0	3.0	0.9	3.0	
8	MAX EXT	9	30	9	9	30	30	9	30	
9	MAX 2									YR
A	MAX 3									MO
B										DAY
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR
E	YELLOW	3.0	4.1	3.0	3.0	3.7	4.1	3.0	4.1	MIN
F	RED	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	SEC
3.5'	PED XING FT		58'				59'			
	BIKE XING FT		86'				80'			

PRE-EMPTION E	
EV SEL	0
RR1 CLR	15
EVA DLY	0
EVA CLR	5
EVB DLY	0
EVB CLR	5
EVC DLY	0
EVC CLR	5
EVD DLY	0
EVD CLR	5
MAX EV	255
RR2 CLR	15

F FLAGS	1	2	3	4	5	6	7	8	
PERMIT		2			5	6		8	0
RED LOCK									1
YEL LOCK									2
V RECALL		2				6			3
P RECALL									4
PED PHASES		2				6			5
RT OLA									6
RT OLB									7
DBL ENTRY									8
MAX 2 PHASES									9
LAG PHASES	READ ONLY								A
RED REST									B
REST-IN-WALK									C
MAX 3 PHASES									D
YEL START UP		2				6			E
FIRST PHASE								8	F
	1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	30
FOF	5

FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FD0 TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

LOCATION: **905 WB @ Britannia Blvd**
CALTRANS C8 Version 3
C PAGE

11/29/2010

#19 PAGE 2

		CONTROL PLANS									Y-COORD			LAG PHASE	FLAGS									
		1	2	3	4	5	6	7	8	9		C	D	E	F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH														LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR													GAPOUT CP1	LAG FZ CP 1									1
2														GAPOUT CP2	LAG FZ CP 2									2
3	FZ3 GRN FCTR													GAPOUT CP3	LAG FZ CP 3									3
4	FZ4 GRN FCTR										PERM TIME			GAPOUT CP4	LAG FZ CP 4									4
5	FZ5 GRN FCTR										LAG OFFSET			GAPOUT CP5	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	LAG FZ CP 6									6
7	FZ7 GRN FCTR										LONG GRN			GAPOUT CP7	LAG FZ CP 7									7
8	FZ8 GRN FCTR										NO GREEN			GAPOUT CP8	LAG FZ CP 8									8
9	MULTI CYCLE													GAPOUT CP9	LAG FZ CP 9									9
A	OFFSET A										OFFSET				LAG C COORD									A
B	OFFSET B														LAG D COORD									B
C	OFFSET C														COORD FAZES		2				6			C
D	FZ 3 EXT																							D
E	FZ 7 EXT																							E
F	OFFSET INTRPT																							F
																1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

System Master:
EB @ Britannia

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1	1	
2		2
3	3	
4	4	
5	5	
6	6	
7		
8		

COO = 2

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: 905 WB @ Britannia Blvd
CALTRANS C8 Version 3
D PAGE

11/29/2010

#19

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1									CP 1								
2	CP 2									CP 2									CP 2								
3	CP 3									CP 3									CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		2							5
6										5 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E
MINUTE = D-B-E
DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES
(CALL ACTIVE LIGHTS)
RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES
(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F
MINUTE = D-B-F
DAY = D-C-F

D-E-E = C8 VERSION NUMBER
D-E-F = LITHIUM BATTERY CONDITION
84 = BAD
85 = GOOD

LOCATION: 905 WB @ Britannia Blvd
CALTRANS C8 Version 3
7 PAGE

11/29/2010

#19

TIME OF DAY ACTIVITY TABLE										
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS										
	HR	MIN	ACT	ON/ OFF	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

9 PAGE CO9 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

#19

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	905	R13.9/R18.6	760	895

Enrique P. Bernal 08-12-08
REGISTERED ELECTRICAL ENGINEER DATE

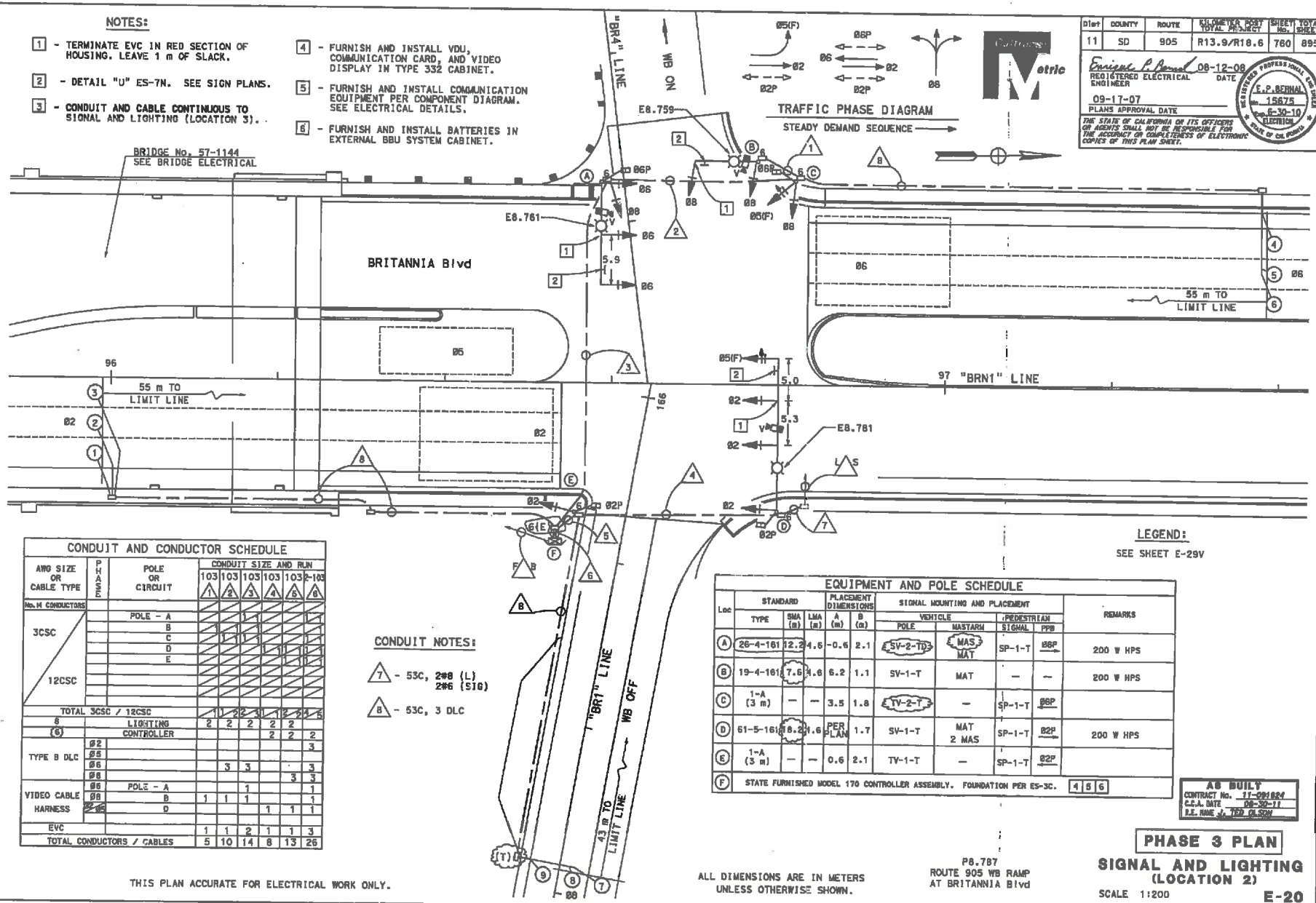
09-17-07
PLANS APPROVAL DATE

E.P. BERNAL No. 15675 6-30-10 ELECTRICAL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

NOTES:

1. TERMINATE EVC IN RED SECTION OF HOUSING. LEAVE 1 m OF SLACK.
2. DETAIL "U" ES-7N. SEE SIGN PLANS.
3. CONDUIT AND CABLE CONTINUOUS TO SIGNAL AND LIGHTING (LOCATION 3).
4. FURNISH AND INSTALL VDU, COMMUNICATION CARD, AND VIDEO DISPLAY IN TYPE 332 CABINET.
5. FURNISH AND INSTALL COMMUNICATION EQUIPMENT PER COMPONENT DIAGRAM. SEE ELECTRICAL DETAILS.
6. FURNISH AND INSTALL BATTERIES IN EXTERNAL BBU SYSTEM CABINET.



CONDUIT AND CONDUCTOR SCHEDULE

AWG SIZE OR CABLE TYPE	PHASE	POLE OR CIRCUIT	CONDUIT SIZE AND RUN 103 (1)	103 (2)	103 (3)	103 (4)	103 (5)	2-103 (6)
No. H CONDUCTORS								
3CSC		POLE - A			1	1		1
		B	1	1	1	1		1
		C	1	1	1	1		1
		D				1	1	1
		E						1
12CSC								
TOTAL 3CSC / 12CSC			1	1	2	3	1	2	2	4	5
8		LIGHTING	2	2	2	2	2	
(6)		CONTROLLER				2	2	2
TYPE B DLC	Ø2							3
	Ø5							
	Ø6			3	3			3
	Ø8						3	3
VIDEO CABLE HARNESS	Ø6	POLE - A			1			1
	Ø8	B	1	1	1			1
	Ø2P	D				1	1	1
EVC			1	1	2	1	1	3
TOTAL CONDUCTORS / CABLES			5	10	14	8	13	26

CONDUIT NOTES:

7 - 53C, 2#8 (L) 2#6 (SIG)

8 - 53C, 3 DLC

EQUIPMENT AND POLE SCHEDULE

Loc	STANDARD TYPE	STANDARD SNA (m)	STANDARD LMA (m)	PLACEMENT DIMENSIONS A (m)	PLACEMENT DIMENSIONS B (m)	SIGNAL MOUNTING AND PLACEMENT VEHICLE POLE	VEHICLE MASTARM	PEDESTRIAN SIGNAL	PEDESTRIAN PPB	REMARKS
A	26-4-161	12.2	4.6	-0.6	2.1	SV-2-TD	MAS, MAT	SP-1-T	Ø6P	200 W HPS
B	19-4-161	7.6	4.6	6.2	1.1	SV-1-T	MAT	—	—	200 W HPS
C	1-A (3 m)	—	—	3.5	1.8	TV-2-T	—	SP-1-T	Ø6P	
D	61-5-161	18.2	4.6	PER PLAN	1.7	SV-1-T	MAT 2 MAS	SP-1-T	Ø2P	200 W HPS
E	1-A (3 m)	—	—	0.6	2.1	TV-1-T	—	SP-1-T	Ø2P	
F	STATE FURNISHED MODEL 170 CONTROLLER ASSEMBLY. FOUNDATION PER ES-3C. 4 5 6									

LEGEND:

SEE SHEET E-29V

AS BUILT
CONTRACT No. 11-091821
C.E.A. DATE 06-30-11
I.E. NAME J. TED OLSON

THIS PLAN ACCURATE FOR ELECTRICAL WORK ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

P8.787
ROUTE 905 WB RAMP
AT BRITANNIA Blvd

PHASE 3 PLAN

SIGNAL AND LIGHTING (LOCATION 2)

SCALE 1:200

E-20

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
TRAFFIC ELECTRICAL

FUNCTIONAL SUPERVISOR: DALE WILSON
CALCULATED-DESIGNED BY: H. SAMAYA
CHECKED BY: ENRIQUE BERNAL
REVISED BY / DATE REVISED

LAST REVISION 08-15-08
DATE PLOTTED => 20-MAY-2011
TIME PLOTTED => 10:54

BORDER LAST REVISED 3/1/2007
RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80
USERNAME => s109745
DGN FILE => b09162uc020_ab.dgn
CU 11393
EA 091821

LOCATION: 905 EB @ Britannia Blvd
CALTRANS C8 Version 3
C PAGE

11/29/2010

		CONTROL PLANS									Y-COORD			LAG PHASE	FLAGS									
		1	2	3	4	5	6	7	8	9		C	D	E	F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH														LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR													GAPOUT CP1	LAG FZ CP 1									1
2														GAPOUT CP2	LAG FZ CP 2									2
3	FZ3 GRN FCTR													GAPOUT CP3	LAG FZ CP 3									3
4	FZ4 GRN FCTR										PERM TIME			GAPOUT CP4	LAG FZ CP 4									4
5	FZ5 GRN FCTR										LAG OFFSET			GAPOUT CP5	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	LAG FZ CP 6									6
7	FZ7 GRN FCTR										LONG GRN			GAPOUT CP7	LAG FZ CP 7									7
8	FZ8 GRN FCTR										NO GREEN			GAPOUT CP8	LAG FZ CP 8									8
9	MULTI CYCLE													GAPOUT CP9	LAG FZ CP 9									9
A	OFFSET A										OFFSET				LAG C COORD									A
B	OFFSET B														LAG D COORD									B
C	OFFSET C														COORD FAZES		2				6			C
D	FZ 3 EXT																							D
E	FZ 7 EXT																							E
F	OFFSET INTRPT																							F
																1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

System Master:
EB @ Britannia

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1		1
2	2	
3	4	
4	8	
5	16	
6	32	
7		
8		

COO = 1

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: 905 EB @ Britannia Blvd
CALTRANS C8 Version 3
D PAGE

11/29/2010

 #20

E PAGE

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1									CP 1								
2	CP 2									CP 2									CP 2								
3	CP 3									CP 3									CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		2							5
6										6 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E
MINUTE = D-B-E
DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES
(CALL ACTIVE LIGHTS)
RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES
(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F
MINUTE = D-B-F
DAY = D-C-F

D-E-E = C8 VERSION NUMBER
D-E-F = LITHIUM BATTERY CONDITION
84 = BAD
85 = GOOD

LOCATION: 905 EB @ Britannia Blvd
CALTRANS C8 Version 3
7 PAGE

11/29/2010

 #20

TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
	HR	MIN	ACT	ON/ OFF	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

9 PAGE CO9 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

LOCATION: 905 EB @ Britannia Blvd
CALTRANS C8 Version 3
F PAGE

2/24/2015

 #20

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8
0	WALK	1	7	1	1	1	7	1	1
1	DONT WALK	1	16	1	1	1	17	1	1
2	MIN GREEN	5	5	1	5	1	5	1	1
3	TYPE 3 DET	0	0	0	0	0	0	0	0
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	PASSAGE	3.0	3.0	0.9	3.0	0.9	3.0	0.9	0.9
6	MAX GAP	3.0	3.0	0.9	3.0	0.9	3.0	0.9	0.9
7	MIN GAP	3.0	3.0	0.9	3.0	0.9	3.0	0.9	0.9
8	MAX EXT	20	30	9	30	9	30	9	9
9	MAX 2								
A	MAX 3								
B									
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
E	YELLOW	3.7	4.1	3.0	4.1	3.0	4.1	3.0	3.0
F	RED	1.0	1.0	0.0	1.0	0.0	1.0	0.0	0.0
3.5'	PED XING FT		57'				58'		
	BIKE XING FT		65'				75'		

9
CLK RST
YR
MO
DAY
DOW
HR
MIN
SEC

PRE-EMPTION E	
EV SEL	0
RR1 CLR	15
EVA DLY	0
EVA CLR	5
EVB DLY	0
EVB CLR	5
EVC DLY	0
EVC CLR	5
EVD DLY	0
EVD CLR	5
MAX EV	255
RR2 CLR	15

F FLAGS	1	2	3	4	5	6	7	8	
FERMIT	1	2		4		6			0
RED LOCK									1
YEL LOCK									2
V RECALL		2				6			3
P RECALL									4
PED PHASES		2				6			5
RT OLA									6
RT OLB									7
DBL ENTRY									8
MAX 2 PHASES									9
LAG PHASES	READ ONLY								A
RED REST									B
REST-IN-WALK									C
MAX 3 PHASES									D
YEL START UP		2				6			E
FIRST PHASE				4					F
	1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	30
FOF	5

FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FDO TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

#20

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	905	R9.5/R15.0	667A	857

Enrique P Bernal 08-28-09
REGISTERED ELECTRICAL ENGINEER — DATE

10-20-08
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER E.P.BERNAL No. 15675 EXP. 6-30-10 ELECTRICAL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Caltrans Metric

NOTES:

1 - Exist TRAFFIC SIGNAL PARTIAL SHOWN ONLY.

2 - Exist SIGNAL, LIGHTING STANDARD AND ASSOCIATED EQUIPMENT TO REMAIN UNLESS OTHERWISE NOTED.

3 - Exist CONDUIT, PULL BOXES AND DETECTOR LOOPS TO REMAIN UNLESS OTHERWISE NOTED

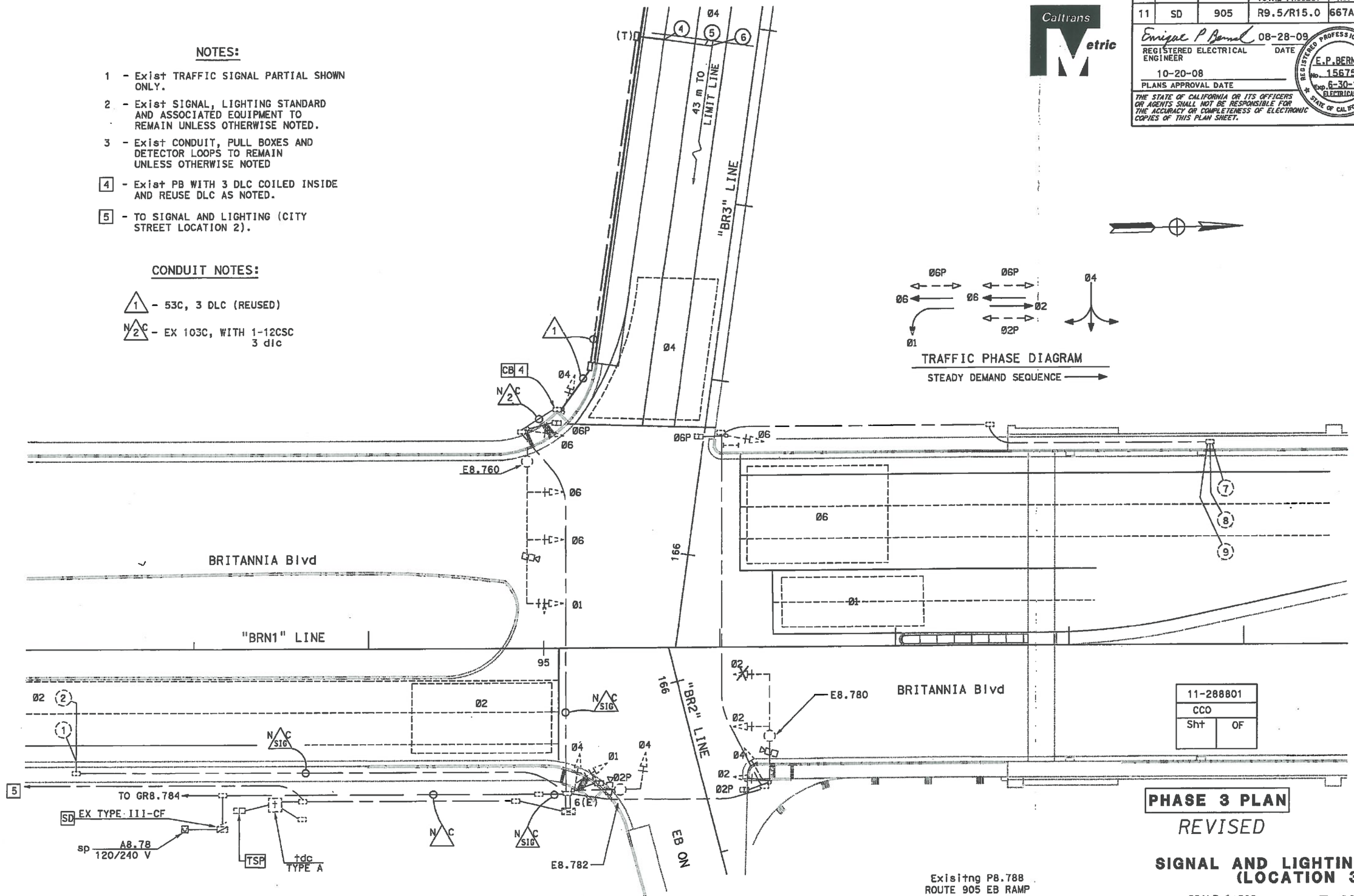
[4] - Exist PB WITH 3 DLC COILED INSIDE AND REUSE DLC AS NOTED.

[5] - TO SIGNAL AND LIGHTING (CITY STREET LOCATION 2).

CONDUIT NOTES:

(1) - 53C, 3 DLC (REUSED)

N (2) C - EX 103C, WITH 1-12CSC 3 dlc



PHASE 3 PLAN

REVISED

SIGNAL AND LIGHTING (LOCATION 3)

SCALE 1:200

E-19A

THIS PLAN SHEET ACCURATE FOR ELECTRICAL WORK ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY	CHECKED BY
H. SAWAYA	ENRIQUE BERNAL

FUNCTIONAL SUPERVISOR: DALE WILSON

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans TRAFFIC ELECTRICAL

LAST REVISION DATE PLOTTED =>13-JUN-2013

INTERSECTION: Airway Rd @ Britannia Bl

Group Assignment:
Field Master Assignment:

N/S Street Name: Britannia
E/W Street Name: Airway

Last Database Change:
System Ref. Number:

223 Program

#21

Row	Column # ----> / Phase # ---->	1	2	3	4	5	6	7	8
		Britannia				Britannia		Airway	Airway
0	Ped Walk		7						7
1	Ped FDW		21						27
2	Min Green	4	10			4	10	4	4
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	3.8			2.0	3.8	2.0	3.7
6	Max Gap	2.0	3.8			2.0	3.8	2.0	3.7
7	Min Gap	2.0	0.2			2.0	0.2	0.2	0.2
8	Max Limit	30	60			30	60	40	40
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1				0.1	0.1	0.1
D	Every		0.8				0.8	1.7	0.8
E	Yellow	3.4	3.9			3.4	4.1	4.3	4.2
F	Red Clear	1.0	1.0			1.0	1.0	1.0	1.0
	Grade								

Phase Timing - Bank 1
F + Phase + Row

<F Page>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing
F + E + Row

Row		F
0	Permit	12__5678
1	Red Lock	
2	Yellow Lock	
3	Min Recall	
4	Ped Recall	
5	Peds (View)	_2____8
6	Rest In Walk	
7	Red Rest	
8	Dbl Entry	
9	Max Recall	
A	Soft Recall	_2___6__
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	_2___6__
F	1st Phases	_____7_

Phase Functions <F Page>
F + F + Row

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number		C + 0 + 0
Zone Number		C + 0 + 1
Area Number		C + 0 + 2
Area Address		C + 0 + 3
QuicNet Channel		(QuicNet)

Communication Addresses

Overlap Timing

	Row	9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page>
F + COLOR +

<D Page>
D + 0 + OVERLAP

Manual Plan	14	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

C + F + O	F	Row
Free Lag	_2___6_8	0

Lag Phases <C Page>

Downtime Flash	255	(minutes)

Downtime Before Auto Manual Flash
F + D + 8

Disable Ports	_234____

Disable Communication Ports
D + D + 9

Timing Sheet By: FLG
Approved By: PLG
Drawing Number:
Timing Implemented On: 4/4/2011

#21

Row	Time	Function	Day of Week	Column F Phases/Bits
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function

7 + ROW

<D Page>

D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	_2_____
6	Ped 6P	
7	Ped 4P	
8	Ped 8P	_____8
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration

<E Page>

E + F + ROW

Day of Week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	_2__5__
B	EV-B Phases	_____7_
C	EV-C Phases	1____6__
D	EV-D Phases	_____8
E	Extra 1 Config. Bits	1_345___
F	IC Select (Interconnect)	_2_____

Configuration

For access, set F + 9 + E = 1

E + E + ROW

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Time and Date

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications
(If set to a non-zero value, parity will be disabled)

Program Information

C + C + 0 = program
C + C + F = version

Remote Download

C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

INTERSECTION: Airway Rd @ Britannia Bl

223 Program

#21

Row	1 Delay	3 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
	2I2U	1
	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	16
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Row	2 Delay	4 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		1.8
8		
9		
A		
B		
C		
D		1.8
E	---	---
F	---	---

Detector Delay & Carryover <D Page>

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 – – – –	1234____
C	13 14 15 16 17 18 19 20	12345678
D	– – – – 21 22 23 24	____5678
E	– – – – – – – –	1234____
F	– 25 26 27 28 – – –	_2345___

Active Detectors <D Page>

Row		0 Detector #
0		
1	System Det. # 1	
2	System Det. # 2	
3	System Det. # 3	
4	System Det. # 4	
5	System Det. # 5	
6	System Det. # 6	
7	System Det. # 7	
8	System Det. # 8	

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number		F+C+1
Time Before Yellow		F+C+3

Advance Warning Beacon - Sign 1

Phase Number		F+D+1
Time Before Yellow		F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

Printed on 3/30/2011 12:29 PM

City of San Diego

DATE: 1/27/15

23

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9
0	WALK	1	7	1	1	1	1	1	7	CLK RST
1	DONT WALK	1	25	1	1	1	1	1	38	
2	MIN GREEN	5	10	1	1	1	10	1	10	
3	TYPE 3 DET	0	0	0	0	0	0	0	0	
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	PASSAGE	2.0	6.9	0.9	0.9	0.9	6.9	0.9	2.0	
6	MAX GAP	2.0	8.9	0.9	0.9	0.9	8.9	0.9	2.0	
7	MIN GAP	2.0	3.0	0.9	0.9	0.9	3.0	0.9	2.0	
8	MAX EXT	25	35	9	9	9	35	9	25	
9	MAX 2									YR
A	MAX 3									MO
B										DAY
C	REDUCE BY	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	DOW
D	EVERY	1.0	0.4	1.0	1.0	1.0	0.4	1.0	1.0	HR
E	YELLOW	3.7	5.2	3.0	3.0	3.0	5.2	3.0	4.1	MIN
F	RED	2.0	2.0	0.0	0.0	0.0	2.0	0.0	2.0	SEC
3.5'	PED XING FT		88'						132'	

PRE-EMPTION E		F FLAGS	1	2	3	4	5	6	7	8	
EV SEL	0	PERMIT	1	2				6		8	0
RR1 CLR	5	RED LOCK									1
EVA DLY	0	YEL LOCK									2
EVA CLR	5	V RECALL		2				6			3
EVB DLY	0	P RECALL									4
EVB CLR	5	PED PHASE*		2						8	5
EVC DLY	0	RT OLA									6
EVC CLR	5	RT OLB									7
EVD DLY	0	DBL ENTRY									8
EVD CLR	5	MAX 2 PHASES									9
MAX EV	255	LAG PHASES	READ ONLY								A
RR2 CLR	5	RED REST									B
		REST-IN-WALK									C
		MAX 3 PHASES									D
		YEL START UP		2				6			E
		FIRST PHASE								8	F
			1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	0
FOF	5

FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FDO TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

NOTES: 50 MPH

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

LOCATION: **RTE 905 @ OTAY MESA CENTER ROAD**

CALTRANS C8 Version 3 DATE: 1/13/13

C PAGE

		CONTROL PLANS									Y-COORD			LAG PHASE	FLAGS								
		1	2	3	4	5	6	7	8	9		C	D	E	F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH														LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR													GAPOUT CP1	LAG FZ CP 1									1
2														GAPOUT CP2	LAG FZ CP 2									2
3	FZ3 GRN FCTR													GAPOUT CP3	LAG FZ CP 3									3
4	FZ4 GRN FCTR										PERM TIME			GAPOUT CP4	LAG FZ CP 4									4
5	FZ5 GRN FCTR										LAG OFFSET			GAPOUT CP5	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	LAG FZ CP 6									6
7	FZ7 GRN FCTR										LONG GRN			GAPOUT CP7	LAG FZ CP 7									7
8	FZ8 GRN FCTR										NO GREEN			GAPOUT CP8	LAG FZ CP 8									8
9	MULTI CYCLE													GAPOUT CP9	LAG FZ CP 9									9
A	OFFSET A										OFFSET				LAG C COORD									A
B	OFFSET B														LAG D COORD									B
C	OFFSET C														COORD FAZES		2				6			C
D	FZ 3 EXT																							D
E	FZ 7 EXT																							E
F	OFFSET INTRPT																							F
																1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

SYSTEM MASTER:
Rte 125 NB ON

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1		1
2		2
3		4
4		
5		
6		
7		
8		

COO = 7

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: RTE 905 @ OTAY MESA CENTER ROAD

CALTRANS C8 Version 3

D PAGE

DATE: 7/21/11

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1									CP 1								
2	CP 2									CP 2									CP 2								
3	CP 3									CP 3									CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		2							5
6										6 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E

MINUTE = D-B-E

DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES

(CALL ACTIVE LIGHTS)

RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES

(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F

MINUTE = D-B-F

DAY = D-C-F

D-E-E = C8 VERSION NUMBER

D-E-F = LITHIUM BATTERY CONDITION

84 = BAD

85 = GOOD

LOCATION: **RTE 905 @ OTAY MESA CENTER ROAD**

CALTRANS C8 Version 3 DATE: 07/21/11

7 PAGE

TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
	HR	MIN	ACT	ON/ OFF	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

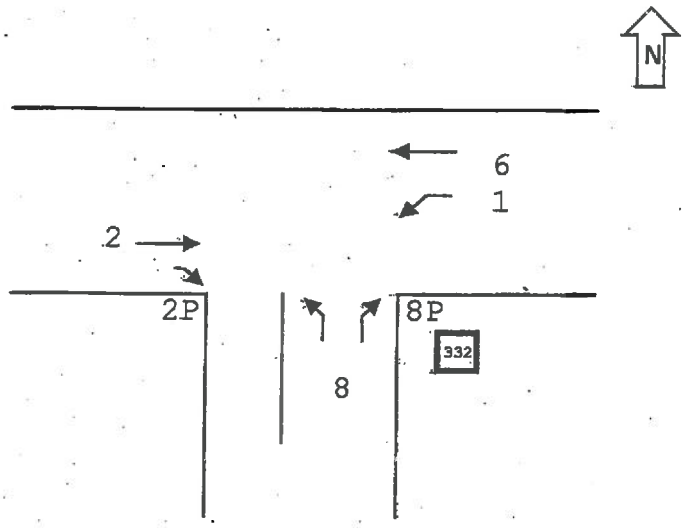
9 PAGE CO9 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

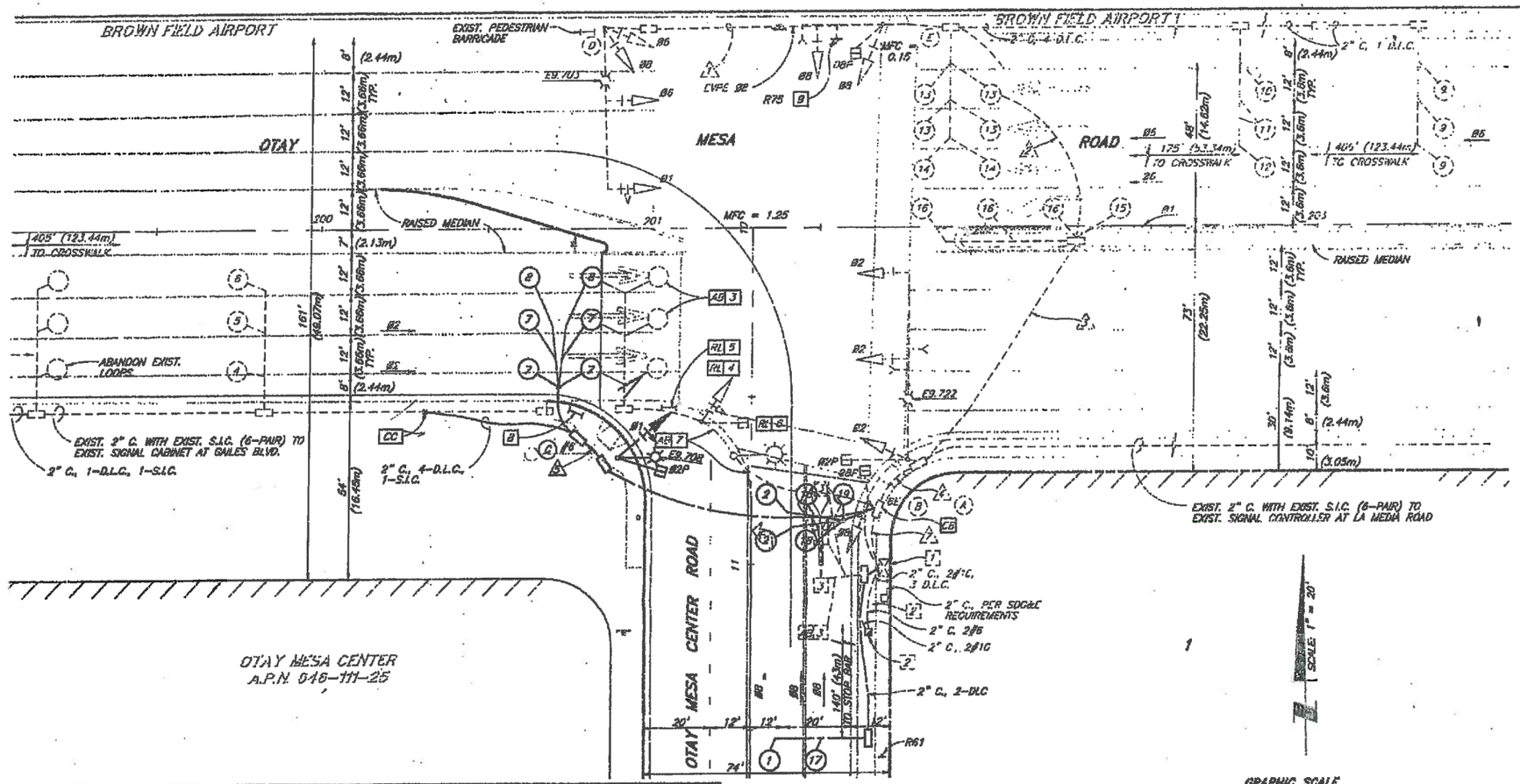
DATE: 1/13/13

LOCATION: RTE 905 @ OTAY MESA CENTER ROAD

CONFLICT MONITOR PROGRAM



23



WORK TO BE DONE

MODIFY TRAFFIC SIGNAL AND STREET LIGHTING SYSTEMS AS SHOWN AND NOTED.

STANDARD SPECIFICATIONS

1. STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (2000 EDITION), INCLUDING THE REGIONAL AND CITY OF SAN DIEGO SUPPLEMENT AMENDMENTS, DOCUMENT NO. 70845 FILED JULY 21, 2000.
2. LIGHTING AND ELECTRICAL SYSTEMS OF CITY OF SAN DIEGO, DOCUMENT NO. 769842, FILED OCTOBER 22, 1999.
3. "STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, MANUAL OF TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE WORK ZONES (1996 (REVISION 2) EDITION)".
4. "STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS, JULY 1999".

STANDARD DRAWINGS

1. CITY OF SAN DIEGO STANDARD DRAWINGS, INCLUDING ALL REGIONAL STANDARD DRAWINGS, DOCUMENT NO. 769840, FILED JULY 21, 2000.
2. "STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, STANDARD PLANS, JULY 1999".
3. "STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, STANDARD PLANS, JULY 1999 ERRATUM NO. 99-1".

TRAFFIC SIGNAL GENERAL NOTES

1. PULL BOXES SHALL BE NO. 5, AND CONDUIT 3" UNLESS NOTED OTHERWISE.
2. LOCATION OF ALL UNDERGROUND UTILITIES ARE APPROXIMATE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS AND VERIFY ALL CONDITIONS ON THE JOB SITE.
3. THE TRAFFIC SIGNAL CONTRACTOR SHALL OBTAIN A TRAFFIC CONTROL PLAN PERMIT FROM THE CITY OF SAN DIEGO PERMIT CENTER A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO START OF WORK.
4. ALL TRAFFIC SIGNAL POLE FOUNDATIONS SHALL HAVE A 3" (78C) CONDUIT INSTALLED TO THE ADJACENT PULL BOX AND THE CONTROLLER FOUNDATION SHALL HAVE A SPARE 3" (78C) CONDUIT INSTALLED TO THE ADJACENT #8 PULL BOX FOR FUTURE USE.
5. THE TRAFFIC SIGNAL CONTRACTOR IS RESPONSIBLE FOR THE LAYOUT AND INSTALLATION OF LOOP DETECTORS, TRAFFIC STRIPING, PAVEMENT MARKINGS, PARKING REMOVAL AND TRAFFIC SIGNING (EXCEPT "G" SERIES STREET NAME SIGNS) AS SHOWN ON THESE PLANS.
   - 5a THE TRAFFIC SIGNAL CONTRACTOR SHALL OBTAIN THE APPROVAL OF THE CITY RESIDENT ENGINEER OF THE LOOP LOCATIONS PRIOR TO CUTTING AND THE STRIPING, PAVEMENT MARKINGS, PARKING REMOVAL AND SIGN LOCATIONS PRIOR TO PAINTING AND INSTALLATION.
   - 5b AFTER APPROVAL OF LOCATION, THE TRAFFIC SIGNAL CONTRACTOR SHALL WAIT A MINIMUM OF FIFTEEN (15) WORKING DAYS BEFORE PERMANENTLY REMOVING ANY PARKING, SO THAT ADVANCE NOTICE TO ADJACENT PROPERTY OWNERS CAN BE MADE BY THE CITY.
   - 5c THE TRAFFIC SIGNAL CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL OF ALL UNNECESSARY AND CONFLICTING STRIPING AND PAVEMENT MARKINGS.
6. TRAFFIC SIGNAL CONTRACTOR SHALL NOT ERECT ANY SIGNAL STANDARDS MORE THAN THREE (3) WEEKS PRIOR TO SCHEDULED TRAFFIC SIGNAL TURN TURNOFF.
7. CONTRACTOR SHALL PROVIDE ALL CABLING AND CONDUCTORS NECESSARY TO PERFORM ALL FUNCTIONS SHOWN ON THESE PLANS.
8. ALL POLES, CONDUIT, PULL BOXES, STRIPING AND LOOP DETECTOR LOCATIONS SHOWN THESE PLANS ARE APPROXIMATE. ACTUAL LOCATIONS SHALL BE DETERMINED BY FIELD CONDITIONS AT THE TIME OF CONSTRUCTION AND AS DIRECTED BY THE CITY OF SAN DIEGO.
9. ROUTING AND LOCATIONS OF UNDERGROUND ELECTRICAL SYSTEM IS DIAGRAMMATIC AND SUBJECT TO APPROVAL OF THE ENGINEER. UNDERGROUND ELECTRICAL LINES AND SUBSURFACE STRUCTURES MAY BE RELOCATED IF NECESSARY TO CLEAR OTHER EXISTING UNDERGROUND FACILITIES.
10. ALL TREES AND SHRUBS SHALL BE TRIMMED OR REMOVED AS DETERMINED BY THE CITY RESIDENT ENGINEER AS REQUIRED TO MAINTAIN SIGNAL HEAD VISIBILITY AND SIGHT DISTANCE.
11. ALL VEHICLES SIGNAL HEADS SHALL BE 12" (300mm) WITH BACK PLATES. ALL VISORS SHALL BE TUNNEL TYPE.
12. ALL VEHICLE AND PEDESTRIAN INDICATIONS SHALL BE OF THE L.E.D. TYPE.

CONSTRUCTION NOTES

1. EXISTING TYPE 170 CONTROLLER AND 332 CABINET. ADD LOOP DETECTOR SENSOR AMPLIFIER.
2. EXISTING SDG&E SERVICE CABINET.
3. ABANDON EXISTING INDUCTIVE LOOP DETECTORS.
4. RELOCATE TYPE 1-A POLE, SIGNAL HEAD, PED. HEAD AND P.P.B.
5. RELOCATE EXISTING PEDESTRIAN BARRICADE AND SIGN.
6. RELOCATE EXISTING TYPE 15 LIGHTING STANDARD.
7. ABANDONED EXISTING 2" CONDUIT AND REMOVE ALL CONDUCTORS.
8. INSTALL PEDESTRIAN BARRICADE PER S.D.E.-103.
9. CALTRANS STANDARD DRAWING ES-7N, DETAIL "U" REQUIRED. REMOVE EXIST. R34.
10. INSTALL BI-DIRECTIONAL DUAL CHANNEL EMERGENCY VEHICLE PRE-EMPTION DETECTOR (E.V.P.E.) PER CITY OF SAN DIEGO REQUIREMENTS.
11. INSTALL TYPE "A" HANDHOLE PER ES-5E WITH LOCKING COVER - NO SPLICING IN HANDHOLE.

POLE SCHEDULE

STANDARD TYPE	HT.	SIG.	ARMS LUM	LUM H.P.S.V.	PUSH BT. TYPE	PUSH BT. Ø	PUSH BT. QUID.	SIGNAL MOUNTING VEHICLE	SIGNAL MOUNTING PED.	REMARKS	LOCATION A	LOCATION B
1-S-129	35'	55	15	250 W*	B	6	W	2-MAS, SV-1-T	SP-1-T	(EXISTING)	—	—
1-A	10'	—	—	—	B	2	N	TV-1-T	SP-1-T	(EXISTING)	—	—
15	30'	—	15	250 W	B	2	S	TV-1-T	SP-1-T	RELOCATED	22'	4'
1-S-129	35'	35	15	250 W*	—	—	—	MAT, 2-MAS, SV-2-TB	—	EXISTING	—	—
3-129	17'	40	—	—	B	6	W	MAS-48, SV-1-T	SP-1-T	EXISTING	—	—

DE EXIST. ST. LT.

CONDUCTOR TABLE

SIZE OR TYPE	PHASE	POLE OR CIRCUIT	EXIST. 3" 1	EXIST. 3" 2	EXIST. 3" 3	EXIST. 3" 4	3" 5	3" 6	EXIST. 3" 7		
		POLE A				1			1/1	—	—
		POLE B				1	1	1	1/1	—	—
		POLE C				1	1	1	1/1	—	—
		POLE D	2/2	2/2	2/2	2/2			2/2	—	—
		POLE E		1/1	1/1	1/1			1/1	—	—
			—	—	—	—	—	—	—	—	—
			—	—	—	—	—	—	—	—	—
			—	—	—	—	—	—	—	—	—
CABLES: 3 C. / 12 C.			2/2	1/3	1/3	2/4	1/1	1/1	4/6	—	—
10		ILL. S.N.S.	—	—	—	—	—	—	—	—	—
8		LIGHTING	2	2	2	2	—	2	—	—	—
		SIGNAL SERVICE	—	—	—	—	—	—	—	—	—
NO. 22 (SIC) CONNECT CABLE			—	—	—	1	1	1	2	—	—
	Ø1	LOOP DETECTOR	—	—	2	2	—	—	2	—	—
	Ø2	LOOP DETECTOR	—	—	—	—	6	6	6	—	—
			—	—	—	—	—	—	—	—	—
			—	—	—	—	—	—	—	—	—
			—	—	—	—	—	—	—	—	—
	3a	LOOP DETECTOR	—	6	6	6	—	—	8	—	—
			—	—	—	—	—	—	—	—	—
	3b	LOOP DETECTOR	—	—	—	—	—	—	3	—	—
NCY VEHICLE DETECTOR (EV-DLC)			—	1	1	3	—	—	3	—	—

PHASE DIAGRAM

GROUP A		GROUP B	
	2P	UNUSED	UNUSED
Ø1	Ø2	Ø3	Ø4
UNUSED		UNUSED	2P
Ø5	Ø6	Ø7	Ø8

PREVIOUS PHASE DIAGRAM

GROUP A		GROUP B	
		UNUSED	UNUSED
Ø1	Ø2	Ø3	Ø4
UNUSED		UNUSED	
Ø5	Ø6	Ø7	Ø8

*PER DWG. NO. 28063-91-D

NOTE

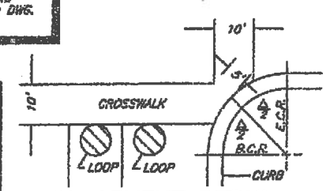
FOR EXIST. SIGNAL PLANS ON OTAY MESA ROAD AND OTAY MESA CENTER ROAD SEE CITY OF SAN DIEGO DWG. NO. 28063-91-D.

DETECTOR ASSIGNMENT SCHEDULE

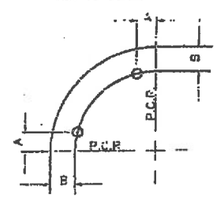
NO.	PHASE	SLOT	FIELD TERMINAL
01	2	I2U	T2-5 AND 8
02	2	I2L	T2-7 AND 8
03	2	I3U	T2-9 AND 10
04	2	I3L	T2-11 AND 12
05	6	J2U	T3-5 AND 6
06	6	J2L	T3-7 AND 8
07	6	J3U	T3-9 AND 10
08	6	J3L	T3-11 AND 12
09	1	I14	T2-1 AND 2
10	8	J6U	T5-9 AND 10
11	8	J6L	T5-11 AND 12
12	8	J7U	T7-1 AND 2
13	8	J7L	T7-3 AND 4
PPB	2	I12U	T8-4 AND COM 6
PPB	8	I13L	T8-8 AND COM 9
EVP A	2	J12U	T9-4 AND COM 6
EVP C	6	J12L	T9-5 AND COM 6
EVP D	8	J13L	T9-8 AND COM 9

GRAPHIC SCALE

20 0 20 40 60



PLACEMENT DETAIL
NOT TO SCALE



STANDARD PLACEMENT DETAIL
NOT TO SCALE

DETAIL - R-75 SIGN
NOT TO SCALE

SIGNAL NO. P 9.710
P.R.D.
PRIVATE CONTRACT

TRAFFIC SIGNAL PLANS FOR:

TRANSBORDER PLAZA

OTAY MESA ROAD AND OTAY MESA CENTER ROAD

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 10 OF 13 SHEETS

T.M. 98-0831
W.O. NO. 420248

FOR CITY ENGINEER — DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	S.B.&O.			

1784-6339
NAD 83 COORDINATES

144-1779
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

31807-10-D

PLANNING DESIGN CONSULTATION

SB&O

Land Planning
Civil Engineering
Land Surveying

SB&O, Inc.
3815 Kearny Villa Road, Suite 201
San Diego, California 92123 (858)560-1141

PETER R. SAFINO R.C.E. 44171 DATE 10-8-07

REGISTERED PROFESSIONAL ENGINEER — PETER R. SAFINO — No. 44171 — Exp. 6/30/08 — CIVIL — STATE OF CALIFORNIA

#23

OCT 1 0 2007

#24

200 SA 1.e

PHASE TIMING

INTERVAL		1	2	3	4	5	6	7	8
			OTAY MESA		LA MEDIA		OTAY MESA		LA MEDIA
WALK	0		7				7		7
FLASH D/W	1		18				19		29
MIN GREEN	2	4	10	4	7	4	10	4	4
TYPE 3 DET	3								
ADD PER VEH	4								
VEH EXTN *	5	2.0	5.0	2.0	5.3	2.0	4.9	2.0	3.2
MAX GAP *	6	2.0	5.0	2.0	5.3	2.0	4.9	2.0	3.2
MIN GAP *	7	2.0	0.2	2.0	0.2	2.0	0.2	2.0	0.2
MAX EXTN	8	30	60	30	40	30	60	30	40
MAX 2	9								
BUS LEAD	A								
CALL TO PHS	B								
REDUCE BY	C		0.1		0.1		0.1		0.1
EVERY	D		0.6		0.6		0.6		1.0
YELLOW	E	3.0	4.7	3.0	3.3	3.0	4.7	3.0	4.2
RED CLEAR	F	1.0	2.0	1.0	1.0	1.0	2.0	1.0	1.0

F + PHASE + LOCATION

* Must be the same for non-density operation

PREEMPT

	E	
RR 1 DELAY		0
RR 1 CLEAR		1
EVA DELAY	0	2
EVA CLEAR	0	3
EVB DELAY	0	4
EVB CLEAR	0	5
EVC DELAY	0	6
EVC CLEAR	0	7
EVD DELAY	0	8
EVD CLEAR	0	9
RR2 DELAY		A
RR 2 CLEAR		B
EV CLR TMR		C
EV DLY TMR		D
RR CLR TMR		E
RR DLY TMR		F

MAX INITIAL (F-0-E) 0 RED REVERT (F-0-F) 5.0 ALL-RED START (F-C-0) 0.0

PHASE FUNCTION FLAGS

		PHASE 1	2	3	4	5	6	7	8
PERMIT	0	X	X	X	X	X	X	X	X
RED LOCK	1								
YELLOW LOCK	2								
VEHICLE RECALL	3								
PED RECALL	4								
PEDS (VIEW)	5								
REST IN WALK	6								
RED REST	7								
DOUBLE ENTRY	8								
MAX RECALL	9								
SOFT RECALL	A		X			X			
MAX 2	B								
COND SERVICE	C								
	D								
START-UP	E		X			X			
FIRST PHASES	F			X			X		

F + F + FUNCTION

OVERLAP TIMING

	LOAD SWITCH	GREEN 9	YELLOW C	RED D
OLAP A				
OLAP B				
OLAP C				
OLAP D				

D + 0 + OVERLAP

F + COLOR +

PHASE SEQUENCE

	PHASE 1	2	3	4	5	6	7	8
LAG 0 (FREE)		X		X		X		X

C + F + 0

MANUAL (C-A-1) 0

ADDRESS (C-0-0) 7

TURN-ON DATE: 01-26-2000

TIME: 10:30

DRAWING NO. D- 284063-92

LAST CHANGE:

BY: REJ

LOCATION La Media Rd & Otay Mesa Rd

#24

DETECTOR TIMES

Y \ X	1 SET DELAY	2	3 SET CARRY	4	5 OBS COUNT	6	7 OBS DELAY	8	9 OBS CARRY	A
0	1/1	5/1	1/1	5/1	1/1	5/1	1/1	5/1	1/1	5/1
1	2/2U	6/2U	2/2U 1.8	6/2U 1.8	2/2U	6/2U	2/2U	6/2U	2/2U	6/2U
2	2/2L	6/2L	2/2L	6/2L	2/2L	6/2L	2/2L	6/2L	2/2L	6/2L
3	2/3U	6/3U	2/3U	6/3U	2/3U	6/3U	2/3U	6/3U	2/3U	6/3U
4	2/3L	6/3L	2/3L	6/3L	2/3L	6/3L	2/3L	6/3L	2/3L	6/3L
5	2/4	6/4	2/4	6/4	2/4	6/4	2/4	6/4	2/4	6/4
6	3/5	7/5	3/5	7/5	3/5	7/5	3/5	7/5	3/5	7/5
7	4/6U	8/6U	4/6U 1.8	8/6U 1.8	4/6U	8/6U	4/6U	8/6U	4/6U	8/6U
8	4/6L	8/6L	4/6L	8/6L	4/6L	8/6L	4/6L	8/6L	4/6L	8/6L
9	4/7U	8/7U	4/7U	8/7U	4/7U	8/7U	4/7U	8/7U	4/7U	8/7U
A	4/7L	8/7L	4/7L	8/7L	4/7L	8/7L	4/7L	8/7L	4/7L	8/7L
B	4/8	8/8	4/8	8/8	4/8	8/8	4/8	8/8	4/8	8/8
C	1/9U	5/9U	1/9U	5/9U	1/9U	5/9U	1/9U	5/9U	1/9U	5/9U
D	3/9L	7/9L	3/9L	7/9L	3/9L	7/9L	3/9L	7/9L	3/9L	7/9L

D + X (ACROSS) + Y (DOWN)

TO ACCESS CONFIGURATION DATA, SET F-8-E = 1

TIME OF DAY FEATURES

EVENT	TIME	FUNC	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0									
1									
2									
3									
4									
5									
6									
7									
8									
9									

7 + EVENT #

PHASE OR FUNCTION

1	2	3	4	5	6	7	8

D + F + EVENT

TIME OF DAY FUNCTION CODES

- 0-PERMIT
- 1-RED LOCK
- 2-YELLOW LOCK
- 3-VEH RECALL
- 4-PED RECALL
- 5-(RESERVED)
- 6-REST IN WALK
- 7-RED REST
- 8-DBL ENTRY
- 9-VEH MAX RCL
- A-SOFT RCL
- B-MAX 2 EXT
- C-COND SERV
- D-TOD LAG PHS

- E-1-LOCAL OVERRIDE
- 2-PHASE BANK 2
- 3-PHASE BANK 3
- 7-DET COUNT
- 8-SPLIT MONITOR

- F - TOD OUTPUTS
- 1- TOD OUTPUT 1
- 2- TOD OUTPUT 2
- 3- TOD OUTPUT 3
- 4- TOD OUTPUT 4

TIME AND DATE

8 - 0 HOUR, MINUTE, DAY-OF-WEEK
8 - 1 DAY-OF-MONTH, YEAR, MONTH
8 - F SECONDS

CONFIGURATION DATA

		PHASE 1	2	3	4	5	6	7	8
EXCLUSIVE	0								
RR1 GN CLR	1								
RR2 GRN CLR	2								
RR2 LTD SRV	3								
PRO/PERM	4								
OLA GN OMIT	5								
OLB GN OMIT	6								
OLC GN OMIT	7								
OLD GN OMIT	8								
OV FL YELLOW	9								
EMVEH A	A		X			X			
EMVEH B	B				X			X	
EMVEH C	C	X					X		
EMVEH D	D			X					X
EXTRA	E	X		X	X				
IC SELECT	F		X						

E + E + INTERVAL

EXTRA (E+E+E)
- 1-TBC TYPE 1
- 2-NEMA COORD
- 3-DAYLIGHT
- 4-EV ADVANCE
- 5-REMOTE EVP
- 6-SPECIAL EVENT
- 7-PRETIMED
- 8-SPLIT RING

ICSELECT (E+E+F)
- 1-SIMPLEX IN
- 2-2 WAY MODEM
- 3-7 WIRE IN
- 4-FLH/FREE
- 5-SIMPLEX OUT
- 6-7 WIRE OUT

ASSIGN5 (E+F+F)
- 1-RT OVERLAP
- 2-TOD OUTPUTS
- 3-STEADY EV BEACON
- 4-FLASH EV BEACON

CONFIGURATION DATA

		PHASE 1	2	3	4	5	6	7	8
	0								
RR OLAP A	1								
RR OLAP B	2								
RR OLAP C	3								
RR OLAP D	4								
PED 2P	5		X						
PED 6P	6						X		
PED 4P	7								
PED 8P	8								X
FLH YELLOW	9								
OVERLAP A	A								
OVERLAP B	B								
OVERLAP C	C								
OVERLAP D	D								
RESTRICT	E								
ASSIGN5	F								

E + F + INTERVAL

LOCATION	La Media Rd	&	Otay Mesa Rd

#24

COORDINATION PARAMETERS

200 SA 1.e

PLAN

FEATURE		1	2	3	4	5	6	7	8	9
CYCLE	0	140	140	120						
FORCE 1	1	88	88	75						
FORCE 2	2	–	–	–						
FORCE 3	3	27	27	23						
FORCE 4	4	60	60	51						
FORCE 5	5	88	88	75						
FORCE 6	6	–	–	–						
FORCE 7	7	27	27	23						
FORCE 8	8	60	60	51						
RING OFFSET	9									
OFFSET A	A	0	0	0						
OFFSET B	B									
OFFSET C	C									
PERMISSIVE	D	14	14	12						
HOLD RELEASE	E	255	255	255						
ZONE OFFSET	F									

C + PLAN + FEATURE

TRANSITION TYPE
C - D - D = 0

SHORTWAY = 0
DWELL > 0

PEDESTRIAN FORCEOFF SHIFT
C - D - F = 10

FOR OBSERVATION ONLY

MASTER PLAN	C - A - 2
CURRENT PLAN	C - A - 3
T.O.D. PLAN	C - A - 5
MASTER CYCLE	C - A - 0
RING A CYCLE	C - B - 0
RING B CYCLE	C - D - 0
MINIMUM CYCLE	C - A - E
MAXIMUM CYCLE	C - B - E

PLAN TIMETABLE

EVENT	TIME	PLAN	OFFSET	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0	0600	1	A		X	X	X	X	X	
1	1400	2	A		X	X	X	X	X	
2	2000	E	A		X	X	X	X	X	
3	0900	3	A	X						X
4	1800	E	A	X						X
5										
6										
7										
8										
9										
A										
B										
C										
D										
E										
F										

DAY OF WEEK

9 + EVENT

SYNC PHASES

		PHASE 1	2	3	4	5	6	7	8
	0								
SYNC 1	1		X				X		
SYNC 2	2		X				X		
SYNC 3	3		X				X		
SYNC 4	4								
SYNC 5	5								
SYNC 6	6								
SYNC 7	7								
SYNC 8	8								
SYNC 9	9								
CPEDRCL	A								
NEMA HLD	B								
SCANMEM	C								
BADPROM	D								
TODFN E	E								
TODFN F	F								

C + E + FUNCTION

PHASE SEQUENCES

		PHASE 1	2	3	4	5	6	7	8
	0								
LAG 1	1	X		X			X		X
LAG 2	2	X		X			X		X
LAG 3	3	X		X			X		X
LAG 4	4								
LAG 5	5								
LAG 6	6								
LAG 7	7								
LAG 8	8								
LAG 9	9								
COOR MAX RCL	A								
COOR LAG RCL	B								
SYNC PHASES	C								
HOLD	D								
NEXT PHASE	E								
FORCE OFF	F								

C + F + FUNCTION

Date: 01/05/2000 DRH

LOCATION La Media Rd & Otay Mesa Rd

INTERSECTION: CUSTOMHOUSE PZ/HARVEST RD @ SIEMPRE VIVA RD

Group Assignment:
Field Master Assignment:

N/S Street Name: CUSTOMHOUSE/HA
E/W Street Name: SIEMPRE VIVA

223 Program

#29

Row	Column # ---> / Phase # --->	1	2	3	4	5	6	7	8
		SIEMPRE VIVA			HARVEST		SIEMPRE VIVA		CUSTOMHOUSE
	Phase	1	2	3	4	5	6	7	8
0	Ped Walk		7		7		7		7
1	Ped FDW		16		26		13		24
2	Min Green	4	10		4	4	10		4
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	6.1		2.0	2.0	5.1		2.0
6	Max Gap	2.0	6.1		2.0	2.0	5.1		2.0
7	Min Gap	2.0	0.2		2.0	2.0	0.2		2.0
8	Max Limit	30	60		40	30	60		40
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1				0.1		
D	Every		0.5				0.6		
E	Yellow	3.4	3.9		3.9	3.4	3.9		3.9
F	Red Clear	1.0	1.0		1.0	1.0	1.0		1.0

Phase Timing - Bank 1
F + Phase + Row

<F Page>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

F + E + Row

Row		F
0	Permit	12_456_8
1	Red Lock	
2	Yellow Lock	
3	Min Recall	
4	Ped Recall	
5	Peds (View)	_2_4_6_8
6	Rest in Walk	
7	Red Rest	
8	Dbl Entry	___4___8
9	Max Recall	
A	Soft Recall	_2___6__
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	_2___6__
F	1st Phases	___4___8

F + F + Row

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number		C + 0 + 0
Zone Number		C + 0 + 1
Area Number		C + 0 + 2
Area Address		C + 0 + 3
QuicNet Channel		(QuicNet)

Communication Addresses

C + F + O	F	Row
Free Lag	_2_4_6_8	0

Lag Phases <C Page>

Overlap Timing

	Row	9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page>
F + COLOR +

<D Page>
D + 0 + OVERLAP

Manual Plan	14	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Downtime Flash	255	(minutes)

Downtime Before Auto Manual Flash
F + 0 + 8

Disable Ports	_234____

Disable Communication Ports
D + D + 9

Timing Sheet By: M28
Approved By: FLG
Drawing Number: 28313-D
Timing Implemented On:

Printed on 10/24/2013 1:19 PM

City of San Diego

INTERSECTION: CUSTOMHOUSE PZ/HARVEST RD @ SIEMPRE VIVA RD 223 Program

#29

Row	1 Delay	3 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
	2I2U	1
	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	16
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Row	2 Delay	4 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7	5.0	
8		
9	10.0	
A		
B		
C		
D		
E	---	---
F	---	---

Detector Delay & Carryover <D Page>

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 – – – –	1234
C	13 14 15 16 17 18 19 20	12345678
D	– – – – 21 22 23 24	5678
E	– – – – – – – –	1234
F	– 25 26 27 28 – – –	2345

Active Detectors <D Page>

Row		0 Detector #
0		
1	System Det. # 1	
2	System Det. # 2	
3	System Det. # 3	
4	System Det. # 4	
5	System Det. # 5	
6	System Det. # 6	
7	System Det. # 7	
8	System Det. # 8	

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number		F+C+1
Time Before Yellow		F+C+3

Advance Warning Beacon - Sign 1

Phase Number		F+D+1
Time Before Yellow		F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

Row	Time	Function	Day of Week	Column F Phases/Bits
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function

7 + ROW

<D Page>

D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest in Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	6
7	Ped 4P	4
8	Ped 8P	8
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration

E + F + ROW

<E Page>

Day of Week
1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 = Bus Advance

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4
C	EV-C Phases	1 6
D	EV-D Phases	8
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

For access, set F + 9 + E = 1

Configuration

E + E + ROW

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Time and Date
8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications
(If set to a non-zero value, parity will be disabled)

Program Information
C + C + 0 = program
C + C + F = version

Remote Download
C + 0 + 4 = 1-255
w/ E + E + E bit 5 on

INTERSECTION: OTAY CENTER DRIVE @ SIEMPRE VIVA ROAD

223 Program

#30

Group Assignment:
Field Master Assignment:

N/S Street Name: OTAY CENTER
E/W Street Name: SIEMPRE VIVA

Row	Phase # --->	1	2	3	4	5	6	7	8
	Column # --->	SIEMPRE VIVA		OTAY CENTER		SIEMPRE VIVA		OTAY CENTER	
		Phase							
0	Ped Walk		7		7		7		7
1	Ped FDW		19		33		19		32
2	Min Green	4	10		10	4	10		10
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	8.2		4.4	2.0	6.7		4.4
6	Max Gap	2.0	8.2		4.4	2.0	6.7		4.4
7	Min Gap	2.0	0.2		0.2	2.0	0.2		0.2
8	Max Limit	30	60		40	30	60		40
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1		0.1		0.1		0.1
D	Every		0.4		0.7		0.5		0.7
E	Yellow	3.4	3.9		3.9	3.4	4.5		3.9
F	Red Clear	1.0	1.0		1.0	1.0	1.0		1.0

Phase Timing - Bank 1
F + Phase + Row

<F Page>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

F + E + Row

	F	Row
Permit	12_456_8	0
Red Lock		1
Yellow Lock		2
Min Recall		3
Ped Recall		4
Peds (View)	_2_4_6_8	5
Rest In Walk		6
Red Rest		7
Dbl Entry	___4___8	8
Max Recall		9
Soft Recall	_2___6__	A
Max 2		B
Cond Serv		C
Ped Lock	12345678	D
Yellow Start	_2___6__	E
1st Phases	___4___8	F

F + F + Row

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number		C + 0 + 0
Zone Number		C + 0 + 1
Area Number		C + 0 + 2
Area Address		C + 0 + 3
QuicNet Channel		(QuicNet)

Communication Addresses

C + F + O	F	Row
Free Lag	2 4 6 8	0

Lag Phases <C Page>

Overlap Timing

	Row	9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page> <D Page>
F + COLOR + D + 0 + OVERLAP

Manual Plan	14	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Downtime Flash	255	(minutes)

Downtime Before Auto Manual Flash
F + 0 + 8

Disable Ports	_234____

Disable Communication Ports
D + D + 9

Timing Sheet By: M28
Approved By: FLG
Drawing Number: 23777-18-D
Timing Implemented On: 09/07/10

Row	Time	Function	Day of Week	Column F Phases/Bits
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function

7 + ROW

<D Page>

D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest in Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	6
7	Ped 4P	4
8	Ped 8P	8
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration

<E Page>

E + F + ROW

Day of Week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4
C	EV-C Phases	1 6
D	EV-D Phases	8
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Configuration

For access, set F + 9 + E = 1

E + E + ROW

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Preimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 = Bus Advance

Time and Date

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications
(If set to a non-zero value, parity will be disabled)

Program Information

C + C + 0 = program
C + C + F = version

Remote Download

C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

#30

Row	1 Delay	3 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		1.8
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
	2I2U	1
	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	16
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Row	2 Delay	4 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		1.8
8	5.0	
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 – – – –	1234____
C	13 14 15 16 17 18 19 20	12345678
D	– – – – 21 22 23 24	____5678
E	– – – – – – – –	1234____
F	– 25 26 27 28 – – –	_2345___

Active Detectors <D Page>

Row		0 Detector #
0		
1	System Det. # 1	
2	System Det. # 2	
3	System Det. # 3	
4	System Det. # 4	
5	System Det. # 5	
6	System Det. # 6	
7	System Det. # 7	
8	System Det. # 8	

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number		F+C+1
Time Before Yellow		F+C+3

Advance Warning Beacon - Sign 1

Phase Number		F+D+1
Time Before Yellow		F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

LOCATION: RTE 905 @ SB SIEMPRE VIVA ROAD
CALTRANS C8 Version 3
F PAGE

DATE: 03/09/15

 #31

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9
0	WALK	1	7	1	1	1	1	1	1	CLK RST
1	DONT WALK	1	28	1	1	1	1	1	1	
2	MIN GREEN	5	5	1	1	1	1	1	1	
3	TYPE 3 DET	0	0	0	0	0	0	0	0	
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	PASSAGE	2.0	3.9	0.9	0.9	0.9	0.9	0.9	0.9	
6	MAX GAP	2.0	5.9	0.9	0.9	0.9	0.9	0.9	0.9	
7	MIN GAP	2.0	3.0	0.9	0.9	0.9	0.9	0.9	0.9	
8	MAX EXT	25	35	9	9	9	9	9	9	
9	MAX 2									YR
A	MAX 3									MO
B										DAY
C	REDUCE BY	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	DOW
D	EVERY	1.0	0.9	1.0	1.0	1.0	1.0	1.0	1.0	HR
E	YELLOW	4.1	4.1	3.0	3.0	3.0	3.0	3.0	3.0	MIN
F	RED	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	SEC
	PED XING FT		98'							
			99'							

NOTES: 35 Mph

PRE-EMPTION E	
EV SEL	0
RR1 CLR	5
EVA DLY	0
EVA CLR	5
EVB DLY	0
EVB CLR	5
EVC DLY	0
EVC CLR	5
EVD DLY	0
EVD CLR	5
MAX EV	255
RR2 CLR	5

F FLAGS	1	2	3	4	5	6	7	8	
PERMIT	1	2				6			0
RED LOCK									1
YEL LOCK									2
V RECALL		2				6			3
P RECALL									4
PED PHASES		2							5
RT OLA									6
RT OLB									7
DBL ENTRY									8
MAX 2 PHASES									9
LAG PHASES	READ ONLY								A
RED REST									B
REST-IN-WALK									C
MAX 3 PHASES									D
YEL START UP		2				6			E
FIRST PHASE	1								F
	1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	0
FOF	5

FC0	3
FC1	3
FC2	10
FCA	3.0
FCB	0.0
FCC	0.0
FCD	0.0

FD0 TB SELECT	1
FD3 PED SELECT	1
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

C05 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

Cycle Length In "Free"	80 seconds							
Phases	1	2	3	4	5	6	7	8
Phase Total Green Time	30	40	10	10	10	10	10	10
Phase Yellow/Red	5.1	5.1	3.0	3.0	3.0	3.0	3.0	3.0
Total Phase Time	35.1	45.1	13.0	13.0	13.0	13.0	13.0	13.0
% of cycle	44%	56%	16%	16%	16%	16%	16%	16%

LOCATION: RTE 905 @ SB SIEMPRE VIVA ROAD

CALTRANS C8 Version 3 DATE: 02/12/09

C PAGE

		CONTROL PLANS									Y-COORD			LAG PHASE	FLAGS									
		1	2	3	4	5	6	7	8	9		C	D	E	F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH														LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR													GAPOUT CP1	LAG FZ CP 1									1
2														GAPOUT CP2	LAG FZ CP 2									2
3	FZ3 GRN FCTR													GAPOUT CP3	LAG FZ CP 3									3
4	FZ4 GRN FCTR										PERM TIME			GAPOUT CP4	LAG FZ CP 4									4
5	FZ5 GRN FCTR										LAG OFFSET			GAPOUT CP5	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	LAG FZ CP 6									6
7	FZ7 GRN FCTR										LONG GRN			GAPOUT CP7	LAG FZ CP 7									7
8	FZ8 GRN FCTR										NO GREEN			GAPOUT CP8	LAG FZ CP 8									8
9	MULTI CYCLE													GAPOUT CP9	LAG FZ CP 9									9
A	OFFSET A										OFFSET				LAG C COORD									A
B	OFFSET B														LAG D COORD									B
C	OFFSET C														COORD FAZES		2				6			C
D	FZ 3 EXT																							D
E	FZ 7 EXT																							E
F	OFFSET INTRPT																							F
																1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

SYSTEM MASTER:
NB SEMPRE VIVA

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1		
2		X
3		
4		
5		
6		
7		
8		

COO = 2

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: RTE 905 @ SB SIEMPRE VIVA ROAD

CALTRANS C8 Version 3

D PAGE

DATE: 02/12/09

 #31

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1									CP 1								
2	CP 2									CP 2									CP 2								
3	CP 3									CP 3									CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 END		2							5
6										5 END						6			6
7										4 END				4					7
8										8 END								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E

MINUTE = D-B-E

DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES

(CALL ACTIVE LIGHTS)

RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES

(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F

MINUTE = D-B-F

DAY = D-C-F

D-E-E = C8 VERSION NUMBER

D-E-F = LITHIUM BATTERY CONDITION

84 = BAD

85 = GOOD

LOCATION: RTE 905 @ SB SIEMPRE VIVA ROAD

CALTRANS C8 Version 3 DATE: 02/12/09

7 PAGE

TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
	HR	MIN	ACT	ON/ OFF	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

9 PAGE CO9 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

#31

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	905,805	VARIOUS	123	180

Enrique P Bernal 3/28/03
REGISTERED ELECTRICAL ENGINEER — DATE

REGISTERED PROFESSIONAL ENGINEER E.P. BERNAL No. 15675 Exp. 6-30-06 ELECTRICAL STATE OF CALIFORNIA

PLANS APPROVAL DATE

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Caltrans Metric

NOTES

1 - SIGNAL AND LIGHTING(LOCATION 1) IS PART OF THE PROJECT PLANS PHASE IV.

2 - IS DETAIL "U", ES-7T REQUIRED.

3 - TERMINATE EVC IN RED SECTION OF MAS. LEAVE 0.3 m OF SLACK.

4 - EXTEND END OF TERMINATION CONDUIT.

5 - VEH SIGNAL FACE(ONE-SECTION) WITH UP GREEN ARROW.

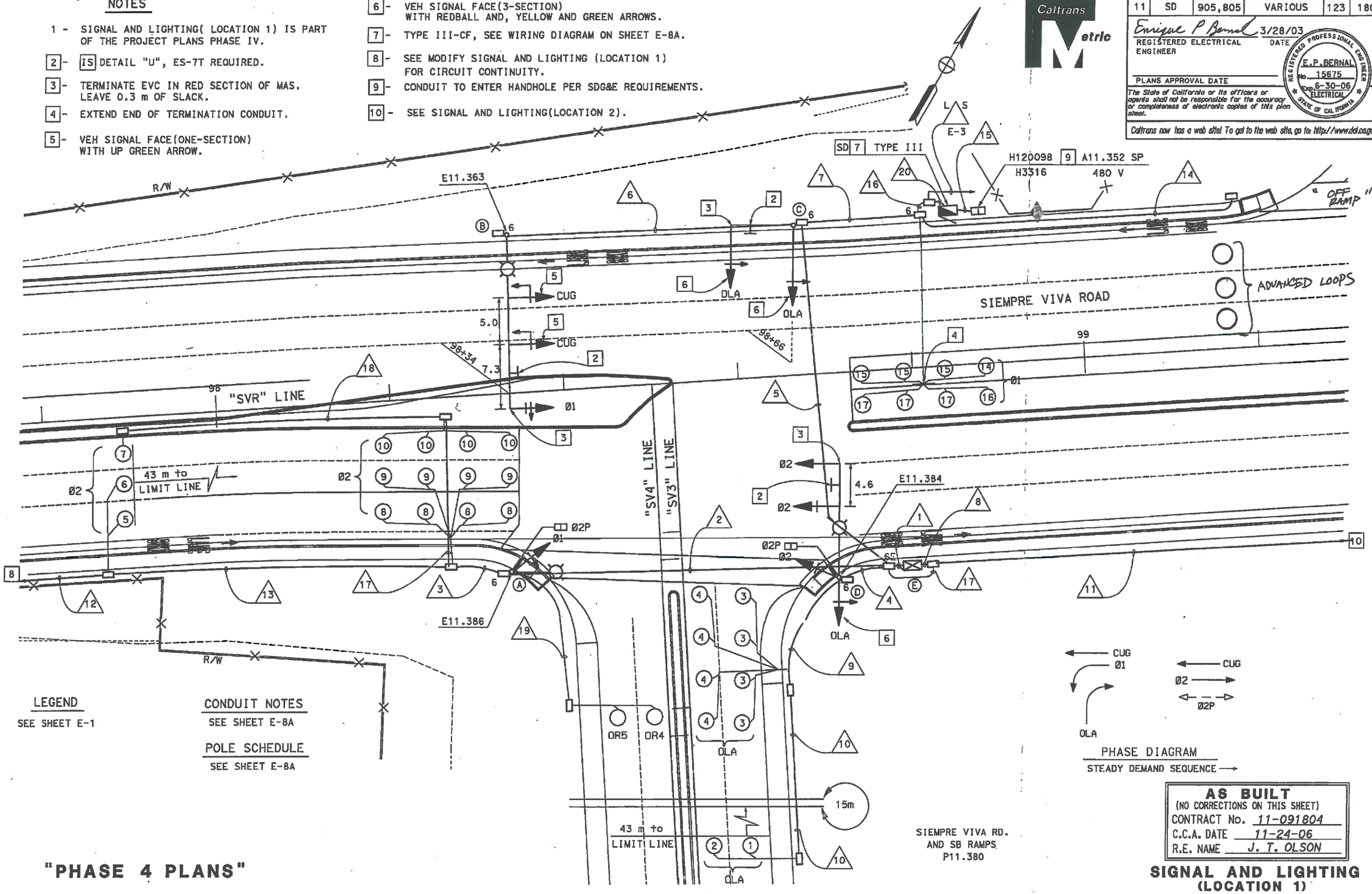
6 - VEH SIGNAL FACE(3-SECTION) WITH REDBALL AND, YELLOW AND GREEN ARROWS.

7 - TYPE III-CF, SEE WIRING DIAGRAM ON SHEET E-8A.

8 - SEE MODIFY SIGNAL AND LIGHTING (LOCATION 1) FOR CIRCUIT CONTINUITY.

9 - CONDUIT TO ENTER HANDHOLE PER SDG&E REQUIREMENTS.

10 - SEE SIGNAL AND LIGHTING(LOCATION 2).



LEGEND
SEE SHEET E-1

CONDUIT NOTES
SEE SHEET E-8A

POLE SCHEDULE
SEE SHEET E-8A

PHASE DIAGRAM
STEADY DEMAND SEQUENCE →

AS BUILT
(NO CORRECTIONS ON THIS SHEET)
CONTRACT No. 11-091804
C.C.A. DATE 11-24-06
R.E. NAME J. T. OLSON

"PHASE 4 PLANS"

THIS SHEET ACCURATE FOR ELECTRICAL WORK ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SIGNAL AND LIGHTING (LOCATION 1)

SCALE 1:200

E-8

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans TRAFFIC ELECTRICAL
PROJECT ENGINEER E. P. BERNAL
CALCULATED/DESIGNED BY A.RODRIGUEZ
CHECKED BY
REVISED BY
DATE REVISED
DATE 2/03

USERNAME => s109748

LOCATION: RTE 905 @ NB SIEMPRE VIVA ROAD

CALTRANS C8 Version 3

F PAGE

DATE: 03/04/15

#33

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9
0	WALK	1	7	1	1	1	7	1	1	CLK RST
1	DONT WALK	1	14	1	1	1	14	1	1	
2	MIN GREEN	1	5	1	1	10	5	1	5	
3	TYPE 3 DET	0	0	0	0	0	0	0	0	
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	PASSAGE	0.9	3.9	0.9	0.9	2.0	3.9	0.9	3.0	
6	MAX GAP	0.9	5.9	0.9	0.9	2.0	5.9	0.9	3.0	
7	MIN GAP	0.9	3.0	0.9	0.9	2.0	3.0	0.9	3.0	
8	MAX EXT	9	35	9	9	25	35	9	35	
9	MAX 2									YR
A	MAX 3									MO
B										DAY
C	REDUCE BY	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	DOW
D	EVERY	1.0	0.9	1.0	1.0	1.0	0.9	1.0	1.0	HR
E	YELLOW	3.0	4.1	3.0	3.0	3.7	4.1	3.0	4.1	MIN
F	RED	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	SEC
	PED XING FT		50'				49'			
			71'				68'			

NOTES: 35 MPH

PRE-EMPTION E	
EV SEL	0
RR1 CLR	5
EVA DLY	0
EVA CLR	5
EVB DLY	0
EVB CLR	5
EVC DLY	0
EVC CLR	5
EVD DLY	0
EVD CLR	5
MAX EV	255
RR2 CLR	5

F FLAGS	1	2	3	4	5	6	7	8	
PERMIT		2			5	6		8	0
RED LOCK					5				1
YEL LOCK									2
V RECALL		2				6			3
P RECALL									4
PED PHASES		2				6			5
RT OLA									6
RT OLB									7
DBL ENTRY									8
MAX 2 PHASES									9
LAG PHASES	READ ONLY								A
RED REST									B
REST-IN-WALK									C
MAX 3 PHASES									D
YEL START UP		2				6			E
FIRST PHASE								8	F
	1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	0
FOF	5

FC0	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FD0 TB SELECT	1
FD3 PED SELECT	1
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

Cycle Length in "Free"	130 seconds							
Phases	1	2	3	4	5	6	7	8
Phase Total Green Time	10	40	10	10	35	40	10	40
Phase Yellow/Red	3.0	5.1	3.0	3.0	4.7	5.1	3.0	5.1
Total Phase Time	13.0	45.1	13.0	13.0	39.7	45.1	13.0	45.1
% of cycle	10%	35%	10%	10%	31%	35%	10%	35%

LOCATION: RTE 905 @ NB SIEMPRE VIVA ROAD

CALTRANS C8 Version 3 DATE: 2/12/2009

C PAGE

		CONTROL PLANS									Y-COORD			LAG PHASE	FLAGS								
		1	2	3	4	5	6	7	8	9		C	D	E	F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH														LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR													GAPOUT CP1	LAG FZ CP 1									1
2														GAPOUT CP2	LAG FZ CP 2									2
3	FZ3 GRN FCTR													GAPOUT CP3	LAG FZ CP 3									3
4	FZ4 GRN FCTR										PERM TIME			GAPOUT CP4	LAG FZ CP 4									4
5	FZ5 GRN FCTR										LAG OFFSET			GAPOUT CP5	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	LAG FZ CP 6									6
7	FZ7 GRN FCTR										LONG GRN			GAPOUT CP7	LAG FZ CP 7									7
8	FZ8 GRN FCTR										NO GREEN			GAPOUT CP8	LAG FZ CP 8									8
9	MULTI CYCLE													GAPOUT CP9	LAG FZ CP 9									9
A	OFFSET A										OFFSET				LAG C COORD									A
B	OFFSET B														LAG D COORD									B
C	OFFSET C														COORD FAZES		2				6			C
D	FZ 3 EXT																							D
E	FZ 7 EXT																							E
F	OFFSET INTRPT																							F
																1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

SYSTEM MASTER:
NB SIEMPRE VIVA

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

COO = 1

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: RTE 905 @ NB SIEMPRE VIVA ROAD

CALTRANS C8 Version 3

D PAGE

DATE: 02/12/09

 #33

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1									CP 1								
2	CP 2									CP 2									CP 2								
3	CP 3									CP 3									CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXTENSIVE									4
5										2 PED		2							5
6										6 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E

MINUTE = D-B-E

DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES

(CALL ACTIVE LIGHTS)

RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES

(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F

MINUTE = D-B-F

DAY = D-C-F

D-E-E = C8 VERSION NUMBER

D-E-F = LITHIUM BATTERY CONDITION

84 = BAD

85 = GOOD

LOCATION: RTE 905 @ NB SIEMPRE VIVA ROAD

CALTRANS C8 Version 3 DATE: 02/12/09

7 PAGE

TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
	HR	MIN	ACT	ON/ OFF	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

9 PAGE CO9 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

#33

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	905,805	VARIOUS	124	180

Enrique P Bernal 3/28/03
REGISTERED ELECTRICAL ENGINEER — DATE

REGISTERED PROFESSIONAL ENGINEER E.P.BERNAL No. 15675 EXP. 6-30-06 ELECTRICAL STATE OF CALIFORNIA

PLANS APPROVAL DATE

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Caltrans Metric

NOTES

1 - SIGNAL AND LIGHTING (LOCATION 2) IS PART OF THE PROJECT PLANS PHASE IV.

[2] - [IS] DETAIL "U", ES-6T REQUIRED.

[3] - EXTEND END OF TERMINATION CONDUIT.

[4] - PREFORMED LOOPS SEE BRIDGE ELECTRICAL PLANS.

[5] - TYPE III-BF, SEE WIRING DIAGRAM ON SHEET E-9A.

[6] - CONDUIT TO ENTER PER SDG&E REQUIREMENTS.

[7] - CONDUIT TO ENTER PER SBC REQUIREMENTS.

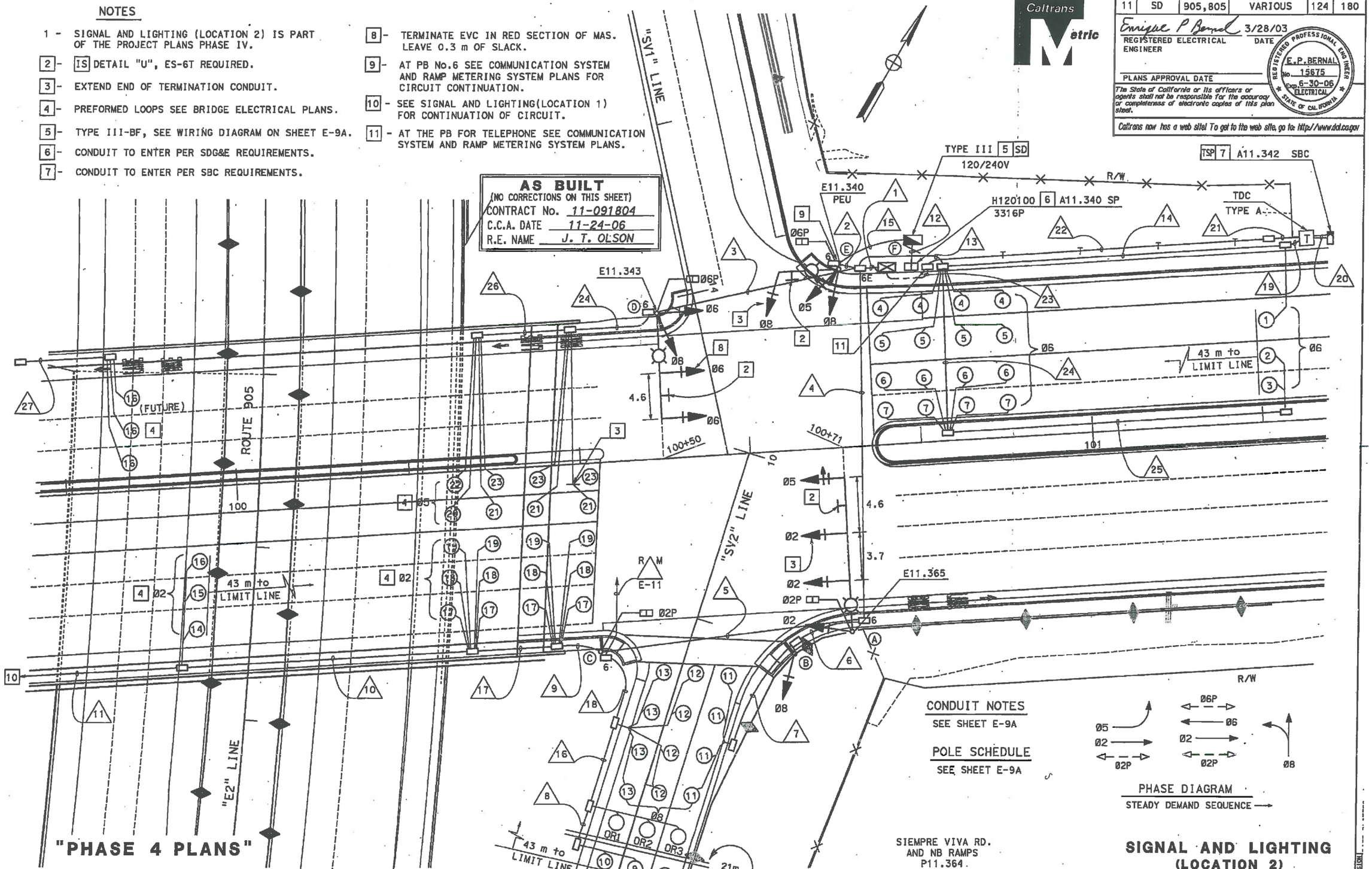
[8] - TERMINATE EVC IN RED SECTION OF MAS. LEAVE 0.3 m OF SLACK.

[9] - AT PB No.6 SEE COMMUNICATION SYSTEM AND RAMP METERING SYSTEM PLANS FOR CIRCUIT CONTINUATION.

[10] - SEE SIGNAL AND LIGHTING(LOCATION 1) FOR CONTINUATION OF CIRCUIT.

[11] - AT THE PB FOR TELEPHONE SEE COMMUNICATION SYSTEM AND RAMP METERING SYSTEM PLANS.

AS BUILT
(NO CORRECTIONS ON THIS SHEET)
CONTRACT No. 11-091804
C.C.A. DATE 11-24-06
R.E. NAME J. T. OLSON



"PHASE 4 PLANS"

THIS SHEET ACCURATE FOR ELECTRICAL WORK ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SIGNAL AND LIGHTING (LOCATION 2)

SCALE 1:200

E-9

REVISED BY	DATE REVISED
A.RODRIGUEZ	DATE 3/03

CALCULATED/DESIGNED BY — CHECKED BY

PROJECT ENGINEER E. P. BERNAL

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans TRAFFIC ELECTRICAL

LAST REVISION

FOR REPLACED PLANS ORIGINAL 0 20 40 60 80 USERNAME =>s109748

Appendix B
SANDAG Select Zone Assignments

Trip Distribution Calculation Memo and Select Zone Analysis Results

CHEN RYAN

MEMORANDUM

TO:	Ann Gonsalves, City of San Diego Jim Lundquist, City of San Diego
FROM:	Phuong Nguyen, PE; Chen Ryan Associates Jonathan Sanchez; Chen Ryan Associates
DATE:	April 13, 2016
RE:	Otay Mesa Central Village Specific Plan – Trip Distribution

The purpose of this memo is to document the steps taken when conducting trip distribution for the proposed Otay Mesa Central Village Specific Plan project (Proposed Project).

Proposed Project (previously submitted in the scoping letter)

The Proposed Project site contains the entire Otay Mesa Central Village Specific Plan Area, located within the City of San Diego Otay Mesa Community Planning Area (CPA). The recently adopted Otay Mesa Community Plan Update (March 2014) assumes the following land uses within Otay Mesa Central Village Specific Plan Area:

- 5,246 multi-family dwelling units (<20 ac/du)
- 32.7 ksf of community commercial
- 32.3 acres of active park space
- 1 elementary school

However, the project is proposing to change the land uses within the Otay Mesa Central Village Specific Plan Area to the following:

- 425 multi-family dwelling units (<20 du/ac)
- 4,060 multi-family dwelling units (>20 du/ac)
- 139.7 ksf of community commercial
- 16.1 acres of active park space
- 1 elementary school

Transportation Modeling (previously submitted in the scoping letter)

The City of San Diego recently completed the Otay Mesa Community Plan Update (CPU) on March 11, 2014. As part of the CPU process, a subarea model was developed by the City of San Diego. Unfortunately, this subarea model is no longer available. Based on our review of the Otay Mesa CPU subarea model, both the SANDAG Series 11 and 12 Regional Models, daily traffic generated by Traffic Analysis Zones (TAZs) within the Otay Mesa Community boundaries are shown below:

- Otay Mesa CPU: 1,045,025 daily trips
- Series 11 Regional 2030: 365,082 daily trips
- Series 12 Regional 2035: 478,223 daily trips
- Series 12 Regional 2050: 577,919 daily trips

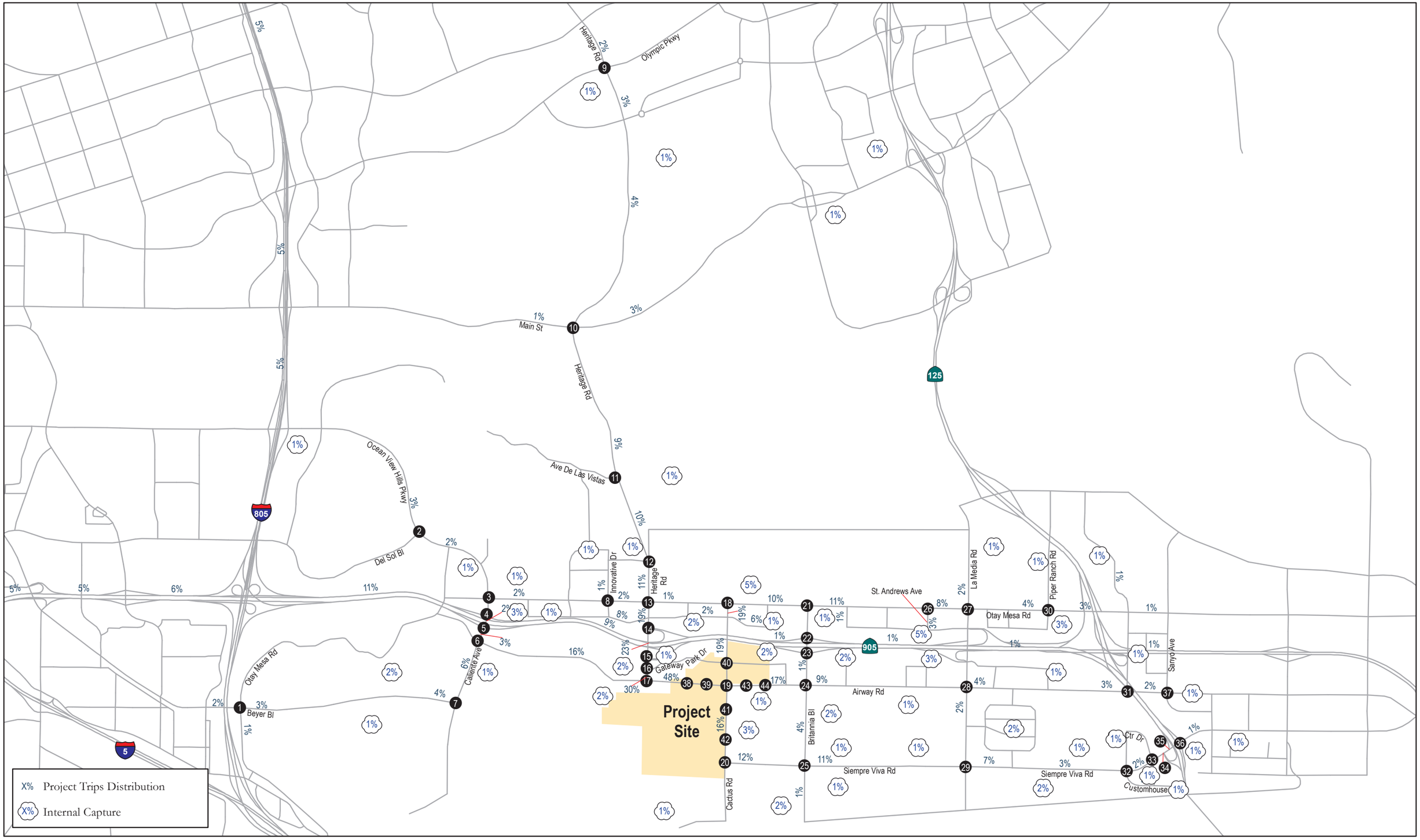
As shown, the buildout of the Otay Mesa CPU land uses is anticipated to generate significantly more traffic than both the Series 11 and Series 12 Regional Models. To ensure the reasonableness of the project trip distribution patterns, we recommended that SANDAG replaced the Series 12 2035 land uses with the Otay Mesa CPU land uses within the community boundaries. This approach was approved by City staff.

Series 12 2035 model is updated with the Otay Mesa CPU land uses, we replaced land uses within the TAZs (4623 and 4683) which the Otay Mesa Central Village Specific Plan occupies with the proposed project land uses. To estimate Horizon Year 2035 traffic volumes and establish the project study area, two (2) select zone assignments were conducted using the SANDAG Series 12 Year 2035 model:

- *Select Zone A* - Assumes the currently Adopted CPU land uses within the project site.
- *Select Zone B* - Assumes the Proposed Project land uses within the project site.

Project trip distribution pattern was developed for the proposed project using both the Adopted CPU land uses and the Proposed Project land uses.

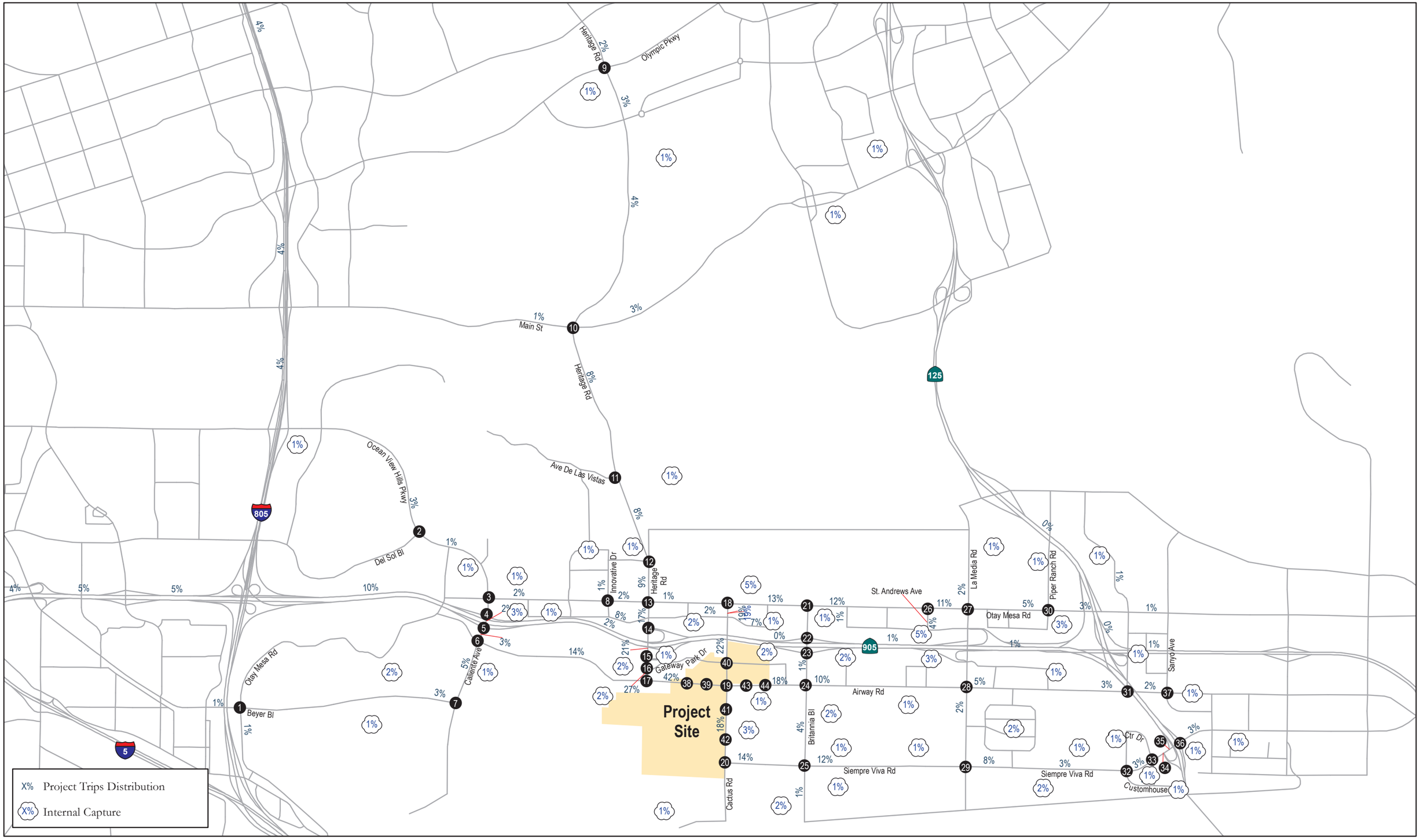
Figure 1 displays the assumed trip distribution pattern for the Adopted CPU land uses, while **Figure 2** displays the assumed trip distribution pattern for the Proposed Project.



Otay Mesa Central Village Specific Plan

Figure 1
Year 2035 Project Trips Distribution - Proposed Project

CHEN RYAN



Otay Mesa Central Village Specific Plan

Figure 2

Year 2035 Project Trips Distribution - Adopted Community Plan

CHEN RYAN

Roadway network within the Otay Mesa CPU was also updated to match the buildout Year 2030 Mobility Element of the CPU. *Select Zone A* was used to establish the *Horizon Year Base (without Project)* volumes, by subtracting the select zone trip assignment volumes from the volumes contained in the Otay Mesa Adopted Community Plan Scenario 3B Without La Media Road ADT (Section 7 of the Otay Mesa CPU TIS). While *Select Zone B* was used to determine the project distribution, assignment and study area utilizing the City of San Diego Traffic Impact Study Guidelines.

Trip Distribution Development (previously submitted in the scoping letter)

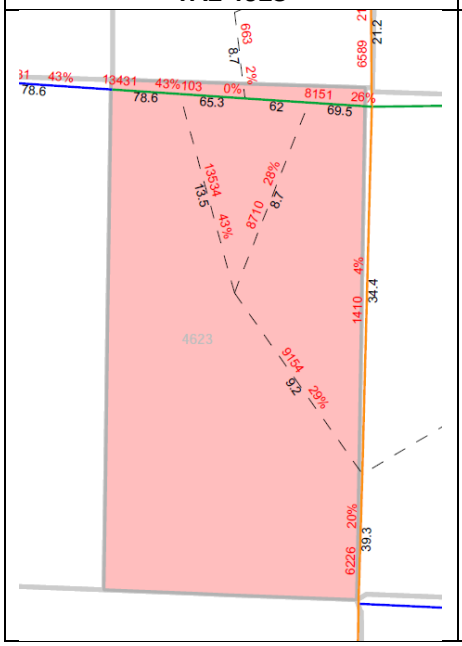
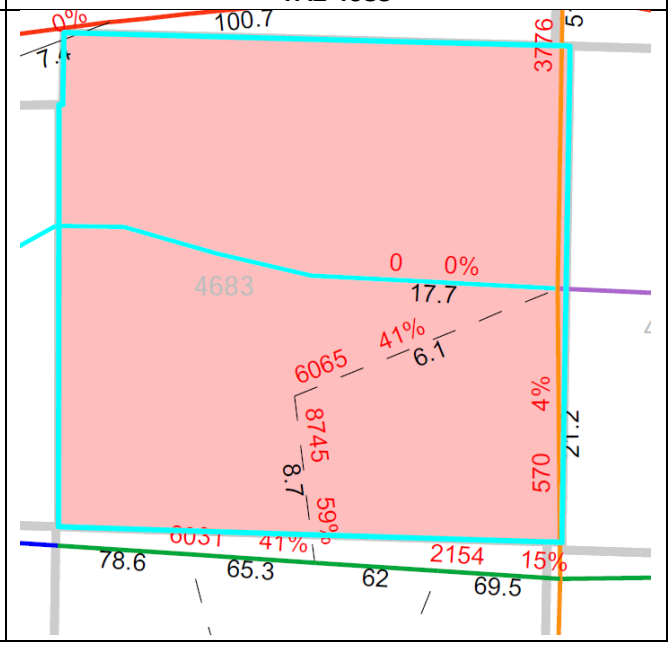
In order to determine the project trip assignment, 2 select zone analysis was conducted, one for the Adopted CPU land use and one for the Proposed Project Land use. Each select zone analysis consist of two individual TAZ (4623 & 4683). TAZ 4623 contain project's land uses south of Airway Road, whereas TAZ 4683 contain project's land uses located north of Airway Road. Select zone analysis results are provided as **Attachment A**.

Project trip distribution was determined by combining the project trip assignment from TAZ 4623 and TAZ 4683 and divided by the total external trips. A breakdown of each calculation steps is provided below:

Step 1: Determine external project trips from the SANDAG Select Zone Analysis results.

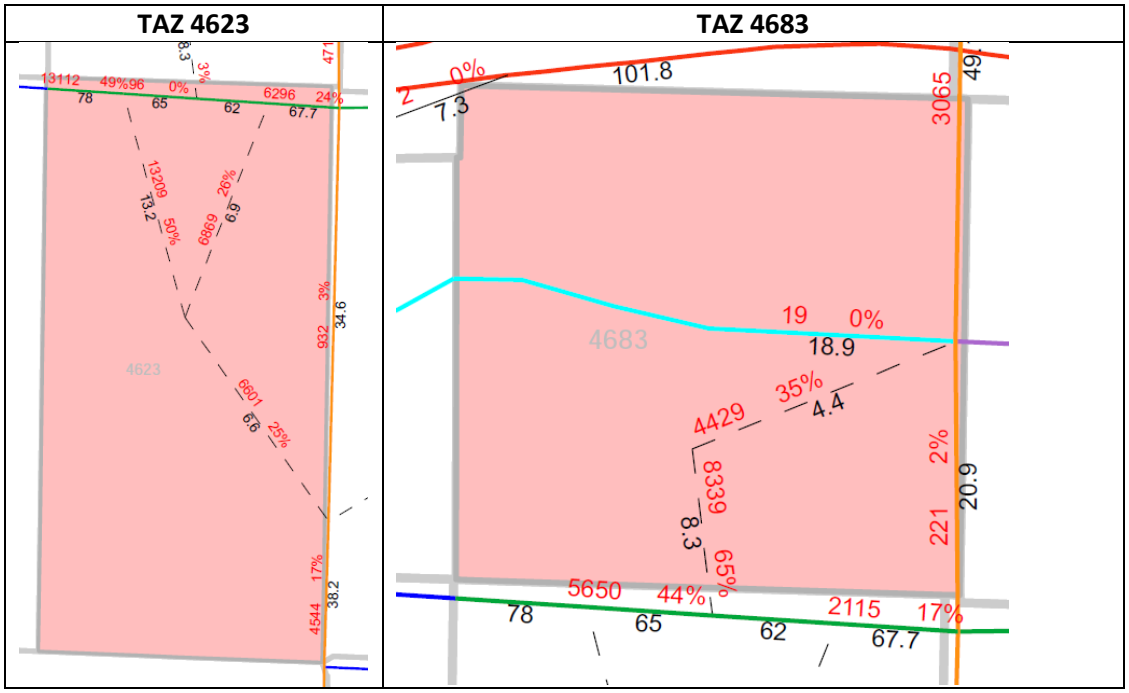
The total external project trips for the Adopted CPU land use and the Proposed Project land use was determined by adding the project trip assignment at the zone connector of each TAZ. A screen shot of the Select Zone Assignment output for each land use scenario is provided below

Select Zone A – Adopted CPU land use

TAZ 4623	TAZ 4683
	

As shown above the Adopted CPU land use would generate a total of 46,208 external trips, with 31,398 trips from TAZ 4623 (13,534+8,710+9,154) and 14,810 from TAZ 4683 (6,065+8,745).

Select Zone B – Proposed Project land use



As shown above the Proposed Project land use would generate a total of 39,447 external trips, with 26,679 trips from TAZ 4623 (13,209+6,869+6,601) and 12,768 from TAZ 4683 (4,429+8,339).

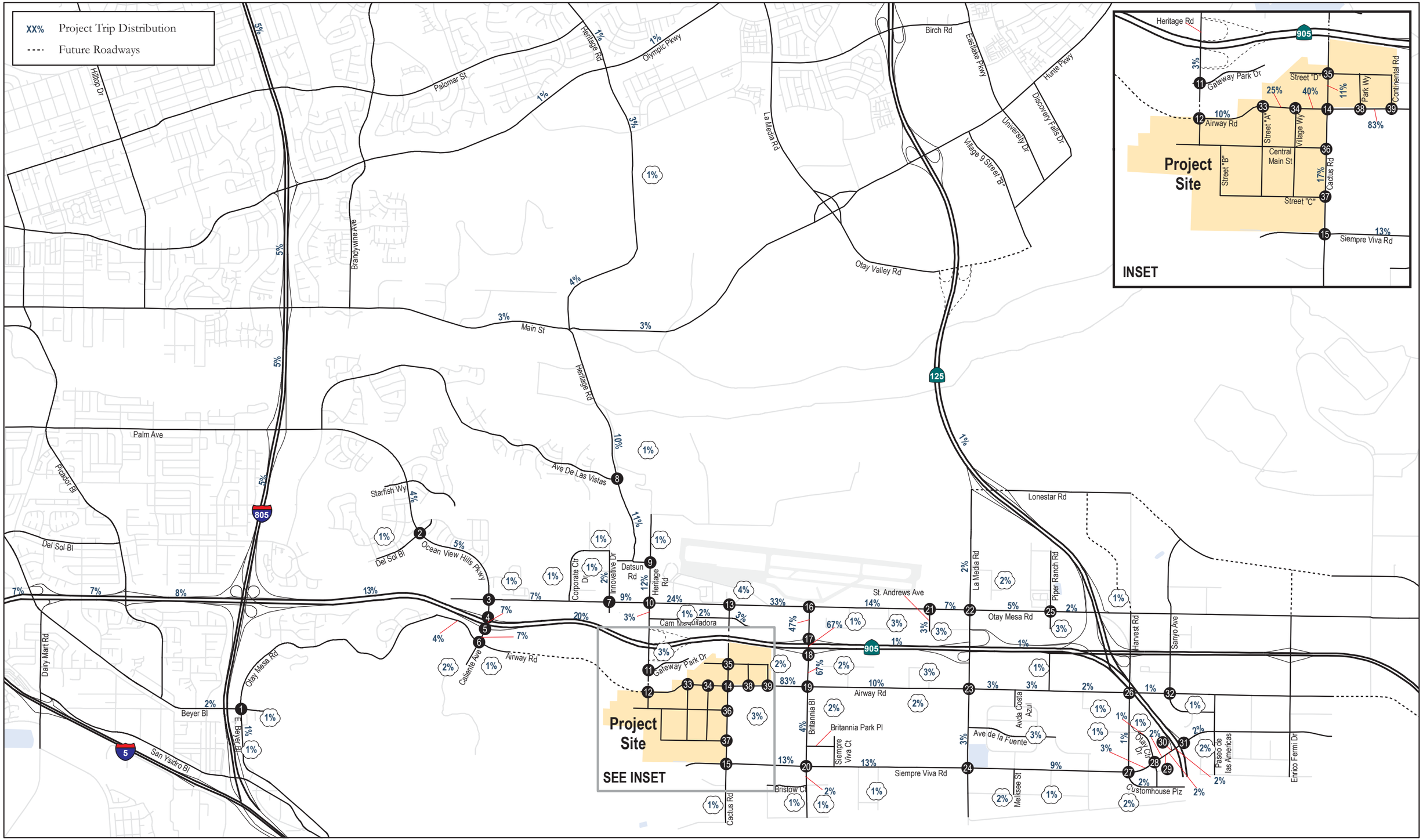
Step 2: Determine project trip distribution

The sum of the project trip assignment from both TAZs were divided by the total external trips to determine the project trip distribution. Table 1 displays the project trip distribution calculation for the Adopted CPU land use and Table 2 displays the project trip distribution calculation for the Proposed Project land use.

Cumulative Conditions (new)

Since the Series 12 Select Zone B model assumed full buildout of the Otay Mesa Community Plan street network, the trip distribution developed for the aforementioned model was manually adjusted to reflect the network and land uses under the Cumulative conditions. Roadway volumes as well as intersection volumes derived from the most recent City of Chula Vista and County of San Diego approved model (developed for the Otay Ranch Resort Village 13 project) was employed since it includes all of the cumulative projects identified in the traffic technical report. The approach was approved by staff at the City of San Diego.

Figure 3 displays assumed trip distribution pattern for the Proposed Project under the Cumulative conditions.



Otay Mesa Central Village Specific Plan

CHEN RYAN

Figure 3-2
Project Trip Distribution

Attachment A

SANDAG Select Zone Assignment Outputs

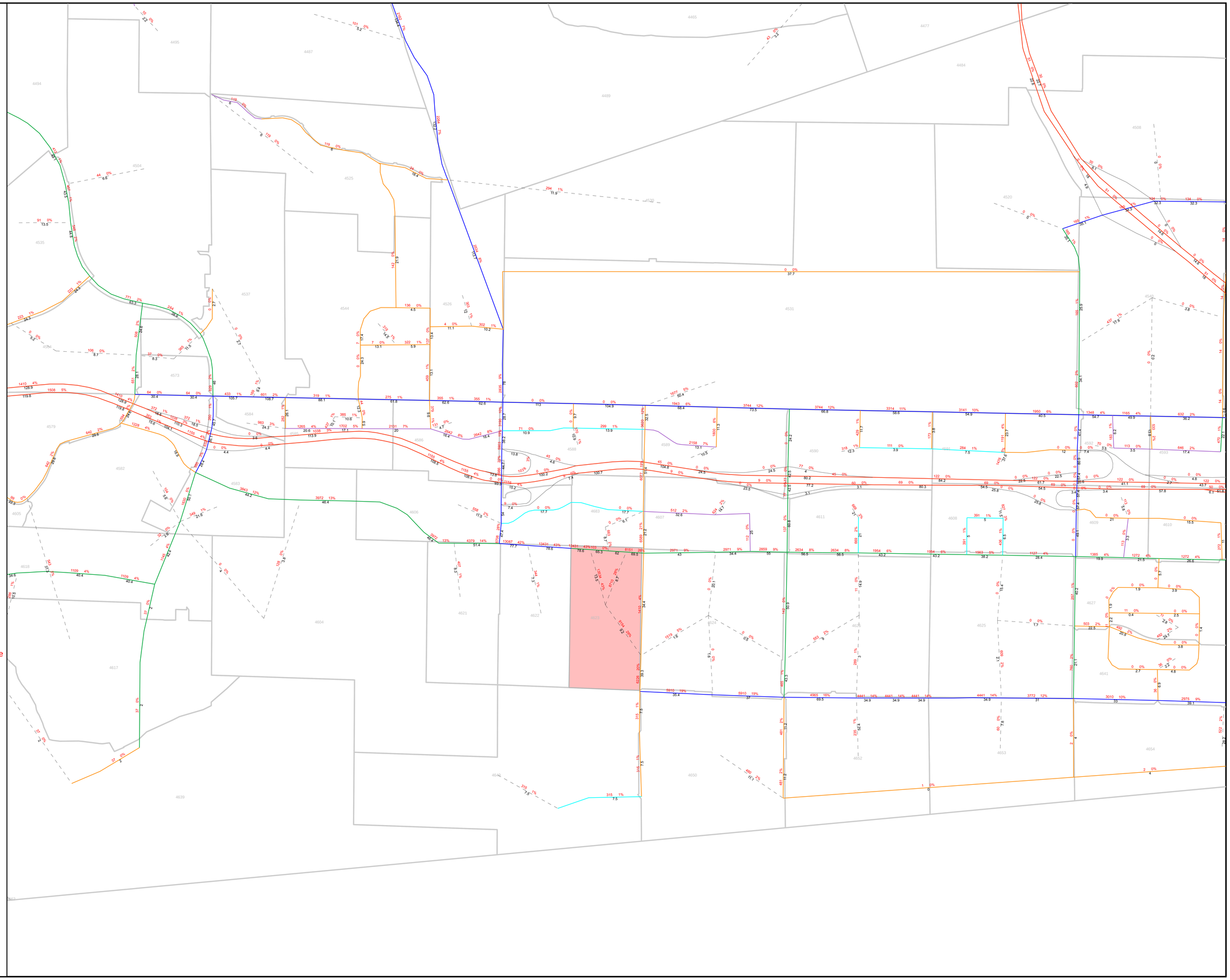
OTAY MESA CPU SELECT ZONE OUTPUT

SANDAG
Series 12
2035rc11

Otay Mesa Village Modeling

Select Zone Plot

TAZ 4623



Functional Classifications

- Freeway
- Prime
- Major
- Collector
- Light Collector
- Rural Collector
- Local
- Freeway Ramp
- Local Ramp
- Zone Connector

Traffic Analysis Zones

\# Selz Volumes & Percentage

\# Unadjusted ADT(x1000)

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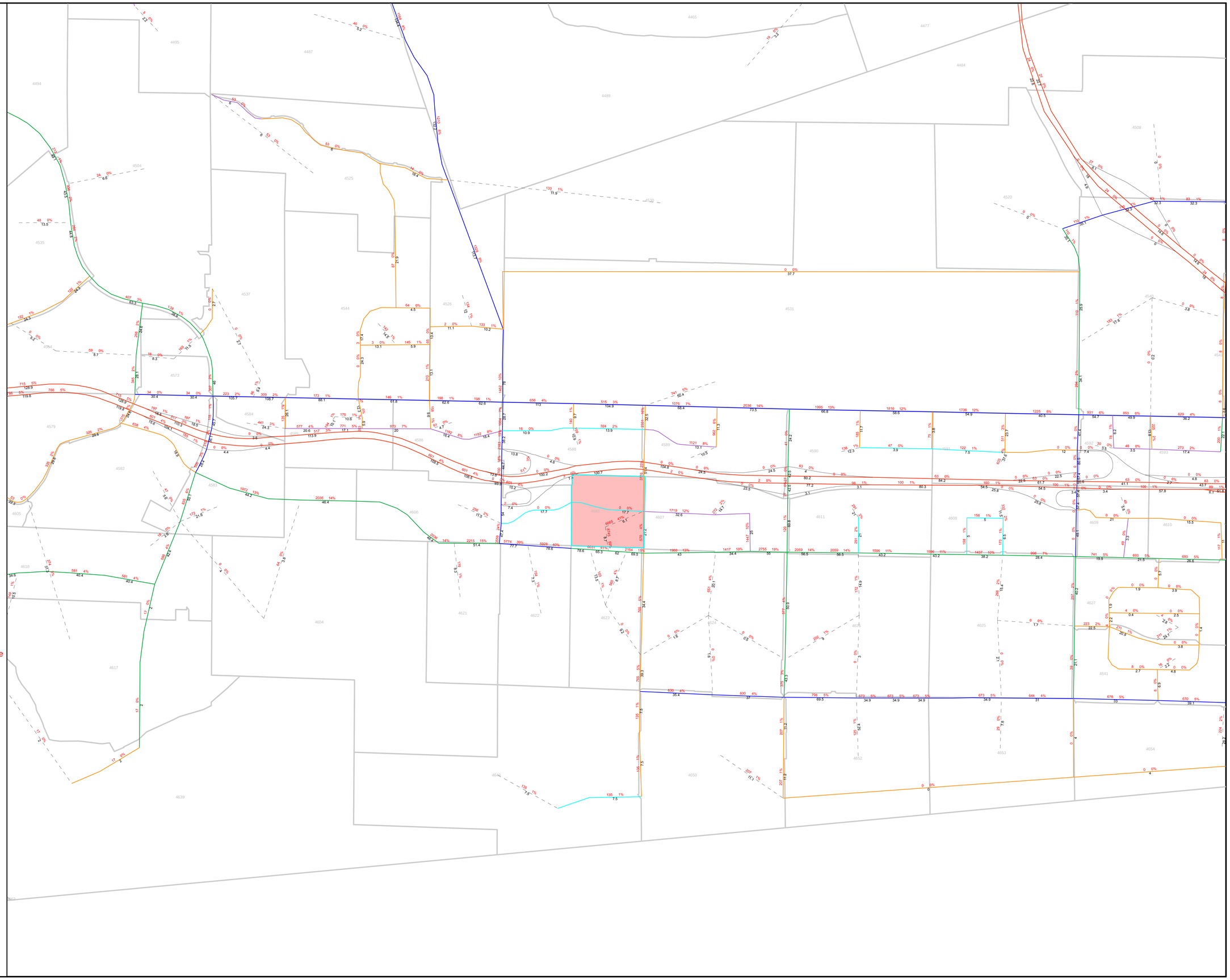
Series 12
2035rc11

Otay Mesa Village
Modeling

Select Zone Plot

TAZ 4683



Functional Classifications

- Freeway
- Prime
- Major
- Collector
- Light Collector
- Rural Collector
- Local
- Freeway Ramp
- Local Ramp
- Zone Connector

Traffic Analysis Zones

\# Selz Volumes & Percentage

\# Unadjusted ADT(x1000)

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PROPOSED PROJECT SELECT ZONE OUTPUT

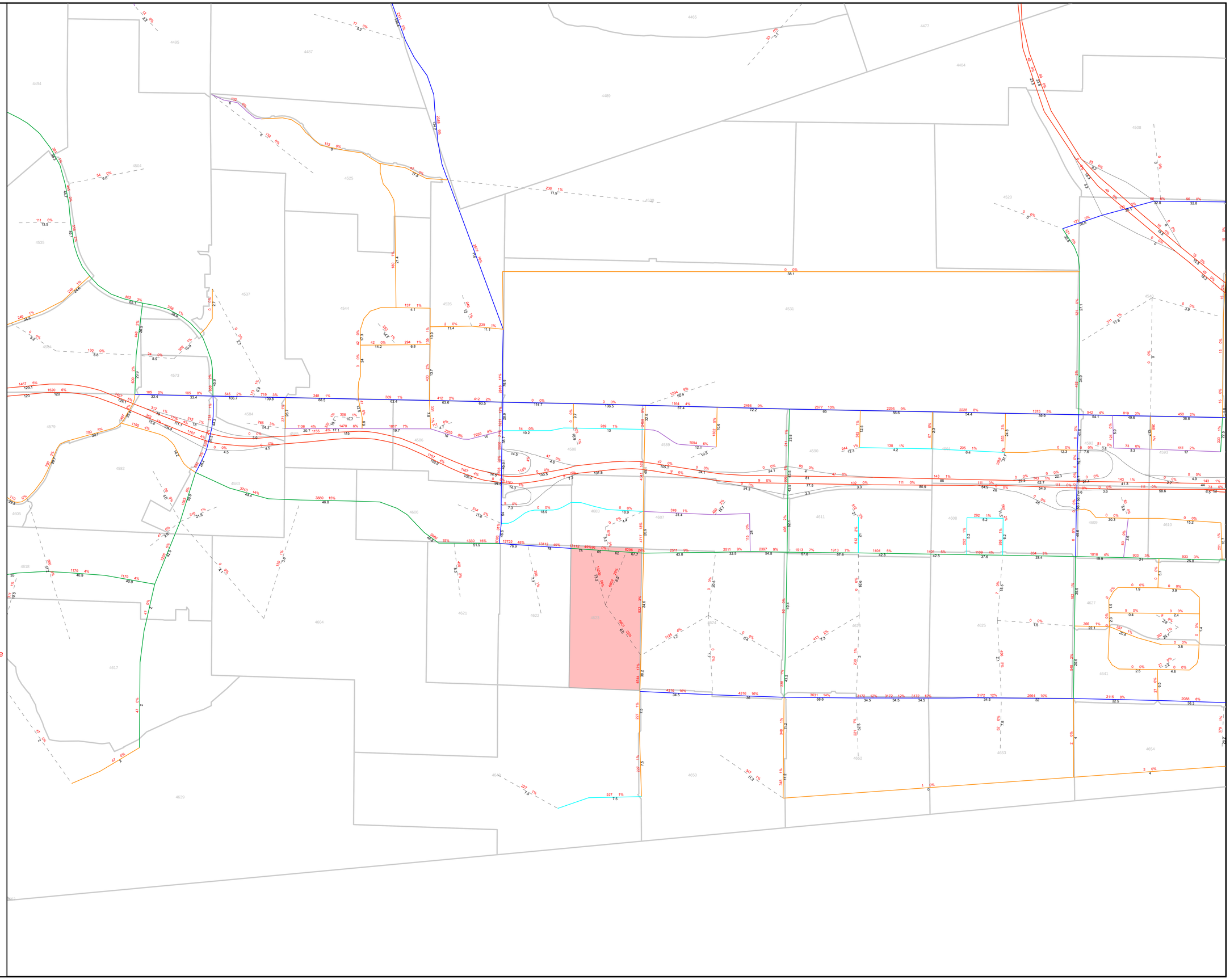
SANDAG
Series 12
2035rc11

Otay Mesa Village Modeling

Run II

Select Zone Plot

TAZ 4623



Functional Classifications

- Freeway
- Prime
- Major
- Collector
- Light Collector
- Rural Collector
- Local
- Freeway Ramp
- Local Ramp
- Zone Connector

Traffic Analysis Zones

Selz Volumes & Percentage

Unadjusted ADT(x1000)

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September 22, 2015

SANDAG
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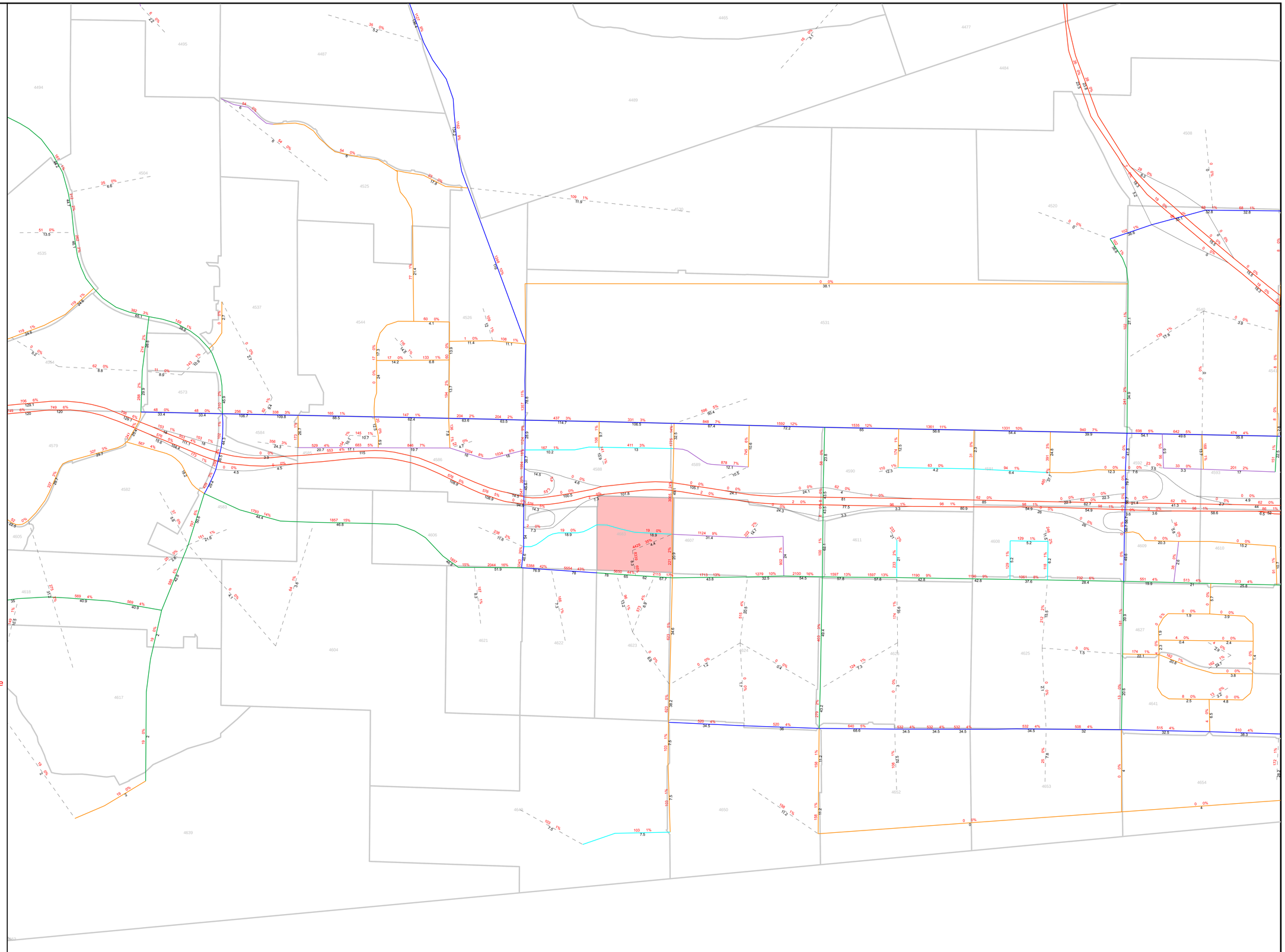
2035rc11

Otay Mesa Village Modeling

Run II

Select Zone Plot

TAZ 4683



Functional Classifications

- Freeway
- Prime
- Major
- Collector
- Light Collector
- Rural Collector
- Local
- Freeway Ramp
- Local Ramp
- Zone Connector

Traffic Analysis Zones

Selz Volumes & Percentage

Unadjusted ADT(x1000)

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Otay Mesa Central Village Specific Plan – MXD Analysis

MIXED USE TRIP GENERATION MODEL V4 - RESULTS

MODEL APPLICATION - ALL TRIPS

	Daily				AM Peak Hour				PM Peak Hour			
	HBW	HBO	NHB	Total	HBW	HBO	NHB	Total	HBW	HBO	NHB	Total
Number of "Raw" SANDAG Rate Trips Subject to Model	7232	25667	7216	40115	1255	1656	135	3045	904	2095	758	3756
Predicted Probabilities:												
Internal Capture	2.60%	5.31%	7.53%	5.22%	2.60%	5.31%	7.53%	4.29%	2.60%	5.31%	7.53%	5.11%
Walking External	2.08%	6.28%	2.52%	4.84%	2.08%	6.28%	2.52%	4.36%	2.08%	6.28%	2.52%	4.51%
Transit External	0.57%	1.58%	2.44%	1.55%	0.57%	1.58%	2.44%	1.19%	0.57%	1.58%	2.44%	1.50%
Number of Trips:												
Internal Capture	188	1363	543	2094	33	88	10	131	24	111	57	192
Walking External	147	1527	168	1842	25	98	3	127	18	125	18	161
Transit External	40	385	163	588	7	25	3	35	5	31	17	53
Net Number of IXXI Vehicle Trips	**6858**	**22393**	**6341**	**35592**	**1190**	**1444**	**118**	**2753**	**857**	**1827**	**666**	**3350**

	External Vehicle Trips			VMT		
Results	Raw	Net	Reduction %	Raw	Net	Reduction %
Daily	40,920	35,592	13%	155,518	139,897	10%
AM Peak Hour	3,150	2,753	13%	14,008	12,871	8%
PM Peak Hour	3,829	3,350	12%	15,287	13,844	9%

NOTE: External trips are attributed half to project site uses, internal trips all to site uses for purposes of VMT allocation.

MODEL APPLICATION - TRIP ENDS TO/FROM RESIDENCES IN THE PROJECT ONLY

	Daily				AM Peak Hour				PM Peak Hour			
	HBW	HBO	NHB	Total	HBW	HBO	NHB	Total	HBW	HBO	NHB	Total
Number of "Raw" ITE Trips Subject to Model	5706	18047	4008	27760	998	1146	77	2221	711	1421	400	2532
Predicted Probabilities:												
Internal Capture	2.60%	5.31%	7.53%	5.07%	2.60%	5.31%	7.53%	4.17%	2.60%	5.31%	7.53%	4.90%
Walking External	2.08%	6.28%	2.52%	4.87%	2.08%	6.28%	2.52%	4.24%	2.08%	6.28%	2.52%	4.50%
Transit External	0.57%	1.58%	2.44%	1.49%	0.57%	1.58%	2.44%	1.15%	0.57%	1.58%	2.44%	1.42%
Number of Trips:												
Internal Capture	148	958	302	1408	26	61	6	93	19	75	30	124
Walking External	116	1074	94	1283	20	68	2	90	14	85	9	108
Transit External	32	270	90	392	6	17	2	24	4	21	9	34
Net Number of IXXI Vehicle Trips generated by Project Residences	**5410**	**15744**	**3522**	**24677**	**946**	**1000**	**67**	**2014**	**674**	**1240**	**352**	**2266**

	External Vehicle Trips			VMT		
Results	Raw	Net	Reduction %	Raw	Net	Reduction %
Daily	27,760	24,677	11%	219,517	222,657	-1%
AM Peak Hour	2,221	2,014	9%	20,951	19,674	6%
PM Peak Hour	2,532	2,266	11%	21,240	21,587	-2%

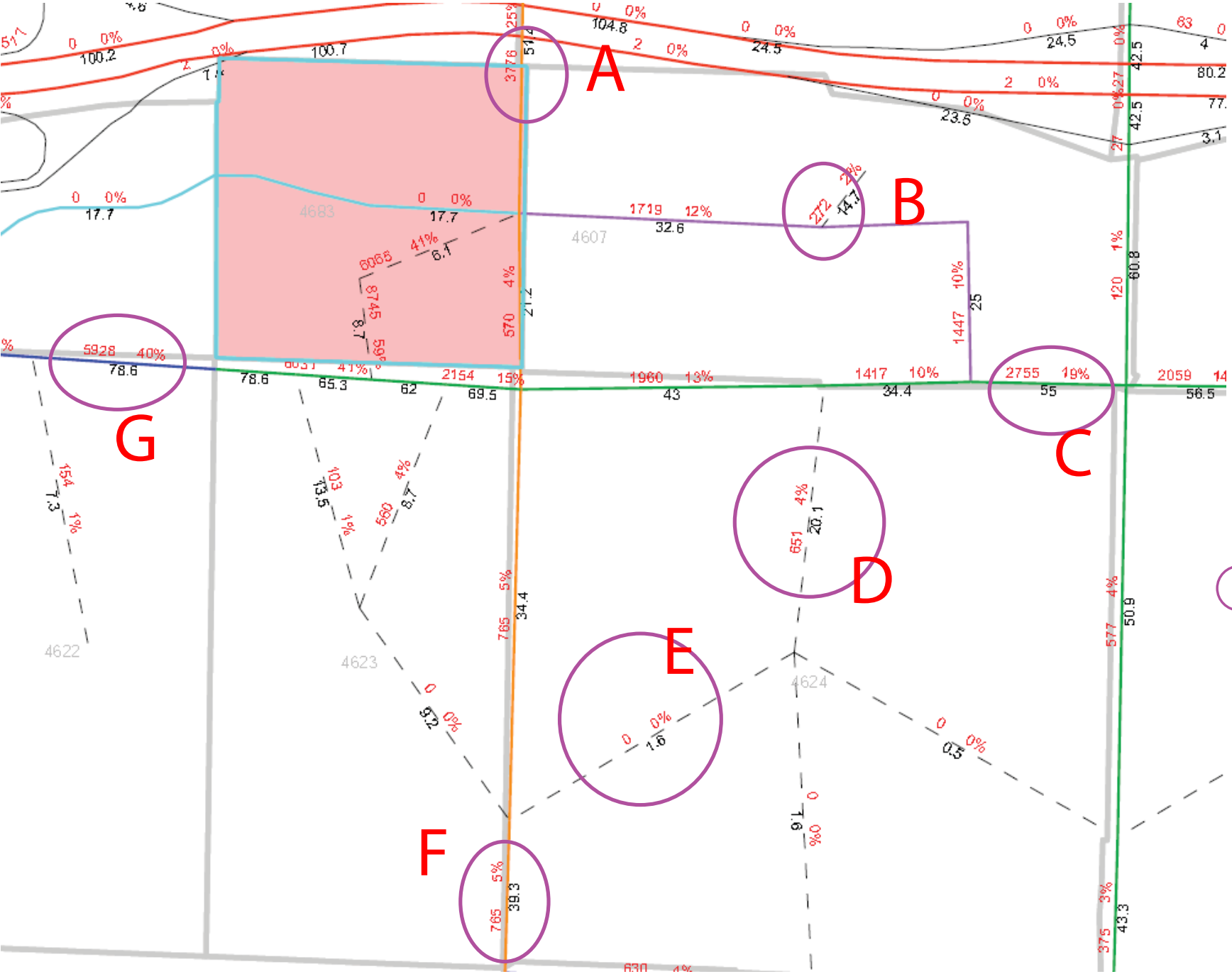
NOTE: all trips generated by project households (either produced or attracted or both) are counted 100%. This cannot be compared directly to the VMT in the section above.

Otay Mesa Central Village Specific Plan – Otay Mesa CPU Land Use Internal Capture Calculation

Otay Mesa CPU Land Use Internal Capture Calculation

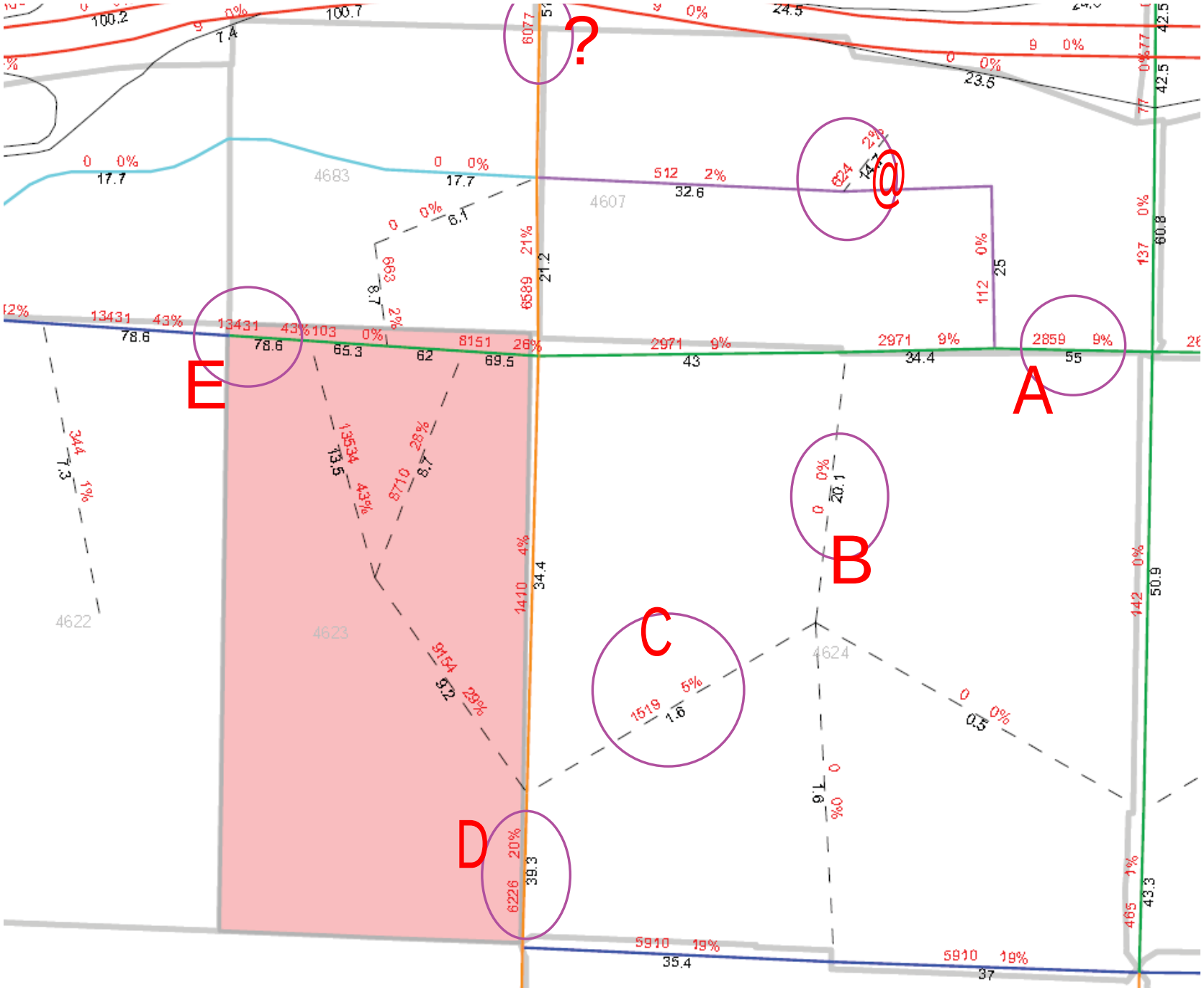
Location	ADT
TAZ 4683 - Location A	3,776
TAZ 4683 - Location B	272
TAZ 4683 - Location C	2,755
TAZ 4683 - Location D	651
TAZ 4683 - Location F	765
TAZ 4683 - Location G	5,928
TAZ 4623 - Location A	6,077
TAZ 4626 - Location B	624
TAZ 4623 - Location C	2,859
TAZ 4623 - Location E	1,519
TAZ 4623 - Location F	6,226
TAZ 4623 - Location G	13,431
Sum of all External ADT	**44,883**
Daily Trip Generation from Model land use file **Sum of TAZ 4683 + TAZ 4623**	**47,079**
Number of trips remaining within the project's site	**2,196**
Internal Capture (Internal Trips / Total Trips)	**4.665%**

Otay Mesa CPU Land Use – Model Results – TAZ 4683



= External Trip General Capture Point

Otay Mesa CPU Land Use – Model Results – TAZ 4623


?
@
A
B
C
D
E
4683
4607
4622
4623
4624
= External Trip General Capture Point

Otay Mesa CPU Land Use – Land Use output

Note: Reported person and vehicle trips are only estimates. The difference between generated and loaded vehicle trips can be attributed to regional trip balancing, the mode choice model, and/or intrazonal trips.

Land Use					Trips	
Zone	Code	Name	Type	Amount	Person	Vehicle
4494	101	SINGLE FAMILY	du	800.0	11653.	8134.
4494	107	MULTI-FAMILY	du	820.0	9348.	6563.
4494	7601	ACTIVE PARK	acre	6.0	399.	263.
4494		TOTAL			21400.	14959.
4503	5012	COMMUNITY COMMERCIAL	ksf	770.9	83180.	58861.
4503	5014	GAS STATION	other	12.0	2476.	1803.
4503	6102	CHURCH	acre	5.0	264.	203.
4503	6510	OTHER HEALTH CARE	ksf	292.7	19699.	14627.
4503	7601	ACTIVE PARK	acre	11.0	732.	481.
4503		TOTAL			106350.	75975.
4525	101	SINGLE FAMILY	du	387.0	5637.	3935.
4525	107	MULTI-FAMILY	du	216.0	2462.	1729.
4525	7601	ACTIVE PARK	acre	7.0	466.	306.
4525		TOTAL			8565.	5970.
4526	107	MULTI-FAMILY	du	145.0	1653.	1160.
4526	2002	HEAVY INDUSTRY	ksf	1420.9	6820.	5754.
4526	2107	LIGHT INDUSTRIAL LRG	ksf	108.5	1052.	874.
4526	5013	NEIGHBORHOOD COMMERCIAL	ksf	35.9	6085.	4307.
4526		TOTAL			15611.	12095.
4531	1504	HOTEL	room	270.0	4401.	2709.
4531	2107	LIGHT INDUSTRIAL LRG	ksf	725.0	7032.	5842.
4531	2109	INDUSTRIAL PARK	ksf	777.0	15152.	12588.
4531	2111	SOLAR FIELD	site	1.0	6.	5.
4531	4121	PARK & RIDE	other	1.0	517.	396.
4531	5005	SPECIALTY COMMERCIAL	ksf	14.3	17632.	12479.
4531	5011	HIGH T/O REST	ksf	15.8	87.	63.
4531	5012	COMMUNITY COMMERCIAL	ksf	182.9	19735.	13965.
4531	5016	GAS STATION	other	1.0	1345.	979.
4531	5019	TRUCK & SOTRAGE	other	1.0	1265.	921.
4531	6021	COMMERCIAL OFFICE	other	1.0	3202.	2466.
4531	6111	AIR&SPACE MUSEUM	other	1.0	1078.	731.
4531		TOTAL			71452.	53145.
4535	101	SINGLE FAMILY	du	1069.0	15572.	10869.
4535	107	MULTI-FAMILY	du	330.0	3762.	2641.
4535	7601	ACTIVE PARK	acre	5.3	352.	232.
4535		TOTAL			19686.	13742.
4537	107	MULTI-FAMILY	du	1016.0	11582.	8131.
4537	5013	NEIGHBORHOOD COMMERCIAL	ksf	33.2	5627.	3983.
4537		TOTAL			17210.	12114.
4540	2002	HEAVY INDUSTRY	ksf	1960.2	9409.	7937.
4540	2107	LIGHT INDUSTRIAL LRG	ksf	1960.2	19014.	15796.
4540		TOTAL			28423.	23734.
4544	2107	LIGHT INDUSTRIAL LRG	ksf	1916.6	18591.	15445.
4544		TOTAL			18591.	15445.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4558	101	SINGLE FAMILY	du	123.0	1792.	1251.
4558	107	MULTI-FAMILY	du	630.0	7182.	5042.
4558	2113	WAREHOUSING	other	1.0	384.	322.
4558	7601	ACTIVE PARK	acre	4.9	326.	214.
4558		TOTAL			9684.	6829.
4564	107	MULTI-FAMILY	du	1578.0	17989.	12629.
4564	6806	ELEMENTARY SCHOOL	site	1.0	2117.	1183.
4564	7601	ACTIVE PARK	acre	15.0	998.	656.
4564		TOTAL			21104.	14469.
4573	5012	COMMUNITY COMMERCIAL	ksf	234.7	25324.	17920.
4573	6806	ELEMENTARY SCHOOL	site	2.0	4234.	2366.
4573		TOTAL			29558.	20286.
4579	101	SINGLE FAMILY	du	435.0	6337.	4423.
4579		TOTAL			6337.	4423.
4582	107	MULTI-FAMILY	du	110.0	1254.	880.
4582	6811	SENIOR HIGH SCHOOL	other	2400.0	9120.	4103.
4582		TOTAL			10374.	4984.
4583	101	SINGLE FAMILY	du	75.0	1093.	763.
4583	107	MULTI-FAMILY	du	340.0	3876.	2721.
4583	5012	COMMUNITY COMMERCIAL	ksf	248.3	26792.	18959.
4583		TOTAL			31760.	22442.
4584	5012	COMMUNITY COMMERCIAL	ksf	326.7	35251.	24945.
4584		TOTAL			35251.	24945.
4585	5012	COMMUNITY COMMERCIAL	ksf	271.7	29316.	20745.
4585		TOTAL			29316.	20745.
4586	2003	IBT-MANUFACTURE	ksf	53.9	259.	218.
4586	2106	IBT-INDUST PARK	ksf	161.6	1568.	1302.
4586	2108	IBT-BUSINESS PARK	ksf	107.7	2100.	1745.
4586	2110	IBT-WAREHOUSE	ksf	161.6	986.	827.
4586	6010	IBT- OFFICE	ksf	53.9	1369.	1054.
4586		TOTAL			6281.	5146.
4588	2003	IBT-MANUFACTURE	ksf	126.5	607.	512.
4588	2106	IBT-INDUST PARK	ksf	379.4	3680.	3057.
4588	2108	IBT-BUSINESS PARK	ksf	252.9	4932.	4097.
4588	2110	IBT-WAREHOUSE	ksf	379.4	2314.	1941.
4588	6020	ibt- OFFICE	ksf	126.5	2619.	2016.
4588		TOTAL			14152.	11624.
4589	2003	IBT-MANUFACTURE	ksf	123.5	593.	500.
4589	2106	IBT-INDUST PARK	ksf	370.5	3594.	2986.
4589	2108	IBT-BUSINESS PARK	ksf	247.0	4816.	4001.
4589	2110	IBT-WAREHOUSE	ksf	370.5	2260.	1895.
4589	6020	ibt- OFFICE	ksf	123.5	2556.	1969.
4589		TOTAL			13820.	11351.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4590	2003	IBT-MANUFACTURE	ksf	141.1	677.	571.
4590	2106	IBT-INDUST PARK	ksf	423.4	4107.	3412.
4590	2108	IBT-BUSINESS PARK	ksf	282.3	5505.	4573.
4590	2110	IBT-WAREHOUSE	ksf	423.4	2583.	2166.
4590	6019	ibt- OFFICE	ksf	141.1	2836.	2184.
4590		TOTAL			15708.	12906.
4591	2109	INDUSTRIAL PARK	ksf	199.6	3892.	3234.
4591	5012	COMMUNITY COMMERCIAL	ksf	478.9	51673.	36566.
4591		TOTAL			55566.	39799.
4592	2003	IBT-MANUFACTURE	ksf	39.5	190.	160.
4592	2106	IBT-INDUST PARK	ksf	118.7	1151.	957.
4592	2108	IBT-BUSINESS PARK	ksf	79.1	1542.	1281.
4592	2110	IBT-WAREHOUSE	ksf	118.7	724.	607.
4592	6011	IBT- OFFICE	ksf	39.5	1007.	776.
4592		TOTAL			4615.	3781.
4593	2109	INDUSTRIAL PARK	ksf	217.4	4239.	3522.
4593	5012	COMMUNITY COMMERCIAL	ksf	521.7	56291.	39834.
4593		TOTAL			60531.	43356.
4594	2002	HEAVY INDUSTRY	ksf	149.9	720.	607.
4594	2107	LIGHT INDUSTRIAL LRG	ksf	1128.0	10942.	9090.
4594	4113	COMMUNICATION OR UTILITY	acre	2.1	7.	5.
4594		TOTAL			11668.	9702.
4595	2107	LIGHT INDUSTRIAL LRG	ksf	1337.1	12970.	10775.
4595		TOTAL			12970.	10775.
4604	101	SINGLE FAMILY	du	125.0	1821.	1271.
4604	107	MULTI-FAMILY	du	590.0	6726.	4722.
4604	6806	ELEMENTARY SCHOOL	site	1.0	2117.	1183.
4604	7601	ACTIVE PARK	acre	5.2	346.	228.
4604		TOTAL			11010.	7404.
4605	101	SINGLE FAMILY	du	59.0	859.	600.
4605	107	MULTI-FAMILY	du	40.0	456.	320.
4605	4113	COMMUNICATION OR UTILITY	acre	3.9	12.	10.
4605		TOTAL			1328.	930.
4606	2109	INDUSTRIAL PARK	ksf	778.2	15175.	12607.
4606		TOTAL			15175.	12607.
4607	2109	INDUSTRIAL PARK	ksf	991.9	19342.	16069.
4607		TOTAL			19342.	16069.
4608	2109	INDUSTRIAL PARK	ksf	179.2	3494.	2903.
4608	6810	JUNIOR COLLEGE	other	5000.0	11500.	9095.
4608		TOTAL			14994.	11998.
4609	2003	IBT-MANUFACTURE	ksf	66.7	320.	270.

Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4609	2106	IBT-INDUST PARK	ksf	200.1	1941.	1613.
4609	2108	IBT-BUSINESS PARK	ksf	133.4	2601.	2161.
4609	2110	IBT-WAREHOUSE	ksf	200.1	1221.	1024.
4609	6007	IBT- OFFICE	ksf	66.7	1607.	1238.
4609		TOTAL			7691.	6305.
4610	2003	IBT-MANUFACTURE	ksf	167.4	804.	678.
4610	2106	IBT-INDUST PARK	ksf	502.3	4872.	4048.
4610	2108	IBT-BUSINESS PARK	ksf	334.9	6531.	5425.
4610	2110	IBT-WAREHOUSE	ksf	502.3	3064.	2569.
4610	6018	ibt- OFFICE	ksf	167.4	3231.	2488.
4610		TOTAL			18501.	15208.
4611	2109	INDUSTRIAL PARK	ksf	1417.9	27649.	22970.
4611		TOTAL			27649.	22970.
4617	101	SINGLE FAMILY	du	765.0	11144.	7778.
4617	107	MULTI-FAMILY	du	2025.0	23085.	16207.
4617	5012	COMMUNITY COMMERCIAL	ksf	47.0	5071.	3589.
4617	6005	LOW RISE OFFICE	ksf	98.0	2038.	1570.
4617	6806	ELEMENTARY SCHOOL	site	2.0	4234.	2366.
4617	7601	ACTIVE PARK	acre	20.7	1377.	906.
4617		TOTAL			46949.	32415.
4618	107	MULTI-FAMILY	du	265.0	3021.	2121.
4618	7601	ACTIVE PARK	acre	5.8	386.	254.
4618		TOTAL			3407.	2375.
4623	107	MULTI-FAMILY	du	3754.0	42796.	30045.
4623	6806	ELEMENTARY SCHOOL	site	1.0	2117.	1183.
4623	7601	ACTIVE PARK	acre	24.2	1609.	1059.
4623		TOTAL			46522.	32287.
4624	2109	INDUSTRIAL PARK	ksf	1178.9	22989.	19098.
4624	6811	SENIOR HIGH SCHOOL	other	2400.0	9120.	4103.
4624	7601	ACTIVE PARK	acre	39.4	2620.	1724.
4624		TOTAL			34729.	24926.
4625	2003	IBT-MANUFACTURE	ksf	234.3	1125.	949.
4625	2106	IBT-INDUST PARK	ksf	702.9	6818.	5664.
4625	2108	IBT-BUSINESS PARK	ksf	468.6	9138.	7591.
4625	2110	IBT-WAREHOUSE	ksf	702.9	4288.	3596.
4625	6017	ibt- OFFICE	ksf	234.3	4147.	3194.
4625		TOTAL			25515.	20994.
4626	2003	IBT-MANUFACTURE	ksf	333.8	1602.	1352.
4626	2106	IBT-INDUST PARK	ksf	1001.5	9715.	8071.
4626	2108	IBT-BUSINESS PARK	ksf	667.6	13018.	10815.
4626	2110	IBT-WAREHOUSE	ksf	1001.5	6109.	5123.
4626	6014	ibt- OFFICE	ksf	333.8	5441.	4190.
4626		TOTAL			35885.	29550.

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Zone	Code	Name	Type	Amount	Person	Vehicle
		Land Use			Trips	
4627	2003	IBT-MANUFACTURE	ksf	345.2	1657.	1398.
4627	2106	IBT-INDUST PARK	ksf	1035.5	10044.	8345.
4627	2108	IBT-BUSINESS PARK	ksf	690.3	13461.	11183.
4627	2110	IBT-WAREHOUSE	ksf	1035.5	6317.	5297.
4627	6013	ibt- OFFICE	ksf	345.2	5592.	4306.
4627		TOTAL			37071.	30529.
4628	2003	IBT-MANUFACTURE	ksf	281.4	1351.	1139.
4628	2106	IBT-INDUST PARK	ksf	844.2	8189.	6803.
4628	2108	IBT-BUSINESS PARK	ksf	562.8	10975.	9117.
4628	2110	IBT-WAREHOUSE	ksf	844.2	5150.	4318.
4628	6015	ibt- OFFICE	ksf	281.4	4756.	3662.
4628		TOTAL			30419.	25040.
4629	2107	LIGHT INDUSTRIAL LRG	ksf	1086.8	10542.	8758.
4629		TOTAL			10542.	8758.
4630	2003	IBT-MANUFACTURE	ksf	69.6	334.	282.
4630	2106	IBT-INDUST PARK	ksf	208.9	2026.	1683.
4630	2108	IBT-BUSINESS PARK	ksf	139.3	2716.	2257.
4630	2110	IBT-WAREHOUSE	ksf	208.9	1274.	1069.
4630	5012	COMMUNITY COMMERCIAL	ksf	95.4	10294.	7284.
4630	6008	IBT- OFFICE	ksf	69.6	1684.	1297.
4630		TOTAL			18329.	13872.
4631	2107	LIGHT INDUSTRIAL LRG	ksf	1287.4	12488.	10375.
4631		TOTAL			12488.	10375.
4639	101	SINGLE FAMILY	du	435.0	6337.	4423.
4639	107	MULTI-FAMILY	du	1150.0	13110.	9204.
4639	5012	COMMUNITY COMMERCIAL	ksf	47.0	5071.	3589.
4639	6005	LOW RISE OFFICE	ksf	98.0	2038.	1570.
4639	7601	ACTIVE PARK	acre	13.6	904.	595.
4639		TOTAL			27461.	19380.
4643	2107	LIGHT INDUSTRIAL LRG	ksf	83.0	805.	669.
4643	5012	COMMUNITY COMMERCIAL	ksf	352.2	38002.	26892.
4643		TOTAL			38807.	27561.
4644	2107	LIGHT INDUSTRIAL LRG	ksf	2156.4	20917.	17377.
4644		TOTAL			20917.	17377.
4647	2003	IBT-MANUFACTURE	ksf	59.0	283.	239.
4647	2106	IBT-INDUST PARK	ksf	177.1	1718.	1427.
4647	2107	LIGHT INDUSTRIAL LRG	ksf	65.3	633.	526.
4647	2108	IBT-BUSINESS PARK	ksf	118.1	2303.	1913.
4647	2110	IBT-WAREHOUSE	ksf	177.1	1080.	906.
4647	5012	COMMUNITY COMMERCIAL	ksf	158.5	17102.	12102.
4647	6009	IBT- OFFICE	ksf	59.0	1469.	1131.
4647		TOTAL			24589.	18245.
4649	2002	HEAVY INDUSTRY	ksf	1887.7	9061.	7644.
4649		TOTAL			9061.	7644.

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Zone	Code	Name	Type	Amount	Person	Vehicle
		Land Use			Trips	
4650	2002	HEAVY INDUSTRY	ksf	3039.0	14587.	12306.
4650		TOTAL			14587.	12306.
4652	1505	CORSS BORDER FAC-HOTEL	other	1.0	4893.	3012.
4652	2003	IBT-MANUFACTURE	ksf	176.7	848.	716.
4652	2106	IBT-INDUST PARK	ksf	530.0	5141.	4271.
4652	2108	IBT-BUSINESS PARK	ksf	353.4	6891.	5725.
4652	2110	IBT-WAREHOUSE	ksf	530.0	3233.	2711.
4652	2112	CROSS BORDER FAC-INDRK	other	1.0	4063.	3375.
4652	4101	COMMERCIAL AIRPORT	unique	0.0	42907.	27761.
4652	5017	CROSS BORDER GAS STATION	other	1.0	2462.	1793.
4652	5018	CROSS BORDER RETAIL	other	1.0	4302.	3132.
4652	6016	ibt- OFFICE	ksf	269.9	4642.	3575.
4652		TOTAL			79383.	56071.
4653	2003	IBT-MANUFACTURE	ksf	100.1	480.	405.
4653	2106	IBT-INDUST PARK	ksf	300.2	2912.	2419.
4653	2108	IBT-BUSINESS PARK	ksf	200.2	3904.	3243.
4653	2110	IBT-WAREHOUSE	ksf	300.2	1831.	1536.
4653	6006	IBT- OFFICE	ksf	100.1	2192.	1688.
4653	6110	FIRE OR POLICE STATION	acre	10.9	295.	218.
4653		TOTAL			11615.	9509.
4654	2003	IBT-MANUFACTURE	ksf	359.4	1725.	1455.
4654	2106	IBT-INDUST PARK	ksf	1078.1	10458.	8688.
4654	2108	IBT-BUSINESS PARK	ksf	718.7	14015.	11643.
4654	2110	IBT-WAREHOUSE	ksf	1078.1	6576.	5515.
4654	6012	ibt- OFFICE	ksf	359.4	5750.	4428.
4654		TOTAL			38524.	31729.
4659	2004	OMPOE IN/OUT	ksf	6000.0	28800.	24296.
4659		TOTAL			28800.	24296.
4683	107	MULTI-FAMILY	du	1492.0	17009.	11941.
4683	5012	COMMUNITY COMMERCIAL	ksf	32.7	3528.	2497.
4683	7601	ACTIVE PARK	acre	8.1	539.	354.
4683		TOTAL			21076.	14792.

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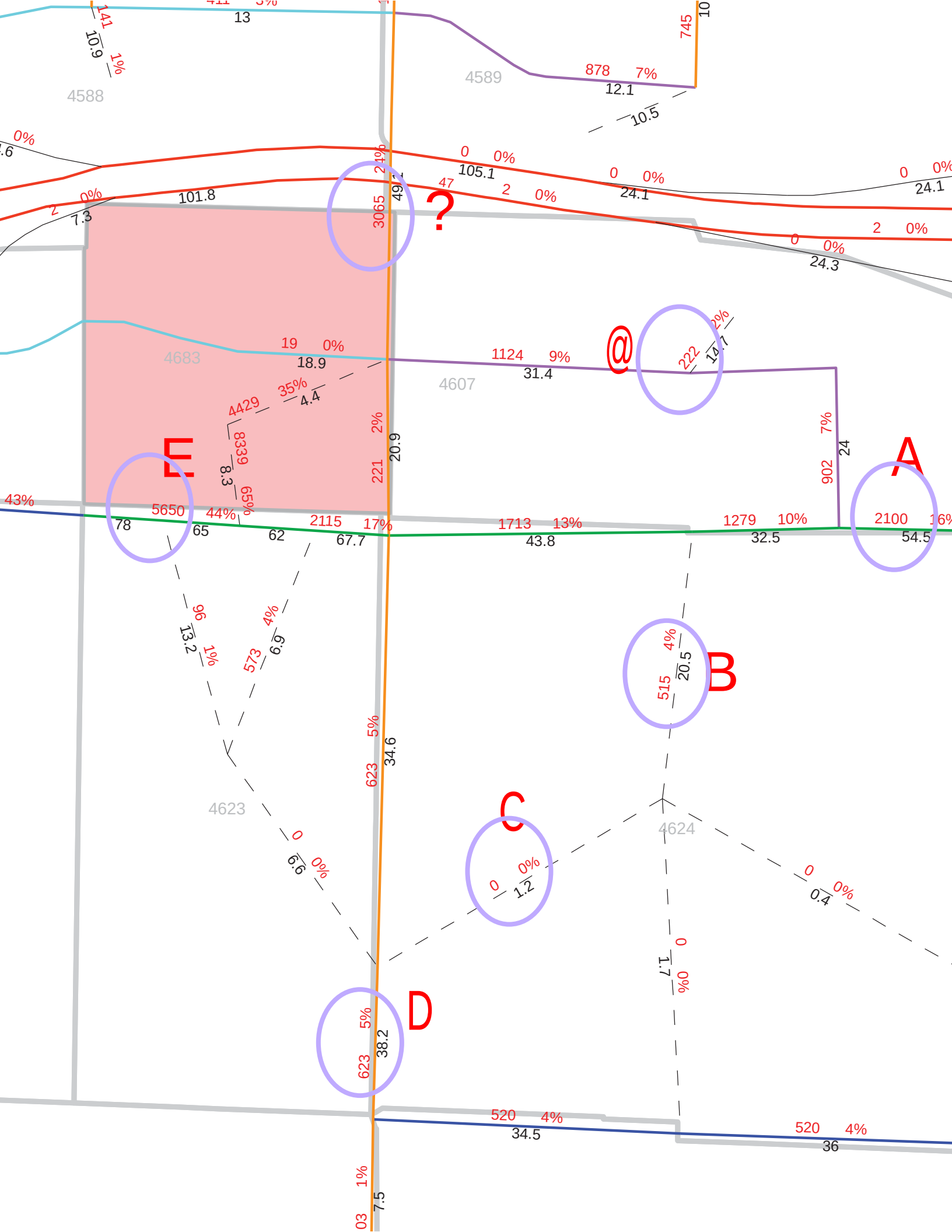
Otay Mesa Central Village Specific Plan – Proposed Project Land Use Internal Capture Calculation

Proposed Project Land Use Internal Capture Calculation

Location	ADT
TAZ 4683 - Location A	3,065
TAZ 4683 - Location B	222
TAZ 4683 - Location C	2,100
TAZ 4683 - Location D	515
TAZ 4683 - Location F	623
TAZ 4683 - Location G	5,554
TAZ 4623 - Location A	4,341
TAZ 4626 - Location B	490
TAZ 4623 - Location C	2,397
TAZ 4623 - Location E	1,125
TAZ 4623 - Location F	4,544
TAZ 4623 - Location G	13,112
Sum of all External ADT	**38,088**
Daily Trip Generation from Model land use file **Sum of TAZ 4683 + TAZ 4623**	**42,041**
Number of trips remaining within the project's site	**3,953**
Internal Capture (Internal Trips / Total Trips)	**9.403%**

Proposed Project Land Use – Model Results – TAZ 4683



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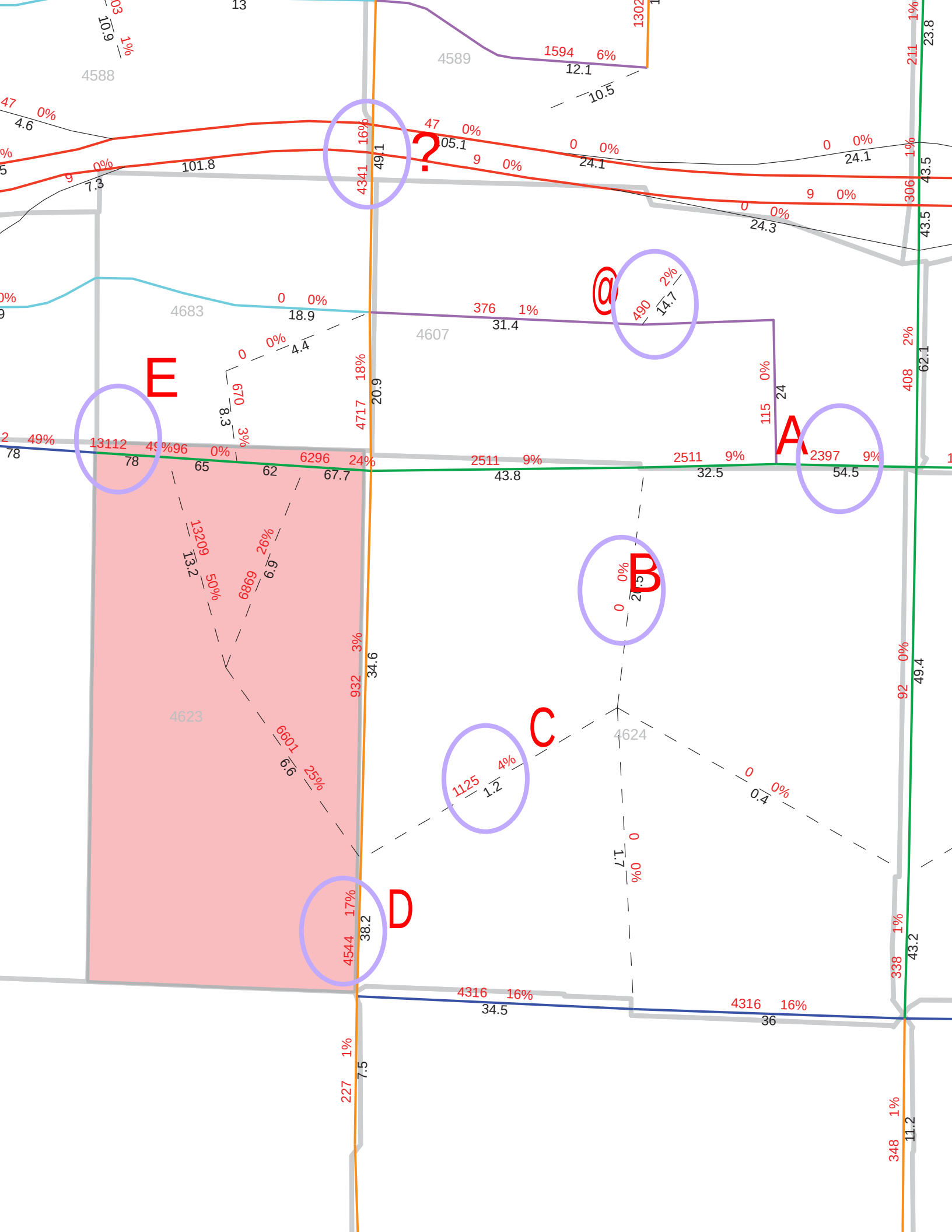
Proposed Project Land Use – Model Results – TAZ 4623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13112 49% 78
6296 24% 67.7
2511 9% 43.8
2511 9% 32.5
2397 9% 54.5
376 1% 31.4
490 2% 14.7
4341 16% 49.1
4717 18% 20.9
932 3% 34.6
4544 17% 38.2
4316 16% 34.5
4316 16% 36
13209 50% 13.2
6869 26% 6.9
6601 25% 6.6
1125 4% 1.2
670 3% 8.3
227 1% 7.5
348 1% 11.2
338 1% 43.2
306 1% 43.5
408 2% 62.1
92 0% 49.4
211 1% 23.8
115 0% 24
1302 1%
10.9 1%
13
7.3 9% 0%
4.6 47 0%
105.1 47 0%
24.1 0 0%
24.3 0 0%
18.9 0 0%
4.4 0 0%
8.3 0 0%
1.7 0 0%
0.4 0 0%
6.9 0 0%
6.6 0 0%
1.2 0 0%

Proposed Project Land Use – Land Use output

Note: Reported person and vehicle trips are only estimates. The difference between generated and loaded vehicle trips can be attributed to regional trip balancing, the mode choice model, and/or intrazonal trips.

Land Use					Trips	
Zone	Code	Name	Type	Amount	Person	Vehicle
4494	101	SINGLE FAMILY	du	800.0	11653.	8134.
4494	107	MULTI-FAMILY	du	820.0	9348.	6563.
4494	7601	ACTIVE PARK	acre	6.0	399.	263.
4494		TOTAL			21400.	14959.
4503	5012	COMMUNITY COMMERCIAL	ksf	770.9	83180.	58861.
4503	5014	GAS STATION	other	12.0	2476.	1803.
4503	6102	CHURCH	acre	5.0	264.	203.
4503	6510	OTHER HEALTH CARE	ksf	292.7	19699.	14627.
4503	7601	ACTIVE PARK	acre	11.0	732.	481.
4503		TOTAL			106350.	75975.
4525	101	SINGLE FAMILY	du	387.0	5637.	3935.
4525	107	MULTI-FAMILY	du	216.0	2462.	1729.
4525	7601	ACTIVE PARK	acre	7.0	466.	306.
4525		TOTAL			8565.	5970.
4526	107	MULTI-FAMILY	du	145.0	1653.	1160.
4526	2002	HEAVY INDUSTRY	ksf	1420.9	6820.	5754.
4526	2107	LIGHT INDUSTRIAL LRG	ksf	108.5	1052.	874.
4526	5013	NEIGHBORHOOD COMMERCIAL	ksf	35.9	6085.	4307.
4526		TOTAL			15611.	12095.
4531	1504	HOTEL	room	270.0	4401.	2709.
4531	2107	LIGHT INDUSTRIAL LRG	ksf	725.0	7032.	5842.
4531	2109	INDUSTRIAL PARK	ksf	777.0	15152.	12588.
4531	2111	SOLAR FIELD	site	1.0	6.	5.
4531	4121	PARK & RIDE	other	1.0	517.	396.
4531	5005	SPECIALTY COMMERCIAL	ksf	14.3	17632.	12479.
4531	5011	HIGH T/O REST	ksf	15.8	87.	63.
4531	5012	COMMUNITY COMMERCIAL	ksf	182.9	19735.	13965.
4531	5016	GAS STATION	other	1.0	1345.	979.
4531	5019	TRUCK & SOTRAGE	other	1.0	1265.	921.
4531	6021	COMMERCIAL OFFICE	other	1.0	3202.	2466.
4531	6111	AIR&SPACE MUSEUM	other	1.0	1078.	731.
4531		TOTAL			71452.	53145.
4535	101	SINGLE FAMILY	du	1069.0	15572.	10869.
4535	107	MULTI-FAMILY	du	330.0	3762.	2641.
4535	7601	ACTIVE PARK	acre	5.3	352.	232.
4535		TOTAL			19686.	13742.
4537	107	MULTI-FAMILY	du	1016.0	11582.	8131.
4537	5013	NEIGHBORHOOD COMMERCIAL	ksf	33.2	5627.	3983.
4537		TOTAL			17210.	12114.
4540	2002	HEAVY INDUSTRY	ksf	1960.2	9409.	7937.
4540	2107	LIGHT INDUSTRIAL LRG	ksf	1960.2	19014.	15796.
4540		TOTAL			28423.	23734.
4544	2107	LIGHT INDUSTRIAL LRG	ksf	1916.6	18591.	15445.
4544		TOTAL			18591.	15445.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4558	101	SINGLE FAMILY	du	123.0	1792.	1251.
4558	107	MULTI-FAMILY	du	630.0	7182.	5042.
4558	2113	WAREHOUSING	other	1.0	384.	322.
4558	7601	ACTIVE PARK	acre	4.9	326.	214.
4558		TOTAL			9684.	6829.
4564	107	MULTI-FAMILY	du	1578.0	17989.	12629.
4564	6806	ELEMENTARY SCHOOL	site	1.0	2117.	1183.
4564	7601	ACTIVE PARK	acre	15.0	998.	656.
4564		TOTAL			21104.	14469.
4573	5012	COMMUNITY COMMERCIAL	ksf	234.7	25324.	17920.
4573	6806	ELEMENTARY SCHOOL	site	2.0	4234.	2366.
4573		TOTAL			29558.	20286.
4579	101	SINGLE FAMILY	du	435.0	6337.	4423.
4579		TOTAL			6337.	4423.
4582	107	MULTI-FAMILY	du	110.0	1254.	880.
4582	6811	SENIOR HIGH SCHOOL	other	2400.0	9120.	4103.
4582		TOTAL			10374.	4984.
4583	101	SINGLE FAMILY	du	75.0	1093.	763.
4583	107	MULTI-FAMILY	du	340.0	3876.	2721.
4583	5012	COMMUNITY COMMERCIAL	ksf	248.3	26792.	18959.
4583		TOTAL			31760.	22442.
4584	5012	COMMUNITY COMMERCIAL	ksf	326.7	35251.	24945.
4584		TOTAL			35251.	24945.
4585	5012	COMMUNITY COMMERCIAL	ksf	271.7	29316.	20745.
4585		TOTAL			29316.	20745.
4586	2003	IBT-MANUFACTURE	ksf	53.9	259.	218.
4586	2106	IBT-INDUST PARK	ksf	161.6	1568.	1302.
4586	2108	IBT-BUSINESS PARK	ksf	107.7	2100.	1745.
4586	2110	IBT-WAREHOUSE	ksf	161.6	986.	827.
4586	6010	IBT- OFFICE	ksf	53.9	1369.	1054.
4586		TOTAL			6281.	5146.
4588	2003	IBT-MANUFACTURE	ksf	126.5	607.	512.
4588	2106	IBT-INDUST PARK	ksf	379.4	3680.	3057.
4588	2108	IBT-BUSINESS PARK	ksf	252.9	4932.	4097.
4588	2110	IBT-WAREHOUSE	ksf	379.4	2314.	1941.
4588	6020	ibt- OFFICE	ksf	126.5	2619.	2016.
4588		TOTAL			14152.	11624.
4589	2003	IBT-MANUFACTURE	ksf	123.5	593.	500.
4589	2106	IBT-INDUST PARK	ksf	370.5	3594.	2986.
4589	2108	IBT-BUSINESS PARK	ksf	247.0	4816.	4001.
4589	2110	IBT-WAREHOUSE	ksf	370.5	2260.	1895.
4589	6020	ibt- OFFICE	ksf	123.5	2556.	1969.
4589		TOTAL			13820.	11351.

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Zone	Code	Name	Type	Amount	Person	Vehicle
		Land Use			Trips	
4590	2003	IBT-MANUFACTURE	ksf	141.1	677.	571.
4590	2106	IBT-INDUST PARK	ksf	423.4	4107.	3412.
4590	2108	IBT-BUSINESS PARK	ksf	282.3	5505.	4573.
4590	2110	IBT-WAREHOUSE	ksf	423.4	2583.	2166.
4590	6019	ibt- OFFICE	ksf	141.1	2836.	2184.
4590		TOTAL			15708.	12906.
4591	2109	INDUSTRIAL PARK	ksf	199.6	3892.	3234.
4591	5012	COMMUNITY COMMERCIAL	ksf	478.9	51673.	36566.
4591		TOTAL			55566.	39799.
4592	2003	IBT-MANUFACTURE	ksf	39.5	190.	160.
4592	2106	IBT-INDUST PARK	ksf	118.7	1151.	957.
4592	2108	IBT-BUSINESS PARK	ksf	79.1	1542.	1281.
4592	2110	IBT-WAREHOUSE	ksf	118.7	724.	607.
4592	6011	IBT- OFFICE	ksf	39.5	1007.	776.
4592		TOTAL			4615.	3781.
4593	2109	INDUSTRIAL PARK	ksf	217.4	4239.	3522.
4593	5012	COMMUNITY COMMERCIAL	ksf	521.7	56291.	39834.
4593		TOTAL			60531.	43356.
4594	2002	HEAVY INDUSTRY	ksf	149.9	720.	607.
4594	2107	LIGHT INDUSTRIAL LRG	ksf	1128.0	10942.	9090.
4594	4113	COMMUNICATION OR UTILITY	acre	2.1	7.	5.
4594		TOTAL			11668.	9702.
4595	2107	LIGHT INDUSTRIAL LRG	ksf	1337.1	12970.	10775.
4595		TOTAL			12970.	10775.
4604	101	SINGLE FAMILY	du	125.0	1821.	1271.
4604	107	MULTI-FAMILY	du	590.0	6726.	4722.
4604	6806	ELEMENTARY SCHOOL	site	1.0	2117.	1183.
4604	7601	ACTIVE PARK	acre	5.2	346.	228.
4604		TOTAL			11010.	7404.
4605	101	SINGLE FAMILY	du	59.0	859.	600.
4605	107	MULTI-FAMILY	du	40.0	456.	320.
4605	4113	COMMUNICATION OR UTILITY	acre	3.9	12.	10.
4605		TOTAL			1328.	930.
4606	2109	INDUSTRIAL PARK	ksf	778.2	15175.	12607.
4606		TOTAL			15175.	12607.
4607	2109	INDUSTRIAL PARK	ksf	991.9	19342.	16069.
4607		TOTAL			19342.	16069.
4608	2109	INDUSTRIAL PARK	ksf	179.2	3494.	2903.
4608	6810	JUNIOR COLLEGE	other	5000.0	11500.	9095.
4608		TOTAL			14994.	11998.
4609	2003	IBT-MANUFACTURE	ksf	66.7	320.	270.

Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4609	2106	IBT-INDUST PARK	ksf	200.1	1941.	1613.
4609	2108	IBT-BUSINESS PARK	ksf	133.4	2601.	2161.
4609	2110	IBT-WAREHOUSE	ksf	200.1	1221.	1024.
4609	6007	IBT- OFFICE	ksf	66.7	1607.	1238.
4609		TOTAL			7691.	6305.
4610	2003	IBT-MANUFACTURE	ksf	167.4	804.	678.
4610	2106	IBT-INDUST PARK	ksf	502.3	4872.	4048.
4610	2108	IBT-BUSINESS PARK	ksf	334.9	6531.	5425.
4610	2110	IBT-WAREHOUSE	ksf	502.3	3064.	2569.
4610	6018	ibt- OFFICE	ksf	167.4	3231.	2488.
4610		TOTAL			18501.	15208.
4611	2109	INDUSTRIAL PARK	ksf	1417.9	27649.	22970.
4611		TOTAL			27649.	22970.
4617	101	SINGLE FAMILY	du	765.0	11144.	7778.
4617	107	MULTI-FAMILY	du	2025.0	23085.	16207.
4617	5012	COMMUNITY COMMERCIAL	ksf	47.0	5071.	3589.
4617	6005	LOW RISE OFFICE	ksf	98.0	2038.	1570.
4617	6806	ELEMENTARY SCHOOL	site	2.0	4234.	2366.
4617	7601	ACTIVE PARK	acre	20.7	1377.	906.
4617		TOTAL			46949.	32415.
4618	107	MULTI-FAMILY	du	265.0	3021.	2121.
4618	7601	ACTIVE PARK	acre	5.8	386.	254.
4618		TOTAL			3407.	2375.
4623	107	MULTI-FAMILY	du	344.0	3922.	2753.
4623	108	MULTI-FAMILY	du	2741.0	23573.	17041.
4623	5012	COMMUNITY COMMERCIAL	ksf	85.7	9247.	7036.
4623	6806	ELEMENTARY SCHOOL	site	1.0	2117.	1183.
4623	7601	ACTIVE PARK	acre	12.6	838.	551.
4623		TOTAL			39696.	28254.
4624	2109	INDUSTRIAL PARK	ksf	1178.9	22989.	19098.
4624	6811	SENIOR HIGH SCHOOL	other	2400.0	9120.	4103.
4624	7601	ACTIVE PARK	acre	39.4	2620.	1724.
4624		TOTAL			34729.	24926.
4625	2003	IBT-MANUFACTURE	ksf	234.3	1125.	949.
4625	2106	IBT-INDUST PARK	ksf	702.9	6818.	5664.
4625	2108	IBT-BUSINESS PARK	ksf	468.6	9138.	7591.
4625	2110	IBT-WAREHOUSE	ksf	702.9	4288.	3596.
4625	6017	ibt- OFFICE	ksf	234.3	4147.	3194.
4625		TOTAL			25515.	20994.
4626	2003	IBT-MANUFACTURE	ksf	333.8	1602.	1352.
4626	2106	IBT-INDUST PARK	ksf	1001.5	9715.	8071.
4626	2108	IBT-BUSINESS PARK	ksf	667.6	13018.	10815.
4626	2110	IBT-WAREHOUSE	ksf	1001.5	6109.	5123.
4626	6014	ibt- OFFICE	ksf	333.8	5441.	4190.
4626		TOTAL			35885.	29550.

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Zone	Code	Name	Type	Amount	Person	Vehicle
		Land Use			Trips	
4627	2003	IBT-MANUFACTURE	ksf	345.2	1657.	1398.
4627	2106	IBT-INDUST PARK	ksf	1035.5	10044.	8345.
4627	2108	IBT-BUSINESS PARK	ksf	690.3	13461.	11183.
4627	2110	IBT-WAREHOUSE	ksf	1035.5	6317.	5297.
4627	6013	ibt- OFFICE	ksf	345.2	5592.	4306.
4627		TOTAL			37071.	30529.
4628	2003	IBT-MANUFACTURE	ksf	281.4	1351.	1139.
4628	2106	IBT-INDUST PARK	ksf	844.2	8189.	6803.
4628	2108	IBT-BUSINESS PARK	ksf	562.8	10975.	9117.
4628	2110	IBT-WAREHOUSE	ksf	844.2	5150.	4318.
4628	6015	ibt- OFFICE	ksf	281.4	4756.	3662.
4628		TOTAL			30419.	25040.
4629	2107	LIGHT INDUSTRIAL LRG	ksf	1086.8	10542.	8758.
4629		TOTAL			10542.	8758.
4630	2003	IBT-MANUFACTURE	ksf	69.6	334.	282.
4630	2106	IBT-INDUST PARK	ksf	208.9	2026.	1683.
4630	2108	IBT-BUSINESS PARK	ksf	139.3	2716.	2257.
4630	2110	IBT-WAREHOUSE	ksf	208.9	1274.	1069.
4630	5012	COMMUNITY COMMERCIAL	ksf	95.4	10294.	7284.
4630	6008	IBT- OFFICE	ksf	69.6	1684.	1297.
4630		TOTAL			18329.	13872.
4631	2107	LIGHT INDUSTRIAL LRG	ksf	1287.4	12488.	10375.
4631		TOTAL			12488.	10375.
4639	101	SINGLE FAMILY	du	435.0	6337.	4423.
4639	107	MULTI-FAMILY	du	1150.0	13110.	9204.
4639	5012	COMMUNITY COMMERCIAL	ksf	47.0	5071.	3589.
4639	6005	LOW RISE OFFICE	ksf	98.0	2038.	1570.
4639	7601	ACTIVE PARK	acre	13.6	904.	595.
4639		TOTAL			27461.	19380.
4643	2107	LIGHT INDUSTRIAL LRG	ksf	83.0	805.	669.
4643	5012	COMMUNITY COMMERCIAL	ksf	352.2	38002.	26892.
4643		TOTAL			38807.	27561.
4644	2107	LIGHT INDUSTRIAL LRG	ksf	2156.4	20917.	17377.
4644		TOTAL			20917.	17377.
4647	2003	IBT-MANUFACTURE	ksf	59.0	283.	239.
4647	2106	IBT-INDUST PARK	ksf	177.1	1718.	1427.
4647	2107	LIGHT INDUSTRIAL LRG	ksf	65.3	633.	526.
4647	2108	IBT-BUSINESS PARK	ksf	118.1	2303.	1913.
4647	2110	IBT-WAREHOUSE	ksf	177.1	1080.	906.
4647	5012	COMMUNITY COMMERCIAL	ksf	158.5	17102.	12102.
4647	6009	IBT- OFFICE	ksf	59.0	1469.	1131.
4647		TOTAL			24589.	18245.
4649	2002	HEAVY INDUSTRY	ksf	1887.7	9061.	7644.
4649		TOTAL			9061.	7644.

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Zone	Code	Name	Type	Amount	Person	Vehicle
		Land Use			Trips	
4650	2002	HEAVY INDUSTRY	ksf	3039.0	14587.	12306.
4650		TOTAL			14587.	12306.
4652	1505	CORSS BORDER FAC-HOTEL	other	1.0	4893.	3012.
4652	2003	IBT-MANUFACTURE	ksf	176.7	848.	716.
4652	2106	IBT-INDUST PARK	ksf	530.0	5141.	4271.
4652	2108	IBT-BUSINESS PARK	ksf	353.4	6891.	5725.
4652	2110	IBT-WAREHOUSE	ksf	530.0	3233.	2711.
4652	2112	CROSS BORDER FAC-INDRK	other	1.0	4063.	3375.
4652	4101	COMMERCIAL AIRPORT	unique	0.0	42907.	27761.
4652	5017	CROSS BORDER GAS STATION	other	1.0	2462.	1793.
4652	5018	CROSS BORDER RETAIL	other	1.0	4302.	3132.
4652	6016	ibt- OFFICE	ksf	269.9	4642.	3575.
4652		TOTAL			79383.	56071.
4653	2003	IBT-MANUFACTURE	ksf	100.1	480.	405.
4653	2106	IBT-INDUST PARK	ksf	300.2	2912.	2419.
4653	2108	IBT-BUSINESS PARK	ksf	200.2	3904.	3243.
4653	2110	IBT-WAREHOUSE	ksf	300.2	1831.	1536.
4653	6006	IBT- OFFICE	ksf	100.1	2192.	1688.
4653	6110	FIRE OR POLICE STATION	acre	10.9	295.	218.
4653		TOTAL			11615.	9509.
4654	2003	IBT-MANUFACTURE	ksf	359.4	1725.	1455.
4654	2106	IBT-INDUST PARK	ksf	1078.1	10458.	8688.
4654	2108	IBT-BUSINESS PARK	ksf	718.7	14015.	11643.
4654	2110	IBT-WAREHOUSE	ksf	1078.1	6576.	5515.
4654	6012	ibt- OFFICE	ksf	359.4	5750.	4428.
4654		TOTAL			38524.	31729.
4659	2004	OMPOE IN/OUT	ksf	6000.0	28800.	24296.
4659		TOTAL			28800.	24296.
4683	108	MULTI-FAMILY	du	1408.0	12109.	8501.
4683	5012	COMMUNITY COMMERCIAL	ksf	54.0	5827.	4823.
4683	7601	ACTIVE PARK	acre	3.5	233.	153.
4683		TOTAL			18168.	13477.

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Appendix C
Traffic Count Data

24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 46. Otay Mesa Road South of Beyer Blvd

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

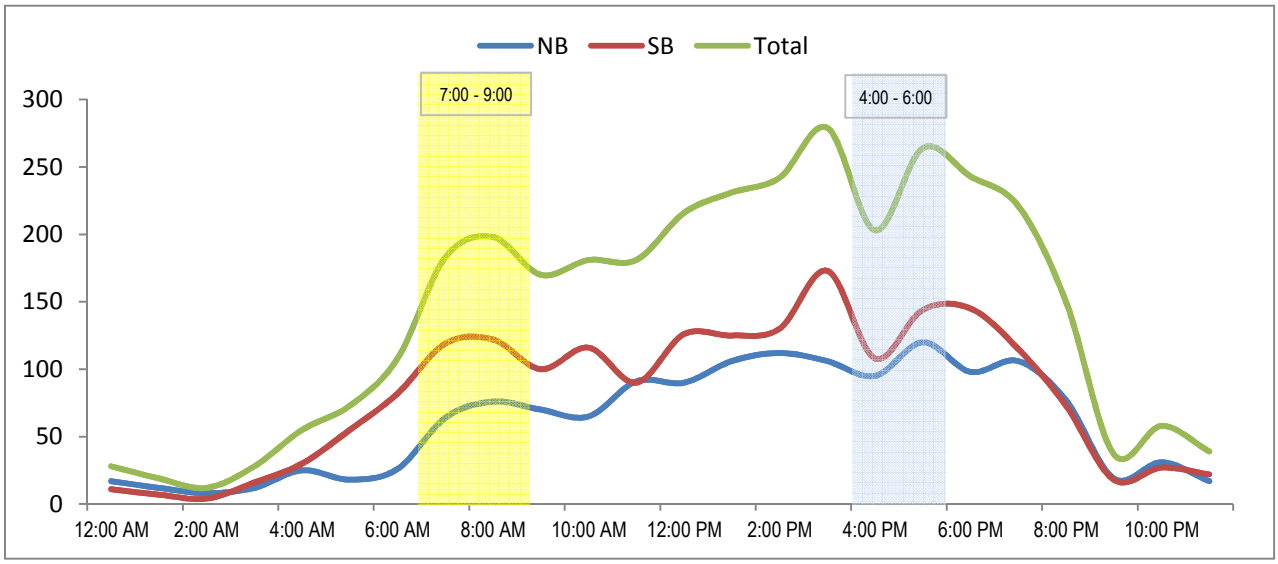
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				3,419			
Time	Hourly Volume			Time	Hourly Volume		
	NB	SB	Total		NB	SB	Total
12:00 AM - 1:00 AM	17	11	28	12:00 PM - 1:00 PM	90	126	216
1:00 AM - 2:00 AM	12	7	19	1:00 PM - 2:00 PM	106	125	231
2:00 AM - 3:00 AM	8	4	12	2:00 PM - 3:00 PM	112	130	242
3:00 AM - 4:00 AM	12	16	28	3:00 PM - 4:00 PM	106	173	279
4:00 AM - 5:00 AM	25	30	55	4:00 PM - 5:00 PM	95	108	203
5:00 AM - 6:00 AM	18	55	73	5:00 PM - 6:00 PM	120	144	264
6:00 AM - 7:00 AM	26	82	108	6:00 PM - 7:00 PM	98	145	243
7:00 AM - 8:00 AM	64	119	183	7:00 PM - 8:00 PM	106	115	221
8:00 AM - 9:00 AM	76	122	198	8:00 PM - 9:00 PM	77	73	150
9:00 AM - 10:00 AM	70	100	170	9:00 PM - 10:00 PM	19	18	37
10:00 AM - 11:00 AM	65	116	181	10:00 PM - 11:00 PM	31	27	58
11:00 AM - 12:00 PM	91	90	181	11:00 PM - 12:00 AM	17	22	39
Total	**484**	**752**	**1,236**	**Total**	**977**	**1,206**	**2,183**

24-Hour	NB	Volume	1,461	24-Hour	SB	Volume	1,958



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

CHEN RYAN

Location: 9. Ocean View Hills Parkway Between Starfish Way and Del Sol Bvld

Orientation: *North-South*

Date of Count: *Thursday, October 08, 2015*

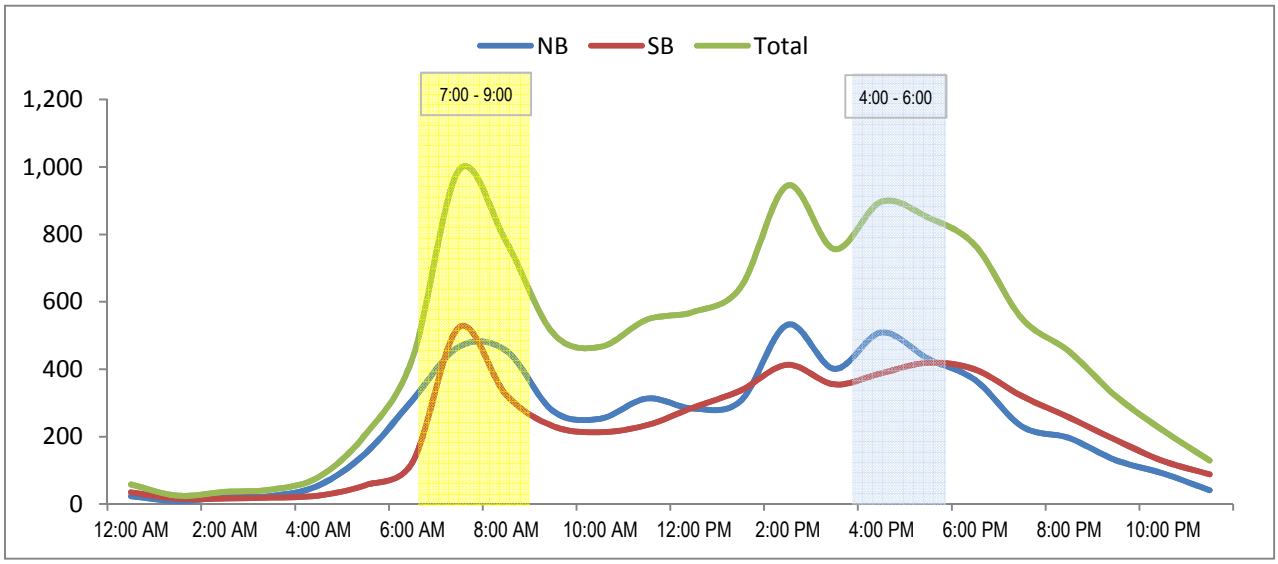
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				11,269			
Time	Hourly Volume			Time	Hourly Volume		
	NB	SB	Total		NB	SB	Total
12:00 AM - 1:00 AM	23	35	58	12:00 PM - 1:00 PM	283	287	570
1:00 AM - 2:00 AM	9	16	25	1:00 PM - 2:00 PM	306	337	643
2:00 AM - 3:00 AM	20	16	36	2:00 PM - 3:00 PM	532	413	945
3:00 AM - 4:00 AM	24	19	43	3:00 PM - 4:00 PM	401	355	756
4:00 AM - 5:00 AM	55	25	80	4:00 PM - 5:00 PM	509	388	897
5:00 AM - 6:00 AM	150	56	206	5:00 PM - 6:00 PM	431	419	850
6:00 AM - 7:00 AM	308	123	431	6:00 PM - 7:00 PM	368	399	767
7:00 AM - 8:00 AM	467	525	992	7:00 PM - 8:00 PM	230	320	550
8:00 AM - 9:00 AM	455	324	779	8:00 PM - 9:00 PM	196	257	453
9:00 AM - 10:00 AM	276	231	507	9:00 PM - 10:00 PM	130	190	320
10:00 AM - 11:00 AM	253	213	466	10:00 PM - 11:00 PM	91	128	219
11:00 AM - 12:00 PM	313	234	547	11:00 PM - 12:00 AM	41	88	129
Total	**2,353**	**1,817**	**4,170**	**Total**	**3,518**	**3,581**	**7,099**

24-Hour	NB	Volume	5,871	24-Hour	SB	Volume	5,398



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 10. Ocean View Hills Parkway Between Del Sol Blvd and Otay Mesa Road

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

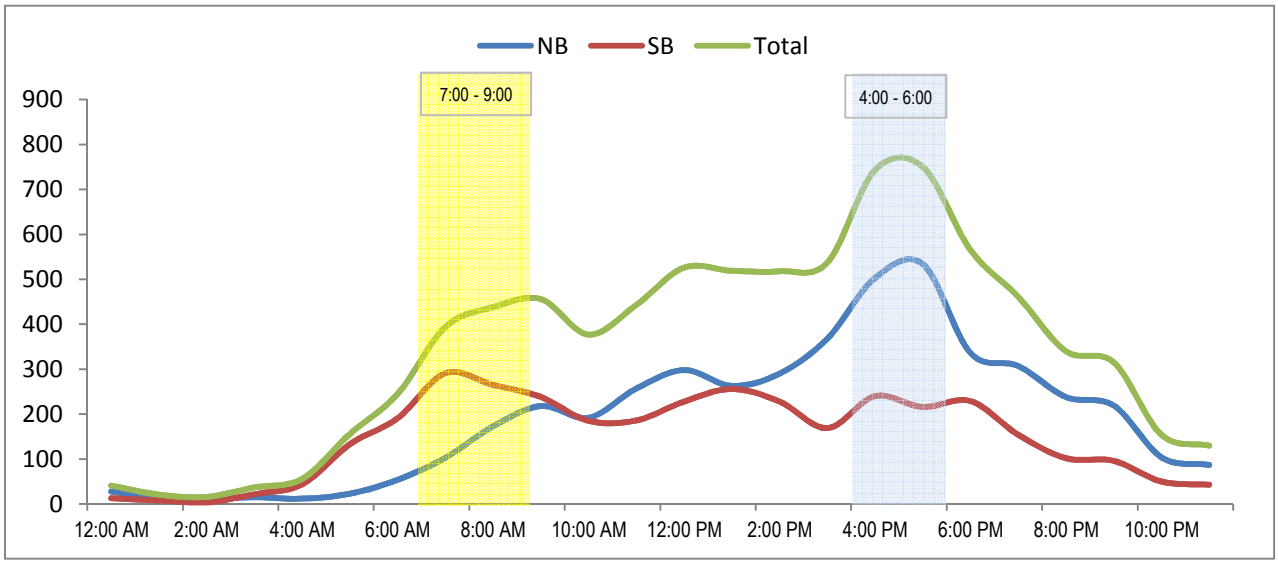
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				8,238			
Time	Hourly Volume			Time	Hourly Volume		
	NB	SB	Total		NB	SB	Total
12:00 AM - 1:00 AM	28	13	41	12:00 PM - 1:00 PM	298	228	526
1:00 AM - 2:00 AM	13	8	21	1:00 PM - 2:00 PM	263	256	519
2:00 AM - 3:00 AM	12	4	16	2:00 PM - 3:00 PM	290	228	518
3:00 AM - 4:00 AM	15	22	37	3:00 PM - 4:00 PM	368	169	537
4:00 AM - 5:00 AM	12	44	56	4:00 PM - 5:00 PM	503	240	743
5:00 AM - 6:00 AM	23	133	156	5:00 PM - 6:00 PM	534	216	750
6:00 AM - 7:00 AM	54	191	245	6:00 PM - 7:00 PM	336	229	565
7:00 AM - 8:00 AM	103	291	394	7:00 PM - 8:00 PM	307	154	461
8:00 AM - 9:00 AM	173	265	438	8:00 PM - 9:00 PM	238	102	340
9:00 AM - 10:00 AM	218	238	456	9:00 PM - 10:00 PM	219	96	315
10:00 AM - 11:00 AM	192	185	377	10:00 PM - 11:00 PM	104	50	154
11:00 AM - 12:00 PM	257	186	443	11:00 PM - 12:00 AM	87	43	130
Total	**1,100**	**1,580**	**2,680**	**Total**	**3,547**	**2,011**	**5,558**

24-Hour	NB	Volume	4,647	24-Hour	SB	Volume	3,591



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 23. Caliente Avenue Between I905 Ramps

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

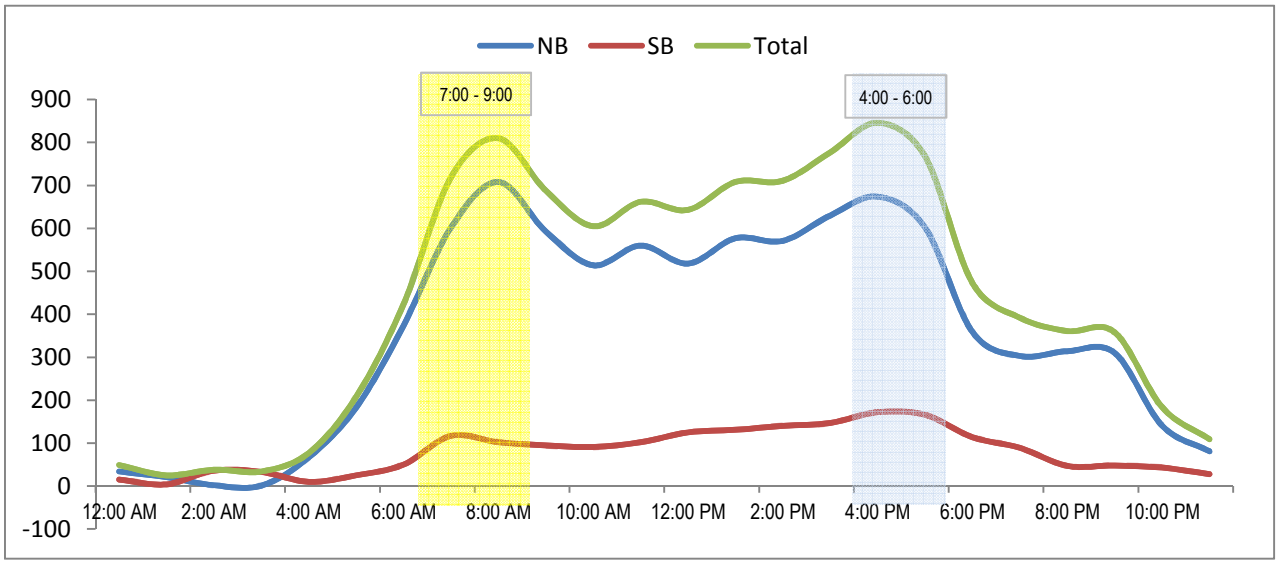
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume 10,669

Time	Hourly Volume NB	SB	Total	Time	Hourly Volume NB	SB	Total
12:00 AM - 1:00 AM	34	15	49	12:00 PM - 1:00 PM	518	125	643
1:00 AM - 2:00 AM	21	4	25	1:00 PM - 2:00 PM	577	131	708
2:00 AM - 3:00 AM	2	36	38	2:00 PM - 3:00 PM	571	140	711
3:00 AM - 4:00 AM	1	33	34	3:00 PM - 4:00 PM	630	147	777
4:00 AM - 5:00 AM	67	10	77	4:00 PM - 5:00 PM	674	172	846
5:00 AM - 6:00 AM	183	25	208	5:00 PM - 6:00 PM	602	166	768
6:00 AM - 7:00 AM	374	50	424	6:00 PM - 7:00 PM	359	114	473
7:00 AM - 8:00 AM	602	117	719	7:00 PM - 8:00 PM	303	89	392
8:00 AM - 9:00 AM	708	102	810	8:00 PM - 9:00 PM	314	47	361
9:00 AM - 10:00 AM	593	95	688	9:00 PM - 10:00 PM	310	48	358
10:00 AM - 11:00 AM	514	91	605	10:00 PM - 11:00 PM	141	43	184
11:00 AM - 12:00 PM	560	102	662	11:00 PM - 12:00 AM	81	28	109
Total	**3,659**	**680**	**4,339**	**Total**	**5,080**	**1,250**	**6,330**

24-Hour NB Volume 8,739 **24-Hour SB Volume 1,930**



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 24. Caliente Avenue Between I905 EB Ramps and Airway Road

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

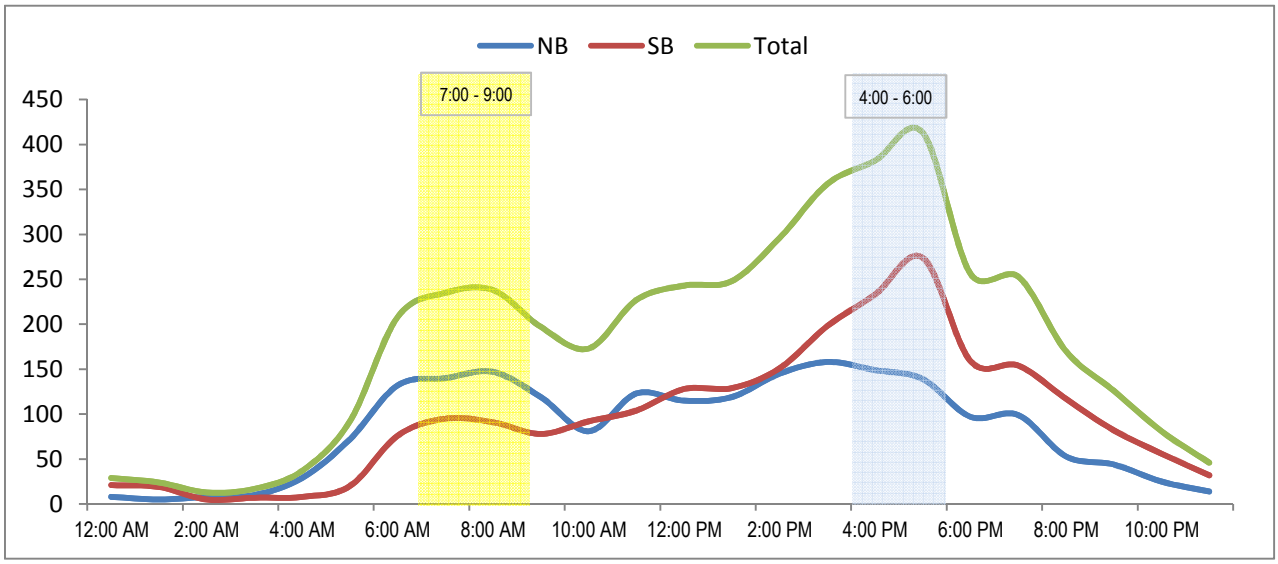
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				4,360				
Time	Hourly Volume			Time	Hourly Volume			
	NB	SB	Total		NB	SB	Total	
12:00 AM - 1:00 AM	8	21	29	12:00 PM - 1:00 PM	115	128	243	
1:00 AM - 2:00 AM	5	19	24	1:00 PM - 2:00 PM	119	129	248	
2:00 AM - 3:00 AM	8	5	13	2:00 PM - 3:00 PM	145	151	296	
3:00 AM - 4:00 AM	10	7	17	3:00 PM - 4:00 PM	158	198	356	
4:00 AM - 5:00 AM	29	8	37	4:00 PM - 5:00 PM	149	233	382	
5:00 AM - 6:00 AM	72	20	92	5:00 PM - 6:00 PM	139	274	413	
6:00 AM - 7:00 AM	132	76	208	6:00 PM - 7:00 PM	97	159	256	
7:00 AM - 8:00 AM	140	95	235	7:00 PM - 8:00 PM	99	154	253	
8:00 AM - 9:00 AM	147	91	238	8:00 PM - 9:00 PM	53	117	170	
9:00 AM - 10:00 AM	119	78	197	9:00 PM - 10:00 PM	44	82	126	
10:00 AM - 11:00 AM	81	92	173	10:00 PM - 11:00 PM	25	56	81	
11:00 AM - 12:00 PM	123	104	227	11:00 PM - 12:00 AM	14	32	46	
Total	**874**	**616**	**1,490**	**Total**	**1,157**	**1,713**	**2,870**	

24-Hour	NB	Volume	2,031	24-Hour	SB	Volume	2,329



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 25. Caliente Avenue South of Airway Road

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

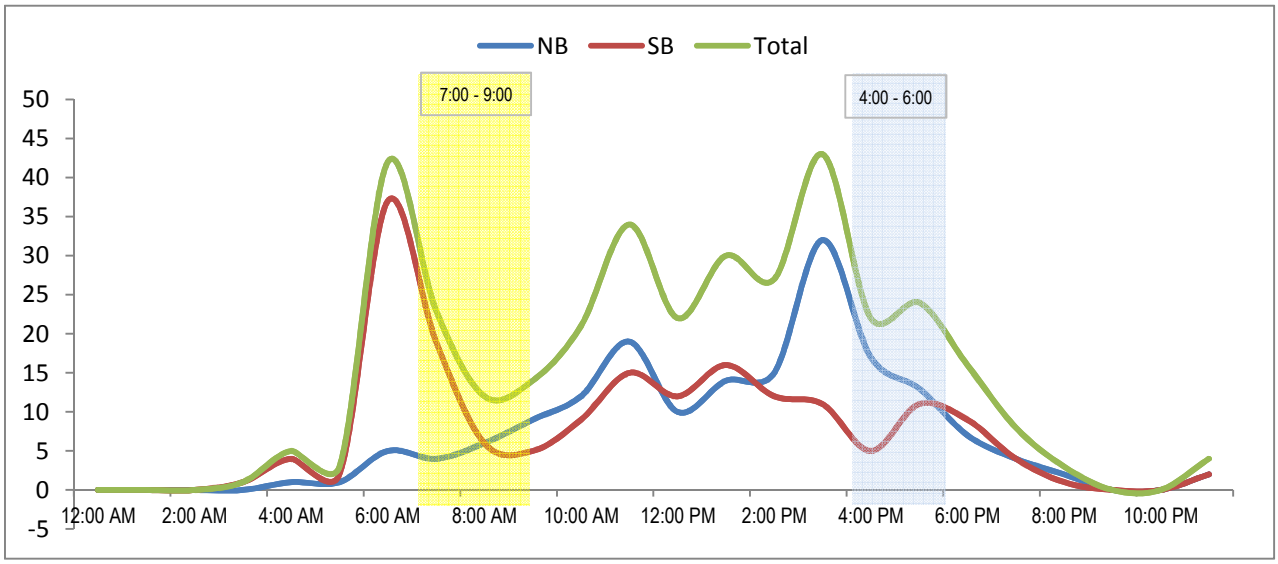
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				354			
Time	Hourly Volume			Time	Hourly Volume		
	NB	SB	Total		NB	SB	Total
12:00 AM - 1:00 AM	0	0	0	12:00 PM - 1:00 PM	10	12	22
1:00 AM - 2:00 AM	0	0	0	1:00 PM - 2:00 PM	14	16	30
2:00 AM - 3:00 AM	0	0	0	2:00 PM - 3:00 PM	15	12	27
3:00 AM - 4:00 AM	0	1	1	3:00 PM - 4:00 PM	32	11	43
4:00 AM - 5:00 AM	1	4	5	4:00 PM - 5:00 PM	17	5	22
5:00 AM - 6:00 AM	1	2	3	5:00 PM - 6:00 PM	13	11	24
6:00 AM - 7:00 AM	5	37	42	6:00 PM - 7:00 PM	7	9	16
7:00 AM - 8:00 AM	4	19	23	7:00 PM - 8:00 PM	4	4	8
8:00 AM - 9:00 AM	6	6	12	8:00 PM - 9:00 PM	2	1	3
9:00 AM - 10:00 AM	9	5	14	9:00 PM - 10:00 PM	0	0	0
10:00 AM - 11:00 AM	12	9	21	10:00 PM - 11:00 PM	0	0	0
11:00 AM - 12:00 PM	19	15	34	11:00 PM - 12:00 AM	2	2	4
Total	**57**	**98**	**155**	**Total**	**116**	**83**	**199**

24-Hour	NB	Volume	173	24-Hour	SB	Volume	181



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

CHEN RYAN

Location: 47. Innovative Drive Between Progressive and Otay Mesa

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

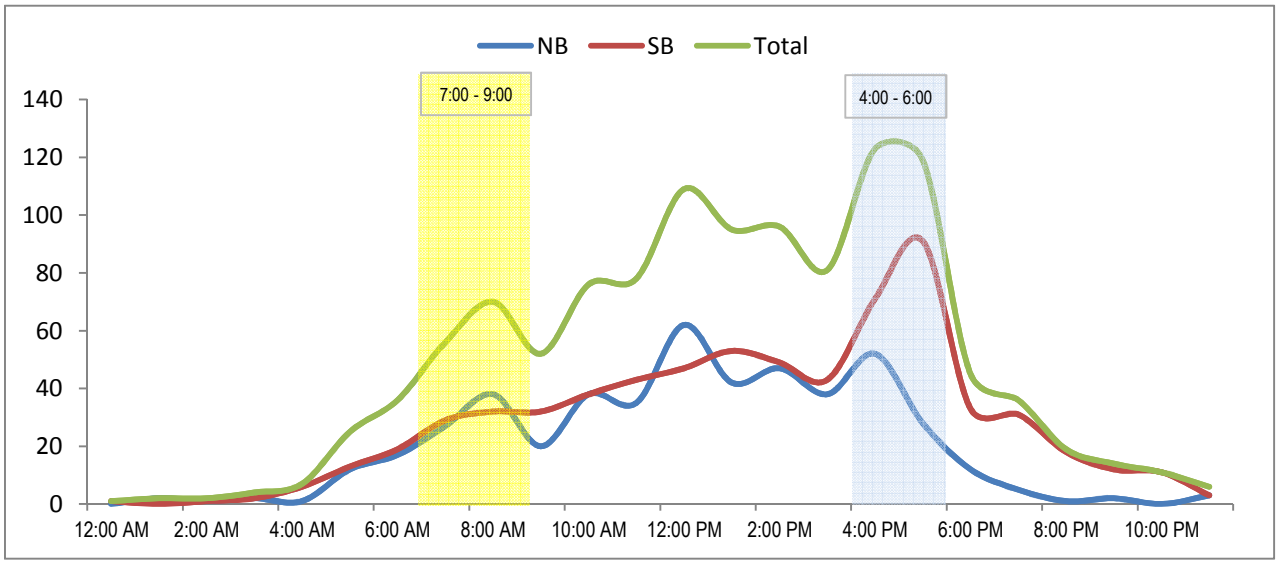
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				1,163			
Time	Hourly Volume			Time	Hourly Volume		
	NB	SB	Total		NB	SB	Total
12:00 AM - 1:00 AM	0	1	1	12:00 PM - 1:00 PM	62	47	109
1:00 AM - 2:00 AM	2	0	2	1:00 PM - 2:00 PM	42	53	95
2:00 AM - 3:00 AM	1	1	2	2:00 PM - 3:00 PM	47	49	96
3:00 AM - 4:00 AM	2	2	4	3:00 PM - 4:00 PM	38	43	81
4:00 AM - 5:00 AM	1	6	7	4:00 PM - 5:00 PM	52	71	123
5:00 AM - 6:00 AM	12	13	25	5:00 PM - 6:00 PM	28	91	119
6:00 AM - 7:00 AM	17	19	36	6:00 PM - 7:00 PM	12	33	45
7:00 AM - 8:00 AM	27	29	56	7:00 PM - 8:00 PM	5	31	36
8:00 AM - 9:00 AM	38	32	70	8:00 PM - 9:00 PM	1	18	19
9:00 AM - 10:00 AM	20	32	52	9:00 PM - 10:00 PM	2	12	14
10:00 AM - 11:00 AM	38	38	76	10:00 PM - 11:00 PM	0	11	11
11:00 AM - 12:00 PM	35	43	78	11:00 PM - 12:00 AM	3	3	6
Total	**193**	**216**	**409**	**Total**	**292**	**462**	**754**

24-Hour	NB	Volume	485	24-Hour	SB	Volume	678



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

CHEN RYAN

Location: 4. Heritage Road Between Avenida de las Vistas and Datsun Street

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

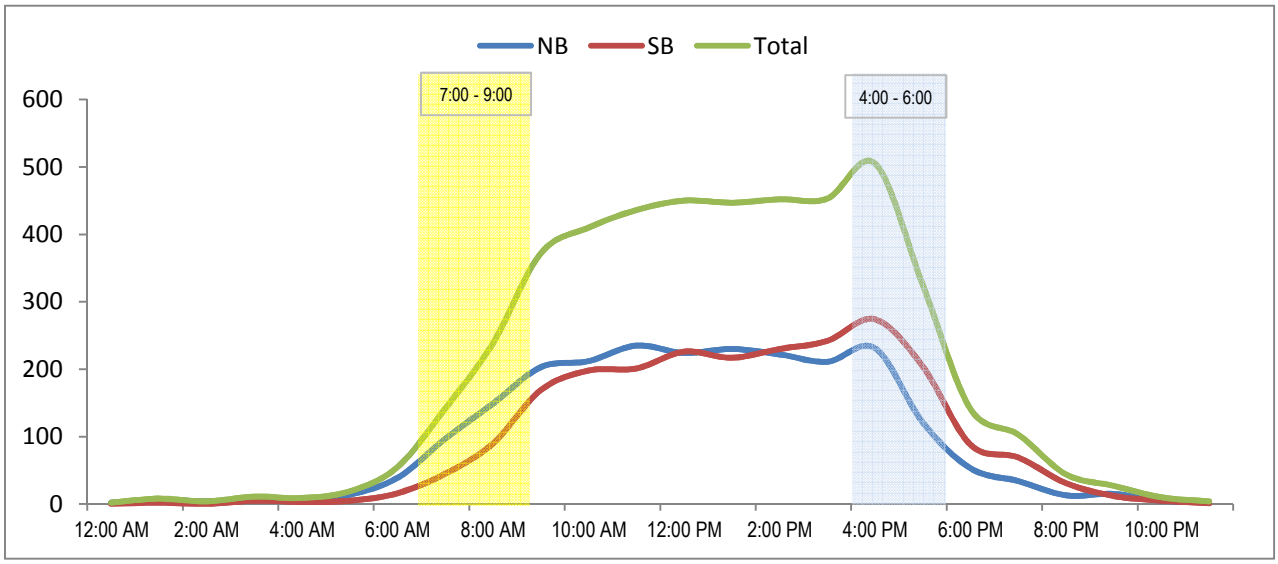
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				4,668				
Time	Hourly Volume			Time	Hourly Volume		
	NB	SB	Total		NB	SB	Total
12:00 AM - 1:00 AM	2	0	2	12:00 PM - 1:00 PM	224	226	450
1:00 AM - 2:00 AM	6	2	8	1:00 PM - 2:00 PM	230	217	447
2:00 AM - 3:00 AM	4	0	4	2:00 PM - 3:00 PM	222	230	452
3:00 AM - 4:00 AM	6	5	11	3:00 PM - 4:00 PM	211	242	453
4:00 AM - 5:00 AM	6	3	9	4:00 PM - 5:00 PM	231	274	505
5:00 AM - 6:00 AM	14	5	19	5:00 PM - 6:00 PM	121	204	325
6:00 AM - 7:00 AM	39	16	55	6:00 PM - 7:00 PM	53	88	141
7:00 AM - 8:00 AM	97	45	142	7:00 PM - 8:00 PM	34	69	103
8:00 AM - 9:00 AM	149	90	239	8:00 PM - 9:00 PM	13	31	44
9:00 AM - 10:00 AM	203	169	372	9:00 PM - 10:00 PM	15	12	27
10:00 AM - 11:00 AM	212	198	410	10:00 PM - 11:00 PM	5	5	10
11:00 AM - 12:00 PM	235	201	436	11:00 PM - 12:00 AM	3	1	4
Total	**973**	**734**	**1,707**	**Total**	**1,362**	**1,599**	**2,961**

24-Hour	NB	Volume	2,335	24-Hour	SB	Volume	2,333



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 5. Heritage Road Between Datsun Street and Otay Mesa Road

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

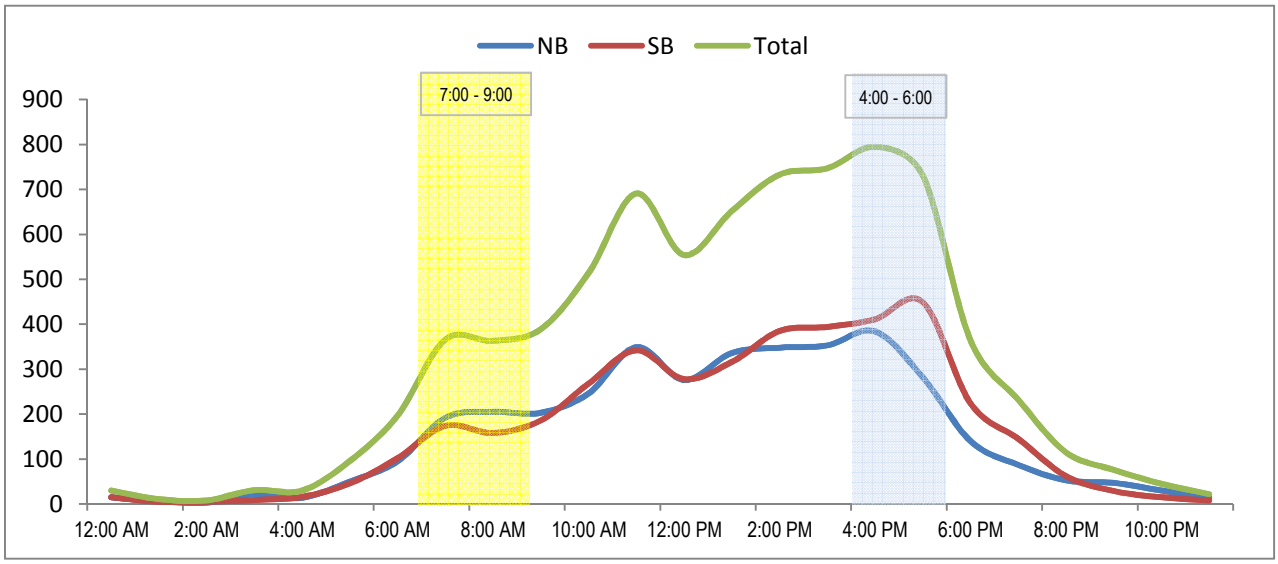
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				7,792				
Time	Hourly Volume				Time	Hourly Volume		
	NB	SB	Total			NB	SB	Total
12:00 AM - 1:00 AM	15	15	30		12:00 PM - 1:00 PM	276	278	554
1:00 AM - 2:00 AM	6	5	11		1:00 PM - 2:00 PM	336	316	652
2:00 AM - 3:00 AM	3	5	8		2:00 PM - 3:00 PM	348	385	733
3:00 AM - 4:00 AM	22	9	31		3:00 PM - 4:00 PM	353	394	747
4:00 AM - 5:00 AM	14	16	30		4:00 PM - 5:00 PM	384	411	795
5:00 AM - 6:00 AM	50	46	96		5:00 PM - 6:00 PM	282	449	731
6:00 AM - 7:00 AM	95	102	197		6:00 PM - 7:00 PM	140	224	364
7:00 AM - 8:00 AM	192	174	366		7:00 PM - 8:00 PM	87	145	232
8:00 AM - 9:00 AM	205	158	363		8:00 PM - 9:00 PM	53	62	115
9:00 AM - 10:00 AM	203	186	389		9:00 PM - 10:00 PM	47	29	76
10:00 AM - 11:00 AM	246	268	514		10:00 PM - 11:00 PM	30	15	45
11:00 AM - 12:00 PM	349	342	691		11:00 PM - 12:00 AM	14	8	22
Total	**1,400**	**1,326**	**2,726**		**Total**	**2,350**	**2,716**	**5,066**

24-Hour	NB	Volume	3,750	24-Hour	SB	Volume	4,042



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 6. Heritage Road Between Otay Mesa Road and Camino Maquiladora

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

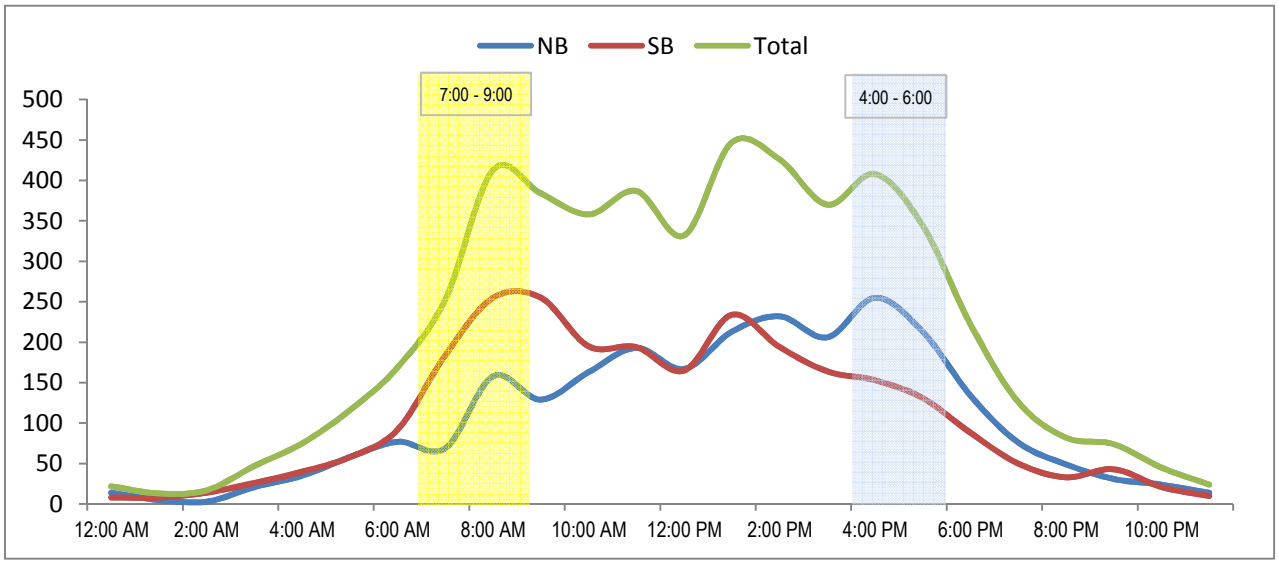
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume 5,154

Time	Hourly Volume NB	SB	Total	Time	Hourly Volume NB	SB	Total
12:00 AM - 1:00 AM	14	8	22	12:00 PM - 1:00 PM	167	165	332
1:00 AM - 2:00 AM	5	8	13	1:00 PM - 2:00 PM	213	234	447
2:00 AM - 3:00 AM	3	14	17	2:00 PM - 3:00 PM	232	194	426
3:00 AM - 4:00 AM	21	26	47	3:00 PM - 4:00 PM	206	164	370
4:00 AM - 5:00 AM	35	40	75	4:00 PM - 5:00 PM	255	153	408
5:00 AM - 6:00 AM	58	58	116	5:00 PM - 6:00 PM	213	131	344
6:00 AM - 7:00 AM	77	92	169	6:00 PM - 7:00 PM	134	88	222
7:00 AM - 8:00 AM	69	184	253	7:00 PM - 8:00 PM	76	50	126
8:00 AM - 9:00 AM	158	255	413	8:00 PM - 9:00 PM	49	33	82
9:00 AM - 10:00 AM	129	255	384	9:00 PM - 10:00 PM	31	43	74
10:00 AM - 11:00 AM	163	195	358	10:00 PM - 11:00 PM	24	21	45
11:00 AM - 12:00 PM	193	194	387	11:00 PM - 12:00 AM	14	10	24
Total	**925**	**1,329**	**2,254**	**Total**	**1,614**	**1,286**	**2,900**

24-Hour NB Volume 2,539 **24-Hour SB Volume 2,615**



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 7. Heritage Road Between Camino Maquiladora and Gateway Park Drive

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

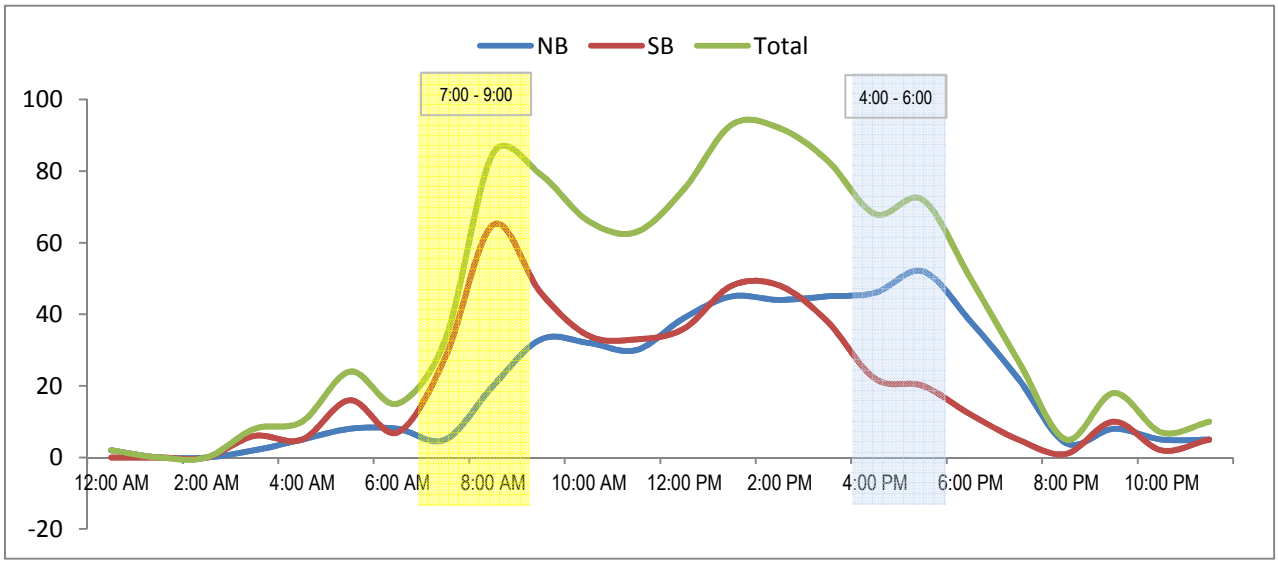
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume 985

Time	Hourly Volume NB	SB	Total	Time	Hourly Volume NB	SB	Total
12:00 AM - 1:00 AM	2	0	2	12:00 PM - 1:00 PM	39	36	75
1:00 AM - 2:00 AM	0	0	0	1:00 PM - 2:00 PM	45	48	93
2:00 AM - 3:00 AM	0	0	0	2:00 PM - 3:00 PM	44	48	92
3:00 AM - 4:00 AM	2	6	8	3:00 PM - 4:00 PM	45	38	83
4:00 AM - 5:00 AM	5	5	10	4:00 PM - 5:00 PM	46	22	68
5:00 AM - 6:00 AM	8	16	24	5:00 PM - 6:00 PM	52	20	72
6:00 AM - 7:00 AM	8	7	15	6:00 PM - 7:00 PM	38	12	50
7:00 AM - 8:00 AM	5	28	33	7:00 PM - 8:00 PM	22	5	27
8:00 AM - 9:00 AM	20	65	85	8:00 PM - 9:00 PM	4	1	5
9:00 AM - 10:00 AM	33	46	79	9:00 PM - 10:00 PM	8	10	18
10:00 AM - 11:00 AM	32	34	66	10:00 PM - 11:00 PM	5	2	7
11:00 AM - 12:00 PM	30	33	63	11:00 PM - 12:00 AM	5	5	10
Total	**145**	**240**	**385**	**Total**	**353**	**247**	**600**

24-Hour NB Volume 498 **24-Hour SB Volume 487**



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 8. Heritage Road South of Gateway Park Drive

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

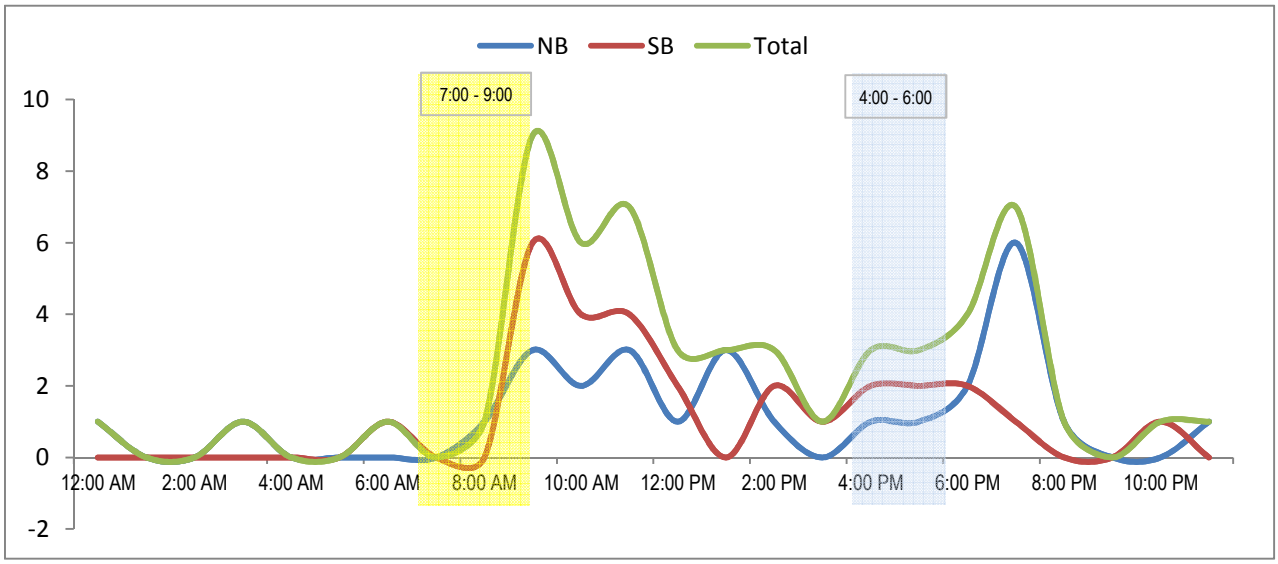
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume 56

Time	Hourly Volume NB	SB	Total	Time	Hourly Volume NB	SB	Total
12:00 AM - 1:00 AM	1	0	1	12:00 PM - 1:00 PM	1	2	3
1:00 AM - 2:00 AM	0	0	0	1:00 PM - 2:00 PM	3	0	3
2:00 AM - 3:00 AM	0	0	0	2:00 PM - 3:00 PM	1	2	3
3:00 AM - 4:00 AM	1	0	1	3:00 PM - 4:00 PM	0	1	1
4:00 AM - 5:00 AM	0	0	0	4:00 PM - 5:00 PM	1	2	3
5:00 AM - 6:00 AM	0	0	0	5:00 PM - 6:00 PM	1	2	3
6:00 AM - 7:00 AM	0	1	1	6:00 PM - 7:00 PM	2	2	4
7:00 AM - 8:00 AM	0	0	0	7:00 PM - 8:00 PM	6	1	7
8:00 AM - 9:00 AM	1	0	1	8:00 PM - 9:00 PM	1	0	1
9:00 AM - 10:00 AM	3	6	9	9:00 PM - 10:00 PM	0	0	0
10:00 AM - 11:00 AM	2	4	6	10:00 PM - 11:00 PM	0	1	1
11:00 AM - 12:00 PM	3	4	7	11:00 PM - 12:00 AM	1	0	1
Total	**11**	**15**	**26**	**Total**	**17**	**13**	**30**

24-Hour NB Volume 28 **24-Hour SB Volume 28**



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 33. Cactus Road Between Otay Mesa Road and Airway Road

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

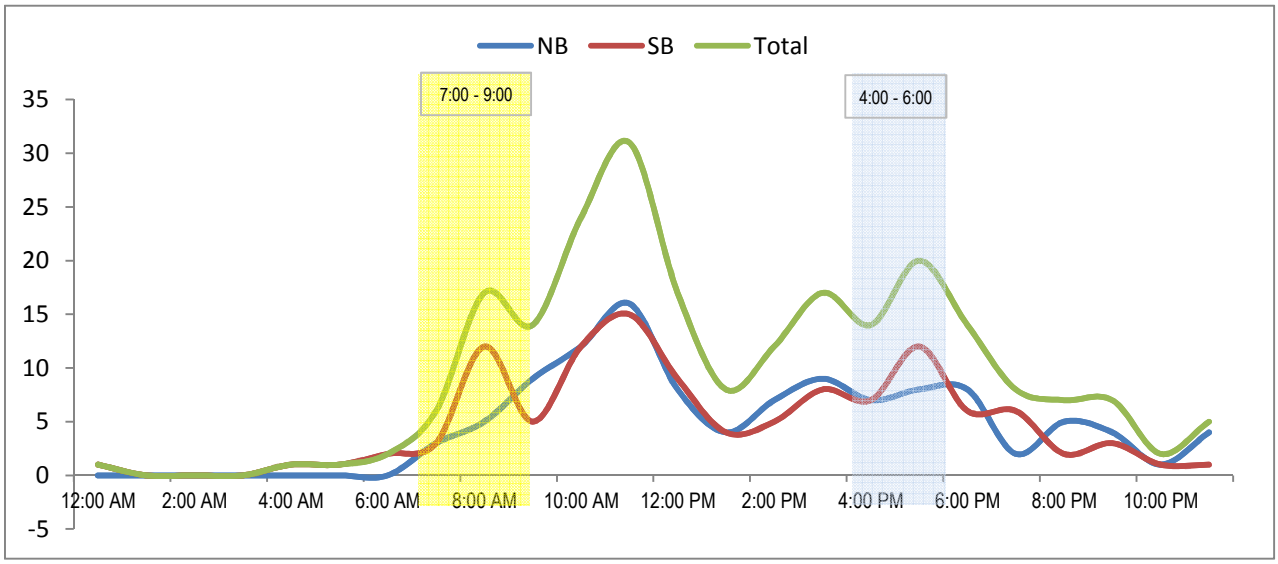
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				228			
Time	Hourly Volume			Time	Hourly Volume		
	NB	SB	Total		NB	SB	Total
12:00 AM - 1:00 AM	0	1	1	12:00 PM - 1:00 PM	8	9	17
1:00 AM - 2:00 AM	0	0	0	1:00 PM - 2:00 PM	4	4	8
2:00 AM - 3:00 AM	0	0	0	2:00 PM - 3:00 PM	7	5	12
3:00 AM - 4:00 AM	0	0	0	3:00 PM - 4:00 PM	9	8	17
4:00 AM - 5:00 AM	0	1	1	4:00 PM - 5:00 PM	7	7	14
5:00 AM - 6:00 AM	0	1	1	5:00 PM - 6:00 PM	8	12	20
6:00 AM - 7:00 AM	0	2	2	6:00 PM - 7:00 PM	8	6	14
7:00 AM - 8:00 AM	3	3	6	7:00 PM - 8:00 PM	2	6	8
8:00 AM - 9:00 AM	5	12	17	8:00 PM - 9:00 PM	5	2	7
9:00 AM - 10:00 AM	9	5	14	9:00 PM - 10:00 PM	4	3	7
10:00 AM - 11:00 AM	12	12	24	10:00 PM - 11:00 PM	1	1	2
11:00 AM - 12:00 PM	16	15	31	11:00 PM - 12:00 AM	4	1	5
Total	**45**	**52**	**97**	**Total**	**67**	**64**	**131**

24-Hour	NB	Volume	112	24-Hour	SB	Volume	116



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 34. Cactus Road Between Airway Road and Siempre Viva Road

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

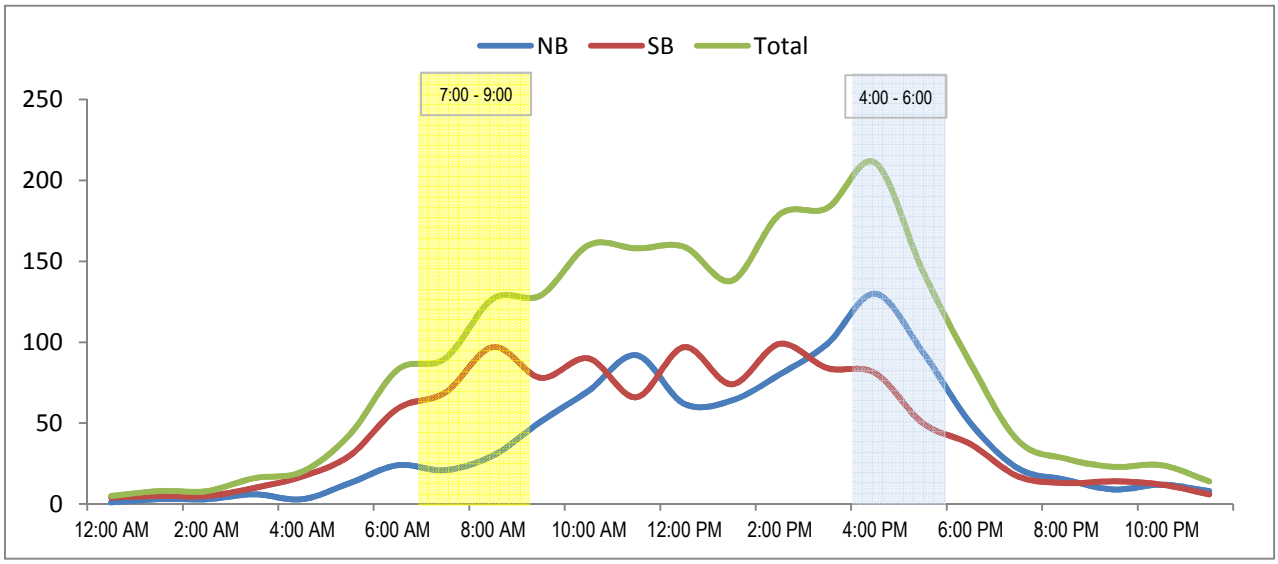
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				2,076			
Time	Hourly Volume			Time	Hourly Volume		
	NB	SB	Total		NB	SB	Total
12:00 AM - 1:00 AM	1	4	5	12:00 PM - 1:00 PM	62	97	159
1:00 AM - 2:00 AM	3	5	8	1:00 PM - 2:00 PM	64	74	138
2:00 AM - 3:00 AM	3	5	8	2:00 PM - 3:00 PM	80	99	179
3:00 AM - 4:00 AM	6	10	16	3:00 PM - 4:00 PM	99	84	183
4:00 AM - 5:00 AM	3	17	20	4:00 PM - 5:00 PM	130	81	211
5:00 AM - 6:00 AM	13	30	43	5:00 PM - 6:00 PM	94	50	144
6:00 AM - 7:00 AM	24	59	83	6:00 PM - 7:00 PM	50	37	87
7:00 AM - 8:00 AM	21	69	90	7:00 PM - 8:00 PM	22	17	39
8:00 AM - 9:00 AM	30	97	127	8:00 PM - 9:00 PM	15	13	28
9:00 AM - 10:00 AM	51	78	129	9:00 PM - 10:00 PM	9	14	23
10:00 AM - 11:00 AM	70	90	160	10:00 PM - 11:00 PM	12	12	24
11:00 AM - 12:00 PM	92	66	158	11:00 PM - 12:00 AM	8	6	14
Total	**317**	**530**	**847**	**Total**	**645**	**584**	**1,229**

24-Hour	NB	Volume	962	24-Hour	SB	Volume	1,114



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

CHEN RYAN

AVC

Location: 1. Britannia Blvd - Between Otay Mesa Road and SR-905 WB Ramps

Orientation: *North-South*

Date of Count: *Tuesday, February 02, 2016*

Analysts: *DASH*

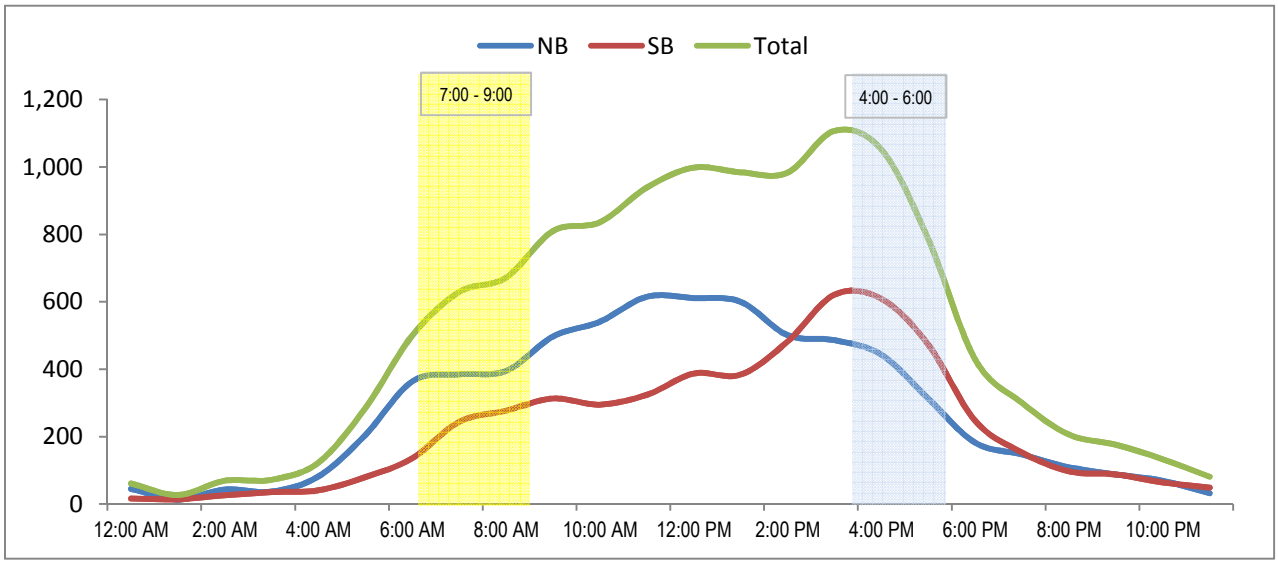
Weather: *Sunny*

AVC Proj. No: *16-0477*

24 Hour Segment Volume ***12,258***

Time	Hourly Volume			Time	Hourly Volume		
	NB	SB	Total		NB	SB	Total
12:00 AM - 1:00 AM	45	16	61	12:00 PM - 1:00 PM	611	387	998
1:00 AM - 2:00 AM	13	14	27	1:00 PM - 2:00 PM	600	384	984
2:00 AM - 3:00 AM	43	26	69	2:00 PM - 3:00 PM	501	482	983
3:00 AM - 4:00 AM	37	35	72	3:00 PM - 4:00 PM	486	621	1,107
4:00 AM - 5:00 AM	82	41	123	4:00 PM - 5:00 PM	443	609	1,052
5:00 AM - 6:00 AM	205	80	285	5:00 PM - 6:00 PM	313	473	786
6:00 AM - 7:00 AM	364	136	500	6:00 PM - 7:00 PM	182	247	429
7:00 AM - 8:00 AM	385	244	629	7:00 PM - 8:00 PM	147	153	300
8:00 AM - 9:00 AM	395	277	672	8:00 PM - 9:00 PM	109	97	206
9:00 AM - 10:00 AM	497	313	810	9:00 PM - 10:00 PM	88	88	176
10:00 AM - 11:00 AM	541	295	836	10:00 PM - 11:00 PM	69	64	133
11:00 AM - 12:00 PM	615	324	939	11:00 PM - 12:00 AM	32	49	81
Total	**3,222**	**1,801**	**5,023**	**Total**	**3,581**	**3,654**	**7,235**

24-Hour NB Volume 6,803 ***24-Hour SB Volume 5,455***



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

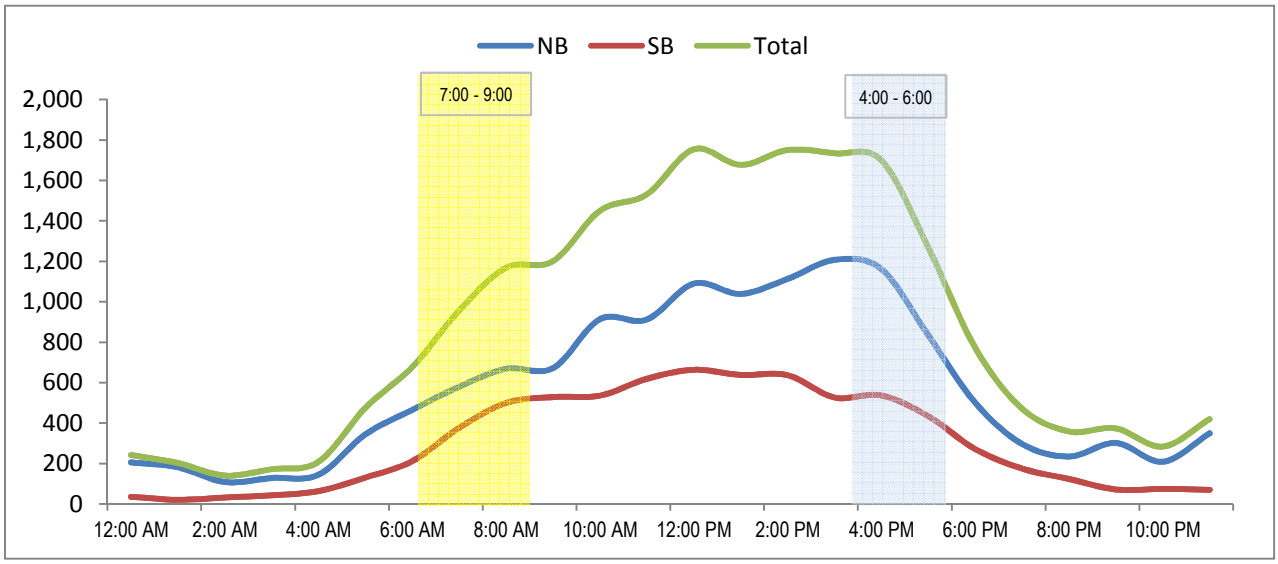
CHEN RYAN

Location:	2. Britannia Blvd - Between SR-905 WB Ramps and SR-905 EB Ramps
Orientation:	*North-South*
Date of Count:	*Tuesday, February 02, 2016*
Analysts:	*DASH*
Weather:	*Sunny*
AVC Proj. No:	*16-0477*

24 Hour Segment Volume ***20,994***

Time	Hourly Volume			Time	Hourly Volume		
	NB	SB	Total		NB	SB	Total
12:00 AM - 1:00 AM	206	36	242	12:00 PM - 1:00 PM	1,090	664	1,754
1:00 AM - 2:00 AM	182	21	203	1:00 PM - 2:00 PM	1,039	638	1,677
2:00 AM - 3:00 AM	109	32	141	2:00 PM - 3:00 PM	1,113	637	1,750
3:00 AM - 4:00 AM	129	43	172	3:00 PM - 4:00 PM	1,207	527	1,734
4:00 AM - 5:00 AM	145	64	209	4:00 PM - 5:00 PM	1,162	537	1,699
5:00 AM - 6:00 AM	345	131	476	5:00 PM - 6:00 PM	835	434	1,269
6:00 AM - 7:00 AM	466	212	678	6:00 PM - 7:00 PM	501	272	773
7:00 AM - 8:00 AM	580	377	957	7:00 PM - 8:00 PM	297	175	472
8:00 AM - 9:00 AM	669	500	1,169	8:00 PM - 9:00 PM	235	124	359
9:00 AM - 10:00 AM	672	529	1,201	9:00 PM - 10:00 PM	302	72	374
10:00 AM - 11:00 AM	914	536	1,450	10:00 PM - 11:00 PM	209	75	284
11:00 AM - 12:00 PM	912	619	1531	11:00 PM - 12:00 AM	350	70	420
Total	**5,329**	**3,100**	**8,429**	**Total**	**8,340**	**4,225**	**12,565**

24-Hour NB Volume 13,669 ***24-Hour SB Volume 7,325***



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

CHEN RYAN

Location: 3. Britannia Blvd - Between SR-905 EB Ramps and Airway Road

Orientation: *North-South*

Date of Count: *Tuesday, February 02, 2016*

Analysts: *DASH*

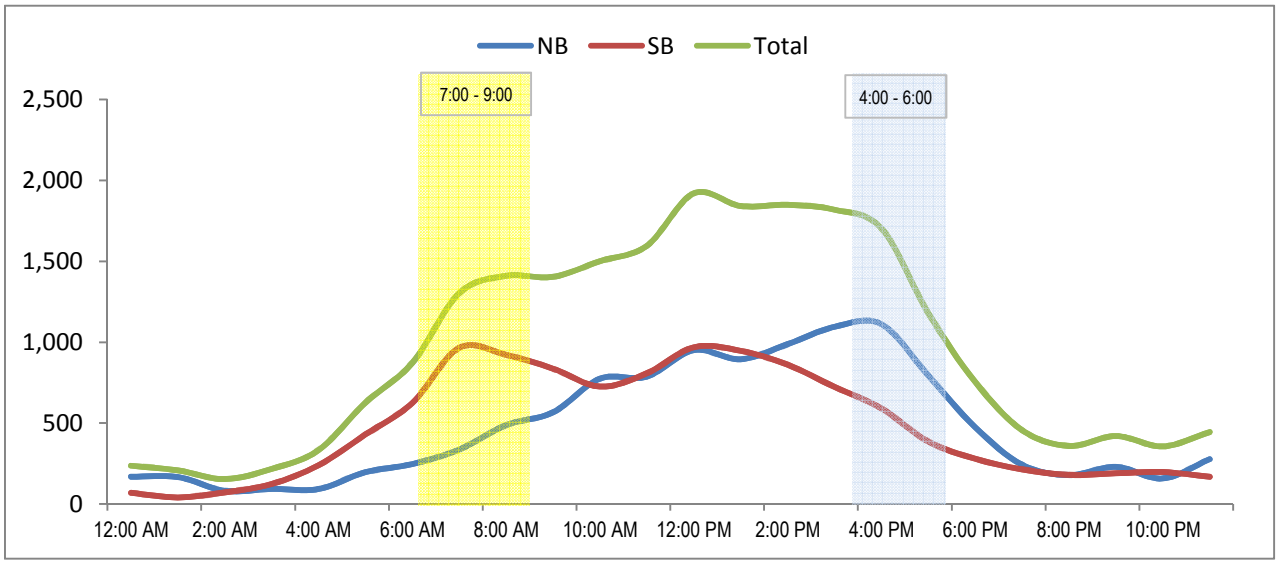
Weather: *Sunny*

AVC Proj. No: *16-0477*

24 Hour Segment Volume ***22,969***

Time	Hourly Volume			Time	Hourly Volume		
	NB	SB	Total		NB	SB	Total
12:00 AM - 1:00 AM	168	69	237	12:00 PM - 1:00 PM	951	969	1,920
1:00 AM - 2:00 AM	167	41	208	1:00 PM - 2:00 PM	895	947	1,842
2:00 AM - 3:00 AM	82	72	154	2:00 PM - 3:00 PM	988	861	1,849
3:00 AM - 4:00 AM	93	124	217	3:00 PM - 4:00 PM	1,095	724	1,819
4:00 AM - 5:00 AM	93	240	333	4:00 PM - 5:00 PM	1,112	592	1,704
5:00 AM - 6:00 AM	197	430	627	5:00 PM - 6:00 PM	795	386	1,181
6:00 AM - 7:00 AM	247	625	872	6:00 PM - 7:00 PM	475	280	755
7:00 AM - 8:00 AM	337	966	1,303	7:00 PM - 8:00 PM	243	214	457
8:00 AM - 9:00 AM	488	922	1,410	8:00 PM - 9:00 PM	179	180	359
9:00 AM - 10:00 AM	567	837	1,404	9:00 PM - 10:00 PM	230	190	420
10:00 AM - 11:00 AM	775	726	1,501	10:00 PM - 11:00 PM	158	198	356
11:00 AM - 12:00 PM	788	808	1596	11:00 PM - 12:00 AM	277	168	445
Total	**4,002**	**5,860**	**9,862**	**Total**	**7,398**	**5,709**	**13,107**

24-Hour NB Volume 11,400 ***24-Hour SB Volume 11,569***



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

CHEN RYAN

AVC

Location: 4. Britannia Blvd - Between Airway Road and Siempre Viva Road

Orientation: *North-South*

Date of Count: *Tuesday, February 02, 2016*

Analysts: *DASH*

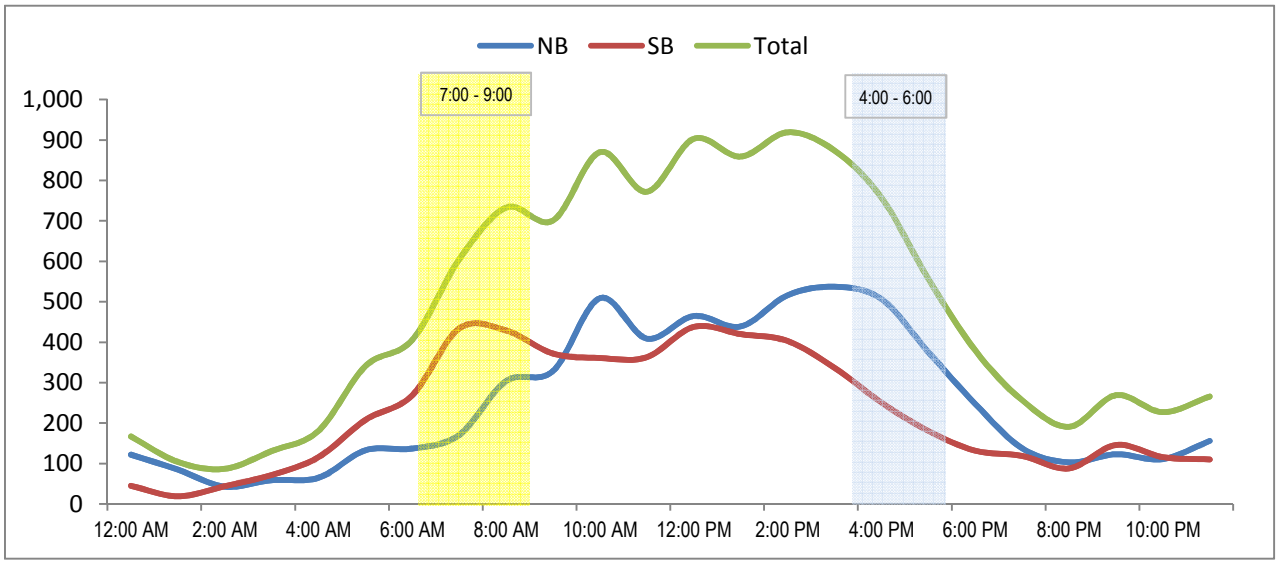
Weather: *Sunny*

AVC Proj. No: *16-0477*

24 Hour Segment Volume ***11,558***

Time	Hourly Volume			Time	Hourly Volume		
	NB	SB	Total		NB	SB	Total
12:00 AM - 1:00 AM	122	45	167	12:00 PM - 1:00 PM	465	438	903
1:00 AM - 2:00 AM	85	19	104	1:00 PM - 2:00 PM	439	420	859
2:00 AM - 3:00 AM	43	44	87	2:00 PM - 3:00 PM	516	403	919
3:00 AM - 4:00 AM	59	72	131	3:00 PM - 4:00 PM	537	337	874
4:00 AM - 5:00 AM	65	116	181	4:00 PM - 5:00 PM	507	251	758
5:00 AM - 6:00 AM	133	208	341	5:00 PM - 6:00 PM	376	181	557
6:00 AM - 7:00 AM	137	269	406	6:00 PM - 7:00 PM	248	132	380
7:00 AM - 8:00 AM	171	434	605	7:00 PM - 8:00 PM	138	119	257
8:00 AM - 9:00 AM	304	429	733	8:00 PM - 9:00 PM	103	88	191
9:00 AM - 10:00 AM	329	372	701	9:00 PM - 10:00 PM	123	146	269
10:00 AM - 11:00 AM	509	361	870	10:00 PM - 11:00 PM	111	116	227
11:00 AM - 12:00 PM	409	363	772	11:00 PM - 12:00 AM	156	110	266
Total	**2,366**	**2,732**	**5,098**	**Total**	**3,719**	**2,741**	**6,460**

24-Hour NB Volume 6,085 ***24-Hour SB Volume 5,473***



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

CHEN RYAN

AVC

Location: 5. Britannia Blvd - Between Siempre Viva Road and Bristown Ct.

Orientation: *North-South*

Date of Count: *Tuesday, February 02, 2016*

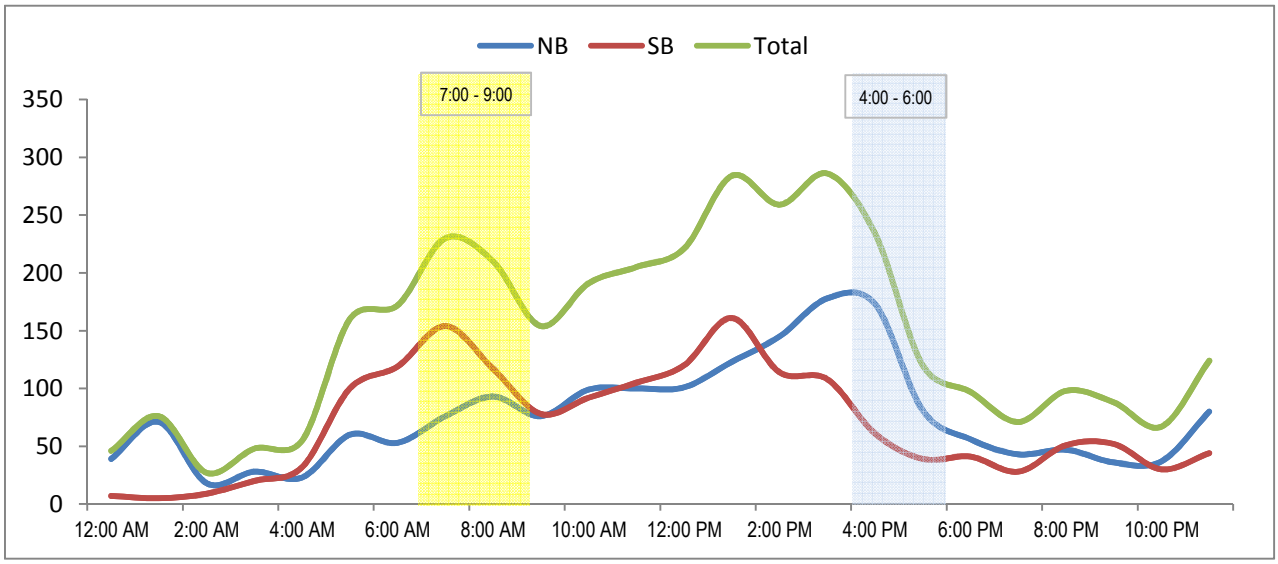
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *16-0477*

24 Hour Segment Volume				3,523			
Time	Hourly Volume			Time	Hourly Volume		
	NB	SB	Total		NB	SB	Total
12:00 AM - 1:00 AM	39	7	46	12:00 PM - 1:00 PM	101	120	221
1:00 AM - 2:00 AM	71	5	76	1:00 PM - 2:00 PM	123	161	284
2:00 AM - 3:00 AM	18	9	27	2:00 PM - 3:00 PM	145	114	259
3:00 AM - 4:00 AM	28	20	48	3:00 PM - 4:00 PM	178	108	286
4:00 AM - 5:00 AM	23	32	55	4:00 PM - 5:00 PM	173	61	234
5:00 AM - 6:00 AM	60	100	160	5:00 PM - 6:00 PM	81	39	120
6:00 AM - 7:00 AM	53	119	172	6:00 PM - 7:00 PM	56	41	97
7:00 AM - 8:00 AM	76	154	230	7:00 PM - 8:00 PM	43	28	71
8:00 AM - 9:00 AM	93	117	210	8:00 PM - 9:00 PM	47	51	98
9:00 AM - 10:00 AM	76	78	154	9:00 PM - 10:00 PM	36	52	88
10:00 AM - 11:00 AM	99	92	191	10:00 PM - 11:00 PM	37	30	67
11:00 AM - 12:00 PM	100	105	205	11:00 PM - 12:00 AM	80	44	124
Total	**736**	**838**	**1,574**	**Total**	**1,100**	**849**	**1,949**

24-Hour	NB	Volume	1,836	24-Hour	SB	Volume	1,687



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 20. St Andrews Avenue between Otay Mesa Road and Otay Mesa Center Road

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

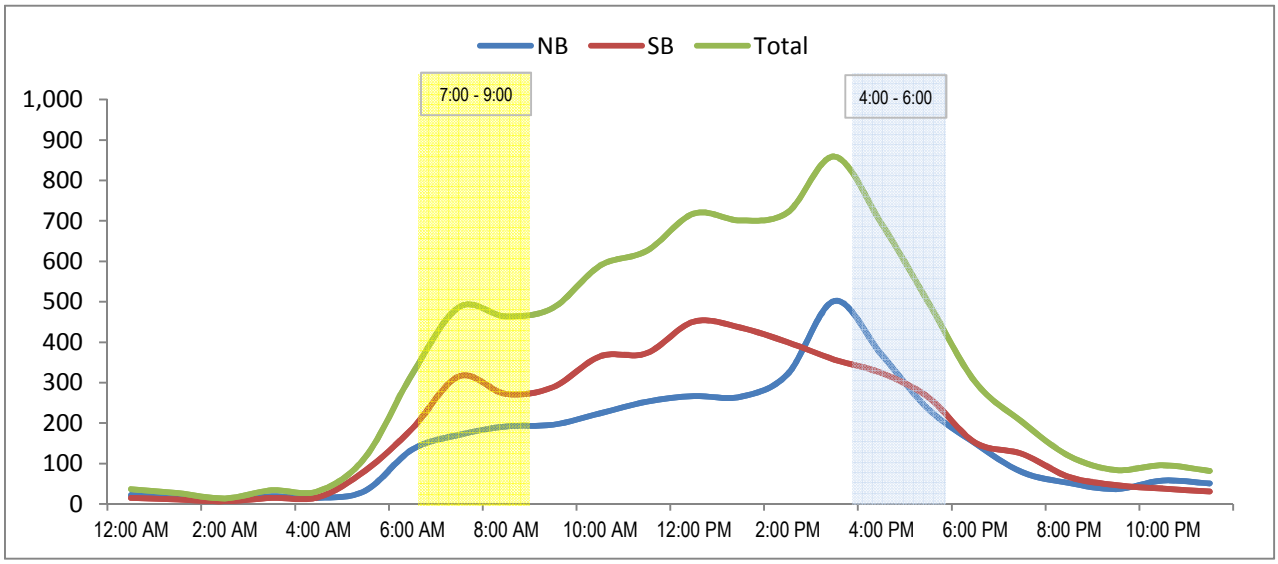
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume 8,311

Time	Hourly Volume NB	SB	Total	Time	Hourly Volume NB	SB	Total
12:00 AM - 1:00 AM	22	15	37	12:00 PM - 1:00 PM	267	451	718
1:00 AM - 2:00 AM	16	11	27	1:00 PM - 2:00 PM	265	436	701
2:00 AM - 3:00 AM	7	7	14	2:00 PM - 3:00 PM	321	400	721
3:00 AM - 4:00 AM	19	15	34	3:00 PM - 4:00 PM	502	357	859
4:00 AM - 5:00 AM	15	17	32	4:00 PM - 5:00 PM	370	324	694
5:00 AM - 6:00 AM	33	83	116	5:00 PM - 6:00 PM	235	264	499
6:00 AM - 7:00 AM	135	187	322	6:00 PM - 7:00 PM	150	152	302
7:00 AM - 8:00 AM	171	316	487	7:00 PM - 8:00 PM	79	124	203
8:00 AM - 9:00 AM	192	272	464	8:00 PM - 9:00 PM	52	67	119
9:00 AM - 10:00 AM	196	289	485	9:00 PM - 10:00 PM	37	47	84
10:00 AM - 11:00 AM	224	365	589	10:00 PM - 11:00 PM	58	38	96
11:00 AM - 12:00 PM	253	373	626	11:00 PM - 12:00 AM	51	31	82
Total	**1,283**	**1,950**	**3,233**	**Total**	**2,387**	**2,691**	**5,078**

24-Hour NB Volume 3,670 **24-Hour SB Volume 4,641**



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 21. La Media Road, North of Otay Mesa Road

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

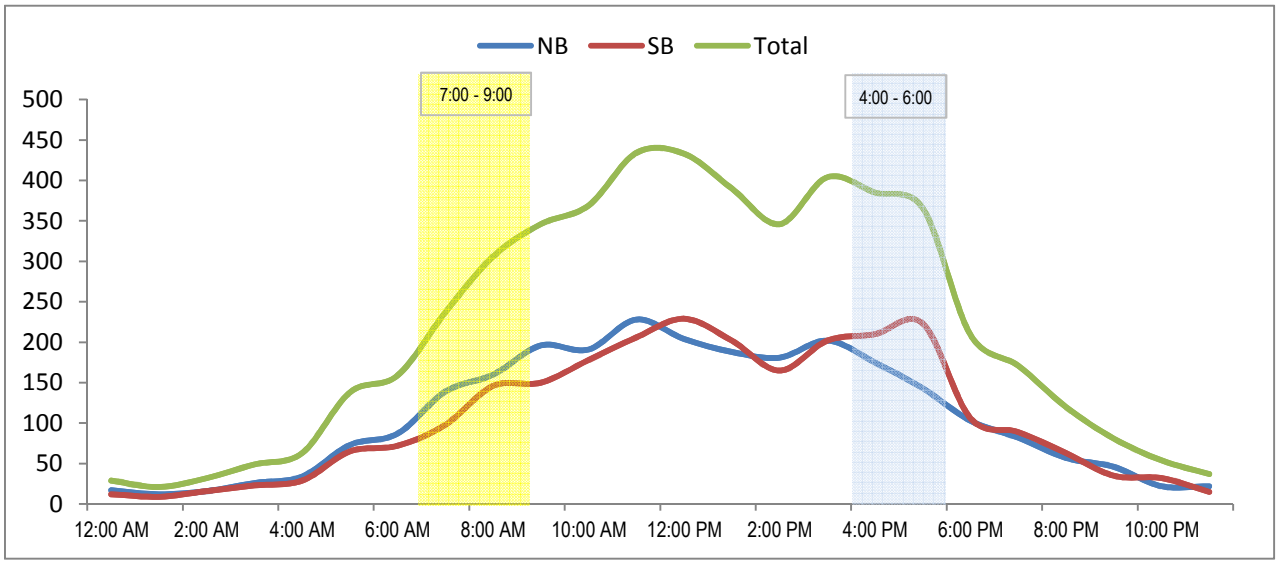
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume 5,179

Time	Hourly Volume NB	SB	Total	Time	Hourly Volume NB	SB	Total
12:00 AM - 1:00 AM	17	12	29	12:00 PM - 1:00 PM	204	229	433
1:00 AM - 2:00 AM	12	9	21	1:00 PM - 2:00 PM	188	202	390
2:00 AM - 3:00 AM	16	16	32	2:00 PM - 3:00 PM	181	165	346
3:00 AM - 4:00 AM	26	23	49	3:00 PM - 4:00 PM	202	202	404
4:00 AM - 5:00 AM	34	29	63	4:00 PM - 5:00 PM	175	210	385
5:00 AM - 6:00 AM	73	65	138	5:00 PM - 6:00 PM	143	223	366
6:00 AM - 7:00 AM	87	72	159	6:00 PM - 7:00 PM	103	106	209
7:00 AM - 8:00 AM	139	98	237	7:00 PM - 8:00 PM	82	89	171
8:00 AM - 9:00 AM	160	146	306	8:00 PM - 9:00 PM	57	63	120
9:00 AM - 10:00 AM	196	150	346	9:00 PM - 10:00 PM	46	35	81
10:00 AM - 11:00 AM	191	178	369	10:00 PM - 11:00 PM	22	32	54
11:00 AM - 12:00 PM	228	206	434	11:00 PM - 12:00 AM	22	15	37
Total	**1,179**	**1,004**	**2,183**	**Total**	**1,425**	**1,571**	**2,996**

24-Hour NB Volume 2,604 **24-Hour SB Volume 2,575**



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

CHEN RYAN

Location: 22. La Media Road Between Avenida de la fuente and Siempre Viva Road

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

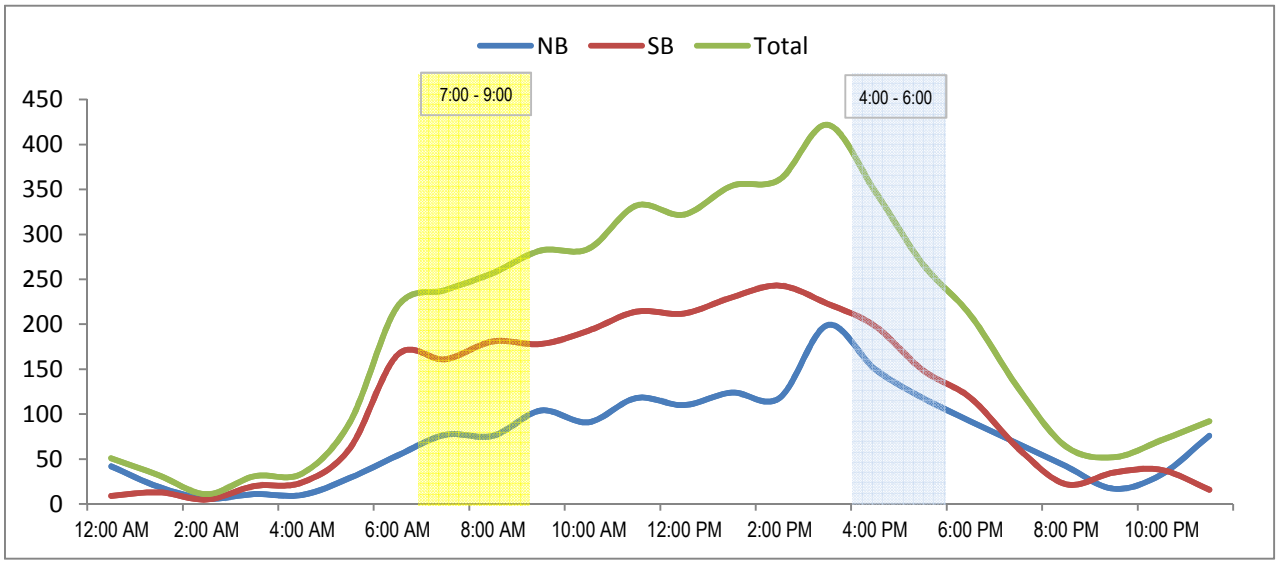
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				4,555			
Time	Hourly Volume			Time	Hourly Volume		
	NB	SB	Total		NB	SB	Total
12:00 AM - 1:00 AM	42	9	51	12:00 PM - 1:00 PM	110	212	322
1:00 AM - 2:00 AM	19	13	32	1:00 PM - 2:00 PM	124	230	354
2:00 AM - 3:00 AM	6	5	11	2:00 PM - 3:00 PM	118	243	361
3:00 AM - 4:00 AM	11	20	31	3:00 PM - 4:00 PM	199	223	422
4:00 AM - 5:00 AM	10	24	34	4:00 PM - 5:00 PM	150	198	348
5:00 AM - 6:00 AM	29	62	91	5:00 PM - 6:00 PM	118	149	267
6:00 AM - 7:00 AM	54	166	220	6:00 PM - 7:00 PM	92	118	210
7:00 AM - 8:00 AM	77	161	238	7:00 PM - 8:00 PM	67	62	129
8:00 AM - 9:00 AM	76	181	257	8:00 PM - 9:00 PM	42	22	64
9:00 AM - 10:00 AM	104	178	282	9:00 PM - 10:00 PM	17	35	52
10:00 AM - 11:00 AM	91	193	284	10:00 PM - 11:00 PM	33	38	71
11:00 AM - 12:00 PM	118	214	332	11:00 PM - 12:00 AM	76	16	92
Total	**637**	**1,226**	**1,863**	**Total**	**1,146**	**1,546**	**2,692**

24-Hour	NB	Volume	1,783	24-Hour	SB	Volume	2,772



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 11. Otay Mesa Road Between Ocean View Hills Parkway and Corporate Center Drive

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

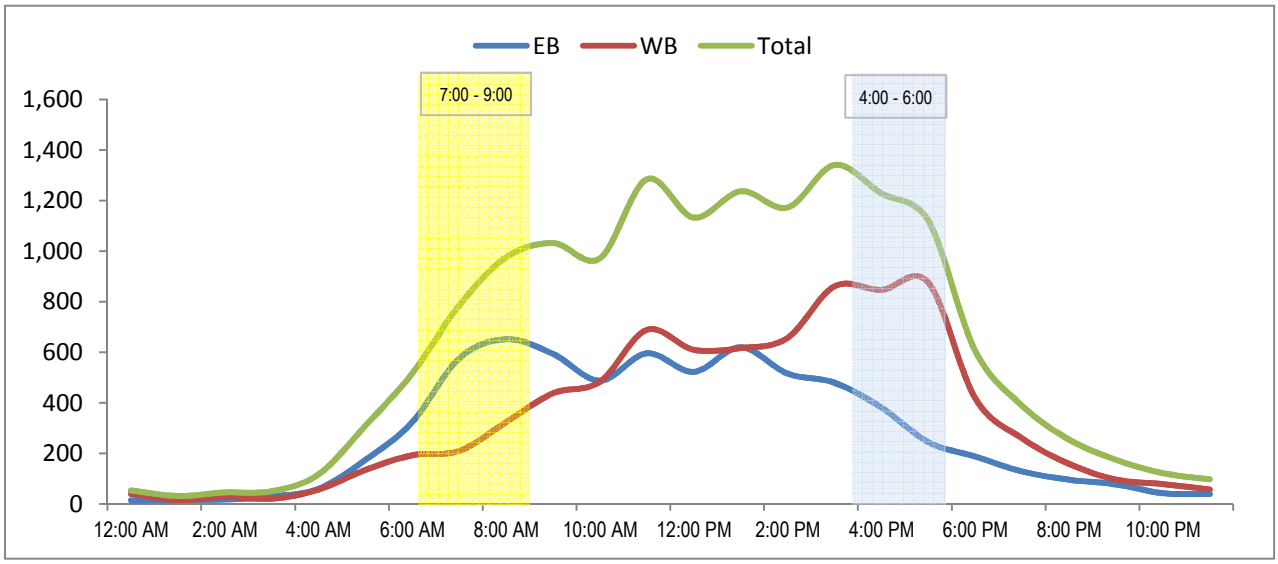
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume 15,058

Time	Hourly Volume EB	Hourly Volume WB	Hourly Volume Total	Time	Hourly Volume EB	Hourly Volume WB	Hourly Volume Total
12:00 AM - 1:00 AM	14	40	54	12:00 PM - 1:00 PM	523	610	1,133
1:00 AM - 2:00 AM	16	16	32	1:00 PM - 2:00 PM	620	617	1,237
2:00 AM - 3:00 AM	18	28	46	2:00 PM - 3:00 PM	516	657	1,173
3:00 AM - 4:00 AM	30	21	51	3:00 PM - 4:00 PM	480	861	1,341
4:00 AM - 5:00 AM	60	57	117	4:00 PM - 5:00 PM	382	847	1,229
5:00 AM - 6:00 AM	175	135	310	5:00 PM - 6:00 PM	245	876	1,121
6:00 AM - 7:00 AM	324	193	517	6:00 PM - 7:00 PM	188	419	607
7:00 AM - 8:00 AM	576	210	786	7:00 PM - 8:00 PM	129	260	389
8:00 AM - 9:00 AM	652	324	976	8:00 PM - 9:00 PM	96	159	255
9:00 AM - 10:00 AM	594	438	1,032	9:00 PM - 10:00 PM	78	97	175
10:00 AM - 11:00 AM	488	484	972	10:00 PM - 11:00 PM	43	79	122
11:00 AM - 12:00 PM	596	689	1285	11:00 PM - 12:00 AM	40	58	98
Total	**3,543**	**2,635**	**6,178**	**Total**	**3,340**	**5,540**	**8,880**

24-Hour EB Volume 6,883 **24-Hour WB Volume 8,175**



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 12. Otay Mesa Road Between Corporate Center Drive and Heritage Road

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

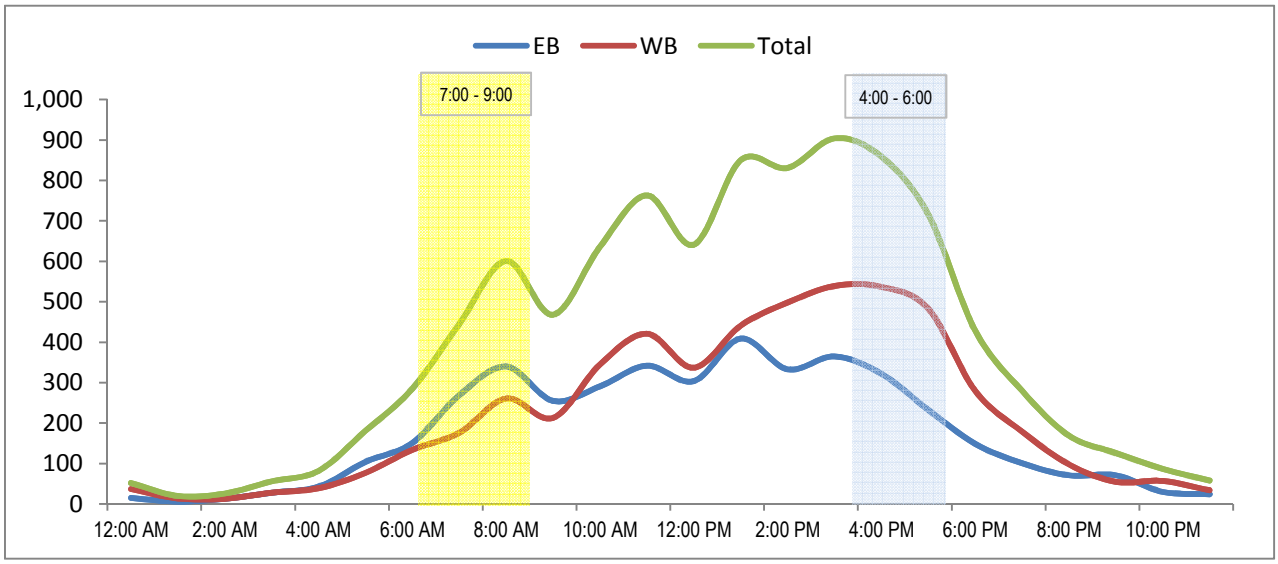
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume 9,565

Time	Hourly Volume EB	Hourly Volume WB	Hourly Volume Total	Time	Hourly Volume EB	Hourly Volume WB	Hourly Volume Total
12:00 AM - 1:00 AM	15	37	52	12:00 PM - 1:00 PM	304	337	641
1:00 AM - 2:00 AM	6	14	20	1:00 PM - 2:00 PM	409	441	850
2:00 AM - 3:00 AM	13	13	26	2:00 PM - 3:00 PM	333	498	831
3:00 AM - 4:00 AM	28	28	56	3:00 PM - 4:00 PM	365	539	904
4:00 AM - 5:00 AM	43	39	82	4:00 PM - 5:00 PM	322	537	859
5:00 AM - 6:00 AM	104	77	181	5:00 PM - 6:00 PM	233	483	716
6:00 AM - 7:00 AM	151	134	285	6:00 PM - 7:00 PM	149	280	429
7:00 AM - 8:00 AM	269	176	445	7:00 PM - 8:00 PM	101	179	280
8:00 AM - 9:00 AM	340	261	601	8:00 PM - 9:00 PM	71	98	169
9:00 AM - 10:00 AM	255	213	468	9:00 PM - 10:00 PM	71	55	126
10:00 AM - 11:00 AM	291	345	636	10:00 PM - 11:00 PM	30	57	87
11:00 AM - 12:00 PM	342	421	763	11:00 PM - 12:00 AM	24	34	58
Total	**1,857**	**1,758**	**3,615**	**Total**	**2,412**	**3,538**	**5,950**

24-Hour EB Volume 4,269 **24-Hour WB Volume 5,296**



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 13. Otay Mesa Road Between Heritage Road and Cactus Road

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

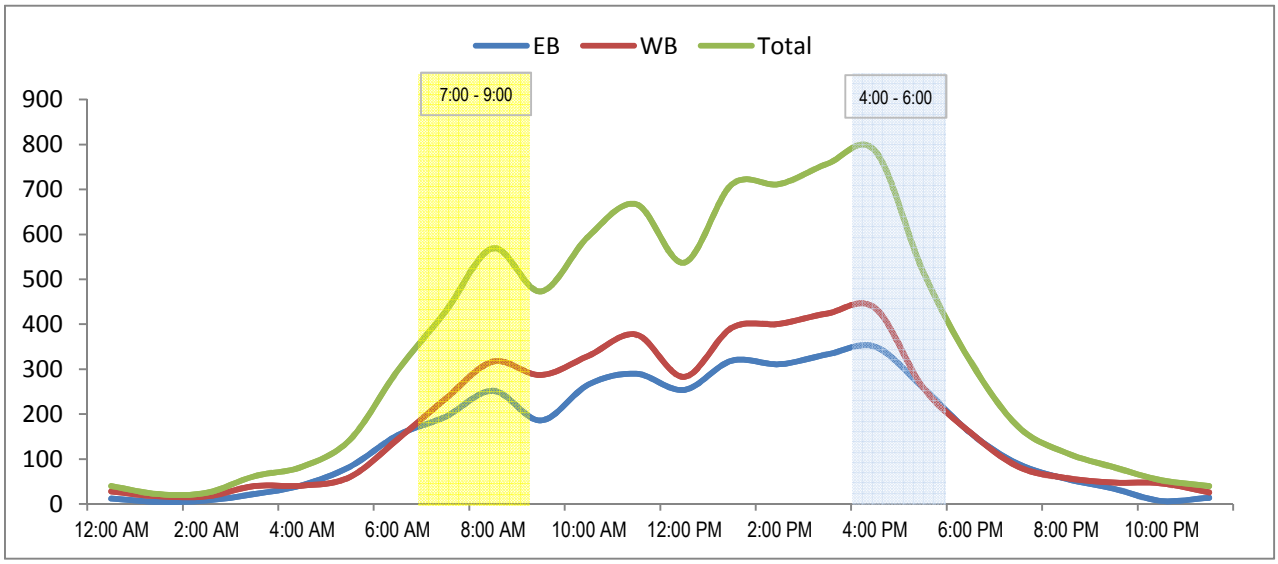
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				8,205				
Time	Hourly Volume				Time	Hourly Volume		
	EB	WB	Total			EB	WB	Total
12:00 AM - 1:00 AM	12	28	40		12:00 PM - 1:00 PM	254	283	537
1:00 AM - 2:00 AM	5	17	22		1:00 PM - 2:00 PM	319	392	711
2:00 AM - 3:00 AM	8	17	25		2:00 PM - 3:00 PM	311	401	712
3:00 AM - 4:00 AM	22	40	62		3:00 PM - 4:00 PM	333	424	757
4:00 AM - 5:00 AM	42	41	83		4:00 PM - 5:00 PM	350	436	786
5:00 AM - 6:00 AM	83	60	143		5:00 PM - 6:00 PM	259	260	519
6:00 AM - 7:00 AM	153	144	297		6:00 PM - 7:00 PM	158	159	317
7:00 AM - 8:00 AM	194	234	428		7:00 PM - 8:00 PM	89	83	172
8:00 AM - 9:00 AM	252	317	569		8:00 PM - 9:00 PM	56	58	114
9:00 AM - 10:00 AM	186	287	473		9:00 PM - 10:00 PM	34	48	82
10:00 AM - 11:00 AM	266	330	596		10:00 PM - 11:00 PM	7	46	53
11:00 AM - 12:00 PM	290	377	667		11:00 PM - 12:00 AM	14	26	40
Total	**1,513**	**1,892**	**3,405**		**Total**	**2,184**	**2,616**	**4,800**

24-Hour	EB	Volume	3,697	24-Hour	WB	Volume	4,508



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 14. Otay Mesa Road Between Cactus Road and Brittania Blvd

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

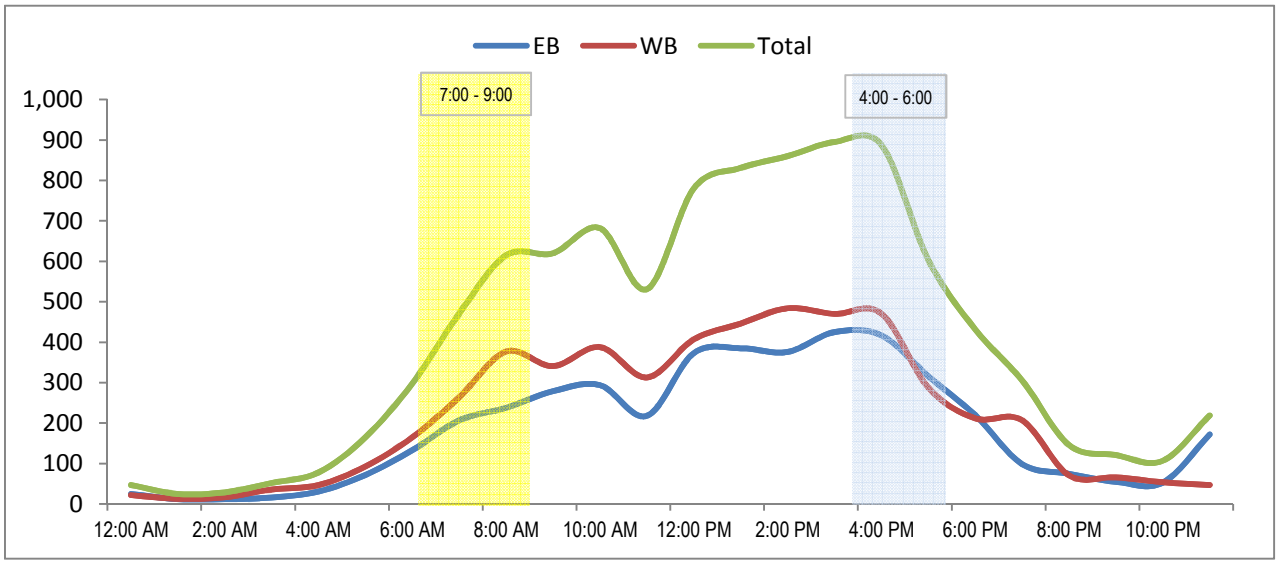
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				9,802				
Time	Hourly Volume			Time	Hourly Volume			
	EB	WB	Total		EB	WB	Total	
12:00 AM - 1:00 AM	25	22	47	12:00 PM - 1:00 PM	373	407	780	
1:00 AM - 2:00 AM	12	13	25	1:00 PM - 2:00 PM	385	446	831	
2:00 AM - 3:00 AM	12	17	29	2:00 PM - 3:00 PM	376	484	860	
3:00 AM - 4:00 AM	16	36	52	3:00 PM - 4:00 PM	425	470	895	
4:00 AM - 5:00 AM	31	47	78	4:00 PM - 5:00 PM	417	471	888	
5:00 AM - 6:00 AM	72	93	165	5:00 PM - 6:00 PM	316	288	604	
6:00 AM - 7:00 AM	133	165	298	6:00 PM - 7:00 PM	220	212	432	
7:00 AM - 8:00 AM	207	264	471	7:00 PM - 8:00 PM	99	207	306	
8:00 AM - 9:00 AM	238	377	615	8:00 PM - 9:00 PM	75	71	146	
9:00 AM - 10:00 AM	279	341	620	9:00 PM - 10:00 PM	55	66	121	
10:00 AM - 11:00 AM	294	388	682	10:00 PM - 11:00 PM	53	54	107	
11:00 AM - 12:00 PM	218	313	531	11:00 PM - 12:00 AM	172	47	219	
Total	1,537	2,076	3,613	Total	2,966	3,223	6,189	

24-Hour	EB	Volume	4,503	24-Hour	WB	Volume	5,299



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 15. Otay Mesa Road Between Brittania Blvd and St Andrews Avenue

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

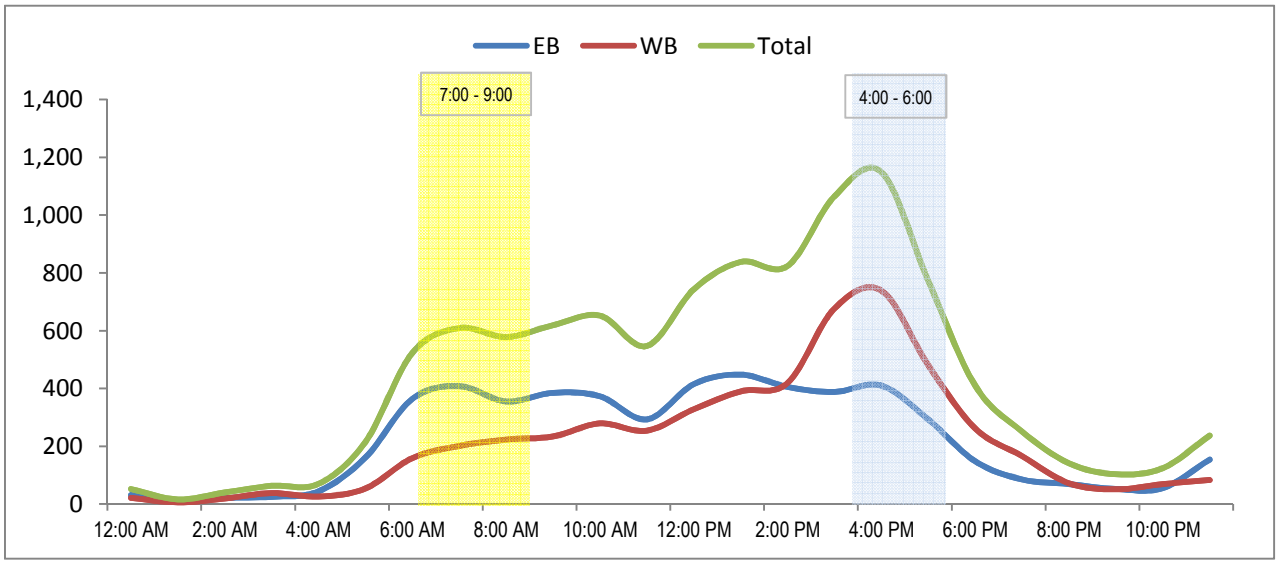
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume ***10,642***

Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	31	21	52	12:00 PM - 1:00 PM	415	328	743
1:00 AM - 2:00 AM	10	6	16	1:00 PM - 2:00 PM	448	390	838
2:00 AM - 3:00 AM	21	19	40	2:00 PM - 3:00 PM	405	419	824
3:00 AM - 4:00 AM	25	38	63	3:00 PM - 4:00 PM	388	677	1,065
4:00 AM - 5:00 AM	44	26	70	4:00 PM - 5:00 PM	410	739	1,149
5:00 AM - 6:00 AM	161	54	215	5:00 PM - 6:00 PM	293	480	773
6:00 AM - 7:00 AM	364	159	523	6:00 PM - 7:00 PM	148	262	410
7:00 AM - 8:00 AM	408	201	609	7:00 PM - 8:00 PM	85	166	251
8:00 AM - 9:00 AM	355	223	578	8:00 PM - 9:00 PM	69	72	141
9:00 AM - 10:00 AM	385	234	619	9:00 PM - 10:00 PM	52	51	103
10:00 AM - 11:00 AM	373	279	652	10:00 PM - 11:00 PM	55	69	124
11:00 AM - 12:00 PM	293	254	547	11:00 PM - 12:00 AM	154	83	237
Total	**2,470**	**1,514**	**3,984**	**Total**	**2,922**	**3,736**	**6,658**

24-Hour EB Volume 5,392 ***24-Hour WB Volume 5,250***



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 16. Otay Mesa Road Between St Andrews Avenue and La Media Road

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

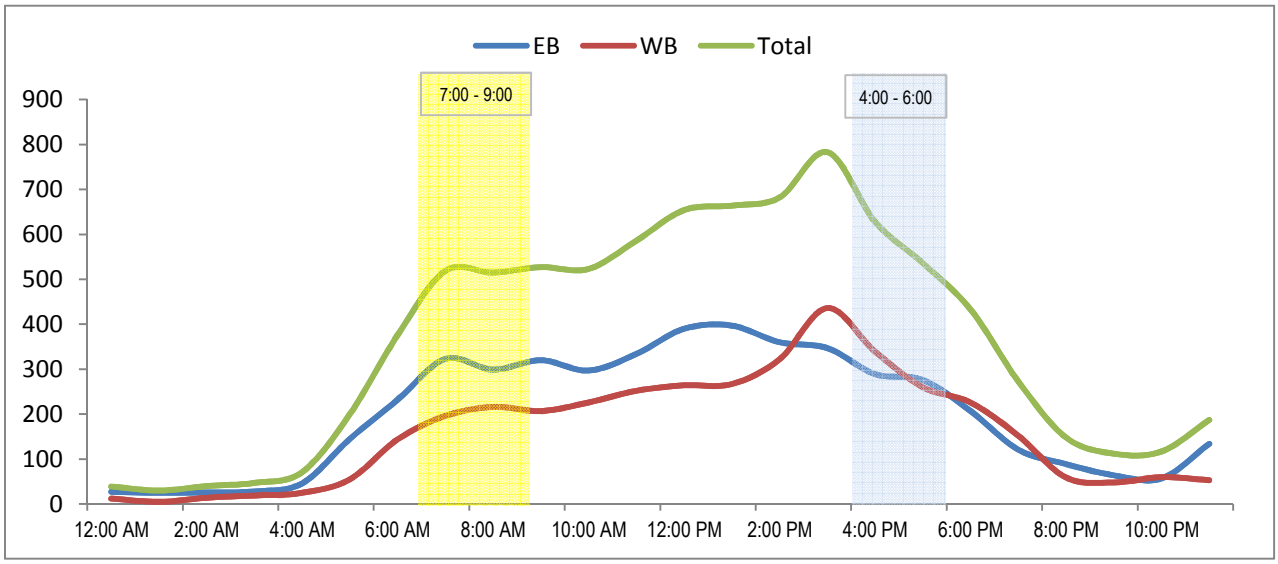
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				8,690			
Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	27	12	39	12:00 PM - 1:00 PM	390	264	654
1:00 AM - 2:00 AM	25	5	30	1:00 PM - 2:00 PM	397	267	664
2:00 AM - 3:00 AM	26	14	40	2:00 PM - 3:00 PM	360	322	682
3:00 AM - 4:00 AM	28	19	47	3:00 PM - 4:00 PM	347	436	783
4:00 AM - 5:00 AM	46	25	71	4:00 PM - 5:00 PM	289	339	628
5:00 AM - 6:00 AM	145	55	200	5:00 PM - 6:00 PM	276	260	536
6:00 AM - 7:00 AM	232	144	376	6:00 PM - 7:00 PM	207	226	433
7:00 AM - 8:00 AM	323	196	519	7:00 PM - 8:00 PM	121	152	273
8:00 AM - 9:00 AM	299	216	515	8:00 PM - 9:00 PM	89	59	148
9:00 AM - 10:00 AM	320	207	527	9:00 PM - 10:00 PM	64	48	112
10:00 AM - 11:00 AM	297	226	523	10:00 PM - 11:00 PM	57	60	117
11:00 AM - 12:00 PM	334	252	586	11:00 PM - 12:00 AM	134	53	187
Total	**2,102**	**1,371**	**3,473**	**Total**	**2,731**	**2,486**	**5,217**

24-Hour	EB	Volume	4,833	24-Hour	WB	Volume	3,857



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 17. Otay Mesa Road Between La Media Road and Pipers Ranch Road

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

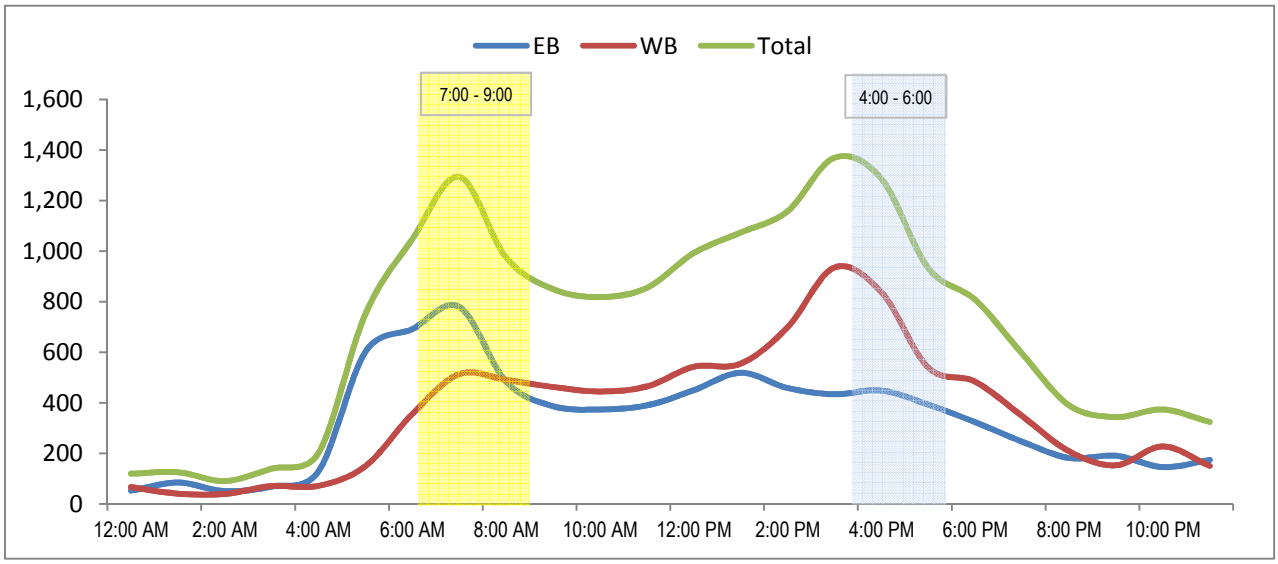
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume 16,924

Time	Hourly Volume EB	WB	Total	Time	Hourly Volume EB	WB	Total
12:00 AM - 1:00 AM	53	67	120	12:00 PM - 1:00 PM	450	543	993
1:00 AM - 2:00 AM	85	41	126	1:00 PM - 2:00 PM	519	555	1,074
2:00 AM - 3:00 AM	51	40	91	2:00 PM - 3:00 PM	459	699	1,158
3:00 AM - 4:00 AM	69	71	140	3:00 PM - 4:00 PM	434	936	1,370
4:00 AM - 5:00 AM	130	72	202	4:00 PM - 5:00 PM	449	838	1,287
5:00 AM - 6:00 AM	602	150	752	5:00 PM - 6:00 PM	393	540	933
6:00 AM - 7:00 AM	692	356	1,048	6:00 PM - 7:00 PM	324	484	808
7:00 AM - 8:00 AM	780	514	1,294	7:00 PM - 8:00 PM	247	348	595
8:00 AM - 9:00 AM	484	491	975	8:00 PM - 9:00 PM	182	209	391
9:00 AM - 10:00 AM	387	463	850	9:00 PM - 10:00 PM	191	153	344
10:00 AM - 11:00 AM	374	445	819	10:00 PM - 11:00 PM	146	228	374
11:00 AM - 12:00 PM	390	465	855	11:00 PM - 12:00 AM	174	151	325
Total	**4,097**	**3,175**	**7,272**	**Total**	**3,968**	**5,684**	**9,652**

24-Hour EB Volume 8,065 **24-Hour WB Volume 8,859**



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 18. Camino Maquiladora Between Pacific Rim and Cactus Road

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

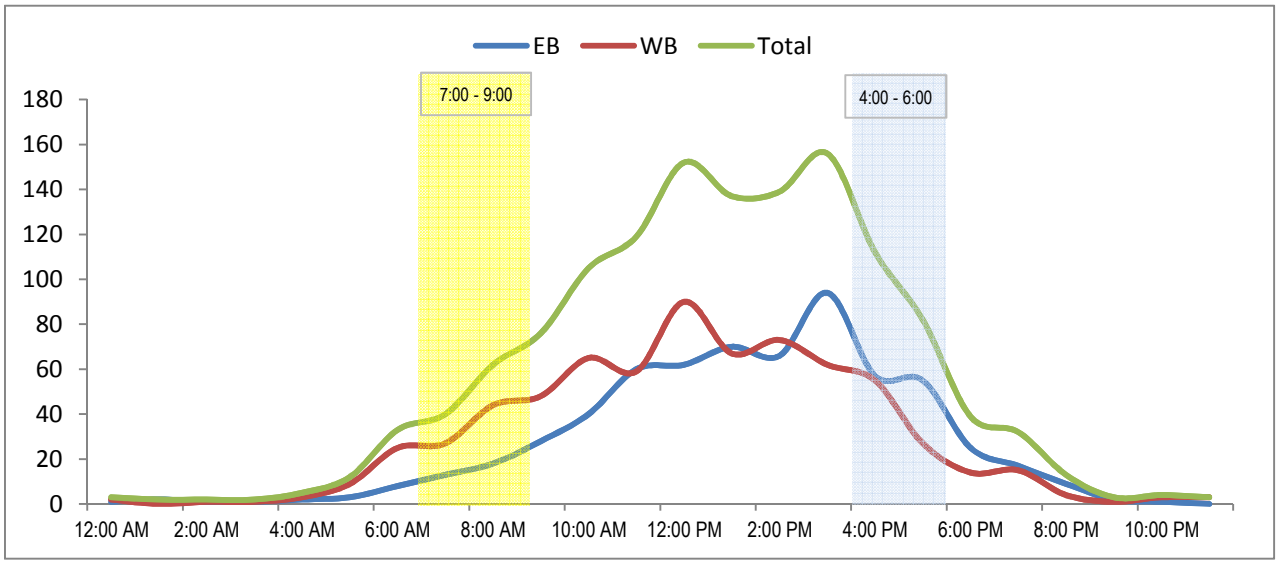
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				1,333			
Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	1	2	3	12:00 PM - 1:00 PM	62	90	152
1:00 AM - 2:00 AM	2	0	2	1:00 PM - 2:00 PM	70	67	137
2:00 AM - 3:00 AM	1	1	2	2:00 PM - 3:00 PM	66	73	139
3:00 AM - 4:00 AM	1	1	2	3:00 PM - 4:00 PM	94	62	156
4:00 AM - 5:00 AM	2	3	5	4:00 PM - 5:00 PM	57	55	112
5:00 AM - 6:00 AM	3	9	12	5:00 PM - 6:00 PM	55	27	82
6:00 AM - 7:00 AM	8	25	33	6:00 PM - 7:00 PM	25	14	39
7:00 AM - 8:00 AM	13	27	40	7:00 PM - 8:00 PM	17	15	32
8:00 AM - 9:00 AM	18	44	62	8:00 PM - 9:00 PM	9	4	13
9:00 AM - 10:00 AM	28	48	76	9:00 PM - 10:00 PM	2	1	3
10:00 AM - 11:00 AM	40	65	105	10:00 PM - 11:00 PM	1	3	4
11:00 AM - 12:00 PM	60	59	119	11:00 PM - 12:00 AM	0	3	3
Total	**177**	**284**	**461**	**Total**	**458**	**414**	**872**

24-Hour	EB	Volume	635	24-Hour	WB	Volume	698



CHEN RYAN

24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

AVC

Location: 19. Camino Maquiladora Between Cactus Road and Otay Heights Court

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

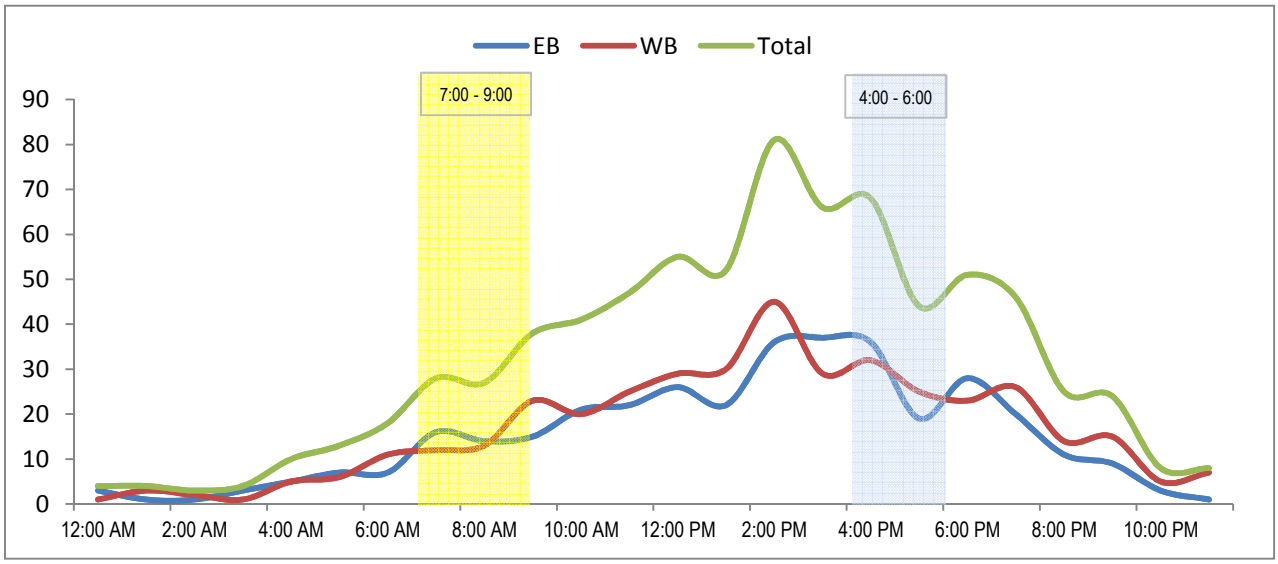
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume ***765***

Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	3	1	4	12:00 PM - 1:00 PM	26	29	55
1:00 AM - 2:00 AM	1	3	4	1:00 PM - 2:00 PM	22	30	52
2:00 AM - 3:00 AM	1	2	3	2:00 PM - 3:00 PM	36	45	81
3:00 AM - 4:00 AM	3	1	4	3:00 PM - 4:00 PM	37	29	66
4:00 AM - 5:00 AM	5	5	10	4:00 PM - 5:00 PM	36	32	68
5:00 AM - 6:00 AM	7	6	13	5:00 PM - 6:00 PM	19	25	44
6:00 AM - 7:00 AM	7	11	18	6:00 PM - 7:00 PM	28	23	51
7:00 AM - 8:00 AM	16	12	28	7:00 PM - 8:00 PM	20	26	46
8:00 AM - 9:00 AM	14	13	27	8:00 PM - 9:00 PM	11	14	25
9:00 AM - 10:00 AM	15	23	38	9:00 PM - 10:00 PM	9	15	24
10:00 AM - 11:00 AM	21	20	41	10:00 PM - 11:00 PM	3	5	8
11:00 AM - 12:00 PM	22	25	47	11:00 PM - 12:00 AM	1	7	8
Total	**115**	**122**	**237**	**Total**	**248**	**280**	**528**

24-Hour EB Volume 363 ***24-Hour WB Volume 402***



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 26. Airway Road Between Otay Mesa Road and Caliente Avenue

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

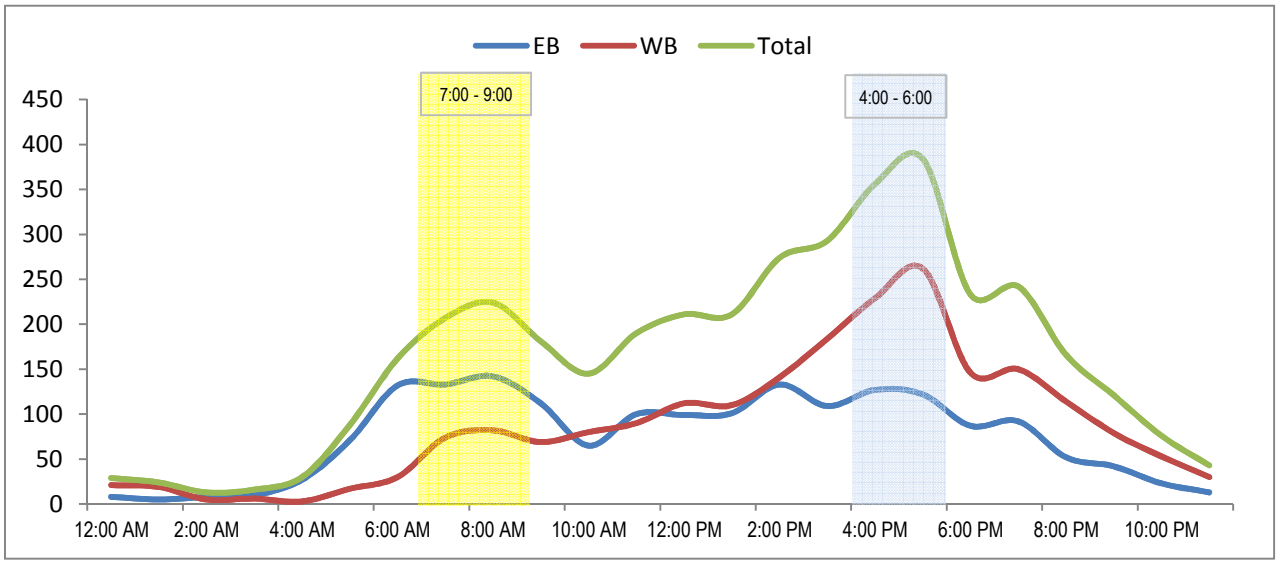
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume 3,919

Time	Hourly Volume EB	Hourly Volume WB	Hourly Volume Total	Time	Hourly Volume EB	Hourly Volume WB	Hourly Volume Total
12:00 AM - 1:00 AM	8	21	29	12:00 PM - 1:00 PM	99	112	211
1:00 AM - 2:00 AM	5	19	24	1:00 PM - 2:00 PM	101	110	211
2:00 AM - 3:00 AM	8	5	13	2:00 PM - 3:00 PM	133	141	274
3:00 AM - 4:00 AM	10	6	16	3:00 PM - 4:00 PM	109	184	293
4:00 AM - 5:00 AM	27	3	30	4:00 PM - 5:00 PM	127	229	356
5:00 AM - 6:00 AM	71	17	88	5:00 PM - 6:00 PM	122	262	384
6:00 AM - 7:00 AM	132	30	162	6:00 PM - 7:00 PM	87	146	233
7:00 AM - 8:00 AM	133	74	207	7:00 PM - 8:00 PM	92	150	242
8:00 AM - 9:00 AM	142	82	224	8:00 PM - 9:00 PM	52	114	166
9:00 AM - 10:00 AM	112	69	181	9:00 PM - 10:00 PM	42	79	121
10:00 AM - 11:00 AM	65	80	145	10:00 PM - 11:00 PM	23	53	76
11:00 AM - 12:00 PM	100	90	190	11:00 PM - 12:00 AM	13	30	43
Total	**813**	**496**	**1,309**	**Total**	**1,000**	**1,610**	**2,610**

24-Hour EB Volume 1,813 **24-Hour WB Volume 2,106**



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 27. Airway Road East of Caliente Avenue

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

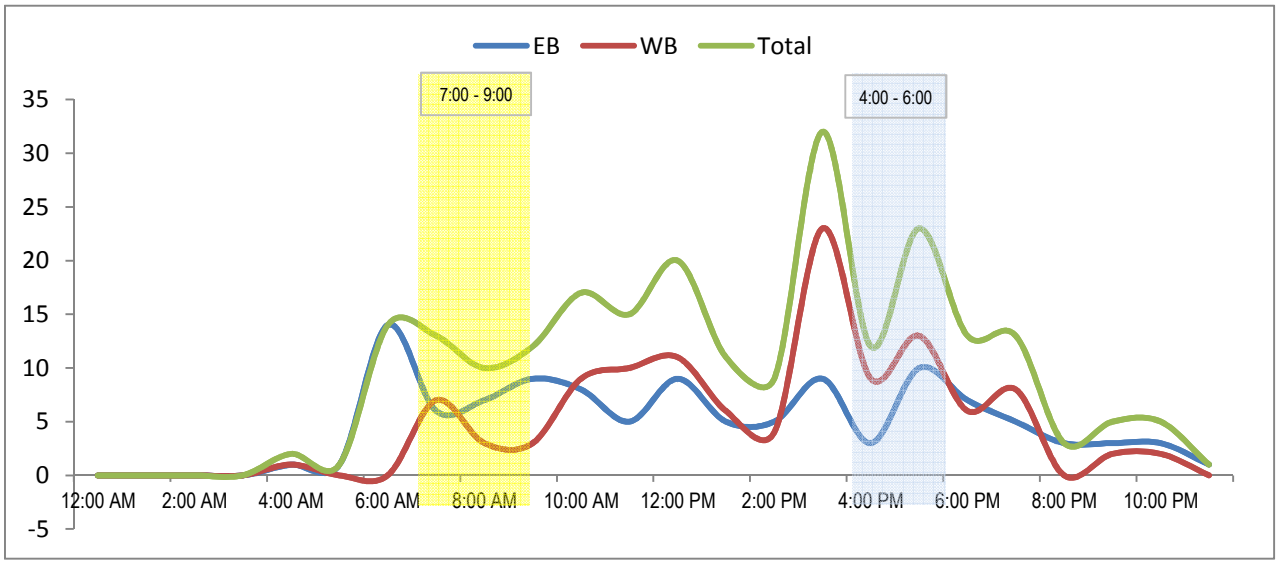
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				231			
Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	0	0	0	12:00 PM - 1:00 PM	9	11	20
1:00 AM - 2:00 AM	0	0	0	1:00 PM - 2:00 PM	5	6	11
2:00 AM - 3:00 AM	0	0	0	2:00 PM - 3:00 PM	5	4	9
3:00 AM - 4:00 AM	0	0	0	3:00 PM - 4:00 PM	9	23	32
4:00 AM - 5:00 AM	1	1	2	4:00 PM - 5:00 PM	3	9	12
5:00 AM - 6:00 AM	1	0	1	5:00 PM - 6:00 PM	10	13	23
6:00 AM - 7:00 AM	14	0	14	6:00 PM - 7:00 PM	7	6	13
7:00 AM - 8:00 AM	6	7	13	7:00 PM - 8:00 PM	5	8	13
8:00 AM - 9:00 AM	7	3	10	8:00 PM - 9:00 PM	3	0	3
9:00 AM - 10:00 AM	9	3	12	9:00 PM - 10:00 PM	3	2	5
10:00 AM - 11:00 AM	8	9	17	10:00 PM - 11:00 PM	3	2	5
11:00 AM - 12:00 PM	5	10	15	11:00 PM - 12:00 AM	1	0	1
Total	**51**	**33**	**84**	**Total**	**63**	**84**	**147**

24-Hour	EB	Volume	114	24-Hour	WB	Volume	117



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 28. Airway Road Between Cactus Road and Britannia Blvd

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

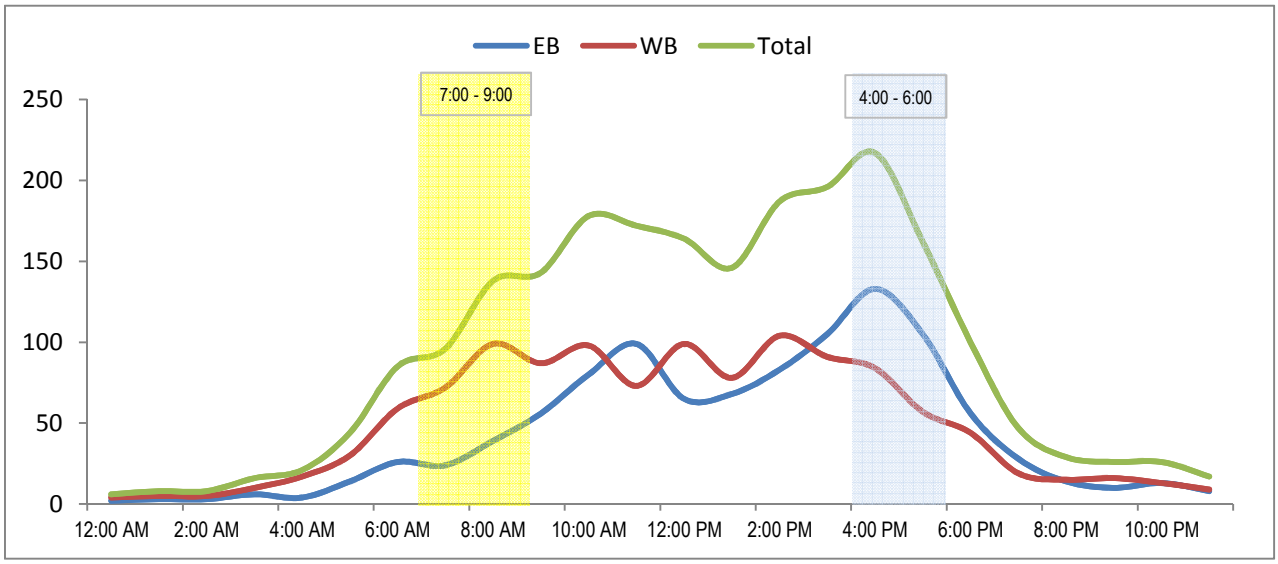
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				2,232			
Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	2	4	6	12:00 PM - 1:00 PM	65	99	164
1:00 AM - 2:00 AM	3	5	8	1:00 PM - 2:00 PM	68	78	146
2:00 AM - 3:00 AM	3	5	8	2:00 PM - 3:00 PM	83	104	187
3:00 AM - 4:00 AM	6	10	16	3:00 PM - 4:00 PM	105	91	196
4:00 AM - 5:00 AM	4	17	21	4:00 PM - 5:00 PM	133	84	217
5:00 AM - 6:00 AM	14	30	44	5:00 PM - 6:00 PM	105	57	162
6:00 AM - 7:00 AM	26	59	85	6:00 PM - 7:00 PM	56	44	100
7:00 AM - 8:00 AM	24	72	96	7:00 PM - 8:00 PM	28	19	47
8:00 AM - 9:00 AM	39	99	138	8:00 PM - 9:00 PM	14	15	29
9:00 AM - 10:00 AM	56	87	143	9:00 PM - 10:00 PM	10	16	26
10:00 AM - 11:00 AM	80	98	178	10:00 PM - 11:00 PM	13	13	26
11:00 AM - 12:00 PM	99	73	172	11:00 PM - 12:00 AM	8	9	17
Total	**356**	**559**	**915**	**Total**	**688**	**629**	**1,317**

24-Hour	EB	Volume	1,044	24-Hour	WB	Volume	1,188



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 29. Airway Road Between Brittania Blvd and La Media Road

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

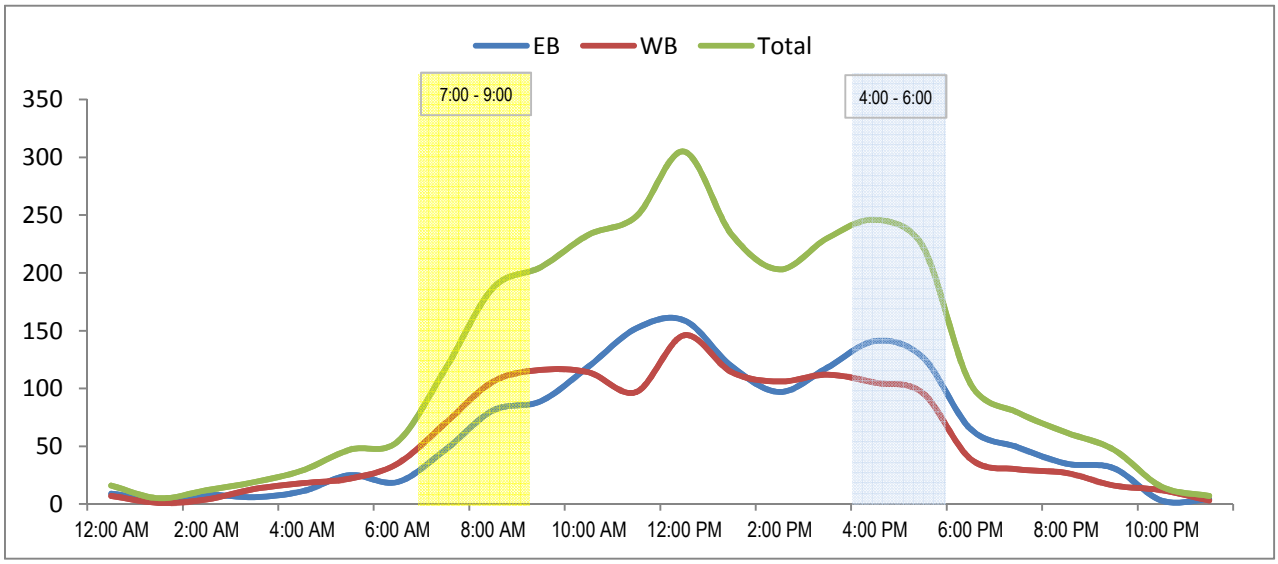
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				2,927			
Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	9	7	16	12:00 PM - 1:00 PM	159	146	305
1:00 AM - 2:00 AM	4	1	5	1:00 PM - 2:00 PM	119	114	233
2:00 AM - 3:00 AM	8	4	12	2:00 PM - 3:00 PM	97	106	203
3:00 AM - 4:00 AM	6	13	19	3:00 PM - 4:00 PM	118	112	230
4:00 AM - 5:00 AM	11	18	29	4:00 PM - 5:00 PM	141	105	246
5:00 AM - 6:00 AM	25	22	47	5:00 PM - 6:00 PM	127	96	223
6:00 AM - 7:00 AM	19	35	54	6:00 PM - 7:00 PM	65	39	104
7:00 AM - 8:00 AM	47	70	117	7:00 PM - 8:00 PM	49	30	79
8:00 AM - 9:00 AM	81	106	187	8:00 PM - 9:00 PM	35	27	62
9:00 AM - 10:00 AM	89	116	205	9:00 PM - 10:00 PM	31	16	47
10:00 AM - 11:00 AM	119	114	233	10:00 PM - 11:00 PM	3	12	15
11:00 AM - 12:00 PM	152	97	249	11:00 PM - 12:00 AM	4	3	7
Total	**570**	**603**	**1,173**	**Total**	**948**	**806**	**1,754**

24-Hour	EB	Volume	1,518	24-Hour	WB	Volume	1,409



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 30. Airway Road Between La Media Road and Pipers Ranch Road

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

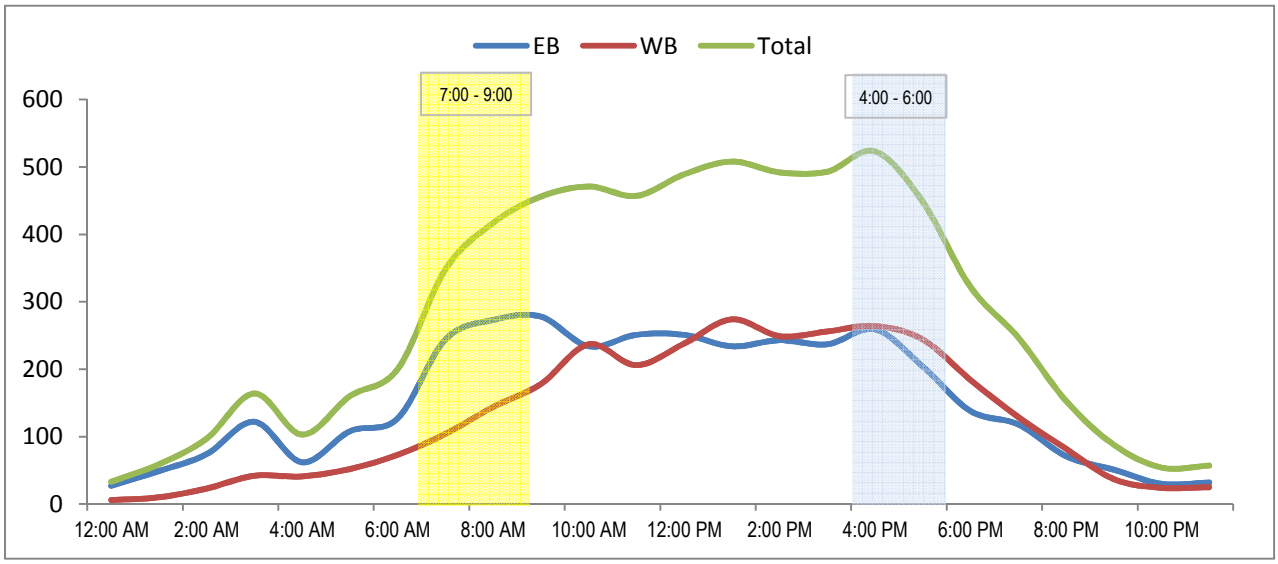
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				6,839			
Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	27	6	33	12:00 PM - 1:00 PM	251	238	489
1:00 AM - 2:00 AM	49	10	59	1:00 PM - 2:00 PM	234	274	508
2:00 AM - 3:00 AM	74	23	97	2:00 PM - 3:00 PM	243	249	492
3:00 AM - 4:00 AM	122	42	164	3:00 PM - 4:00 PM	237	256	493
4:00 AM - 5:00 AM	62	41	103	4:00 PM - 5:00 PM	259	264	523
5:00 AM - 6:00 AM	108	52	160	5:00 PM - 6:00 PM	204	244	448
6:00 AM - 7:00 AM	127	73	200	6:00 PM - 7:00 PM	138	184	322
7:00 AM - 8:00 AM	244	104	348	7:00 PM - 8:00 PM	118	129	247
8:00 AM - 9:00 AM	273	144	417	8:00 PM - 9:00 PM	71	82	153
9:00 AM - 10:00 AM	278	178	456	9:00 PM - 10:00 PM	51	37	88
10:00 AM - 11:00 AM	234	237	471	10:00 PM - 11:00 PM	30	24	54
11:00 AM - 12:00 PM	251	206	457	11:00 PM - 12:00 AM	32	25	57
Total	**1,849**	**1,116**	**2,965**	**Total**	**1,868**	**2,006**	**3,874**

24-Hour	EB	Volume	3,717	24-Hour	WB	Volume	3,122



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 31. Airway Road Between Pipers Ranch Road and Harvest Road

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

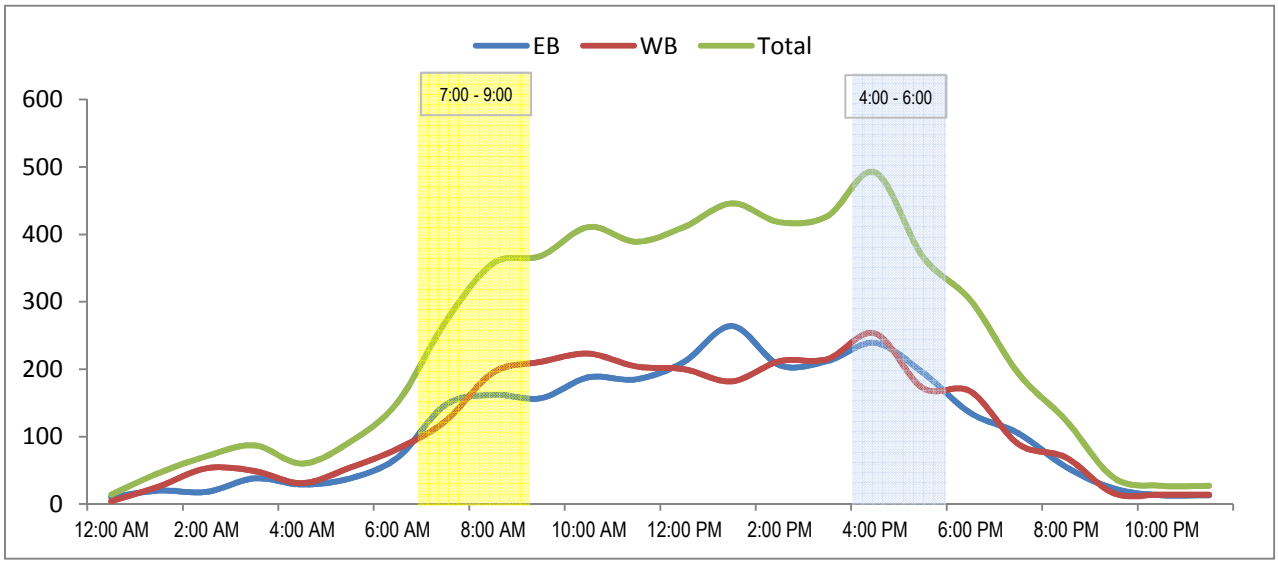
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				5,590			
Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	10	4	14	12:00 PM - 1:00 PM	211	200	411
1:00 AM - 2:00 AM	20	26	46	1:00 PM - 2:00 PM	264	182	446
2:00 AM - 3:00 AM	18	53	71	2:00 PM - 3:00 PM	206	212	418
3:00 AM - 4:00 AM	38	49	87	3:00 PM - 4:00 PM	212	215	427
4:00 AM - 5:00 AM	29	31	60	4:00 PM - 5:00 PM	239	253	492
5:00 AM - 6:00 AM	38	54	92	5:00 PM - 6:00 PM	195	172	367
6:00 AM - 7:00 AM	69	82	151	6:00 PM - 7:00 PM	135	167	302
7:00 AM - 8:00 AM	147	123	270	7:00 PM - 8:00 PM	105	89	194
8:00 AM - 9:00 AM	162	195	357	8:00 PM - 9:00 PM	55	69	124
9:00 AM - 10:00 AM	157	211	368	9:00 PM - 10:00 PM	23	16	39
10:00 AM - 11:00 AM	188	223	411	10:00 PM - 11:00 PM	13	14	27
11:00 AM - 12:00 PM	185	204	389	11:00 PM - 12:00 AM	13	14	27
Total	**1,061**	**1,255**	**2,316**	**Total**	**1,671**	**1,603**	**3,274**

24-Hour	EB	Volume	2,732	24-Hour	WB	Volume	2,858



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 32. Airway Road Between Harvest Road and Sanyo Avenue

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

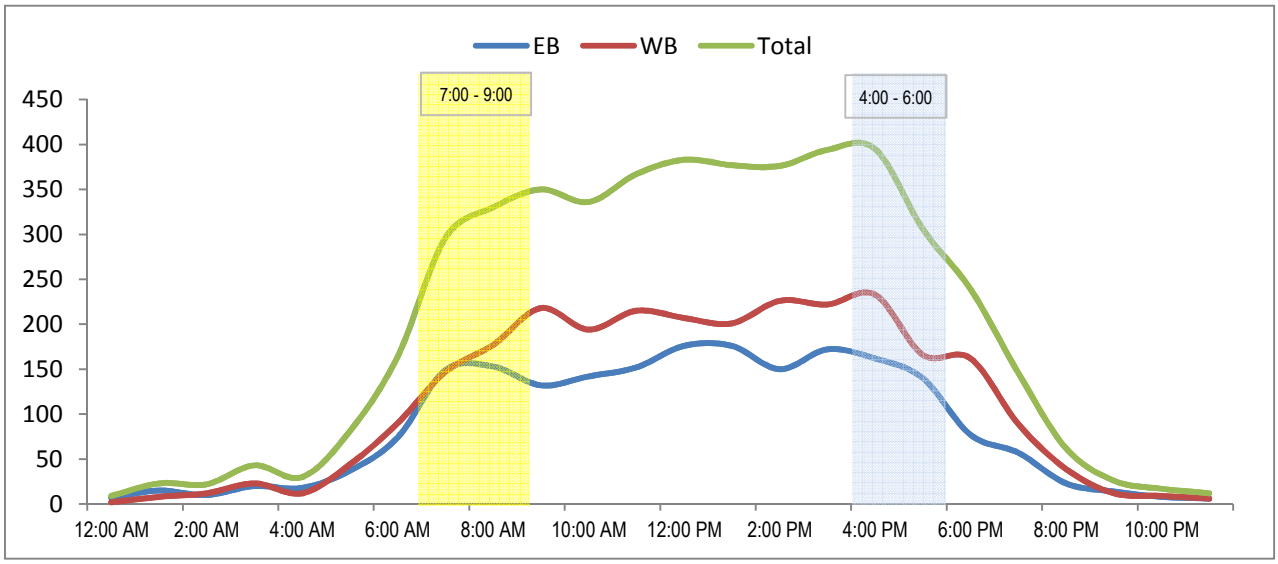
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				4,784			
Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	7	2	9	12:00 PM - 1:00 PM	176	207	383
1:00 AM - 2:00 AM	15	8	23	1:00 PM - 2:00 PM	176	201	377
2:00 AM - 3:00 AM	10	12	22	2:00 PM - 3:00 PM	150	226	376
3:00 AM - 4:00 AM	20	23	43	3:00 PM - 4:00 PM	172	222	394
4:00 AM - 5:00 AM	18	12	30	4:00 PM - 5:00 PM	162	233	395
5:00 AM - 6:00 AM	37	44	81	5:00 PM - 6:00 PM	140	166	306
6:00 AM - 7:00 AM	74	90	164	6:00 PM - 7:00 PM	77	162	239
7:00 AM - 8:00 AM	149	147	296	7:00 PM - 8:00 PM	57	89	146
8:00 AM - 9:00 AM	153	177	330	8:00 PM - 9:00 PM	23	39	62
9:00 AM - 10:00 AM	132	218	350	9:00 PM - 10:00 PM	14	12	26
10:00 AM - 11:00 AM	142	194	336	10:00 PM - 11:00 PM	8	9	17
11:00 AM - 12:00 PM	152	215	367	11:00 PM - 12:00 AM	6	6	12
Total	**909**	**1,142**	**2,051**	**Total**	**1,161**	**1,572**	**2,733**

24-Hour	EB	Volume	2,070	24-Hour	WB	Volume	2,714



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 44. Beyer Blvd Between Park Avenue and Otay Mesa Road

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

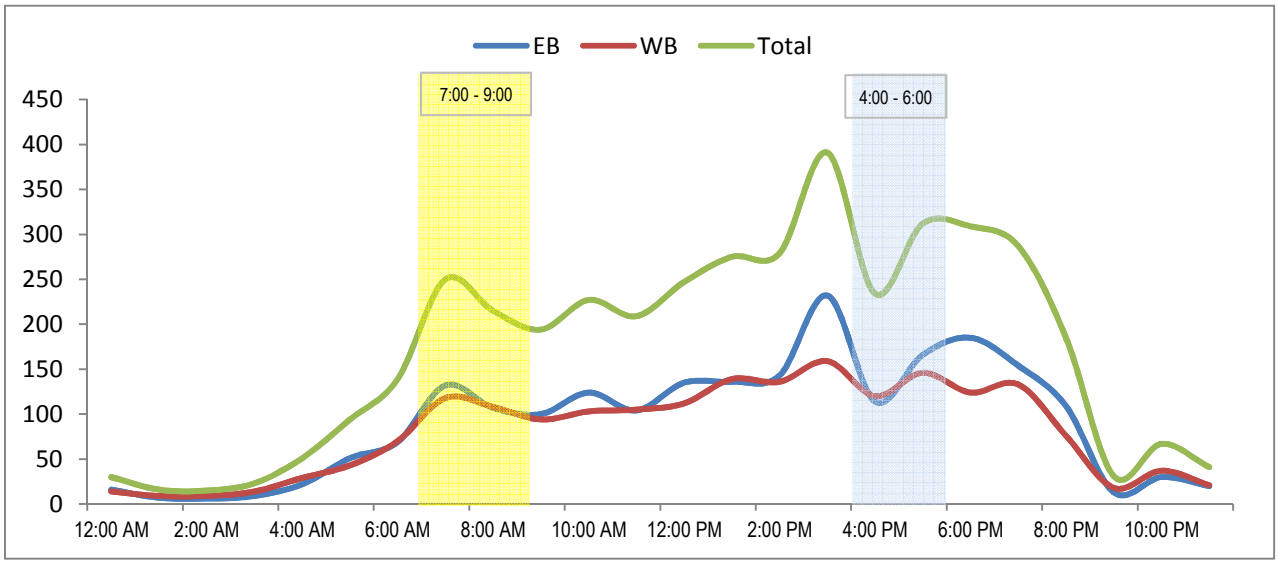
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				4,121			
Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	16	14	30	12:00 PM - 1:00 PM	135	112	247
1:00 AM - 2:00 AM	7	9	16	1:00 PM - 2:00 PM	136	139	275
2:00 AM - 3:00 AM	6	9	15	2:00 PM - 3:00 PM	143	136	279
3:00 AM - 4:00 AM	9	14	23	3:00 PM - 4:00 PM	232	159	391
4:00 AM - 5:00 AM	22	29	51	4:00 PM - 5:00 PM	114	120	234
5:00 AM - 6:00 AM	51	43	94	5:00 PM - 6:00 PM	166	146	312
6:00 AM - 7:00 AM	69	70	139	6:00 PM - 7:00 PM	185	124	309
7:00 AM - 8:00 AM	132	118	250	7:00 PM - 8:00 PM	154	133	287
8:00 AM - 9:00 AM	107	108	215	8:00 PM - 9:00 PM	109	76	185
9:00 AM - 10:00 AM	100	94	194	9:00 PM - 10:00 PM	13	18	31
10:00 AM - 11:00 AM	124	103	227	10:00 PM - 11:00 PM	30	37	67
11:00 AM - 12:00 PM	104	105	209	11:00 PM - 12:00 AM	20	21	41
Total	**747**	**716**	**1,463**	**Total**	**1,437**	**1,221**	**2,658**

24-Hour	EB	Volume	2,184	24-Hour	WB	Volume	1,937



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 45. Beyer Blvd East of Otay Mesa Road

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

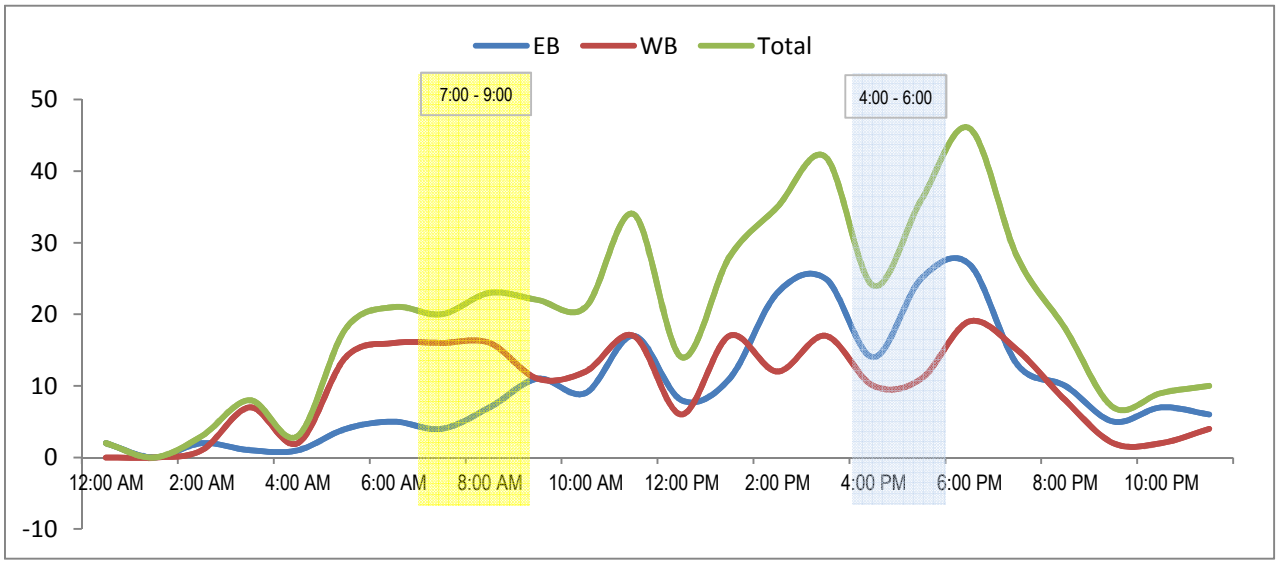
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				472			
Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	2	0	2	12:00 PM - 1:00 PM	8	6	14
1:00 AM - 2:00 AM	0	0	0	1:00 PM - 2:00 PM	11	17	28
2:00 AM - 3:00 AM	2	1	3	2:00 PM - 3:00 PM	23	12	35
3:00 AM - 4:00 AM	1	7	8	3:00 PM - 4:00 PM	25	17	42
4:00 AM - 5:00 AM	1	2	3	4:00 PM - 5:00 PM	14	10	24
5:00 AM - 6:00 AM	4	14	18	5:00 PM - 6:00 PM	25	11	36
6:00 AM - 7:00 AM	5	16	21	6:00 PM - 7:00 PM	27	19	46
7:00 AM - 8:00 AM	4	16	20	7:00 PM - 8:00 PM	13	15	28
8:00 AM - 9:00 AM	7	16	23	8:00 PM - 9:00 PM	10	8	18
9:00 AM - 10:00 AM	11	11	22	9:00 PM - 10:00 PM	5	2	7
10:00 AM - 11:00 AM	9	12	21	10:00 PM - 11:00 PM	7	2	9
11:00 AM - 12:00 PM	17	17	34	11:00 PM - 12:00 AM	6	4	10
Total	**63**	**112**	**175**	**Total**	**174**	**123**	**297**

24-Hour	EB	Volume	237	24-Hour	WB	Volume	235



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 35. Siempre Viva Road Between Cactus Road and Britannia Blvd

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

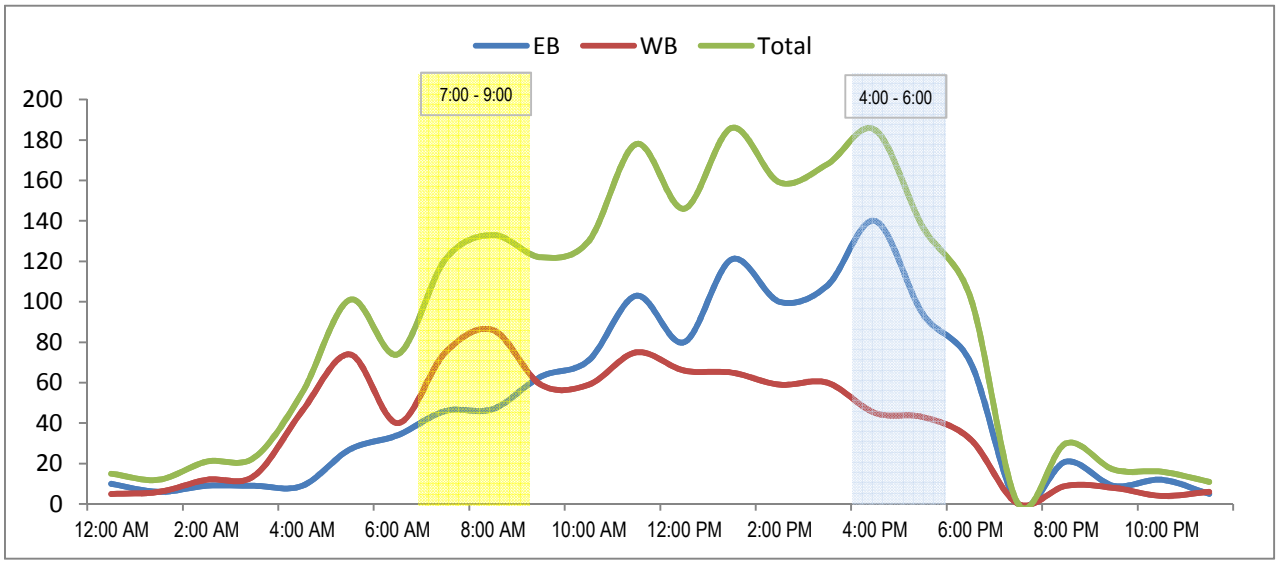
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume 2,142

Time	Hourly Volume EB	Hourly Volume WB	Hourly Volume Total	Time	Hourly Volume EB	Hourly Volume WB	Hourly Volume Total
12:00 AM - 1:00 AM	10	5	15	12:00 PM - 1:00 PM	80	66	146
1:00 AM - 2:00 AM	6	6	12	1:00 PM - 2:00 PM	121	65	186
2:00 AM - 3:00 AM	9	12	21	2:00 PM - 3:00 PM	100	59	159
3:00 AM - 4:00 AM	9	14	23	3:00 PM - 4:00 PM	108	60	168
4:00 AM - 5:00 AM	9	46	55	4:00 PM - 5:00 PM	140	45	185
5:00 AM - 6:00 AM	27	74	101	5:00 PM - 6:00 PM	94	43	137
6:00 AM - 7:00 AM	34	40	74	6:00 PM - 7:00 PM	70	32	102
7:00 AM - 8:00 AM	46	75	121	7:00 PM - 8:00 PM	0	0	0
8:00 AM - 9:00 AM	47	86	133	8:00 PM - 9:00 PM	21	9	30
9:00 AM - 10:00 AM	63	59	122	9:00 PM - 10:00 PM	9	8	17
10:00 AM - 11:00 AM	71	59	130	10:00 PM - 11:00 PM	12	4	16
11:00 AM - 12:00 PM	103	75	178	11:00 PM - 12:00 AM	5	6	11
Total	**434**	**551**	**985**	**Total**	**760**	**397**	**1,157**

24-Hour EB Volume 1,194 **24-Hour WB Volume 948**



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 36. Siempre Viva Road Between Brittania Blvd and La Media Road

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

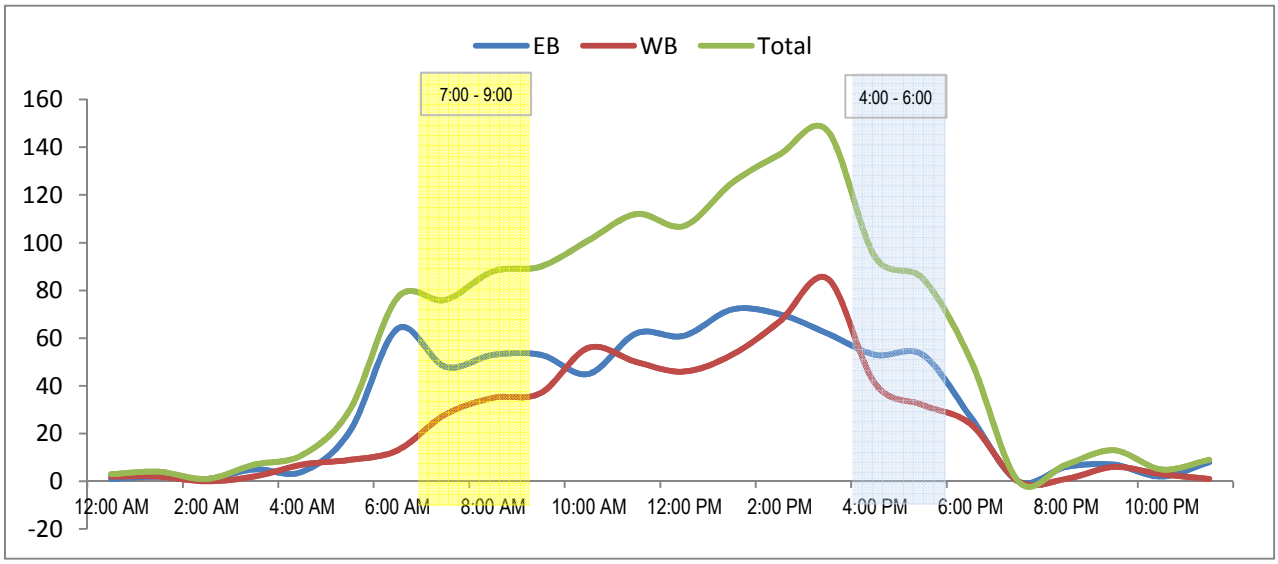
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				1,380			
Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	1	2	3	12:00 PM - 1:00 PM	61	46	107
1:00 AM - 2:00 AM	2	2	4	1:00 PM - 2:00 PM	72	53	125
2:00 AM - 3:00 AM	1	0	1	2:00 PM - 3:00 PM	70	67	137
3:00 AM - 4:00 AM	5	2	7	3:00 PM - 4:00 PM	62	85	147
4:00 AM - 5:00 AM	4	7	11	4:00 PM - 5:00 PM	53	41	94
5:00 AM - 6:00 AM	21	9	30	5:00 PM - 6:00 PM	53	32	85
6:00 AM - 7:00 AM	64	13	77	6:00 PM - 7:00 PM	27	24	51
7:00 AM - 8:00 AM	48	28	76	7:00 PM - 8:00 PM	0	0	0
8:00 AM - 9:00 AM	53	35	88	8:00 PM - 9:00 PM	6	1	7
9:00 AM - 10:00 AM	53	37	90	9:00 PM - 10:00 PM	7	6	13
10:00 AM - 11:00 AM	45	56	101	10:00 PM - 11:00 PM	2	3	5
11:00 AM - 12:00 PM	62	50	112	11:00 PM - 12:00 AM	8	1	9
Total	**359**	**241**	**600**	**Total**	**421**	**359**	**780**

24-Hour	EB	Volume	780	24-Hour	WB	Volume	600



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 37. Siempre Viva Road Between La Media Road and Customhouse Plaza

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

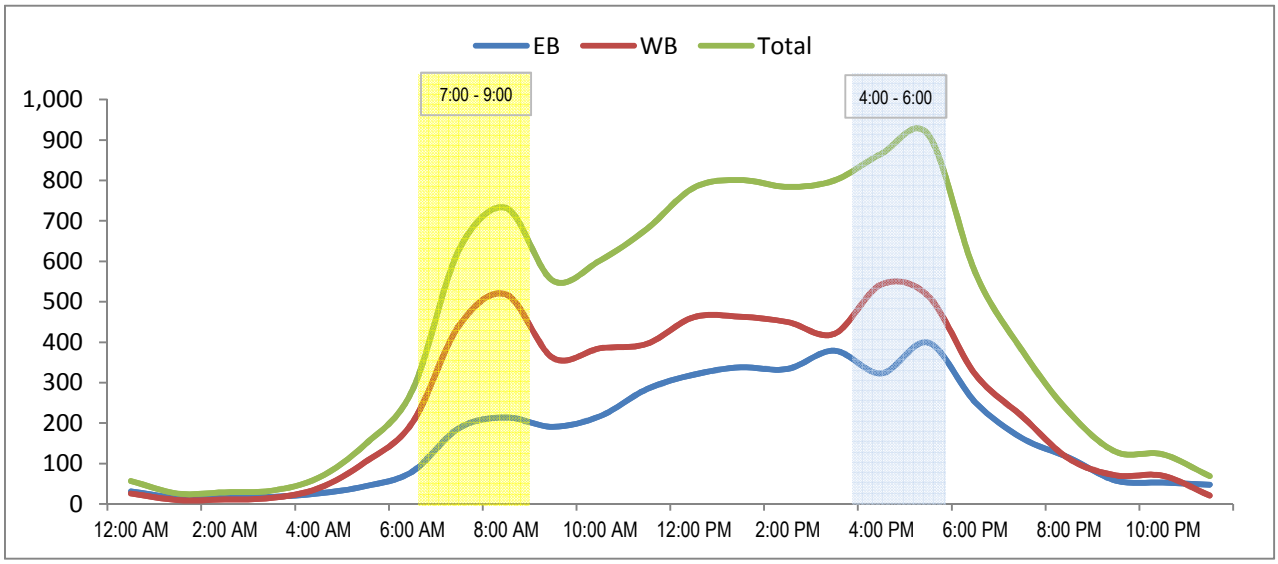
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume 10,282

Time	Hourly Volume EB	Hourly Volume WB	Hourly Volume Total	Time	Hourly Volume EB	Hourly Volume WB	Hourly Volume Total
12:00 AM - 1:00 AM	31	26	57	12:00 PM - 1:00 PM	320	462	782
1:00 AM - 2:00 AM	16	10	26	1:00 PM - 2:00 PM	338	463	801
2:00 AM - 3:00 AM	18	11	29	2:00 PM - 3:00 PM	334	450	784
3:00 AM - 4:00 AM	18	15	33	3:00 PM - 4:00 PM	379	421	800
4:00 AM - 5:00 AM	26	39	65	4:00 PM - 5:00 PM	323	543	866
5:00 AM - 6:00 AM	44	104	148	5:00 PM - 6:00 PM	399	514	913
6:00 AM - 7:00 AM	80	201	281	6:00 PM - 7:00 PM	252	321	573
7:00 AM - 8:00 AM	188	442	630	7:00 PM - 8:00 PM	163	217	380
8:00 AM - 9:00 AM	214	518	732	8:00 PM - 9:00 PM	115	112	227
9:00 AM - 10:00 AM	191	361	552	9:00 PM - 10:00 PM	58	71	129
10:00 AM - 11:00 AM	217	385	602	10:00 PM - 11:00 PM	53	70	123
11:00 AM - 12:00 PM	284	396	680	11:00 PM - 12:00 AM	48	21	69
Total	**1,327**	**2,508**	**3,835**	**Total**	**2,782**	**3,665**	**6,447**

24-Hour	EB	Volume	4,109	24-Hour	WB	Volume	6,173



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 38. Siempre Viva Road Between Customhouse Plaza and Otay Center Drive

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

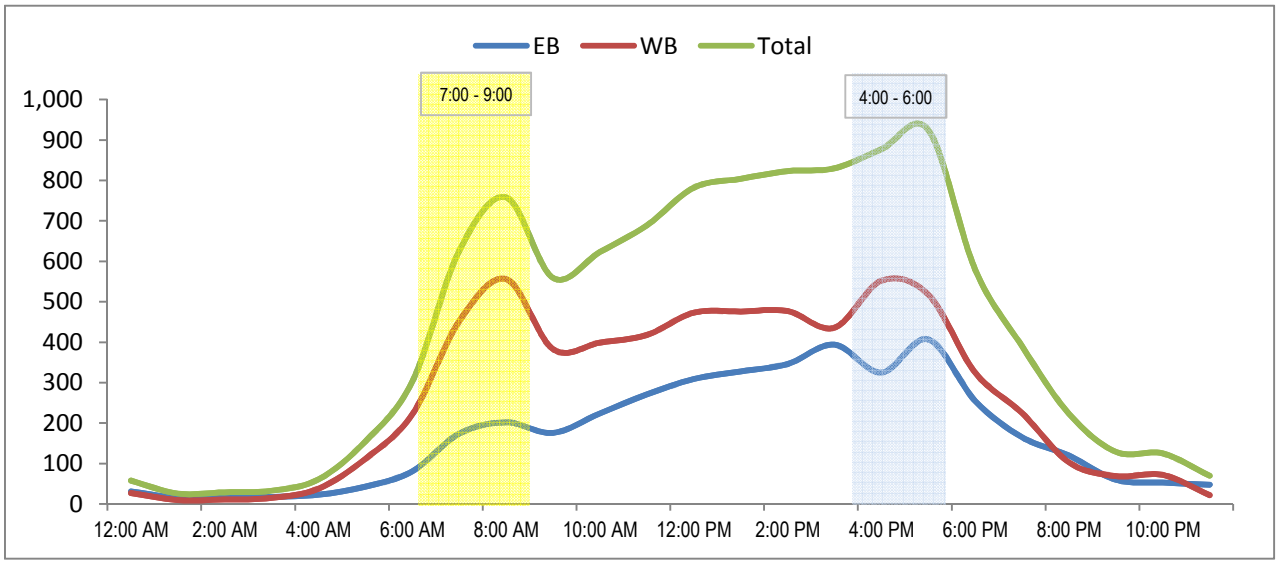
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume 10,478

Time	Hourly Volume EB	Hourly Volume WB	Hourly Volume Total	Time	Hourly Volume EB	Hourly Volume WB	Hourly Volume Total
12:00 AM - 1:00 AM	31	27	58	12:00 PM - 1:00 PM	309	473	782
1:00 AM - 2:00 AM	16	10	26	1:00 PM - 2:00 PM	328	476	804
2:00 AM - 3:00 AM	18	11	29	2:00 PM - 3:00 PM	346	477	823
3:00 AM - 4:00 AM	18	15	33	3:00 PM - 4:00 PM	394	436	830
4:00 AM - 5:00 AM	23	38	61	4:00 PM - 5:00 PM	325	552	877
5:00 AM - 6:00 AM	43	112	155	5:00 PM - 6:00 PM	407	518	925
6:00 AM - 7:00 AM	81	222	303	6:00 PM - 7:00 PM	255	325	580
7:00 AM - 8:00 AM	174	452	626	7:00 PM - 8:00 PM	165	225	390
8:00 AM - 9:00 AM	202	556	758	8:00 PM - 9:00 PM	120	103	223
9:00 AM - 10:00 AM	176	383	559	9:00 PM - 10:00 PM	60	69	129
10:00 AM - 11:00 AM	224	399	623	10:00 PM - 11:00 PM	53	72	125
11:00 AM - 12:00 PM	271	418	689	11:00 PM - 12:00 AM	48	22	70
Total	**1,277**	**2,643**	**3,920**	**Total**	**2,810**	**3,748**	**6,558**

24-Hour EB Volume 4,087 **24-Hour WB Volume 6,391**



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 39. Siempre Viva Road Between Otay Center Drive and SB Off Ramp

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

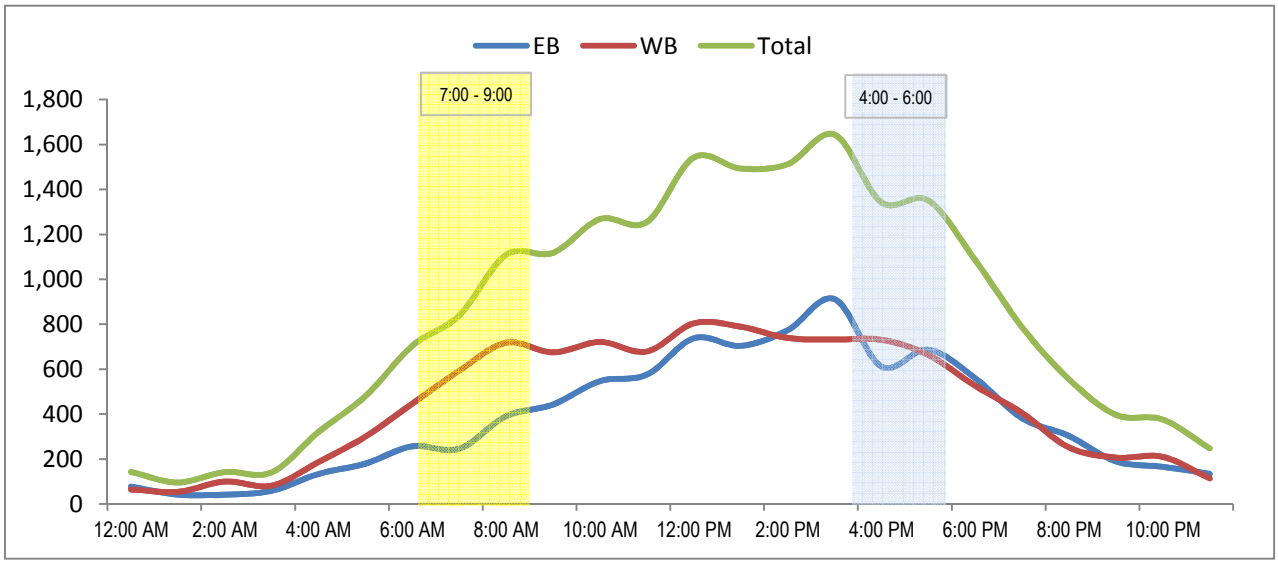
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				19,950			
Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	78	65	143	12:00 PM - 1:00 PM	738	804	1,542
1:00 AM - 2:00 AM	42	54	96	1:00 PM - 2:00 PM	704	789	1,493
2:00 AM - 3:00 AM	42	100	142	2:00 PM - 3:00 PM	773	739	1,512
3:00 AM - 4:00 AM	59	82	141	3:00 PM - 4:00 PM	912	732	1,644
4:00 AM - 5:00 AM	134	187	321	4:00 PM - 5:00 PM	612	731	1,343
5:00 AM - 6:00 AM	180	300	480	5:00 PM - 6:00 PM	687	664	1,351
6:00 AM - 7:00 AM	257	447	704	6:00 PM - 7:00 PM	560	526	1,086
7:00 AM - 8:00 AM	246	593	839	7:00 PM - 8:00 PM	382	405	787
8:00 AM - 9:00 AM	391	718	1,109	8:00 PM - 9:00 PM	303	252	555
9:00 AM - 10:00 AM	443	675	1,118	9:00 PM - 10:00 PM	190	207	397
10:00 AM - 11:00 AM	547	721	1,268	10:00 PM - 11:00 PM	166	210	376
11:00 AM - 12:00 PM	576	679	1255	11:00 PM - 12:00 AM	134	114	248
Total	**2,995**	**4,621**	**7,616**	**Total**	**6,161**	**6,173**	**12,334**

24-Hour	EB	Volume	9,156	24-Hour	WB	Volume	10,794



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 40. Siempre Viva Road Between SB Off Ramp and SB Off Ramp

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

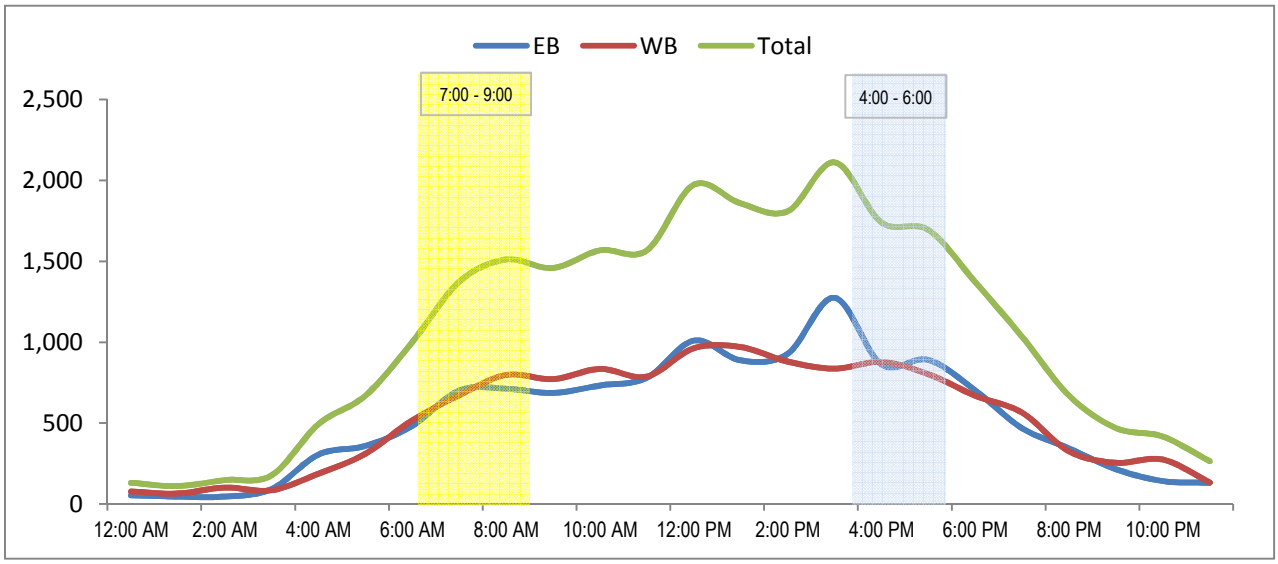
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				25,629				
Time	Hourly Volume			Time	Hourly Volume			
	EB	WB	Total		EB	WB	Total	
12:00 AM - 1:00 AM	54	77	131	12:00 PM - 1:00 PM	1,010	963	1,973	
1:00 AM - 2:00 AM	46	65	111	1:00 PM - 2:00 PM	888	970	1,858	
2:00 AM - 3:00 AM	46	102	148	2:00 PM - 3:00 PM	928	881	1,809	
3:00 AM - 4:00 AM	93	85	178	3:00 PM - 4:00 PM	1,275	837	2,112	
4:00 AM - 5:00 AM	306	188	494	4:00 PM - 5:00 PM	863	878	1,741	
5:00 AM - 6:00 AM	359	311	670	5:00 PM - 6:00 PM	891	803	1,694	
6:00 AM - 7:00 AM	483	518	1,001	6:00 PM - 7:00 PM	703	669	1,372	
7:00 AM - 8:00 AM	702	672	1,374	7:00 PM - 8:00 PM	469	565	1,034	
8:00 AM - 9:00 AM	713	798	1,511	8:00 PM - 9:00 PM	345	326	671	
9:00 AM - 10:00 AM	687	772	1,459	9:00 PM - 10:00 PM	215	255	470	
10:00 AM - 11:00 AM	733	835	1,568	10:00 PM - 11:00 PM	142	275	417	
11:00 AM - 12:00 PM	780	788	1568	11:00 PM - 12:00 AM	131	134	265	
Total	**5,002**	**5,211**	**10,213**	**Total**	**7,860**	**7,556**	**15,416**	

24-Hour	EB	Volume	12,862	24-Hour	WB	Volume	12,767



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 41. Siempre Viva Road Between SB Off Ramp and NB Off Ramp

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

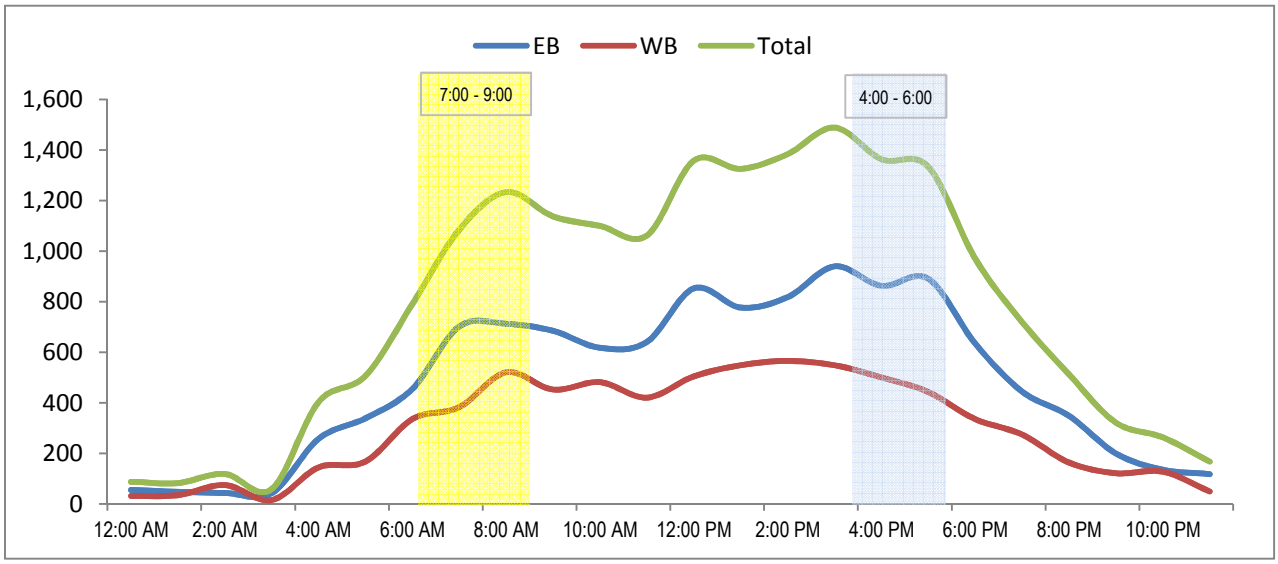
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				18,882			
Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	56	32	88	12:00 PM - 1:00 PM	853	505	1,358
1:00 AM - 2:00 AM	48	35	83	1:00 PM - 2:00 PM	777	549	1,326
2:00 AM - 3:00 AM	44	75	119	2:00 PM - 3:00 PM	818	566	1,384
3:00 AM - 4:00 AM	43	16	59	3:00 PM - 4:00 PM	940	549	1,489
4:00 AM - 5:00 AM	258	145	403	4:00 PM - 5:00 PM	863	501	1,364
5:00 AM - 6:00 AM	339	168	507	5:00 PM - 6:00 PM	891	443	1,334
6:00 AM - 7:00 AM	455	336	791	6:00 PM - 7:00 PM	635	336	971
7:00 AM - 8:00 AM	702	383	1,085	7:00 PM - 8:00 PM	445	275	720
8:00 AM - 9:00 AM	713	521	1,234	8:00 PM - 9:00 PM	349	164	513
9:00 AM - 10:00 AM	685	453	1,138	9:00 PM - 10:00 PM	200	122	322
10:00 AM - 11:00 AM	618	482	1,100	10:00 PM - 11:00 PM	136	128	264
11:00 AM - 12:00 PM	641	421	1062	11:00 PM - 12:00 AM	118	50	168
Total	**4,602**	**3,067**	**7,669**	**Total**	**7,025**	**4,188**	**11,213**

24-Hour	EB	Volume	11,627	24-Hour	WB	Volume	7,255



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 42. Siempre Viva Road East of NB Off Ramp

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

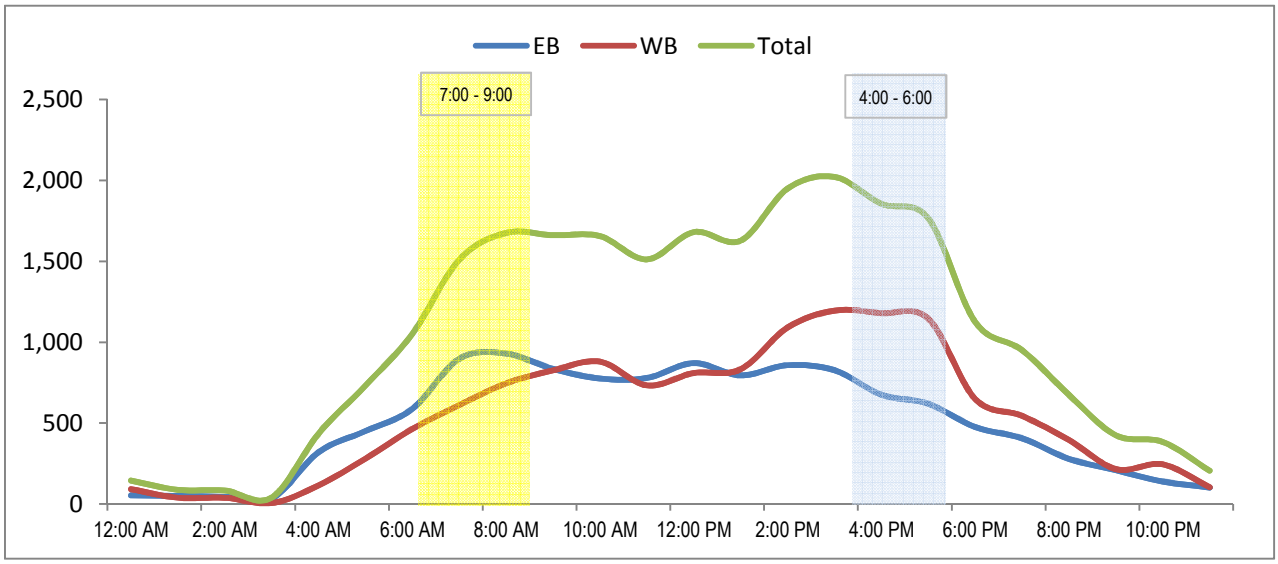
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				25,260			
Time	Hourly Volume			Time	Hourly Volume		
	EB	WB	Total		EB	WB	Total
12:00 AM - 1:00 AM	53	92	145	12:00 PM - 1:00 PM	871	810	1,681
1:00 AM - 2:00 AM	49	39	88	1:00 PM - 2:00 PM	795	833	1,628
2:00 AM - 3:00 AM	45	39	84	2:00 PM - 3:00 PM	858	1,091	1,949
3:00 AM - 4:00 AM	34	6	40	3:00 PM - 4:00 PM	827	1,195	2,022
4:00 AM - 5:00 AM	320	115	435	4:00 PM - 5:00 PM	676	1,180	1,856
5:00 AM - 6:00 AM	451	281	732	5:00 PM - 6:00 PM	620	1,146	1,766
6:00 AM - 7:00 AM	588	464	1,052	6:00 PM - 7:00 PM	476	650	1,126
7:00 AM - 8:00 AM	898	612	1,510	7:00 PM - 8:00 PM	406	545	951
8:00 AM - 9:00 AM	930	746	1,676	8:00 PM - 9:00 PM	279	396	675
9:00 AM - 10:00 AM	835	826	1,661	9:00 PM - 10:00 PM	209	216	425
10:00 AM - 11:00 AM	776	880	1,656	10:00 PM - 11:00 PM	139	245	384
11:00 AM - 12:00 PM	779	733	1512	11:00 PM - 12:00 AM	102	104	206
Total	**5,758**	**4,833**	**10,591**	**Total**	**6,258**	**8,411**	**14,669**

24-Hour	EB	Volume	12,016	24-Hour	WB	Volume	13,244



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 43. Customhouse Plaza South of Siempre Viva Road

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

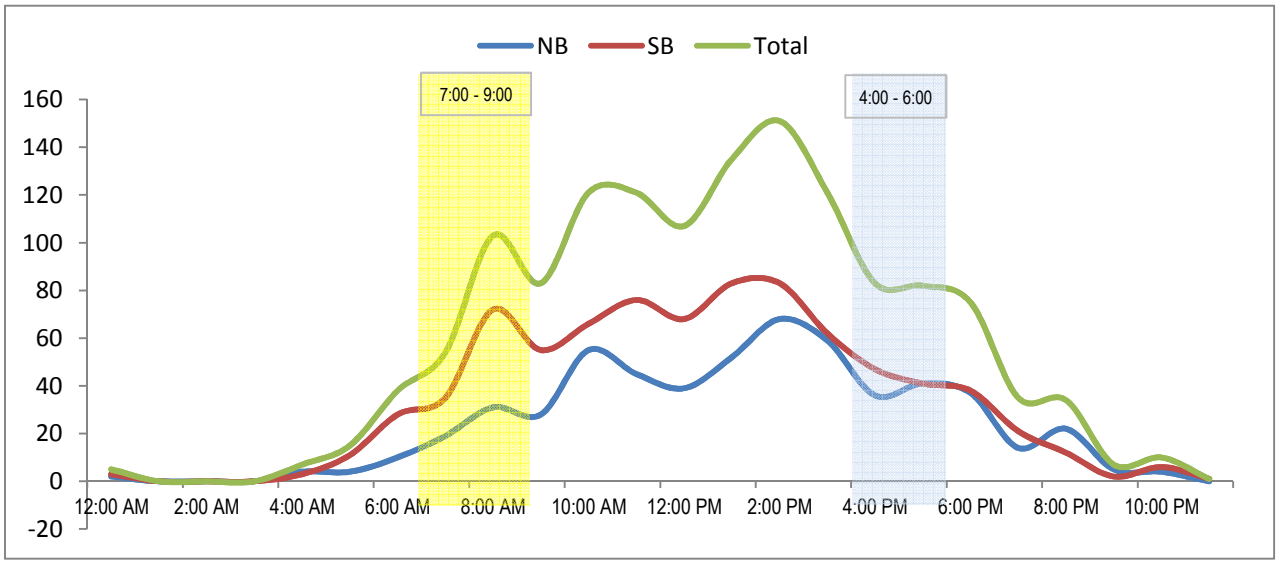
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				1,388			
Time	Hourly Volume			Time	Hourly Volume		
	NB	SB	Total		NB	SB	Total
12:00 AM - 1:00 AM	2	3	5	12:00 PM - 1:00 PM	39	68	107
1:00 AM - 2:00 AM	0	0	0	1:00 PM - 2:00 PM	52	83	135
2:00 AM - 3:00 AM	0	0	0	2:00 PM - 3:00 PM	68	83	151
3:00 AM - 4:00 AM	0	0	0	3:00 PM - 4:00 PM	59	62	121
4:00 AM - 5:00 AM	4	3	7	4:00 PM - 5:00 PM	36	47	83
5:00 AM - 6:00 AM	4	11	15	5:00 PM - 6:00 PM	41	41	82
6:00 AM - 7:00 AM	10	28	38	6:00 PM - 7:00 PM	37	38	75
7:00 AM - 8:00 AM	19	35	54	7:00 PM - 8:00 PM	14	21	35
8:00 AM - 9:00 AM	31	72	103	8:00 PM - 9:00 PM	22	12	34
9:00 AM - 10:00 AM	28	55	83	9:00 PM - 10:00 PM	5	2	7
10:00 AM - 11:00 AM	55	66	121	10:00 PM - 11:00 PM	4	6	10
11:00 AM - 12:00 PM	45	76	121	11:00 PM - 12:00 AM	0	1	1
Total	**198**	**349**	**547**	**Total**	**377**	**464**	**841**

24-Hour	NB	Volume	575	24-Hour	SB	Volume	813



Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Beyer Blvd @ Otay Mesa Road

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Beyer Blvd @ Otay Mesa Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	10	9	0	0	3	2	1	6	12	10	0	6	59
7:15 AM	10	8	0	0	1	0	0	2	9	10	0	8	48
7:30 AM	24	12	1	0	2	2	1	9	11	19	0	7	88
7:45 AM	27	6	0	1	2	3	0	6	7	38	1	33	124
8:00 AM	15	11	0	0	1	2	1	6	5	17	0	11	69
8:15 AM	16	14	0	1	0	2	1	5	13	18	0	9	79
8:30 AM	16	7	0	0	0	2	1	7	11	19	0	8	71
8:45 AM	16	14	0	1	1	6	3	9	14	10	1	14	89
Total	134	81	1	3	10	19	8	50	82	141	2	96	627

AM Intersection Peak Hour : **7:30 AM - 8:30 AM** Intersection PHF : **0.73**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	82	43	1	2	5	9	3	26	36	92	1	60	360
PHF	0.76	0.77	0.25	0.50	0.63	0.75	0.75	0.72	0.69	0.61	0.25	0.45	0.73
Movement PHF		0.85			0.67			0.77			0.53		0.73

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	10	5	0	0	0	1	1	6	14	21	1	5	64
4:15 PM	12	6	1	0	1	1	2	7	15	19	2	9	75
4:30 PM	15	6	0	1	1	1	3	7	16	21	1	11	83
4:45 PM	18	7	0	0	2	2	2	6	16	18	1	5	77
5:00 PM	13	5	0	0	0	0	2	8	17	19	2	5	71
5:15 PM	12	9	0	0	0	3	2	11	19	24	1	9	90
5:30 PM	16	11	0	1	0	1	4	7	14	28	3	17	102
5:45 PM	25	13	1	0	5	1	3	8	25	30	7	21	139
Total	121	62	2	2	9	10	19	60	136	180	18	82	701

PM Intersection Peak Hour : **5:00 PM - 6:00 PM** Intersection PHF : **0.72**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	66	38	1	1	5	5	11	34	75	101	13	52	402
PHF	0.66	0.731	0.25	0.25	0.25	0.417	0.688	0.773	0.75	0.842	0.464	0.619	0.72
Movement PHF		0.67			0.46			0.83			0.72		0.72

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Ocean View Hills Parkway @ Del Sol Blvd

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Ocean View Hills Parkway @ Del Sol Blvd

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	6	0	0	1	27	3	9	0	6	3	40	2	97
7:15 AM	5	0	1	1	37	3	7	0	9	2	26	2	93
7:30 AM	8	0	0	2	39	2	10	0	21	4	38	5	129
7:45 AM	6	0	2	1	31	3	12	0	12	4	42	3	116
8:00 AM	6	0	2	3	37	3	7	0	13	6	46	4	127
8:15 AM	6	0	1	1	46	3	9	0	9	2	34	6	117
8:30 AM	4	0	0	1	31	3	12	0	9	4	39	3	106
8:45 AM	9	0	1	2	40	3	10	0	14	4	29	2	114
Total	50	0	7	12	288	23	76	0	93	29	294	27	899

AM Intersection Peak Hour : **7:30 AM - 8:30 AM** Intersection PHF : **0.95**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	26	0	5	7	153	11	38	0	55	16	160	18	489
PHF	0.81	#####	0.63	0.58	0.83	0.92	0.79	#####	0.65	0.67	0.87	0.75	0.95
Movement PHF		0.97			0.86			0.75			0.87		0.95

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	3	0	1	1	77	11	7	1	10	10	57	6	184
4:15 PM	7	0	1	2	79	9	7	0	9	21	51	13	199
4:30 PM	8	0	0	5	85	18	14	0	12	16	45	9	212
4:45 PM	9	0	1	3	71	18	3	0	8	17	60	8	198
5:00 PM	5	0	1	2	93	18	9	0	4	20	56	12	220
5:15 PM	7	0	1	4	74	34	6	0	13	28	49	11	227
5:30 PM	3	2	0	4	88	15	10	0	7	28	51	6	214
5:45 PM	7	0	0	1	65	9	3	0	18	25	38	8	174
Total	49	2	5	22	632	132	59	1	81	165	407	73	1,628

PM Intersection Peak Hour : **4:45 PM - 5:45 PM** Intersection PHF : **0.95**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	24	2	3	13	326	85	28	0	32	93	216	37	859
PHF	0.67	0.25	0.75	0.813	0.876	0.625	0.7	#####	0.615	0.83	0.9	0.771	0.95
Movement PHF		0.73			0.94			0.79			0.98		0.95

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Otay Mesa Road @ Ocean View Hills Parkway

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Otay Mesa Road @ Ocean View Hills Parkway

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	0	40	13	8	0	37	58	14	0	0	0	0	170
7:15 AM	0	35	23	5	1	49	95	13	0	1	1	0	223
7:30 AM	1	50	24	12	1	38	104	20	0	2	0	0	252
7:45 AM	0	61	44	13	0	46	213	18	0	0	1	0	396
8:00 AM	1	54	33	13	0	37	130	23	0	0	0	0	291
8:15 AM	0	36	25	14	2	60	135	31	0	2	0	0	305
8:30 AM	0	22	28	17	2	78	120	33	0	2	0	0	302
8:45 AM	1	38	27	23	0	78	154	19	0	0	0	0	340
Total	3	336	217	105	6	423	1,009	171	0	7	2	0	2,279

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.82**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	1	173	130	57	4	221	598	105	0	4	1	0	1,294
PHF	0.25	0.71	0.74	0.84	0.50	0.71	0.70	0.80	#####	0.50	0.25	#####	0.82
Movement PHF		0.72			0.73			0.76			0.63		0.82

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	0	37	21	25	1	158	72	79	0	2	1	0	396
4:15 PM	0	44	18	48	2	169	65	106	1	1	2	1	457
4:30 PM	0	39	26	54	2	177	79	78	1	3	1	0	460
4:45 PM	1	34	20	32	3	176	76	79	0	1	1	1	424
5:00 PM	0	47	17	49	4	238	41	97	0	4	0	0	497
5:15 PM	1	41	9	41	1	217	63	103	0	0	1	0	477
5:30 PM	1	35	12	39	0	134	47	96	1	1	1	0	367
5:45 PM	0	38	15	34	0	119	38	75	0	0	1	0	320
Total	3	315	138	322	13	1,388	481	713	3	12	8	2	3,398

PM Intersection Peak Hour : **4:30 PM - 5:30 PM** Intersection PHF : **0.93**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	2	161	72	176	10	808	259	357	1	8	3	1	1858
PHF	0.50	0.856	0.692	0.815	0.625	0.849	0.82	0.867	0.25	0.5	0.75	0.25	0.93
Movement PHF		0.90			0.85			0.93			0.75		0.93

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: I-905 WB Ramps @ Caliente Avenue

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: I-905 WB Ramps @ Caliente Avenue

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	64	13	0	4	0	0	0	68	30	0	0	0	179
7:15 AM	61	24	0	4	0	4	0	104	19	0	0	0	216
7:30 AM	61	29	0	7	0	3	0	117	22	0	0	0	239
7:45 AM	67	40	0	9	0	4	0	222	20	0	0	0	362
8:00 AM	65	26	0	8	0	3	0	145	30	0	0	0	277
8:15 AM	81	17	0	15	1	3	0	151	19	0	0	0	287
8:30 AM	83	19	0	8	0	5	0	145	29	0	0	0	289
8:45 AM	93	23	0	6	0	6	0	167	22	0	0	0	317
Total	575	191	0	61	1	28	0	1,119	191	0	0	0	2,166

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.84**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	296	102	0	40	1	15	0	663	98	0	0	0	1,215
PHF	0.89	0.64	#####	0.67	0.25	0.75	#####	0.75	0.82	#####	#####	#####	0.84
Movement PHF		0.93			0.74			0.79			#DIV/0!		0.84

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	166	31	0	21	1	7	0	130	34	0	0	0	390
4:15 PM	173	41	0	16	0	9	0	156	22	0	0	0	417
4:30 PM	187	32	0	21	1	14	0	137	27	0	0	0	419
4:45 PM	178	33	0	14	0	5	0	141	27	0	0	0	398
5:00 PM	245	44	0	20	0	15	0	118	31	0	0	0	473
5:15 PM	222	36	0	18	1	6	0	148	29	0	0	0	460
5:30 PM	136	34	0	17	0	6	0	127	31	0	0	0	351
5:45 PM	138	19	0	15	1	6	0	98	20	0	0	0	297
Total	1445	270	0	142	4	68	0	1,055	221	0	0	0	3,205

PM Intersection Peak Hour : **4:30 PM - 5:30 PM** Intersection PHF : **0.92**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	832	145	0	73	2	40	0	544	114	0	0	0	1750
PHF	0.85	0.824	#####	0.869	0.5	0.667	#####	0.919	0.919	#####	#####	#####	0.92
Movement PHF		0.85			0.80			0.93			#DIV/0!		0.92

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

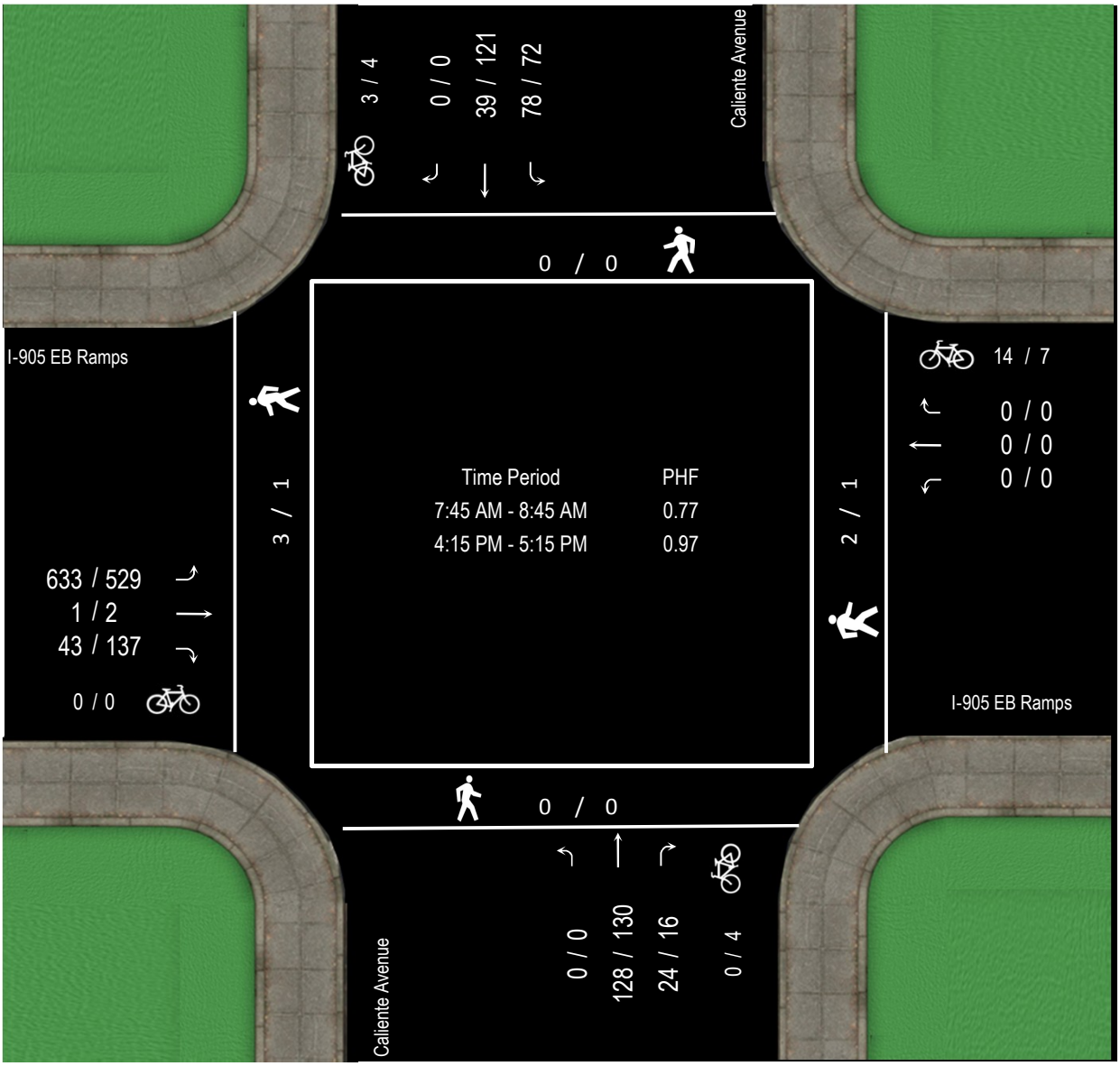
Location: I-905 EB Ramps @ Caliente Avenue

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*



Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: I-905 EB Ramps @ Caliente Avenue

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	0	3	10	0	0	0	6	33	0	17	0	65	134
7:15 AM	0	9	19	0	0	0	5	22	0	16	0	101	172
7:30 AM	0	20	12	0	0	0	11	22	0	12	0	117	194
7:45 AM	0	7	37	0	0	0	10	31	0	11	1	211	308
8:00 AM	0	14	15	0	0	0	5	47	0	14	0	128	223
8:15 AM	0	6	14	0	0	0	7	24	0	10	0	146	207
8:30 AM	0	12	12	0	0	0	2	26	0	8	0	148	208
8:45 AM	0	14	15	0	0	0	7	29	0	13	0	160	238
Total	0	85	134	0	0	0	53	234	0	101	1	1,076	1,684

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.77**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	39	78	0	0	0	24	128	0	43	1	633	946
PHF	#####	0.70	0.53	#####	#####	#####	0.60	0.68	#####	0.77	0.25	0.75	0.77
Movement PHF		0.66			#DIV/0!			0.73			0.76		0.77

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	0	21	17	0	0	0	1	32	0	32	0	132	235
4:15 PM	0	22	28	0	0	0	3	30	0	27	1	148	259
4:30 PM	0	33	13	0	0	0	5	32	0	28	0	132	243
4:45 PM	0	27	11	0	0	0	4	42	0	43	1	126	254
5:00 PM	0	39	20	0	0	0	4	26	0	39	0	123	251
5:15 PM	0	31	11	0	0	0	2	40	0	33	0	137	254
5:30 PM	0	27	13	0	0	0	0	37	0	46	0	121	244
5:45 PM	0	16	9	0	0	0	3	27	0	43	0	91	189
Total	0	216	122	0	0	0	22	266	0	291	2	1,010	1,929

PM Intersection Peak Hour : **4:15 PM - 5:15 PM** Intersection PHF : **0.97**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	121	72	0	0	0	16	130	0	137	2	529	1007
PHF	#####	0.776	0.643	#####	#####	#####	0.8	0.774	#####	0.797	0.5	0.894	0.97
Movement PHF		0.82			#DIV/0!			0.79			0.95		0.97

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Airway Road @ Caliente Avenue

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Airway Road @ Caliente Avenue

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	11	7	2	2	0	0	0	0	1	0	0	37	60
7:15 AM	17	5	3	3	0	0	1	0	0	0	0	24	53
7:30 AM	29	3	0	0	0	1	0	1	0	1	0	32	67
7:45 AM	16	2	0	1	0	0	0	1	0	0	0	39	59
8:00 AM	24	2	2	1	0	0	1	2	0	0	0	49	81
8:15 AM	13	1	2	2	0	0	0	0	0	0	0	29	47
8:30 AM	19	0	1	0	0	0	0	0	0	0	1	28	49
8:45 AM	25	2	0	0	0	0	0	2	1	1	0	34	65
Total	154	22	10	9	0	1	2	6	2	2	1	272	481

AM Intersection Peak Hour : **7:15 AM - 8:15 AM** Intersection PHF : **0.80**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	86	12	5	5	0	1	2	4	0	1	0	144	260
PHF	0.74	0.60	0.42	0.42	#####	0.25	0.50	0.50	#####	0.25	#####	0.73	0.80
Movement PHF		0.80			0.50			0.50			0.74		0.80

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	52	1	0	3	0	0	0	8	0	0	0	22	86
4:15 PM	47	0	2	1	0	1	0	1	1	1	0	31	85
4:30 PM	59	1	1	3	1	0	0	1	0	0	0	33	99
4:45 PM	69	1	0	0	0	0	0	6	0	0	0	40	116
5:00 PM	70	4	4	3	0	0	1	4	1	0	0	23	110
5:15 PM	61	3	0	3	0	0	1	2	1	0	0	37	108
5:30 PM	71	1	1	2	0	0	0	1	0	0	0	34	110
5:45 PM	57	1	1	4	0	1	1	0	1	1	1	26	94
Total	486	12	9	19	1	2	3	23	4	2	1	246	808

PM Intersection Peak Hour : **4:45 PM - 5:45 PM** Intersection PHF : **0.96**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	271	9	5	8	0	0	2	13	2	0	0	134	444
PHF	0.95	0.563	0.313	0.667	#####	#####	0.5	0.542	0.5	#####	#####	0.838	0.96
Movement PHF		0.91			0.67			0.71			0.84		0.96

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Otay Mesa Road @ Innovative Drive

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Otay Mesa Road @ Innovative Drive

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	8	0	0	4	24	0	0	0	0	0	35	0	71
7:15 AM	6	0	0	7	33	0	0	0	0	0	63	0	109
7:30 AM	6	0	0	7	47	0	1	0	0	0	69	0	130
7:45 AM	9	0	0	9	45	0	0	0	0	0	101	0	164
8:00 AM	4	0	0	11	47	0	1	0	0	1	88	0	152
8:15 AM	11	0	0	6	59	0	0	0	0	0	78	0	154
8:30 AM	10	0	0	7	63	0	0	0	0	0	76	0	156
8:45 AM	7	0	0	14	54	0	0	0	0	0	97	0	172
Total	61	0	0	65	372	0	2	0	0	1	607	0	1,108

AM Intersection Peak Hour : **8:00 AM - 9:00 AM** Intersection PHF : **0.92**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	32	0	0	38	223	0	1	0	0	1	339	0	634
PHF	0.73	#####	#####	0.68	0.88	#####	0.25	#####	#####	0.25	0.87	#####	0.92
Movement PHF		0.73			0.93			0.25			0.88		0.92

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	12	0	0	6	118	0	1	0	0	0	84	0	221
4:15 PM	19	0	0	20	130	0	0	0	0	1	88	0	258
4:30 PM	15	0	0	7	134	0	0	0	0	0	70	0	226
4:45 PM	25	0	0	19	103	0	0	0	0	1	79	0	227
5:00 PM	40	0	0	11	143	0	1	0	0	0	72	0	267
5:15 PM	27	0	0	6	130	0	0	0	0	0	59	0	222
5:30 PM	14	0	0	5	94	0	0	0	0	2	54	0	169
5:45 PM	10	0	0	6	88	0	0	0	0	0	47	0	151
Total	162	0	0	80	940	0	2	0	0	4	553	0	1,741

PM Intersection Peak Hour : **4:15 PM - 5:15 PM** Intersection PHF : **0.92**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	99	0	0	57	510	0	1	0	0	2	309	0	978
PHF	0.62	#####	#####	0.713	0.892	#####	0.25	#####	#####	0.5	0.878	#####	0.92
Movement PHF		0.62			0.92			0.25			0.87		0.92

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Avenida de las Vista @ Otay Valley Road

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Avenida de las Vista @ Otay Valley Road

AM Period (7:00 AM - 9:00 AM)								
	Southbound			Northbound		Eastbound		
	Right	Thru		Thru	Left	Right	Left	TOTAL
7:00 AM	6	18		6	2	11	35	78
7:15 AM	8	22		7	1	18	30	86
7:30 AM	9	35		10	3	18	43	118
7:45 AM	8	41		10	1	19	32	111
8:00 AM	14	43		8	2	15	27	109
8:15 AM	12	24		10	4	15	29	94
8:30 AM	10	20		13	5	14	28	90
8:45 AM	15	22		16	3	8	17	81
Total	82	225		80	21	118	241	767

AM Intersection Peak Hour : **7:30 AM - 8:30 AM** Intersection PHF : **0.92**

	Southbound			Northbound		Eastbound		TOTAL
	Right	Thru		Thru	Left	Right	Left	
Volume	43	143		38	10	67	131	432
PHF	0.77	0.83		0.95	0.63	0.88	0.76	0.92
Movement PHF		0.82		0.86		0.81		0.92

PM Period (4:00 PM - 6:00 PM)								
	Southbound			Northbound		Eastbound		
	Right	Thru		Thru	Left	Right	Left	TOTAL
4:00 PM	41	38		37	12	3	17	148
4:15 PM	51	26		27	17	15	24	160
4:30 PM	42	26		33	22	13	16	152
4:45 PM	47	29		26	19	11	17	149
5:00 PM	49	30		55	16	15	41	206
5:15 PM	51	11		33	19	10	21	145
5:30 PM	50	15		33	12	12	33	155
5:45 PM	49	9		19	14	13	24	128
Total	380	184		263	131	92	193	1,243

PM Intersection Peak Hour : **4:15 PM - 5:15 PM** Intersection PHF : **0.81**

	Southbound			Northbound		Eastbound		TOTAL
	Right	Thru		Thru	Left	Right	Left	
Volume	189	111		141	74	54	98	667
PHF	0.93	0.925		0.641	0.841	0.9	0.598	0.81
Movement PHF		0.95		0.76		0.68		0.81

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Datsun Street @ Heritage Road

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Datsun Street @ Heritage Road

AM Period (7:00 AM - 9:00 AM)								
	Southbound			Northbound		Eastbound		
	Right	Thru		Thru	Left	Right	Left	TOTAL
7:00 AM	1	4		9	12	18	1	45
7:15 AM	2	11		16	17	35	3	84
7:30 AM	5	9		22	25	35	6	102
7:45 AM	7	6		36	31	50	4	134
8:00 AM	12	11		37	31	29	8	128
8:15 AM	5	20		18	12	32	5	92
8:30 AM	6	13		31	17	35	6	108
8:45 AM	7	16		33	20	33	11	120
Total	45	90		202	165	267	44	813

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.86**

	Southbound			Northbound		Eastbound		TOTAL
	Right	Thru		Thru	Left	Right	Left	
Volume	30	50		122	91	146	23	462
PHF	0.63	0.63		0.82	0.73	0.73	0.72	0.86
Movement PHF		0.80		0.78		0.78		0.86

PM Period (4:00 PM - 6:00 PM)								
	Southbound			Northbound		Eastbound		
	Right	Thru		Thru	Left	Right	Left	TOTAL
4:00 PM	24	45		54	53	49	17	242
4:15 PM	24	57		40	53	39	22	235
4:30 PM	16	51		37	47	36	16	203
4:45 PM	17	40		30	40	37	15	179
5:00 PM	14	71		33	57	56	12	243
5:15 PM	8	48		20	44	42	8	170
5:30 PM	8	29		25	27	37	2	128
5:45 PM	1	25		19	37	19	2	103
Total	112	366		258	358	315	94	1,503

PM Intersection Peak Hour : **4:15 PM - 5:15 PM** Intersection PHF : **0.88**

	Southbound			Northbound		Eastbound		TOTAL
	Right	Thru		Thru	Left	Right	Left	
Volume	71	219		140	197	168	65	860
PHF	0.74	0.771		0.875	0.864	0.75	0.739	0.88
Movement PHF		0.85		0.91		0.86		0.88

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Otay Mesa Road @ Heritage Road

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

CHEN RYAN

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Otay Mesa Road @ Heritage Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	5	1	12	15	16	6	1	3	7	20	6	9	101
7:15 AM	16	4	26	23	19	7	4	2	5	31	17	15	169
7:30 AM	14	13	24	24	30	11	4	12	10	31	21	18	212
7:45 AM	12	12	35	44	30	9	3	6	12	39	41	21	264
8:00 AM	15	9	21	31	29	16	4	8	14	41	11	37	236
8:15 AM	13	11	23	14	28	13	9	10	24	26	28	24	223
8:30 AM	5	7	15	22	44	25	15	7	21	31	38	7	237
8:45 AM	4	12	23	26	34	35	9	7	30	29	56	12	277
Total	84	69	179	199	230	122	49	55	123	248	218	143	1,719

AM Intersection Peak Hour : **8:00 AM - 9:00 AM** Intersection PHF : **0.88**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	37	39	82	93	135	89	37	32	89	127	133	80	973
PHF	0.62	0.81	0.89	0.75	0.77	0.64	0.62	0.80	0.74	0.77	0.59	0.54	0.88
Movement PHF		0.84			0.83			0.86			0.88		0.88

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	53	14	41	63	34	11	25	14	37	24	26	35	377
4:15 PM	46	12	45	52	77	6	13	18	27	19	36	33	384
4:30 PM	58	10	46	58	43	4	10	9	40	15	27	28	348
4:45 PM	44	8	34	38	45	5	18	11	33	25	29	25	315
5:00 PM	85	21	61	48	29	7	7	19	40	15	26	32	390
5:15 PM	69	10	36	27	39	4	11	7	28	8	25	26	290
5:30 PM	53	18	26	26	29	7	11	12	17	16	17	21	253
5:45 PM	39	8	23	21	18	5	7	17	37	12	9	26	222
Total	447	101	312	333	314	49	102	107	259	134	195	226	2,579

PM Intersection Peak Hour : **4:15 PM - 5:15 PM** Intersection PHF : **0.92**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	233	51	186	196	194	22	48	57	140	74	118	118	1437
PHF	0.69	0.607	0.762	0.845	0.63	0.786	0.667	0.75	0.875	0.74	0.819	0.894	0.92
Movement PHF		0.70			0.76			0.93			0.88		0.92

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Gateway Park Drive @ Heritage Road

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Gateway Park Drive @ Heritage Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
7:15 AM	0	0	5	1	0	0	0	0	0	0	0	0	6
7:30 AM	2	0	8	0	0	0	0	0	0	0	0	0	10
7:45 AM	2	0	11	4	0	0	0	0	0	0	0	0	17
8:00 AM	0	0	18	3	0	0	0	1	0	0	0	0	22
8:15 AM	2	0	18	2	0	0	0	0	0	0	0	0	22
8:30 AM	2	0	13	6	0	0	0	0	0	0	0	1	22
8:45 AM	0	0	12	7	0	0	0	0	0	0	0	0	19
Total	8	0	85	23	0	0	0	1	0	0	2	1	120

AM Intersection Peak Hour : **8:00 AM - 9:00 AM** Intersection PHF : **0.97**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	4	0	61	18	0	0	0	1	0	0	0	1	85
PHF	0.50	#####	0.85	0.64	#####	#####	#####	0.25	#####	#####	#####	0.25	0.97
Movement PHF		0.81			0.64			0.25			0.25		0.97

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	0	2	5	7	0	0	0	0	0	0	0	4	18
4:15 PM	1	0	6	12	0	0	0	1	0	0	1	1	22
4:30 PM	0	0	6	8	0	0	0	0	0	0	0	0	14
4:45 PM	0	0	2	11	0	0	0	0	0	0	0	2	15
5:00 PM	0	0	3	8	0	0	0	1	0	0	0	2	14
5:15 PM	0	0	8	24	0	0	0	0	0	0	0	0	32
5:30 PM	0	0	5	7	0	0	0	0	0	0	0	0	12
5:45 PM	1	2	1	10	0	0	0	0	0	0	0	0	14
Total	2	4	36	87	0	0	0	2	0	0	1	9	141

PM Intersection Peak Hour : **4:30 PM - 5:30 PM** Intersection PHF : **0.59**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	0	19	51	0	0	0	1	0	0	0	4	75
PHF	#####	#####	0.594	0.531	#####	#####	#####	0.25	#####	#####	#####	0.5	0.59
Movement PHF		0.59			0.53			0.25			0.50		0.59

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Otay Mesa Road @ Cactus Road

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

CHEN RYAN

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Otay Mesa Road @ Cactus Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	0	0	0	1	32	8	9	0	5	3	27	0	85
7:15 AM	1	1	0	1	45	6	8	0	3	6	44	1	116
7:30 AM	0	0	1	3	62	9	6	0	3	1	51	2	138
7:45 AM	1	0	0	6	78	13	9	0	4	12	52	2	177
8:00 AM	0	0	2	3	71	12	8	0	5	10	38	2	151
8:15 AM	0	0	2	1	53	21	13	0	2	6	50	0	148
8:30 AM	0	0	2	2	91	17	15	0	0	9	45	1	182
8:45 AM	0	0	0	0	86	20	20	0	9	18	43	3	199
Total	2	1	7	17	518	106	88	0	31	65	350	11	1,196

AM Intersection Peak Hour : **8:00 AM - 9:00 AM** Intersection PHF : **0.85**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	0	6	6	301	70	56	0	16	43	176	6	680
PHF	#####	#####	0.75	0.50	0.83	0.83	0.70	#####	0.44	0.60	0.88	0.50	0.85
Movement PHF		0.75			0.86			0.62			0.88		0.85

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	4	4	8	3	97	27	23	1	7	11	74	0	259
4:15 PM	2	1	2	0	120	20	23	1	13	7	96	0	285
4:30 PM	1	0	3	2	91	15	21	0	13	13	70	1	230
4:45 PM	1	0	1	5	79	12	20	0	8	6	76	1	209
5:00 PM	1	0	0	3	79	14	25	1	4	14	83	1	225
5:15 PM	0	0	1	0	62	13	23	0	8	8	68	1	184
5:30 PM	0	0	1	0	57	10	11	0	5	4	49	1	138
5:45 PM	0	0	0	0	38	12	19	0	6	2	36	1	114
Total	9	5	16	13	623	123	165	3	64	65	552	6	1,644

PM Intersection Peak Hour : **4:00 PM - 5:00 PM** Intersection PHF : **0.86**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	8	5	14	10	387	74	87	2	41	37	316	2	983
PHF	0.50	0.313	0.438	0.5	0.806	0.685	0.946	0.5	0.788	0.712	0.823	0.5	0.86
Movement PHF		0.42			0.84			0.88			0.86		0.86

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Airway Road @ Cactus Road

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

CHEN RYAN

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Airway Road @ Cactus Road

AM Period (7:00 AM - 9:00 AM)								
	Southbound		Westbound		Northbound			
	Thru	Left	Right	Left	Right	Thru		TOTAL
7:00 AM	0	1	0	16	1	0		18
7:15 AM	0	0	0	12	5	0		17
7:30 AM	0	2	0	13	9	0		24
7:45 AM	0	0	3	28	6	0		37
8:00 AM	0	4	1	29	6	0		40
8:15 AM	0	3	2	20	9	1		35
8:30 AM	0	4	0	21	9	0		34
8:45 AM	1	0	0	26	4	1		32
Total	1	14	6	165	49	2		237

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.91**

	Southbound		Westbound		Northbound			TOTAL
	Thru	Left	Right	Left	Right	Thru		
Volume	0	11	6	98	30	1		146
PHF	#####	0.69	0.50	0.84	0.83	0.25		0.91
Movement PHF	0.69		0.84			0.78		0.91

PM Period (4:00 PM - 6:00 PM)								
	Southbound		Westbound		Northbound			
	Thru	Left	Right	Left	Right	Thru		TOTAL
4:00 PM	0	1	1	19	37	1		59
4:15 PM	1	2	1	23	25	1		53
4:30 PM	0	2	0	20	31	1		54
4:45 PM	0	1	2	18	34	0		55
5:00 PM	0	3	2	16	37	1		59
5:15 PM	0	7	3	12	27	0		49
5:30 PM	0	0	0	12	17	0		29
5:45 PM	0	2	2	10	12	0		26
Total	1	18	11	130	220	4		384

PM Intersection Peak Hour : **4:00 PM - 5:00 PM** Intersection PHF : **0.94**

	Southbound		Westbound		Northbound			TOTAL
	Thru	Left	Right	Left	Right	Thru		
Volume	1	6	4	80	127	3		221
PHF	0.25	0.75	0.5	0.87	0.858	0.75		0.94
Movement PHF	0.58		0.88			0.86		0.94

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

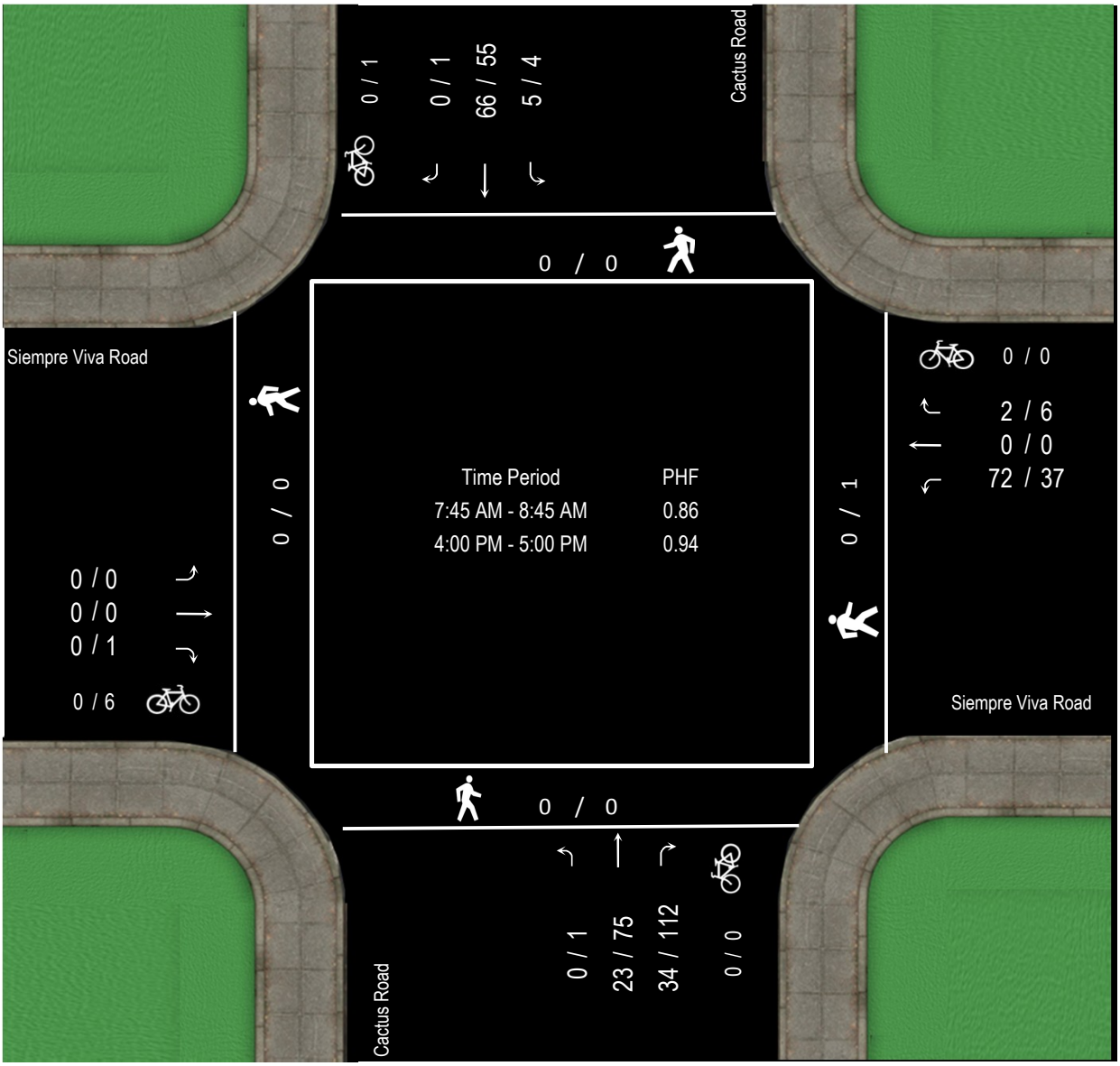
Location: Siempre Viva Road @ Cactus Road

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*



Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Siempre Viva Road @ Cactus Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	0	6	0	0	0	17	9	2	0	0	0	0	34
7:15 AM	0	12	1	1	0	14	8	2	0	0	0	0	38
7:30 AM	0	7	1	0	0	18	6	4	0	0	0	0	36
7:45 AM	0	22	0	1	0	21	7	8	0	0	0	0	59
8:00 AM	0	20	1	1	0	16	12	7	0	0	0	0	57
8:15 AM	0	8	4	0	0	21	9	4	0	0	0	0	46
8:30 AM	0	16	0	0	0	14	6	4	0	0	0	0	40
8:45 AM	0	14	1	0	0	14	8	8	0	0	0	0	45
Total	0	105	8	3	0	135	65	39	0	0	0	0	355

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.86**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	66	5	2	0	72	34	23	0	0	0	0	202
PHF	#####	0.75	0.31	0.50	#####	0.86	0.71	0.72	#####	#####	#####	#####	0.86
Movement PHF		0.81			0.84			0.75			#DIV/0!		0.86

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	0	19	3	1	0	9	32	14	0	0	0	0	78
4:15 PM	0	15	1	2	0	16	26	17	0	0	0	0	77
4:30 PM	1	7	0	2	0	12	33	21	1	1	0	0	78
4:45 PM	0	14	0	1	0	0	21	23	0	0	0	0	59
5:00 PM	0	13	1	0	0	8	33	11	0	0	0	0	66
5:15 PM	0	11	1	0	0	8	20	15	0	0	0	0	55
5:30 PM	0	11	1	0	0	3	9	12	0	0	0	0	36
5:45 PM	0	6	3	0	0	9	13	6	0	0	0	0	37
Total	1	96	10	6	0	65	187	119	1	1	0	0	486

PM Intersection Peak Hour : **4:00 PM - 5:00 PM** Intersection PHF : **0.94**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	1	55	4	6	0	37	112	75	1	1	0	0	292
PHF	0.25	0.724	0.333	0.75	#####	0.578	0.848	0.815	0.25	0.25	#####	#####	0.94
Movement PHF		0.68			0.60			0.85			0.25		0.94

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Otay Mesa Road @ Brittania Blvd

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Otay Mesa Road @ Brittania Blvd

AM Period (7:00 AM - 9:00 AM)								
		Westbound		Northbound		Eastbound		
		Thru	Left	Right	Left	Right	Thru	TOTAL
7:00 AM		16	10	59	25	18	18	146
7:15 AM		20	25	79	32	17	35	208
7:30 AM		32	17	69	42	26	32	218
7:45 AM		41	40	83	56	28	33	281
8:00 AM		38	20	75	48	12	36	229
8:15 AM		29	22	56	46	38	27	218
8:30 AM		32	14	57	78	38	24	243
8:45 AM		38	30	53	68	36	27	252
Total		246	178	531	395	213	232	1,795

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.86**

		Westbound		Northbound		Eastbound		TOTAL
		Thru	Left	Right	Left	Right	Thru	
Volume		140	96	271	228	116	120	971
PHF		0.85	0.60	0.82	0.73	0.76	0.83	0.86
Movement PHF		0.73		0.90			0.91	0.86

PM Period (4:00 PM - 6:00 PM)								
		Westbound		Northbound		Eastbound		
		Thru	Left	Right	Left	Right	Thru	TOTAL
4:00 PM		83	110	52	44	42	63	394
4:15 PM		73	165	37	67	36	85	463
4:30 PM		58	77	45	50	47	47	324
4:45 PM		73	100	38	23	54	43	331
5:00 PM		66	52	32	30	58	50	288
5:15 PM		61	108	34	14	31	61	309
5:30 PM		47	53	18	20	20	41	199
5:45 PM		42	51	18	8	16	39	174
Total		503	716	274	256	304	429	2,482

PM Intersection Peak Hour : **4:00 PM - 5:00 PM** Intersection PHF : **0.82**

		Westbound		Northbound		Eastbound		TOTAL
		Thru	Left	Right	Left	Right	Thru	
Volume		287	452	172	184	179	238	1512
PHF		0.864	0.685	0.827	0.687	0.829	0.7	0.82
Movement PHF		0.78		0.86			0.86	0.82

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: SR-905 WB Ramps @ Britannia Blvd

Date of Count: *Thursday, November 05, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0436*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: SR-905 WB Ramps @ Britannia Blvd

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	9	40	0	35	0	22	0	49	25	0	0	0	180
7:15 AM	12	32	0	28	0	30	0	49	15	0	0	0	166
7:30 AM	16	38	0	24	0	40	0	46	39	0	0	0	203
7:45 AM	11	44	0	21	0	55	0	73	37	0	0	0	241
8:00 AM	13	42	0	28	0	56	0	52	52	0	0	0	243
8:15 AM	6	53	0	46	0	45	0	46	24	0	0	0	220
8:30 AM	15	37	0	69	0	41	0	47	30	0	0	0	239
8:45 AM	15	52	0	46	0	34	0	57	30	0	0	0	234
Total	97	338	0	297	0	323	0	419	252	0	0	0	1,726

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.97**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	45	176	0	164	0	197	0	218	143	0	0	0	943
PHF	0.75	0.83	#####	0.59	#####	0.88	#####	0.75	0.69	#####	#####	#####	0.97
Movement PHF		0.94			0.82			0.82			#DIV/0!		0.97

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	107	54	0	21	0	33	0	56	163	0	0	0	434
4:15 PM	70	47	0	26	0	28	0	60	97	0	0	0	328
4:30 PM	95	61	0	35	1	26	0	57	141	0	0	0	416
4:45 PM	50	67	0	26	0	26	0	61	95	0	0	0	325
5:00 PM	59	73	0	17	0	21	0	47	149	0	0	0	366
5:15 PM	45	71	0	20	1	21	0	33	112	0	0	0	303
5:30 PM	53	53	0	15	0	19	0	32	95	0	0	0	267
5:45 PM	26	30	0	13	0	23	0	29	64	0	0	0	185
Total	505	456	0	173	2	197	0	375	916	0	0	0	2,624

PM Intersection Peak Hour : **4:00 PM - 5:00 PM** Intersection PHF : **0.87**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	322	229	0	108	1	113	0	234	496	0	0	0	1503
PHF	0.75	0.854	#####	0.771	0.25	0.856	#####	0.959	0.761	#####	#####	#####	0.87
Movement PHF		0.86			0.90			0.83			#DIV/0!		0.87

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: SR-905 EB Ramps @ Britannia Blvd

Date of Count: *Thursday, November 05, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0436*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: SR-905 EB Ramps @ Britannia Blvd

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	0	52	10	0	0	0	11	38	0	121	0	36	268
7:15 AM	0	56	6	0	0	0	22	25	0	104	0	39	252
7:30 AM	0	71	7	0	0	0	26	38	0	146	0	47	335
7:45 AM	0	96	3	0	0	0	39	60	0	183	1	50	432
8:00 AM	0	91	7	0	0	0	28	60	0	138	1	44	369
8:15 AM	0	87	11	0	0	0	23	45	0	116	1	25	308
8:30 AM	0	67	11	0	0	0	25	44	0	105	1	33	286
8:45 AM	0	53	33	0	0	0	24	54	0	125	0	33	322
Total	0	573	88	0	0	0	198	364	0	1,038	4	307	2,572

AM Intersection Peak Hour : **7:30 AM - 8:30 AM** Intersection PHF : **0.84**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	345	28	0	0	0	116	203	0	583	3	166	1,444
PHF	#####	0.90	0.64	#####	#####	#####	0.74	0.85	#####	0.80	0.75	0.83	0.84
Movement PHF		0.94			#DIV/0!			0.81			0.80		0.84

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	0	54	33	0	0	0	36	200	0	38	0	19	380
4:15 PM	0	41	34	0	0	0	36	134	0	52	0	23	320
4:30 PM	0	48	39	0	0	0	36	178	0	60	0	20	381
4:45 PM	0	49	44	0	0	0	30	141	0	50	1	15	330
5:00 PM	0	52	42	0	0	0	40	187	0	31	1	9	362
5:15 PM	0	48	44	0	0	0	29	137	0	35	1	8	302
5:30 PM	0	37	35	0	0	0	31	115	0	28	2	12	260
5:45 PM	0	35	18	0	0	0	28	82	0	35	0	11	209
Total	0	364	289	0	0	0	266	1,174	0	329	5	117	2,544

PM Intersection Peak Hour : **4:00 PM - 5:00 PM** Intersection PHF : **0.93**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	192	150	0	0	0	138	653	0	200	1	77	1411
PHF	#####	0.889	0.852	#####	#####	#####	0.958	0.816	#####	0.833	0.25	0.837	0.93
Movement PHF		0.92			#DIV/0!			0.84			0.87		0.93

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Airway Road @ Brittania Blvd

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Airway Road @ Brittania Blvd

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	14	49	58	6	0	2	0	24	0	0	0	4	157
7:15 AM	16	71	60	12	1	1	4	20	0	0	0	2	187
7:30 AM	15	66	63	27	2	3	4	25	0	0	2	7	214
7:45 AM	24	87	82	17	2	8	2	27	0	1	3	7	260
8:00 AM	25	68	69	11	4	5	6	42	0	1	0	10	241
8:15 AM	15	65	74	15	2	8	7	33	0	0	2	5	226
8:30 AM	22	52	46	22	3	12	7	30	1	3	2	7	207
8:45 AM	28	54	47	14	2	9	5	32	1	0	0	9	201
Total	159	512	499	124	16	48	35	233	2	5	9	51	1,693

AM Intersection Peak Hour : **7:30 AM - 8:30 AM** Intersection PHF : **0.90**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	79	286	288	70	10	24	19	127	0	2	7	29	941
PHF	0.79	0.82	0.88	0.65	0.63	0.75	0.68	0.76	#####	0.50	0.58	0.73	0.90
Movement PHF		0.85			0.81			0.76			0.86		0.90

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	19	45	45	94	3	6	7	98	1	0	7	36	361
4:15 PM	24	33	40	71	5	11	7	71	0	3	5	24	294
4:30 PM	22	32	37	65	3	4	9	109	0	1	7	30	319
4:45 PM	17	36	63	47	7	8	8	64	1	0	6	34	291
5:00 PM	20	26	31	81	3	4	4	103	0	1	4	40	317
5:15 PM	16	41	23	44	3	5	12	68	1	1	4	34	252
5:30 PM	11	18	33	35	0	3	8	47	0	1	3	18	177
5:45 PM	16	30	35	33	1	4	6	63	0	0	1	11	200
Total	145	261	307	470	25	45	61	623	3	7	37	227	2,211

PM Intersection Peak Hour : **4:00 PM - 5:00 PM** Intersection PHF : **0.88**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	82	146	185	277	18	29	31	342	2	4	25	124	1265
PHF	0.85	0.811	0.734	0.737	0.643	0.659	0.861	0.784	0.5	0.333	0.893	0.861	0.88
Movement PHF		0.89			0.79			0.79			0.89		0.88

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

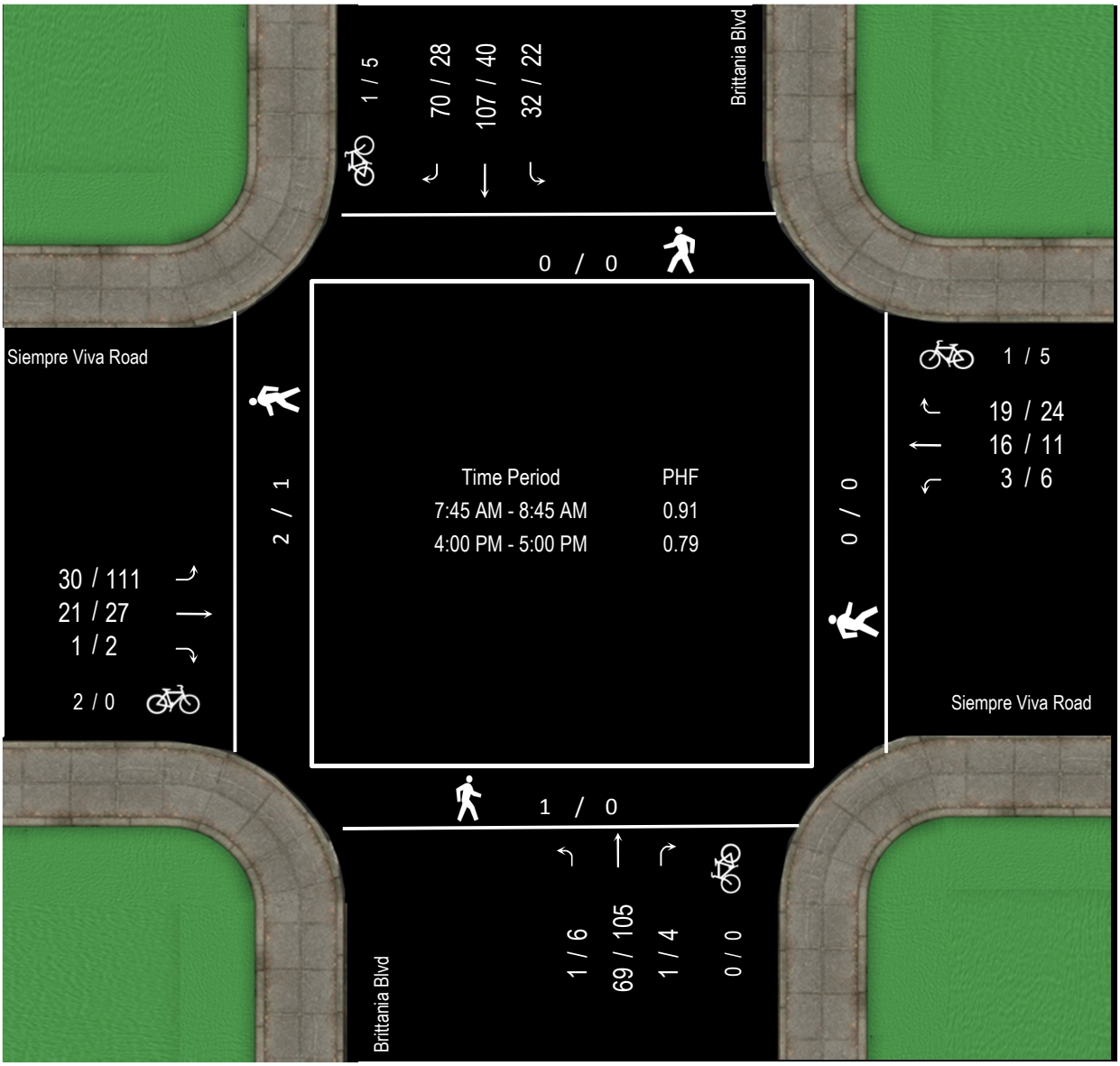
Location: Siempre Viva Road @ Brittania Blvd

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*



Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Siempre Viva Road @ Brittania Blvd

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	18	18	9	3	3	3	1	9	0	0	2	8	74
7:15 AM	17	32	7	3	2	1	0	13	1	0	5	6	87
7:30 AM	14	32	7	2	2	2	3	14	1	0	2	9	88
7:45 AM	14	45	7	2	3	2	0	15	0	0	5	9	102
8:00 AM	19	21	9	4	5	0	0	14	0	0	5	3	80
8:15 AM	21	21	7	8	1	0	1	15	0	1	6	10	91
8:30 AM	16	20	9	5	7	1	0	25	1	0	5	8	97
8:45 AM	14	14	8	3	1	0	0	16	1	0	3	6	66
Total	133	203	63	30	24	9	5	121	4	1	33	59	685

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.91**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	70	107	32	19	16	3	1	69	1	1	21	30	370
PHF	0.83	0.59	0.89	0.59	0.57	0.38	0.25	0.69	0.25	0.25	0.88	0.75	0.91
Movement PHF		0.79			0.73			0.68			0.76		0.91

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	6	11	5	5	3	2	1	34	2	0	8	32	109
4:15 PM	8	8	2	11	1	1	0	18	1	0	6	25	81
4:30 PM	5	14	10	3	3	2	2	38	2	2	11	30	122
4:45 PM	9	7	5	5	4	1	1	15	1	0	2	24	74
5:00 PM	12	10	3	6	4	1	1	24	0	0	6	22	89
5:15 PM	8	5	7	5	4	1	0	19	0	0	7	21	77
5:30 PM	5	7	7	5	2	1	5	21	0	1	5	14	73
5:45 PM	7	0	7	3	0	0	2	12	1	1	3	14	50
Total	60	62	46	43	21	9	12	181	7	4	48	182	675

PM Intersection Peak Hour : **4:00 PM - 5:00 PM** Intersection PHF : **0.79**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	28	40	22	24	11	6	4	105	6	2	27	111	386
PHF	0.78	0.714	0.55	0.545	0.688	0.75	0.5	0.691	0.75	0.25	0.614	0.867	0.79
Movement PHF		0.78			0.79			0.68			0.81		0.79

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Otay Mesa Road @ St Andrews Avenue

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Otay Mesa Road @ St Andrews Avenue

AM Period (7:00 AM - 9:00 AM)								
		Westbound		Northbound		Eastbound		
		Thru	Left	Right	Left	Right	Thru	TOTAL
7:00 AM		27	2	0	5	1	71	106
7:15 AM		49	1	1	6	2	86	145
7:30 AM		49	0	1	12	7	67	136
7:45 AM		67	1	2	5	3	88	166
8:00 AM		62	1	0	11	7	65	146
8:15 AM		44	0	0	13	4	59	120
8:30 AM		45	1	2	6	9	78	141
8:45 AM		66	0	0	13	4	68	151
Total		409	6	6	71	37	582	1,111

AM Intersection Peak Hour : **7:15 AM - 8:15 AM** Intersection PHF : **0.89**

		Westbound		Northbound		Eastbound		TOTAL
		Thru	Left	Right	Left	Right	Thru	
Volume		227	3	4	34	19	306	593
PHF		0.85	0.75	0.50	0.71	0.68	0.87	0.89
Movement PHF		0.85		0.73			0.89	0.89

PM Period (4:00 PM - 6:00 PM)								
		Westbound		Northbound		Eastbound		
		Thru	Left	Right	Left	Right	Thru	TOTAL
4:00 PM		113	1	1	11	10	87	223
4:15 PM		93	1	3	14	11	81	203
4:30 PM		84	3	3	16	7	80	193
4:45 PM		63	2	0	6	14	69	154
5:00 PM		80	2	2	9	12	89	194
5:15 PM		72	3	3	17	12	70	177
5:30 PM		51	1	1	7	2	55	117
5:45 PM		50	1	2	7	4	42	106
Total		606	14	15	87	72	573	1,367

PM Intersection Peak Hour : **4:00 PM - 5:00 PM** Intersection PHF : **0.87**

		Westbound		Northbound		Eastbound		TOTAL
		Thru	Left	Right	Left	Right	Thru	
Volume		353	7	7	47	42	317	773
PHF		0.781	0.583	0.583	0.734	0.75	0.911	0.87
Movement PHF		0.79		0.71			0.93	0.87

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

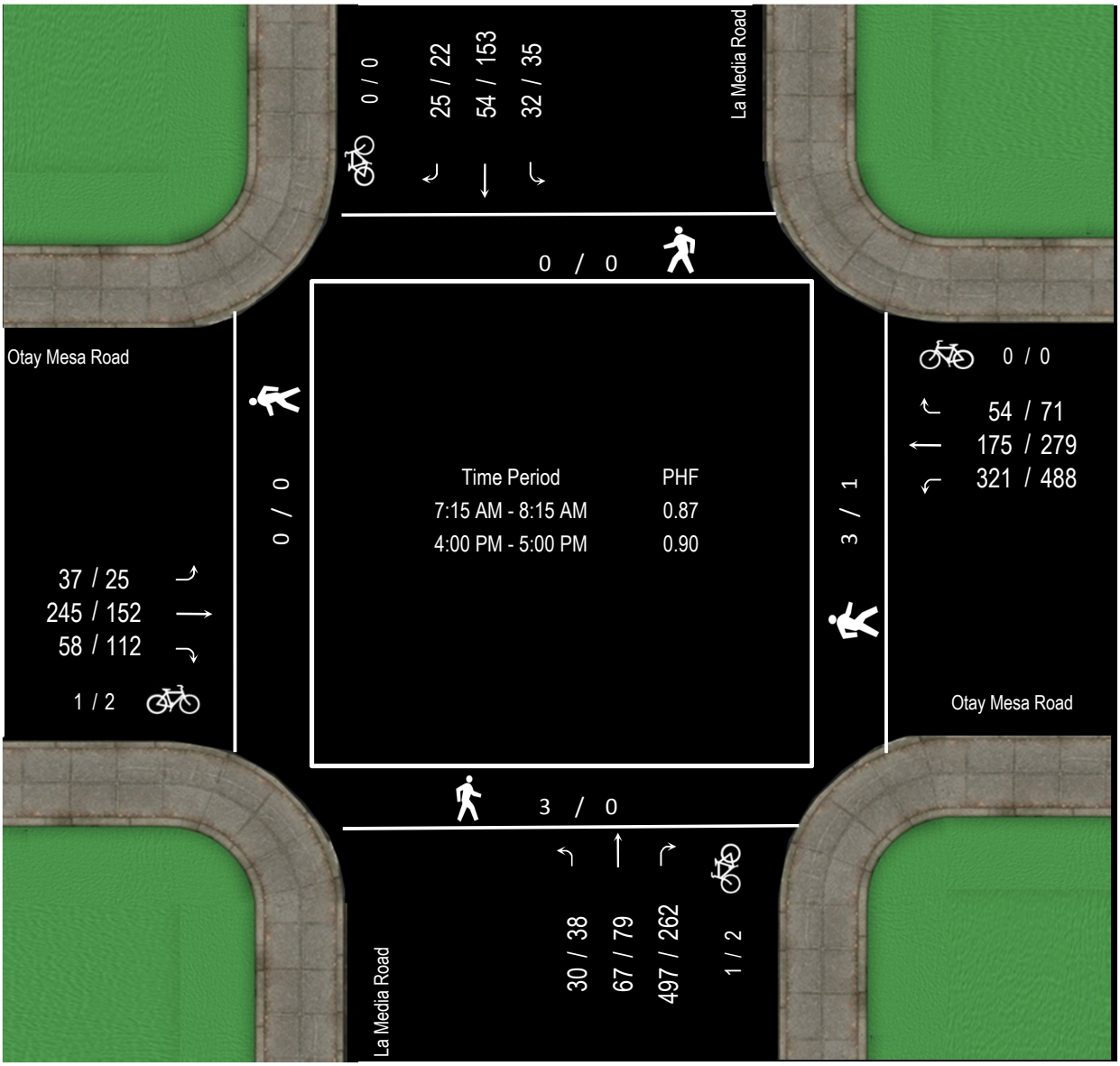
Location: Otay Mesa Road @ La Media Road

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*



CHEN RYAN

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Otay Mesa Road @ La Media Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	7	10	5	11	19	68	78	17	3	10	62	2	292
7:15 AM	4	15	5	5	37	88	100	14	9	8	79	6	370
7:30 AM	8	8	10	12	37	85	162	13	4	11	46	9	405
7:45 AM	6	11	9	16	56	80	161	23	6	16	63	11	458
8:00 AM	7	20	8	21	45	68	74	17	11	23	57	11	362
8:15 AM	4	32	9	11	37	61	68	14	3	13	48	8	308
8:30 AM	3	21	7	15	30	72	59	12	10	22	43	7	301
8:45 AM	5	21	9	15	49	67	72	20	12	28	30	9	337
Total	44	138	62	106	310	589	774	130	58	131	428	63	2,833

AM Intersection Peak Hour : **7:15 AM - 8:15 AM** Intersection PHF : **0.87**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	25	54	32	54	175	321	497	67	30	58	245	37	1,595
PHF	0.78	0.68	0.80	0.64	0.78	0.91	0.77	0.73	0.68	0.63	0.78	0.84	0.87
Movement PHF		0.79			0.90			0.78			0.91		0.87

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	9	43	8	35	89	153	33	15	9	29	52	3	478
4:15 PM	3	32	9	15	70	128	56	26	7	25	39	4	414
4:30 PM	8	43	8	13	63	118	97	18	16	31	37	10	462
4:45 PM	2	35	10	8	57	89	76	20	6	27	24	8	362
5:00 PM	4	49	14	11	68	103	55	17	10	31	47	8	417
5:15 PM	9	47	6	12	47	58	67	27	19	32	30	5	359
5:30 PM	4	32	6	11	37	83	51	17	11	31	38	9	330
5:45 PM	7	40	5	12	36	62	52	10	8	19	22	4	277
Total	46	321	66	117	467	794	487	150	86	225	289	51	3,099

PM Intersection Peak Hour : **4:00 PM - 5:00 PM** Intersection PHF : **0.90**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	22	153	35	71	279	488	262	79	38	112	152	25	1716
PHF	0.61	0.89	0.875	0.507	0.784	0.797	0.675	0.76	0.594	0.903	0.731	0.625	0.90
Movement PHF		0.88			0.76			0.72			0.86		0.90

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Airway Road @ La Media Road

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

CHEN RYAN

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Airway Road @ La Media Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	4	45	41	18	2	1	1	37	3	1	4	5	162
7:15 AM	5	51	55	15	5	1	1	34	4	1	7	4	183
7:30 AM	6	45	51	25	6	1	1	30	6	6	3	0	180
7:45 AM	13	82	73	16	12	2	0	20	4	7	7	2	238
8:00 AM	5	42	63	21	11	3	1	20	5	6	13	1	191
8:15 AM	11	56	54	12	12	0	1	30	7	6	7	1	197
8:30 AM	7	45	57	18	13	3	2	22	9	7	10	7	200
8:45 AM	9	48	54	38	11	2	2	31	6	11	9	3	224
Total	60	414	448	163	72	13	9	224	44	45	60	23	1,575

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.87**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	36	225	247	67	48	8	4	92	25	26	37	11	826
PHF	0.69	0.69	0.85	0.80	0.92	0.67	0.50	0.77	0.69	0.93	0.71	0.39	0.87
Movement PHF		0.76			0.88			0.80			0.77		0.87

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	1	51	59	64	11	1	2	56	7	14	21	7	294
4:15 PM	11	40	46	43	11	5	0	58	2	4	24	17	261
4:30 PM	11	36	32	54	6	1	1	74	13	4	19	9	260
4:45 PM	8	32	45	46	16	6	0	57	8	5	10	7	240
5:00 PM	15	20	25	59	11	8	2	74	6	7	16	13	256
5:15 PM	2	37	40	66	8	5	1	61	7	11	17	9	264
5:30 PM	10	27	26	46	8	4	1	47	8	5	18	7	207
5:45 PM	6	24	39	19	8	2	3	38	7	5	16	3	170
Total	64	267	312	397	79	32	10	465	58	55	141	72	1,952

PM Intersection Peak Hour : **4:00 PM - 5:00 PM** Intersection PHF : **0.90**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	31	159	182	207	44	13	3	245	30	27	74	40	1055
PHF	0.70	0.779	0.771	0.809	0.688	0.542	0.375	0.828	0.577	0.482	0.771	0.588	0.90
Movement PHF		0.84			0.87			0.79			0.78		0.90

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Siempre Viva Road @ La Media Road

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

CHEN RYAN

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Siempre Viva Road @ La Media Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	0	4	29	19	7	3	0	2	0	0	5	0	69
7:15 AM	0	4	33	19	4	1	1	2	0	0	4	0	68
7:30 AM	0	1	31	12	7	3	0	7	2	2	4	1	70
7:45 AM	0	5	54	12	8	2	2	3	1	1	6	0	94
8:00 AM	0	8	25	13	5	2	1	3	1	0	7	1	66
8:15 AM	1	13	41	12	6	4	0	4	0	1	7	1	90
8:30 AM	1	19	27	20	12	0	0	4	1	2	4	1	91
8:45 AM	0	23	23	16	1	4	0	1	0	1	7	0	76
Total	2	77	263	123	50	19	4	26	5	7	44	4	624

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.91**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	2	45	147	57	31	8	3	14	3	4	24	3	341
PHF	0.50	0.59	0.68	0.71	0.65	0.50	0.38	0.88	0.75	0.50	0.86	0.75	0.91
Movement PHF		0.82			0.75			0.83			0.86		0.91

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	1	35	19	31	7	6	0	8	0	9	9	0	125
4:15 PM	1	31	26	17	4	6	0	19	0	4	4	1	113
4:30 PM	2	30	11	21	8	5	1	23	0	5	14	0	120
4:45 PM	1	26	15	16	9	9	0	12	0	6	8	2	104
5:00 PM	1	32	17	20	8	5	1	15	0	2	10	2	113
5:15 PM	0	24	10	21	9	10	0	14	0	6	5	1	100
5:30 PM	0	33	7	15	4	9	1	8	0	2	10	0	89
5:45 PM	1	21	3	9	5	2	0	12	1	12	8	1	75
Total	7	232	108	150	54	52	3	111	1	46	68	7	839

PM Intersection Peak Hour : **4:00 PM - 5:00 PM** Intersection PHF : **0.92**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	5	122	71	85	28	26	1	62	0	24	35	3	462
PHF	0.63	0.871	0.683	0.685	0.778	0.722	0.25	0.674	#####	0.667	0.625	0.375	0.92
Movement PHF		0.85			0.79			0.66			0.82		0.92

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Otay Mesa Road @ Pipers Ranch Road

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Otay Mesa Road @ Pipers Ranch Road

AM Period (7:00 AM - 9:00 AM)								
	Southbound		Westbound			Eastbound		
	Right	Left	Right	Thru		Thru	Left	TOTAL
7:00 AM	16	12	23	82		109	36	278
7:15 AM	28	7	20	102		147	37	341
7:30 AM	30	21	18	104		177	41	391
7:45 AM	22	20	24	130		158	75	429
8:00 AM	28	19	25	106		94	45	317
8:15 AM	31	18	27	78		93	32	279
8:30 AM	33	12	21	84		72	37	259
8:45 AM	28	9	25	103		67	44	276
Total	216	118	183	789		917	347	2,570

AM Intersection Peak Hour : **7:15 AM - 8:15 AM** Intersection PHF : **0.86**

	Southbound		Westbound			Eastbound		TOTAL
	Right	Left	Right	Thru		Thru	Left	
Volume	108	67	87	442		576	198	1,478
PHF	0.90	0.80	0.87	0.85		0.81	0.66	0.86
Movement PHF	0.86			0.86		0.83		0.86

PM Period (4:00 PM - 6:00 PM)								
	Southbound		Westbound			Eastbound		
	Right	Left	Right	Thru		Thru	Left	TOTAL
4:00 PM	69	17	32	208		75	18	419
4:15 PM	41	13	17	172		89	15	347
4:30 PM	50	32	25	144		97	45	393
4:45 PM	33	26	20	121		76	34	310
5:00 PM	79	27	18	103		90	26	343
5:15 PM	30	24	20	87		79	24	264
5:30 PM	35	11	23	96		76	19	260
5:45 PM	33	12	18	77		67	12	219
Total	370	162	173	1,008		649	193	2,555

PM Intersection Peak Hour : **4:00 PM - 5:00 PM** Intersection PHF : **0.88**

	Southbound		Westbound			Eastbound		TOTAL
	Right	Left	Right	Thru		Thru	Left	
Volume	193	88	94	645		337	112	1469
PHF	0.70	0.688	0.734	0.775		0.869	0.622	0.88
Movement PHF	0.82			0.77		0.79		0.88

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Airway Road @ Harvest Road

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Time Period	PHF
8:00 AM - 9:00 AM	0.85
4:00 PM - 5:00 PM	0.89

CHEN RYAN

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Airway Road @ Harvest Road

AM Period (7:00 AM - 9:00 AM)								
		Westbound		Northbound		Eastbound		
		Thru	Left	Right	Left	Right	Thru	TOTAL
7:00 AM		14	7	8	7	8	15	59
7:15 AM		8	11	9	11	6	33	78
7:30 AM		21	23	7	15	13	28	107
7:45 AM		24	31	15	23	15	29	137
8:00 AM		19	21	8	19	19	22	108
8:15 AM		23	19	14	21	13	18	108
8:30 AM		31	15	9	22	16	28	121
8:45 AM		30	15	21	29	21	25	141
Total		170	142	91	147	111	198	859

AM Intersection Peak Hour : **8:00 AM - 9:00 AM** Intersection PHF : **0.85**

		Westbound		Northbound		Eastbound		TOTAL
		Thru	Left	Right	Left	Right	Thru	
Volume		103	70	52	91	69	93	478
PHF		0.83	0.83	0.62	0.78	0.82	0.83	0.85
Movement PHF		0.94		0.72			0.88	0.85

PM Period (4:00 PM - 6:00 PM)								
		Westbound		Northbound		Eastbound		
		Thru	Left	Right	Left	Right	Thru	TOTAL
4:00 PM		40	14	17	27	36	38	172
4:15 PM		41	18	13	20	37	20	149
4:30 PM		44	16	15	16	28	25	144
4:45 PM		43	16	8	22	30	25	144
5:00 PM		35	15	14	12	26	27	129
5:15 PM		17	11	13	19	38	23	121
5:30 PM		32	13	10	13	21	21	110
5:45 PM		25	18	13	19	20	19	114
Total		277	121	103	148	236	198	1,083

PM Intersection Peak Hour : **4:00 PM - 5:00 PM** Intersection PHF : **0.89**

		Westbound		Northbound		Eastbound		TOTAL
		Thru	Left	Right	Left	Right	Thru	
Volume		168	64	53	85	131	108	609
PHF		0.955	0.889	0.779	0.787	0.885	0.711	0.89
Movement PHF		0.97		0.78			0.81	0.89

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Siempre Viva Road @ Customhouse Plaza

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Siempre Viva Road @ Customhouse Plaza

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	1	0	0	0	73	5	1	0	1	0	26	2	109
7:15 AM	1	0	0	0	92	10	2	0	6	3	41	4	159
7:30 AM	2	0	0	0	112	2	2	0	2	0	20	4	144
7:45 AM	0	0	0	0	147	11	0	0	5	4	82	2	251
8:00 AM	1	0	0	0	121	21	3	0	10	1	42	3	202
8:15 AM	2	0	0	0	130	10	4	0	5	3	79	4	237
8:30 AM	0	0	0	1	135	18	2	0	3	2	20	2	183
8:45 AM	2	0	0	0	106	14	1	0	3	3	51	4	184
Total	9	0	0	1	916	91	15	0	35	16	361	25	1,469

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.87**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	3	0	0	1	533	60	9	0	23	10	223	11	873
PHF	0.38	#####	#####	0.25	0.91	0.71	0.56	#####	0.58	0.63	0.68	0.69	0.87
Movement PHF		0.38			0.94			0.62			0.69		0.87

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	0	0	0	1	120	5	3	1	7	4	87	0	228
4:15 PM	4	0	0	1	122	15	3	0	4	2	54	0	205
4:30 PM	4	1	0	1	151	1	7	0	3	2	84	0	254
4:45 PM	1	0	0	0	124	11	3	2	3	6	84	0	234
5:00 PM	1	0	0	0	130	9	7	0	4	1	134	0	286
5:15 PM	5	0	0	1	137	9	9	1	3	7	79	0	251
5:30 PM	0	0	0	0	113	2	2	0	2	4	105	0	228
5:45 PM	0	0	0	0	112	5	6	0	7	4	65	0	199
Total	15	1	0	4	1,009	57	40	4	33	30	692	0	1,885

PM Intersection Peak Hour : **4:30 PM - 5:30 PM** Intersection PHF : **0.90**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	11	1	0	2	542	30	26	3	13	16	381	0	1025
PHF	0.55	0.25	#####	0.5	0.897	0.682	0.722	0.375	0.813	0.571	0.711	#####	0.90
Movement PHF		0.60			0.94			0.81			0.74		0.90

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

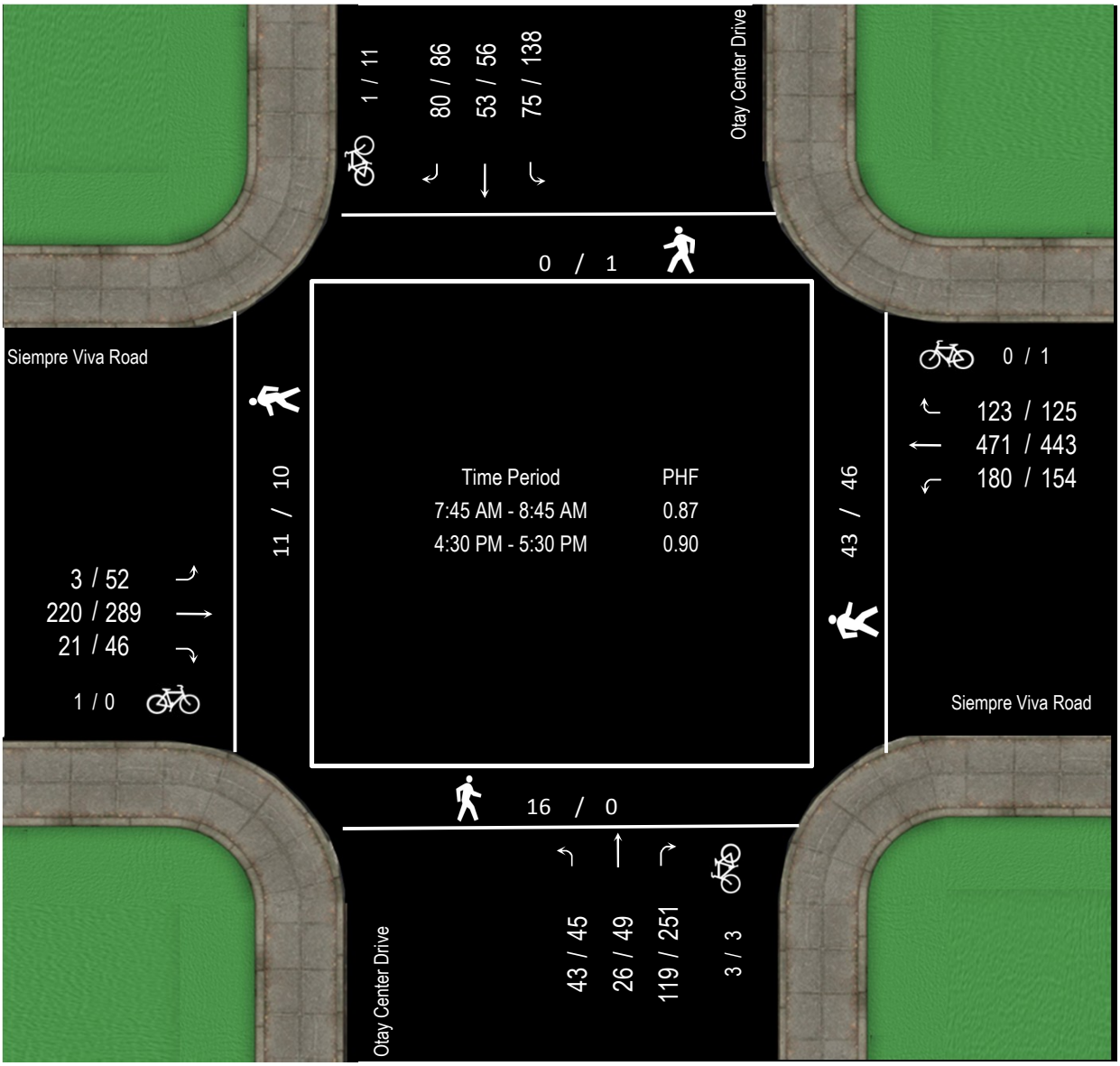
Location: Siempre Viva Road @ Otay Center Drive

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*



Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Siempre Viva Road @ Otay Center Drive

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	4	11	15	8	63	26	24	8	11	5	16	6	197
7:15 AM	13	10	8	18	74	30	10	11	15	6	19	8	222
7:30 AM	12	10	6	34	90	36	9	5	12	5	10	4	233
7:45 AM	19	13	18	33	124	57	28	8	15	7	83	2	407
8:00 AM	21	11	18	26	112	49	18	5	9	4	43	1	317
8:15 AM	18	14	22	34	115	42	26	2	7	6	80	0	366
8:30 AM	22	15	17	30	120	32	47	11	12	4	14	0	324
8:45 AM	15	13	18	28	97	33	38	12	8	5	50	0	317
Total	124	97	122	211	795	305	200	62	89	42	315	21	2,383

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.87**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	80	53	75	123	471	180	119	26	43	21	220	3	1,414
PHF	0.91	0.88	0.85	0.90	0.95	0.79	0.63	0.59	0.72	0.75	0.66	0.38	0.87
Movement PHF		0.96			0.90			0.67			0.66		0.87

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	20	14	35	42	99	35	70	14	7	8	74	9	427
4:15 PM	15	12	42	35	116	35	54	14	7	8	35	13	386
4:30 PM	25	13	44	28	122	25	61	11	6	10	70	3	418
4:45 PM	15	14	29	36	108	50	53	10	12	9	45	23	404
5:00 PM	24	9	39	33	105	43	70	10	10	16	109	15	483
5:15 PM	22	20	26	28	108	36	67	18	17	11	65	11	429
5:30 PM	18	6	38	27	87	32	47	1	10	6	91	16	379
5:45 PM	18	11	38	30	92	43	51	6	7	10	46	10	362
Total	157	99	291	259	837	299	473	84	76	78	535	100	3,288

PM Intersection Peak Hour : **4:30 PM - 5:30 PM** Intersection PHF : **0.90**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	86	56	138	125	443	154	251	49	45	46	289	52	1734
PHF	0.86	0.7	0.784	0.868	0.908	0.77	0.896	0.681	0.662	0.719	0.663	0.565	0.90
Movement PHF		0.85			0.93			0.85			0.69		0.90

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

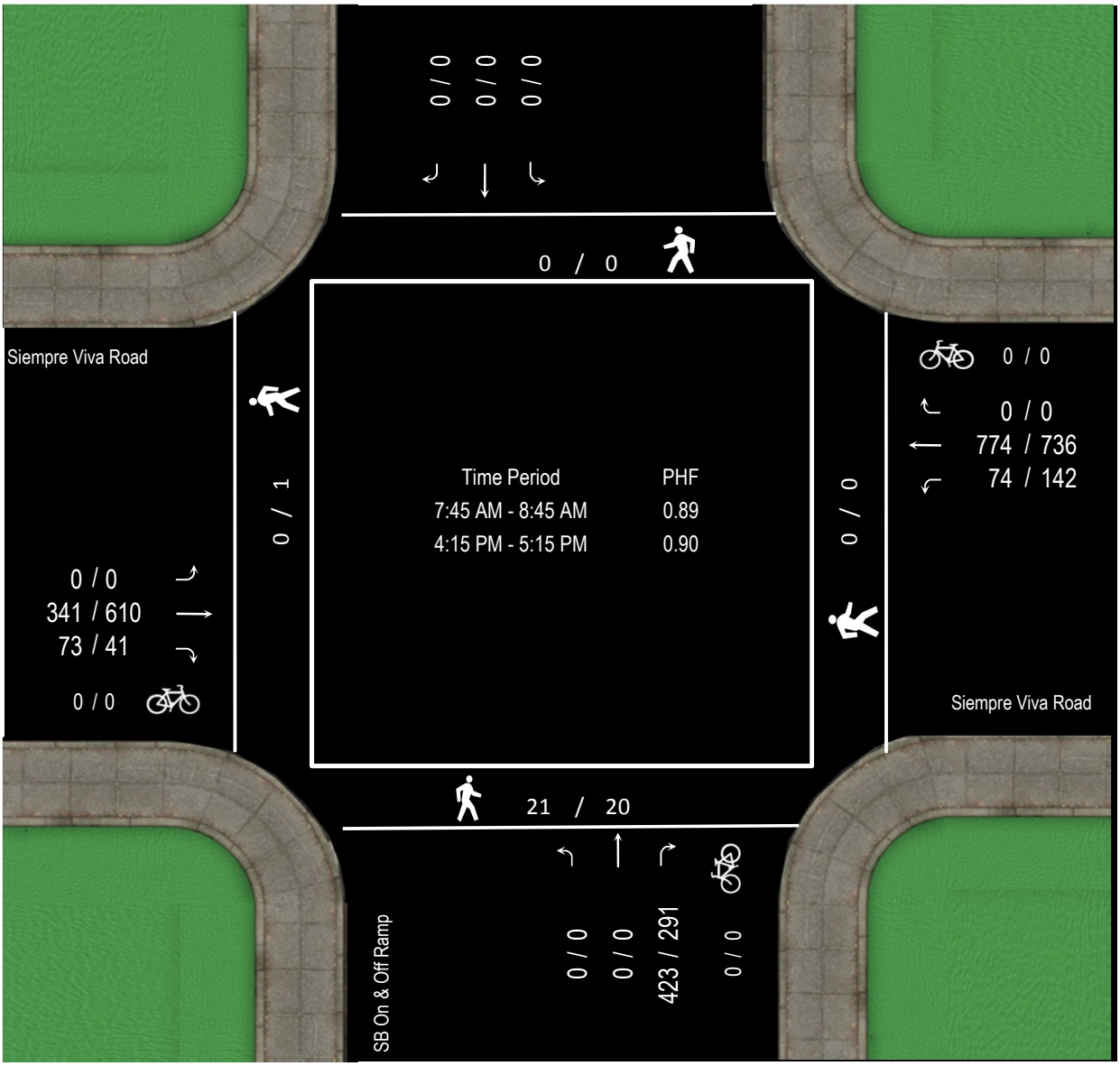
Location: Siempre Viva Road @ SB On & Off Ramp

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*



Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Siempre Viva Road @ SB On & Off Ramp

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	0	0	0	0	97	15	97	0	0	16	39	0	264
7:15 AM	0	0	0	0	122	24	136	0	0	12	25	0	319
7:30 AM	0	0	0	0	160	20	168	0	0	12	13	0	373
7:45 AM	0	0	0	0	214	20	111	0	0	16	113	0	474
8:00 AM	0	0	0	0	187	13	122	0	0	14	65	0	401
8:15 AM	0	0	0	0	191	22	90	0	0	29	99	0	431
8:30 AM	0	0	0	0	182	19	100	0	0	14	64	0	379
8:45 AM	0	0	0	0	158	26	86	0	0	19	87	0	376
Total	0	0	0	0	1,311	159	910	0	0	132	505	0	3,017

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.89**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	0	0	0	774	74	423	0	0	73	341	0	1,685
PHF	#####	#####	#####	#####	0.90	0.84	0.87	#####	#####	0.63	0.75	#####	0.89
Movement PHF	#DIV/0!			0.91			0.87			0.80			0.89

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	0	0	0	0	176	42	81	0	0	24	155	0	478
4:15 PM	0	0	0	0	186	41	85	0	0	8	123	0	443
4:30 PM	0	0	0	0	175	33	70	0	0	6	169	0	453
4:45 PM	0	0	0	0	194	31	65	0	0	12	115	0	417
5:00 PM	0	0	0	0	181	37	71	0	0	15	203	0	507
5:15 PM	0	0	0	0	172	28	72	0	0	19	139	0	430
5:30 PM	0	0	0	0	146	41	66	0	0	36	140	0	429
5:45 PM	0	0	0	0	165	33	75	0	0	10	125	0	408
Total	0	0	0	0	1,395	286	585	0	0	130	1,169	0	3,565

PM Intersection Peak Hour : **4:15 PM - 5:15 PM** Intersection PHF : **0.90**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	0	0	0	736	142	291	0	0	41	610	0	1820
PHF	#####	#####	#####	#####	0.948	0.866	0.856	#####	#####	0.683	0.751	#####	0.90
Movement PHF	#DIV/0!			0.97			0.86			0.75			0.90

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Siempre Viva Road @ SB Off Ramp

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Siempre Viva Road @ SB Off Ramp

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	33	0	0	0	79	0	0	0	0	0	136	0	248
7:15 AM	55	0	0	0	91	0	0	0	0	0	161	0	307
7:30 AM	86	0	0	0	94	0	0	0	0	0	181	0	361
7:45 AM	115	0	0	0	119	0	0	0	0	0	224	0	458
8:00 AM	75	0	0	0	125	0	0	0	0	0	187	0	387
8:15 AM	88	0	0	0	125	0	0	0	0	0	189	0	402
8:30 AM	56	0	0	0	145	0	0	0	0	0	164	0	365
8:45 AM	58	0	0	0	126	0	0	0	0	0	173	0	357
Total	566	0	0	0	904	0	0	0	0	0	1,415	0	2,885

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.88**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	334	0	0	0	514	0	0	0	0	0	764	0	1,612
PHF	0.73	#####	#####	#####	0.89	#####	#####	#####	#####	#####	0.85	#####	0.88
Movement PHF	0.73			0.89			#DIV/0!			0.85			0.88

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	91	0	0	0	127	0	0	0	0	0	236	0	454
4:15 PM	86	0	0	0	141	0	0	0	0	0	208	0	435
4:30 PM	94	0	0	0	114	0	0	0	0	0	239	0	447
4:45 PM	106	0	0	0	119	0	0	0	0	0	180	0	405
5:00 PM	101	0	0	0	117	0	0	0	0	0	274	0	492
5:15 PM	76	0	0	0	124	0	0	0	0	0	211	0	411
5:30 PM	81	0	0	0	106	0	0	0	0	0	206	0	393
5:45 PM	102	0	0	0	96	0	0	0	0	0	200	0	398
Total	737	0	0	0	944	0	0	0	0	0	1,754	0	3,435

PM Intersection Peak Hour : **4:15 PM - 5:15 PM** Intersection PHF : **0.90**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	387	0	0	0	491	0	0	0	0	0	901	0	1779
PHF	0.91	#####	#####	#####	0.871	#####	#####	#####	#####	#####	0.822	#####	0.90
Movement PHF	0.91			0.87			#DIV/0!			0.82			0.90

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Siempre Viva Road @ NB Off Ramp

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

CHEN RYAN

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Siempre Viva Road @ NB Off Ramp

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	0	0	0	89	47	0	86	0	32	0	108	28	390
7:15 AM	0	0	0	83	45	0	91	0	46	0	125	36	426
7:30 AM	0	0	0	105	62	0	74	0	32	0	158	23	454
7:45 AM	0	0	0	108	73	0	67	0	46	0	189	35	518
8:00 AM	0	0	0	100	70	0	78	2	55	0	166	21	492
8:15 AM	0	0	0	93	74	0	89	0	51	0	160	29	496
8:30 AM	0	0	0	110	91	0	101	1	54	0	126	38	521
8:45 AM	0	0	0	120	88	0	72	0	38	0	138	35	491
Total	0	0	0	808	550	0	658	3	354	0	1,170	245	3,788

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.97**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	0	0	411	308	0	335	3	206	0	641	123	2,027
PHF	#####	#####	#####	0.93	0.85	#####	0.83	0.38	0.94	#####	0.85	0.81	0.97
Movement PHF	#DIV/0!				0.89			0.87			0.85		0.97

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	0	0	0	198	104	0	53	0	23	0	132	104	614
4:15 PM	0	0	0	184	120	0	69	0	21	0	114	94	602
4:30 PM	0	0	0	217	106	0	51	0	8	0	117	121	620
4:45 PM	0	0	0	144	107	0	46	1	12	0	94	86	490
5:00 PM	0	0	0	204	108	0	53	0	9	0	127	147	648
5:15 PM	0	0	0	200	113	0	52	0	11	0	97	114	587
5:30 PM	0	0	0	174	94	0	38	1	12	0	114	92	525
5:45 PM	0	0	0	170	83	0	34	0	13	0	105	95	500
Total	0	0	0	1,491	835	0	396	2	109	0	900	853	4,586

PM Intersection Peak Hour : **4:15 PM - 5:15 PM** Intersection PHF : **0.91**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	0	0	749	441	0	219	1	50	0	452	448	2360
PHF	#####	#####	#####	0.863	0.919	#####	0.793	0.25	0.595	#####	0.89	0.762	0.91
Movement PHF	#DIV/0!				0.92			0.75			0.82		0.91

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Airway Road @ Sanyo Avenue

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Airway Road @ Sanyo Avenue

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	6	16	11	9	4	0	1	12	5	5	6	12	87
7:15 AM	13	17	6	10	8	1	0	20	1	8	9	16	109
7:30 AM	25	41	9	6	13	1	0	11	5	4	14	10	139
7:45 AM	23	44	13	7	15	1	0	14	9	8	13	6	153
8:00 AM	26	29	18	5	12	1	0	16	6	11	12	5	141
8:15 AM	20	32	18	13	15	1	2	17	11	16	7	1	153
8:30 AM	14	29	12	10	21	1	1	14	14	9	15	10	150
8:45 AM	23	27	11	9	12	0	0	11	11	9	20	9	142
Total	150	235	98	69	100	6	4	115	62	70	96	69	1,074

AM Intersection Peak Hour : **7:45 AM - 8:45 AM** Intersection PHF : **0.98**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	83	134	61	35	63	4	3	61	40	44	47	22	597
PHF	0.80	0.76	0.85	0.67	0.75	1.00	0.38	0.90	0.71	0.69	0.78	0.55	0.98
Movement PHF		0.87			0.80			0.87			0.83		0.98

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	6	18	9	22	38	0	0	39	11	10	24	13	190
4:15 PM	9	23	8	17	30	3	0	20	20	16	19	6	171
4:30 PM	8	20	9	24	25	0	0	28	11	7	22	11	165
4:45 PM	8	12	12	26	35	0	0	21	11	11	26	7	169
5:00 PM	7	13	10	28	25	0	0	29	15	8	15	24	174
5:15 PM	5	16	5	17	26	0	0	25	10	4	16	20	144
5:30 PM	3	16	7	23	30	1	0	26	8	6	8	15	143
5:45 PM	6	8	3	12	28	1	0	21	4	10	8	12	113
Total	52	126	63	169	237	5	0	209	90	72	138	108	1,269

PM Intersection Peak Hour : **4:00 PM - 5:00 PM** Intersection PHF : **0.91**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	31	73	38	89	128	3	0	108	53	44	91	37	695
PHF	0.86	0.793	0.792	0.856	0.842	0.25	#####	0.692	0.663	0.688	0.875	0.712	0.91
Movement PHF		0.89			0.90			0.81			0.91		0.91

Appendix D
Peak Hour Intersection LOS & ILV Worksheets – Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	1	92	9	5	2	36	26	3	1	43	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9		4.9		4.9	4.9			5.2	
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.98		0.99		1.00	1.00			0.98	
Flpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85		0.98		1.00	0.98			0.91	
Flt Protected	0.95	0.95	1.00		0.97		0.95	1.00			1.00	
Satd. Flow (prot)	1681	1686	1549		1753		1768	1827			1662	
Flt Permitted	0.95	0.95	1.00		0.97		1.00	1.00			1.00	
Satd. Flow (perm)	1681	1686	1549		1753		1861	1827			1658	
Peak-hour factor, PHF	0.53	0.53	0.53	0.67	0.67	0.67	0.77	0.77	0.77	0.85	0.85	0.85
Adj. Flow (vph)	113	2	174	13	7	3	47	34	4	1	51	96
RTOR Reduction (vph)	0	0	107	0	3	0	0	3	0	0	82	0
Lane Group Flow (vph)	58	57	67	0	20	0	47	35	0	0	66	0
Confl. Peds. (#/hr)	1		1	1		1	2					2
Confl. Bikes (#/hr)			1			4			6			5
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	Perm	Split	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		1	1			8			4	
Permitted Phases			2				8			4		
Actuated Green, G (s)	13.0	13.0	13.0		0.9		5.4	5.4			5.1	
Effective Green, g (s)	13.0	13.0	13.0		0.9		5.4	5.4			5.1	
Actuated g/C Ratio	0.38	0.38	0.38		0.03		0.16	0.16			0.15	
Clearance Time (s)	4.9	4.9	4.9		4.9		4.9	4.9			5.2	
Vehicle Extension (s)	2.9	2.9	2.9		2.9		3.8	3.8			4.5	
Lane Grp Cap (vph)	642	644	592		46		295	290			248	
v/s Ratio Prot	0.03	0.03			c0.01			0.02				
v/s Ratio Perm			c0.04				0.03				c0.04	
v/c Ratio	0.09	0.09	0.11		0.44		0.16	0.12			0.27	
Uniform Delay, d1	6.7	6.7	6.8		16.3		12.3	12.3			12.8	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.1	0.1	0.1		6.2		0.3	0.2			1.0	
Delay (s)	6.8	6.8	6.9		22.5		12.7	12.5			13.8	
Level of Service	A	A	A		C		B	B			B	
Approach Delay (s)		6.8			22.5			12.6			13.8	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	34.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	160	16	11	153	7	55	0	38	5	0	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.6		4.4		4.9	4.4	4.9	
Lane Util. Factor	1.00	0.95		0.97	0.91		1.00		1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		0.99	1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00		0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)	1770	3488		3433	5048		1770		1563	1768	1535	
Flt Permitted	0.95	1.00		0.95	1.00		1.00		1.00	1.00	1.00	
Satd. Flow (perm)	1770	3488		3433	5048		1863		1563	1861	1535	
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.75	0.75	0.75	0.97	0.97	0.97
Adj. Flow (vph)	21	184	18	13	178	8	73	0	51	5	0	27
RTOR Reduction (vph)	0	7	0	0	4	0	0	0	47	0	26	0
Lane Group Flow (vph)	21	195	0	13	182	0	73	0	4	5	1	0
Confl. Peds. (#/hr)			3						2	2		
Confl. Bikes (#/hr)			1			3						2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		pm+pt		Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	0.7	18.3		0.5	17.9		5.3		2.9	1.5	1.0	
Effective Green, g (s)	0.7	18.3		0.5	17.9		5.3		2.9	1.5	1.0	
Actuated g/C Ratio	0.02	0.44		0.01	0.43		0.13		0.07	0.04	0.02	
Clearance Time (s)	4.4	5.4		4.4	5.6		4.4		4.9	4.4	4.9	
Vehicle Extension (s)	2.0	5.4		2.0	5.4		2.0		5.6	2.0	2.0	
Lane Grp Cap (vph)	30	1545		41	2187		233		109	66	37	
v/s Ratio Prot	c0.01	c0.06		0.00	0.04		c0.02			0.00	0.00	
v/s Ratio Perm							c0.02		0.00	0.00		
v/c Ratio	0.70	0.13		0.32	0.08		0.31		0.03	0.08	0.02	
Uniform Delay, d1	20.2	6.8		20.2	6.9		16.4		17.9	19.3	19.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2	44.4	0.1		1.6	0.0		0.3		0.3	0.2	0.1	
Delay (s)	64.6	6.9		21.9	6.9		16.7		18.2	19.5	19.7	
Level of Service	E	A		C	A		B		B	B	B	
Approach Delay (s)		12.3			7.9			17.3			19.7	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	41.3	Sum of lost time (s)	19.3
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

3: Caliente Avenue/Ocean View Hills Parkway & Otay Mesa Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1	4	221	4	57	0	105	598	130	173	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6	5.2	5.2	6.7	6.7		6.3	5.2	5.2	6.3	6.3
Lane Util. Factor		0.95	1.00	0.97	0.95	1.00		0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.99	1.00	1.00	0.99		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3539	1574	3335	3539	1563		3539	1538	3433	3539	1583
Flt Permitted		1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3539	1574	3335	3539	1563		3539	1538	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1	4	240	4	62	0	114	650	141	188	1
RTOR Reduction (vph)	0	0	4	0	0	44	0	0	363	0	0	1
Lane Group Flow (vph)	0	1	0	240	4	18	0	114	287	141	188	0
Confl. Peds. (#/hr)			1			2						
Heavy Vehicles (%)	2%	2%	2%	5%	2%	2%	2%	2%	5%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2	3	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		1.7	3.4	12.3	18.1	18.1		15.6	27.9	11.2	25.1	25.1
Effective Green, g (s)		1.7	3.4	12.3	18.1	18.1		15.6	27.9	11.2	25.1	25.1
Actuated g/C Ratio		0.03	0.05	0.19	0.29	0.29		0.25	0.44	0.18	0.40	0.40
Clearance Time (s)		5.6	5.2	5.2	6.7	6.7		6.3	5.2	5.2	6.3	6.3
Vehicle Extension (s)		2.0	2.0	3.0	2.0	2.0		3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)		95	84	650	1015	448		874	680	609	1407	629
v/s Ratio Prot		0.00	0.00	0.07	0.00			0.03	c0.08	c0.04	0.05	
v/s Ratio Perm			0.00			c0.01			0.10			0.00
v/c Ratio		0.01	0.00	0.37	0.00	0.04		0.13	0.42	0.23	0.13	0.00
Uniform Delay, d1		29.9	28.2	22.0	16.1	16.2		18.5	12.1	22.3	12.1	11.4
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.0	0.0	0.4	0.0	0.0		0.1	0.4	0.1	0.0	0.0
Delay (s)		29.9	28.2	22.4	16.1	16.2		18.5	12.5	22.3	12.1	11.4
Level of Service		C	C	C	B	B		B	B	C	B	B
Approach Delay (s)		28.6			21.1			13.4			16.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	63.1	Sum of lost time (s)	23.4
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	15	1	40	98	663	0	0	102	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.1	5.1	4.7	5.1			5.1	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frpb, ped/bikes					1.00	1.00	1.00	1.00			0.98	
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.89	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1727	1538	1719	4940			4312	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1727	1538	1719	4940			4312	
Peak-hour factor, PHF	0.92	0.92	0.92	0.74	0.74	0.74	0.79	0.79	0.79	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	20	1	54	124	839	0	0	110	318
RTOR Reduction (vph)	0	0	0	0	0	51	0	0	0	0	187	0
Lane Group Flow (vph)	0	0	0	0	21	3	124	839	0	0	241	0
Confl. Peds. (#/hr)												4
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					2.1	2.1	4.5	24.2			15.0	
Effective Green, g (s)					2.1	2.1	4.5	24.2			15.0	
Actuated g/C Ratio					0.06	0.06	0.12	0.66			0.41	
Clearance Time (s)					5.1	5.1	4.7	5.1			5.1	
Vehicle Extension (s)					3.0	3.0	2.0	3.0			3.0	
Lane Grp Cap (vph)					99	88	211	3275			1772	
v/s Ratio Prot							c0.07	c0.17			0.06	
v/s Ratio Perm					0.01	0.00						
v/c Ratio					0.21	0.04	0.59	0.26			0.14	
Uniform Delay, d1					16.4	16.2	15.1	2.5			6.7	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					1.1	0.2	2.7	0.0			0.0	
Delay (s)					17.5	16.4	17.8	2.5			6.7	
Level of Service					B	B	B	A			A	
Approach Delay (s)		0.0			16.7			4.5			6.7	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	36.5	Sum of lost time (s)	14.9
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	633	1	43	0	0	0	0	128	24	78	39	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1						5.1		4.7	5.1	
Lane Util. Factor	1.00	1.00						0.91		1.00	0.95	
Frpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	0.85						0.98		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1641	1473						4586		1641	3282	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1641	1473						4586		1641	3282	
Peak-hour factor, PHF	0.76	0.76	0.76	0.92	0.92	0.92	0.73	0.73	0.73	0.66	0.66	0.66
Adj. Flow (vph)	833	1	57	0	0	0	0	175	33	118	59	0
RTOR Reduction (vph)	0	23	0	0	0	0	0	29	0	0	0	0
Lane Group Flow (vph)	833	35	0	0	0	0	0	179	0	118	59	0
Confl. Peds. (#/hr)									2			
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4											
Actuated Green, G (s)	45.5	45.5						8.4		7.3	20.4	
Effective Green, g (s)	45.5	45.5						8.4		7.3	20.4	
Actuated g/C Ratio	0.60	0.60						0.11		0.10	0.27	
Clearance Time (s)	5.1	5.1						5.1		4.7	5.1	
Vehicle Extension (s)	3.0	3.0						3.0		2.0	3.0	
Lane Grp Cap (vph)	981	880						506		157	879	
v/s Ratio Prot		0.02						c0.04		c0.07	0.02	
v/s Ratio Perm	c0.51											
v/c Ratio	0.85	0.04						0.35		0.75	0.07	
Uniform Delay, d1	12.5	6.3						31.3		33.5	20.8	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	7.0	0.0						0.4		16.3	0.0	
Delay (s)	19.5	6.3						31.8		49.9	20.8	
Level of Service	B	A						C		D	C	
Approach Delay (s)		18.6			0.0			31.8			40.2	
Approach LOS		B			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	76.1	Sum of lost time (s)	14.9
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	144	0	1	1	0	5	0	4	2	5	12	86
Peak Hour Factor	0.74	0.74	0.74	0.50	0.50	0.50	0.50	0.50	0.50	0.80	0.80	0.80
Hourly flow rate (vph)	195	0	1	2	0	10	0	8	4	6	15	108

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	130	66	2	10	0	12	6	123
Volume Left (vph)	130	65	2	0	0	0	6	0
Volume Right (vph)	0	1	0	10	0	4	0	108
Hadj (s)	0.58	0.56	0.67	-0.53	0.00	-0.06	0.67	-0.52
Departure Headway (s)	5.4	5.4	5.7	4.5	5.2	5.1	5.7	4.5
Degree Utilization, x	0.20	0.10	0.00	0.01	0.00	0.02	0.01	0.15
Capacity (veh/h)	637	644	603	762	676	671	601	760
Control Delay (s)	8.6	7.8	7.5	6.4	7.0	7.0	7.6	7.2
Approach Delay (s)	8.3		6.6		7.0		7.2	
Approach LOS	A		A		A		A	

Intersection Summary			
Delay	7.8		
Level of Service	A		
Intersection Capacity Utilization	25.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	339	1	0	223	38	0	0	1	0	0	32
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.93	0.93	0.93	0.25	0.25	0.25	0.73	0.73	0.73
Hourly flow rate (vph)	0	385	1	0	240	41	0	0	4	0	0	44
Pedestrians											6	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											4.0	
Percent Blockage											1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	287			386			510	672	129	378	632	86
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	287			386			510	672	129	378	632	86
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			100	100	100	100	100	95
cM capacity (veh/h)	1210			1113			407	358	872	528	378	926

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	154	154	78	80	80	80	41	4	44
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	1	0	0	0	41	4	44
cSH	1700	1700	1700	1700	1700	1700	1700	872	926
Volume to Capacity	0.09	0.09	0.05	0.05	0.05	0.05	0.02	0.00	0.05
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	9.1
Lane LOS								A	A
Approach Delay (s)	0.0			0.0				9.1	9.1
Approach LOS								A	A

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	16.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	131	67	10	38	143	43
Peak Hour Factor	0.81	0.81	0.86	0.86	0.82	0.82
Hourly flow rate (vph)	162	83	12	44	174	52

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	162	83	12	44	174	52
Volume Left (vph)	162	0	12	0	0	0
Volume Right (vph)	0	83	0	0	0	52
Hadj (s)	0.53	-0.67	0.53	0.17	0.17	-0.67
Departure Headway (s)	5.7	4.5	6.0	5.6	5.4	4.6
Degree Utilization, x	0.26	0.10	0.02	0.07	0.26	0.07
Capacity (veh/h)	599	751	574	611	638	750
Control Delay (s)	9.5	6.9	7.9	7.8	9.1	6.7
Approach Delay (s)	8.6		7.8		8.6	
Approach LOS	A		A		A	

Intersection Summary			
Delay	8.5		
Level of Service	A		
Intersection Capacity Utilization	22.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	23	146	91	122	50	30
Peak Hour Factor	0.78	0.78	0.78	0.78	0.80	0.80
Hourly flow rate (vph)	29	187	117	156	62	38

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	217	117	156	100
Volume Left (vph)	29	117	0	0
Volume Right (vph)	187	0	0	38
Hadj (s)	-0.32	0.67	0.17	-0.05
Departure Headway (s)	4.5	5.8	5.3	4.8
Degree Utilization, x	0.27	0.19	0.23	0.13
Capacity (veh/h)	751	598	653	702
Control Delay (s)	9.2	8.9	8.7	8.6
Approach Delay (s)	9.2	8.8		8.6
Approach LOS	A	A		A

Intersection Summary			
Delay	8.9		
Level of Service	A		
Intersection Capacity Utilization	28.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	133	127	89	135	93	89	32	37	82	39	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	1.00		1.00	1.00	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	4715	1468	3183	4715	1468	1641	1588		1641	1727	2584
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	4715	1468	3183	4715	1468	1641	1588		1641	1727	2584
Peak-hour factor, PHF	0.88	0.88	0.88	0.83	0.83	0.83	0.86	0.86	0.86	0.84	0.84	0.84
Adj. Flow (vph)	91	151	144	107	163	112	103	37	43	98	46	44
RTOR Reduction (vph)	0	0	57	0	0	44	0	39	0	0	0	39
Lane Group Flow (vph)	91	151	87	107	163	68	103	41	0	98	46	6
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	8.4	84.2	84.2	9.1	85.2	85.2	16.3	12.7		12.7	9.1	17.5
Effective Green, g (s)	8.4	84.2	84.2	9.1	85.2	85.2	16.3	12.7		12.7	9.1	17.5
Actuated g/C Ratio	0.06	0.60	0.60	0.06	0.61	0.61	0.12	0.09		0.09	0.06	0.12
Clearance Time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Vehicle Extension (s)	2.0	4.1	4.1	2.0	4.5	4.5	2.0	4.3		2.0	3.7	2.0
Lane Grp Cap (vph)	190	2835	882	206	2869	893	191	144		148	112	323
v/s Ratio Prot	0.03	0.03		c0.03	0.03		0.06	c0.03		c0.06	c0.03	0.00
v/s Ratio Perm			c0.06			0.05						0.00
v/c Ratio	0.48	0.05	0.10	0.52	0.06	0.08	0.54	0.28		0.66	0.41	0.02
Uniform Delay, d1	63.7	11.5	11.8	63.3	11.1	11.2	58.3	59.4		61.6	62.9	53.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.0	0.2	0.9	0.0	0.2	1.5	1.7		8.3	3.1	0.0
Delay (s)	64.4	11.5	12.0	64.3	11.1	11.4	59.8	61.1		69.9	65.9	53.7
Level of Service	E	B	B	E	B	B	E	E		E	E	D
Approach Delay (s)		24.2			26.1			60.4			65.1	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	37.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	1	0	0	0	0	18	0	1	0	61	0	4
Peak Hour Factor	0.25	0.25	0.25	0.64	0.64	0.64	0.25	0.25	0.25	0.81	0.81	0.81
Hourly flow rate (vph)	4	0	0	0	0	28	0	4	0	75	0	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	4	28	4	80
Volume Left (vph)	4	0	0	75
Volume Right (vph)	0	28	0	5
Hadj (s)	0.37	-0.43	0.17	0.32
Departure Headway (s)	4.5	3.7	4.2	4.3
Degree Utilization, x	0.00	0.03	0.00	0.10
Capacity (veh/h)	781	955	832	829
Control Delay (s)	7.5	6.8	7.2	7.7
Approach Delay (s)	7.5	6.8	7.2	7.7
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.5		
Level of Service	A		
Intersection Capacity Utilization	20.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	176	43	70	301	6	16	0	56	6	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		4.0	6.5		4.0		4.0	4.0		
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00		1.00	1.00		
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00		0.99	1.00		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00	1.00		
Frt	1.00	0.97		1.00	1.00		1.00		0.85	1.00		
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00	0.95		
Satd. Flow (prot)	1641	4552		1641	4700		1641		1449	1641		
Flt Permitted	0.95	1.00		0.95	1.00		0.95		1.00	0.95		
Satd. Flow (perm)	1641	4552		1641	4700		1641		1449	1641		
Peak-hour factor, PHF	0.88	0.88	0.88	0.86	0.86	0.86	0.62	0.62	0.62	0.75	0.75	0.75
Adj. Flow (vph)	7	200	49	81	350	7	26	0	90	8	0	0
RTOR Reduction (vph)	0	17	0	0	1	0	0	0	86	0	0	0
Lane Group Flow (vph)	7	232	0	81	356	0	26	0	4	8	0	0
Confl. Peds. (#/hr)			4			2			1			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	1.2	58.4		7.8	65.0		9.3		4.1	1.2		
Effective Green, g (s)	1.2	58.4		7.8	65.0		9.3		4.1	1.2		
Actuated g/C Ratio	0.01	0.65		0.09	0.72		0.10		0.05	0.01		
Clearance Time (s)	4.0	6.5		4.0	6.5		4.0		4.0	4.0		
Vehicle Extension (s)	2.0	5.3		2.0	5.3		2.0		2.0	2.0		
Lane Grp Cap (vph)	21	2953		142	3394		169		66	21		
v/s Ratio Prot	0.00	0.05		c0.05	c0.08		c0.02			c0.00		
v/s Ratio Perm									0.00			
v/c Ratio	0.33	0.08		0.57	0.10		0.15		0.06	0.38		
Uniform Delay, d1	44.0	5.8		39.5	3.8		36.8		41.1	44.0		
Progression Factor	1.00	1.00		0.63	1.77		1.00		1.00	1.00		
Incremental Delay, d2	3.4	0.1		3.4	0.1		0.2		0.1	4.2		
Delay (s)	47.4	5.9		28.2	6.7		36.9		41.3	48.2		
Level of Service	D	A		C	A		D		D	D		
Approach Delay (s)		7.0			10.7			40.3			48.2	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	98	6	1	30	11	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.84	0.84	0.78	0.78	0.69	0.69
Hourly flow rate (vph)	117	7	1	38	16	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	52	21			40	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	52	21			40	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.3	
p0 queue free %	87	99			99	
cM capacity (veh/h)	926	1034			1520	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	117	7	40	16
Volume Left	117	0	0	16
Volume Right	0	7	38	0
cSH	926	1034	1700	1520
Volume to Capacity	0.13	0.01	0.02	0.01
Queue Length 95th (ft)	11	1	0	1
Control Delay (s)	9.4	8.5	0.0	7.4
Lane LOS	A	A		A
Approach Delay (s)	9.4		0.0	7.4
Approach LOS	A			

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	0	0	72	0	2	0	23	34	5	66	0
Peak Hour Factor	0.92	0.92	0.92	0.84	0.84	0.84	0.75	0.75	0.75	0.81	0.81	0.81
Hourly flow rate (vph)	0	0	0	86	0	2	0	31	45	6	81	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	0	88	76	88
Volume Left (vph)	0	86	0	6
Volume Right (vph)	0	2	45	0
Hadj (s)	0.00	0.35	-0.19	0.18
Departure Headway (s)	4.4	4.6	4.0	4.4
Degree Utilization, x	0.00	0.11	0.08	0.11
Capacity (veh/h)	796	744	863	801
Control Delay (s)	7.4	8.2	7.4	7.9
Approach Delay (s)	0.0	8.2	7.4	7.9
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.9		
Level of Service	A		
Intersection Capacity Utilization	18.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	120	116	96	140	228	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	1641	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	1641	4715	3183	1468
Peak-hour factor, PHF	0.91	0.91	0.73	0.73	0.90	0.90
Adj. Flow (vph)	132	127	132	192	253	301
RTOR Reduction (vph)	0	53	0	0	0	262
Lane Group Flow (vph)	132	74	132	192	253	39
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	52.3	52.3	11.6	67.9	11.6	11.6
Effective Green, g (s)	52.3	52.3	11.6	67.9	11.6	11.6
Actuated g/C Ratio	0.58	0.58	0.13	0.75	0.13	0.13
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	2739	853	211	3557	410	189
v/s Ratio Prot	0.03		c0.08	0.04	c0.08	
v/s Ratio Perm		c0.05				0.03
v/c Ratio	0.05	0.09	0.63	0.05	0.62	0.21
Uniform Delay, d1	8.1	8.3	37.1	2.8	37.1	35.1
Progression Factor	0.98	0.96	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2	4.1	0.0	1.9	0.2
Delay (s)	8.0	8.2	41.3	2.9	39.0	35.3
Level of Service	A	A	D	A	D	D
Approach Delay (s)	8.1			18.5	37.0	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	33.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	197	0	164	143	218	0	0	176	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.1	5.1	5.1	4.7	5.1			5.1	
Lane Util. Factor				1.00	0.95	0.95	0.97	0.91			0.91	
Frt				1.00	0.85	0.85	1.00	1.00			0.97	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1641	1395	1395	3183	4715			4571	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1395	1395	3183	4715			4571	
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.82	0.82	0.82	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	240	0	200	174	266	0	0	187	48
RTOR Reduction (vph)	0	0	0	0	72	72	0	0	0	0	37	0
Lane Group Flow (vph)	0	0	0	240	28	28	174	266	0	0	198	0
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				11.0	11.0	11.0	4.0	18.1			9.4	
Effective Green, g (s)				11.0	11.0	11.0	4.0	18.1			9.4	
Actuated g/C Ratio				0.28	0.28	0.28	0.10	0.46			0.24	
Clearance Time (s)				5.1	5.1	5.1	4.7	5.1			5.1	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)				459	390	390	323	2171			1093	
v/s Ratio Prot					0.02		c0.05	0.06			c0.04	
v/s Ratio Perm				c0.15		0.02						
v/c Ratio				0.52	0.07	0.07	0.54	0.12			0.18	
Uniform Delay, d1				11.9	10.4	10.4	16.8	6.1			11.9	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				1.1	0.1	0.1	1.7	0.0			0.1	
Delay (s)				13.0	10.5	10.5	18.5	6.1			12.0	
Level of Service				B	B	B	B	A			B	
Approach Delay (s)		0.0			11.9			11.0			12.0	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	39.3	Sum of lost time (s)	14.9
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	166	3	583	0	0	0	0	203	116	28	345	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1					5.1		4.7	5.1	
Lane Util. Factor		1.00	0.88					0.95		0.97	0.91	
Frpb, ped/bikes		1.00	1.00					1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00		1.00	1.00	
Frt		1.00	0.85					0.95		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1647	2584					3103		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1647	2584					3103		3183	4715	
Peak-hour factor, PHF	0.80	0.80	0.80	0.92	0.92	0.92	0.81	0.81	0.81	0.94	0.94	0.94
Adj. Flow (vph)	208	4	729	0	0	0	0	251	143	30	367	0
RTOR Reduction (vph)	0	0	487	0	0	0	0	108	0	0	0	0
Lane Group Flow (vph)	0	212	242	0	0	0	0	286	0	30	367	0
Confl. Bikes (#/hr)												2
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		12.3	12.3					9.2		0.7	14.6	
Effective Green, g (s)		12.3	12.3					9.2		0.7	14.6	
Actuated g/C Ratio		0.33	0.33					0.25		0.02	0.39	
Clearance Time (s)		5.1	5.1					5.1		4.7	5.1	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		546	856					769		60	1855	
v/s Ratio Prot								c0.09		0.01	c0.08	
v/s Ratio Perm		0.13	0.09									
v/c Ratio		0.39	0.28					0.37		0.50	0.20	
Uniform Delay, d1		9.5	9.1					11.6		18.0	7.4	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.5	0.2					0.3		6.4	0.1	
Delay (s)		10.0	9.3					11.9		24.4	7.5	
Level of Service		A	A					B		C	A	
Approach Delay (s)		9.5			0.0			11.9			8.7	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	37.1	Sum of lost time (s)	14.9
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	7	2	24	10	70	0	127	19	288	286	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3			5.2	5.2		4.9		4.4	5.1	5.1
Lane Util. Factor	1.00	1.00			1.00	1.00		0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.99		1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.97			1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.97	1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1675			1668	1450		3208		1641	1727	1468
Flt Permitted	0.95	1.00			0.97	1.00		1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1675			1668	1450		3208		1641	1727	1468
Peak-hour factor, PHF	0.86	0.86	0.86	0.81	0.81	0.81	0.76	0.76	0.76	0.85	0.85	0.85
Adj. Flow (vph)	34	8	2	30	12	86	0	167	25	339	336	93
RTOR Reduction (vph)	0	2	0	0	0	77	0	11	0	0	0	40
Lane Group Flow (vph)	34	8	0	0	42	9	0	181	0	339	336	53
Confl. Peds. (#/hr)	1					1			2			
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	3.4	3.4			6.0	6.0		11.1		17.4	32.7	32.7
Effective Green, g (s)	3.4	3.4			6.0	6.0		11.1		17.4	32.7	32.7
Actuated g/C Ratio	0.06	0.06			0.10	0.10		0.19		0.30	0.57	0.57
Clearance Time (s)	5.3	5.3			5.2	5.2		4.9		4.4	5.1	5.1
Vehicle Extension (s)	2.0	2.0			3.7	3.7		3.8		2.0	3.8	3.8
Lane Grp Cap (vph)	96	98			173	150		617		494	978	831
v/s Ratio Prot	c0.02	0.00			c0.03			0.06		c0.21	c0.19	
v/s Ratio Perm						0.01						0.04
v/c Ratio	0.35	0.08			0.24	0.06		0.29		0.69	0.34	0.06
Uniform Delay, d1	26.1	25.7			23.8	23.3		19.9		17.7	6.7	5.6
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.1			0.9	0.2		0.3		3.1	0.3	0.0
Delay (s)	26.9	25.8			24.7	23.5		20.3		20.9	7.0	5.7
Level of Service	C	C			C	C		C		C	A	A
Approach Delay (s)		26.7			23.9			20.3			13.0	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	57.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	21	1	3	16	19	1	69	1	32	107	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Lane Util. Factor		0.95			1.00	1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00			1.00	0.85	1.00	1.00		1.00	0.94	
Flt Protected		0.97			0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3183			1714	1446	1641	1725		3183	3055	
Flt Permitted		0.89			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2916			1661	1446	1641	1725		3183	3055	
Peak-hour factor, PHF	0.76	0.76	0.76	0.73	0.73	0.73	0.68	0.68	0.68	0.79	0.79	0.79
Adj. Flow (vph)	39	28	1	4	22	26	1	101	1	41	135	89
RTOR Reduction (vph)	0	1	0	0	0	24	0	0	0	0	66	0
Lane Group Flow (vph)	0	67	0	0	26	2	1	102	0	41	158	0
Confl. Peds. (#/hr)			1	1								2
Confl. Bikes (#/hr)			2			1						1
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		2			1		3	8		7	4	
Permitted Phases	2			1		1						
Actuated Green, G (s)		4.4			2.4	2.4	0.5	8.6		1.0	9.1	
Effective Green, g (s)		4.4			2.4	2.4	0.5	8.6		1.0	9.1	
Actuated g/C Ratio		0.12			0.07	0.07	0.01	0.24		0.03	0.26	
Clearance Time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Vehicle Extension (s)		4.8			4.8	4.8	2.0	3.3		2.0	4.4	
Lane Grp Cap (vph)		361			112	97	23	417		89	783	
v/s Ratio Prot							0.00	c0.06		c0.01	0.05	
v/s Ratio Perm		c0.02			c0.02	0.00						
v/c Ratio		0.19			0.23	0.02	0.04	0.24		0.46	0.20	
Uniform Delay, d1		13.9			15.7	15.5	17.3	10.8		17.0	10.4	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5			2.1	0.1	0.3	0.3		1.4	0.2	
Delay (s)		14.4			17.7	15.6	17.5	11.2		18.4	10.6	
Level of Service		B			B	B	B	B		B	B	
Approach Delay (s)		14.4			16.7			11.2			11.8	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	35.5	Sum of lost time (s)	19.1
Intersection Capacity Utilization	28.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	306	19	3	227	34	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		5.7	7.2	6.1	6.1
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4675		1641	4715	1641	1450
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4675		1641	4715	1641	1450
Peak-hour factor, PHF	0.89	0.89	0.85	0.85	0.73	0.73
Adj. Flow (vph)	344	21	4	267	47	5
RTOR Reduction (vph)	5	0	0	0	0	5
Lane Group Flow (vph)	360	0	4	267	47	0
Confl. Peds. (#/hr)						2
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	24.4		0.8	30.9	3.2	3.2
Effective Green, g (s)	24.4		0.8	30.9	3.2	3.2
Actuated g/C Ratio	0.51		0.02	0.65	0.07	0.07
Clearance Time (s)	7.2		5.7	7.2	6.1	6.1
Vehicle Extension (s)	6.9		2.0	6.9	2.0	2.0
Lane Grp Cap (vph)	2406		27	3073	110	97
v/s Ratio Prot	c0.08		0.00	c0.06	c0.03	
v/s Ratio Perm						0.00
v/c Ratio	0.15		0.15	0.09	0.43	0.00
Uniform Delay, d1	6.0		23.0	3.0	21.2	20.6
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		0.9	0.0	1.0	0.0
Delay (s)	6.1		23.9	3.1	22.2	20.6
Level of Service	A		C	A	C	C
Approach Delay (s)	6.1			3.4	22.0	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	47.4	Sum of lost time (s)	19.0
Intersection Capacity Utilization	29.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	245	58	321	175	54	30	67	497	32	54	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.87		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4715	1441	1641	4548		1641	1478		3183	1644	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	4715	1441	1641	4548		1641	1478		3183	1644	
Peak-hour factor, PHF	0.91	0.91	0.91	0.90	0.90	0.90	0.78	0.78	0.78	0.79	0.79	0.79
Adj. Flow (vph)	41	269	64	357	194	60	38	86	637	41	68	32
RTOR Reduction (vph)	0	0	54	0	37	0	0	192	0	0	12	0
Lane Group Flow (vph)	41	269	10	357	217	0	38	531	0	41	88	0
Confl. Peds. (#/hr)			3						3			
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	6.4	22.8	22.8	36.6	53.0		6.8	55.4		5.3	54.8	
Effective Green, g (s)	6.4	22.8	22.8	36.6	53.0		6.8	55.4		5.3	54.8	
Actuated g/C Ratio	0.05	0.16	0.16	0.26	0.38		0.05	0.40		0.04	0.39	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	75	767	234	429	1721		79	584		120	643	
v/s Ratio Prot	0.02	c0.06		c0.22	0.05		c0.02	c0.36		0.01	0.05	
v/s Ratio Perm			0.01									
v/c Ratio	0.55	0.35	0.04	0.83	0.13		0.48	0.91		0.34	0.14	
Uniform Delay, d1	65.4	52.0	49.4	48.8	28.4		64.9	39.9		65.6	27.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	1.3	0.4	12.4	0.2		1.7	18.5		0.6	0.2	
Delay (s)	69.7	53.3	49.8	61.2	28.5		66.6	58.4		66.3	27.6	
Level of Service	E	D	D	E	C		E	E		E	C	
Approach Delay (s)		54.5			47.6			58.8			38.9	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	52.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	37	26	8	48	67	25	92	4	247	225	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Frt		0.95			0.93			1.00		1.00	0.98	
Flt Protected		0.99			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		1618			1596			1702		1641	1692	
Flt Permitted		0.95			0.97			0.91		0.66	1.00	
Satd. Flow (perm)		1556			1549			1573		1142	1692	
Peak-hour factor, PHF	0.77	0.77	0.77	0.88	0.88	0.88	0.80	0.80	0.80	0.76	0.76	0.76
Adj. Flow (vph)	14	48	34	9	55	76	31	115	5	325	296	47
RTOR Reduction (vph)	0	29	0	0	65	0	0	2	0	0	9	0
Lane Group Flow (vph)	0	67	0	0	75	0	0	149	0	325	334	0
Confl. Bikes (#/hr)			2									
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		4.9			4.9			21.3		21.3	21.3	
Effective Green, g (s)		4.9			4.9			21.3		21.3	21.3	
Actuated g/C Ratio		0.14			0.14			0.62		0.62	0.62	
Clearance Time (s)		4.0			4.0			4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		222			221			979		711	1053	
v/s Ratio Prot											0.20	
v/s Ratio Perm		0.04			c0.05			0.09		c0.28		
v/c Ratio		0.30			0.34			0.15		0.46	0.32	
Uniform Delay, d1		13.1			13.2			2.7		3.4	3.0	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.8			0.9			0.3		2.1	0.8	
Delay (s)		13.9			14.1			3.0		5.5	3.8	
Level of Service		B			B			A		A	A	
Approach Delay (s)		13.9			14.1			3.0			4.6	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	34.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	3	24	4	8	31	57	3	14	3	147	45	2
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.83	0.83	0.83	0.82	0.82	0.82
Hourly flow rate (vph)	3	28	5	11	41	76	4	17	4	179	55	2

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	36	128	24	237
Volume Left (vph)	3	11	4	179
Volume Right (vph)	5	76	4	2
Hadj (s)	0.11	-0.17	0.11	0.32
Departure Headway (s)	4.8	4.4	4.7	4.6
Degree Utilization, x	0.05	0.16	0.03	0.30
Capacity (veh/h)	693	762	725	746
Control Delay (s)	8.1	8.2	7.8	9.7
Approach Delay (s)	8.1	8.2	7.8	9.7
Approach LOS	A	A	A	A

Intersection Summary			
Delay	9.0		
Level of Service	A		
Intersection Capacity Utilization	31.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	198	576	442	87	67	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	6.2	6.2	6.2	5.1	5.1
Lane Util. Factor	0.97	0.95	0.91	1.00	0.97	0.91
Frpb, ped/bikes	1.00	1.00	1.00	0.99	0.99	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	0.93	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.97	1.00
Satd. Flow (prot)	3183	3282	4715	1448	3028	1317
Flt Permitted	0.95	1.00	1.00	1.00	0.97	1.00
Satd. Flow (perm)	3183	3282	4715	1448	3028	1317
Peak-hour factor, PHF	0.83	0.83	0.86	0.86	0.86	0.86
Adj. Flow (vph)	239	694	514	101	78	126
RTOR Reduction (vph)	0	0	0	65	53	59
Lane Group Flow (vph)	239	694	514	36	85	7
Confl. Peds. (#/hr)				3		
Confl. Bikes (#/hr)				1		1
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	5.1	24.1	14.3	14.3	4.5	4.5
Effective Green, g (s)	5.1	24.1	14.3	14.3	4.5	4.5
Actuated g/C Ratio	0.13	0.60	0.36	0.36	0.11	0.11
Clearance Time (s)	4.7	6.2	6.2	6.2	5.1	5.1
Vehicle Extension (s)	2.0	5.8	5.8	5.8	2.0	2.0
Lane Grp Cap (vph)	406	1982	1689	518	341	148
v/s Ratio Prot	c0.08	c0.21	0.11		c0.03	
v/s Ratio Perm				0.02		0.01
v/c Ratio	0.59	0.35	0.30	0.07	0.25	0.05
Uniform Delay, d1	16.4	4.0	9.2	8.4	16.2	15.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.3	0.3	0.2	0.1	0.1
Delay (s)	17.8	4.3	9.5	8.6	16.3	15.8
Level of Service	B	A	A	A	B	B
Approach Delay (s)		7.7	9.3		16.2	
Approach LOS		A	A		B	

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	39.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	93	69	70	103	91	52
Peak Hour Factor	0.88	0.88	0.94	0.94	0.72	0.72
Hourly flow rate (vph)	106	78	74	110	126	72

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	184	74	110	199
Volume Left (vph)	0	74	0	126
Volume Right (vph)	78	0	0	72
Hadj (s)	-0.09	0.67	0.17	0.08
Departure Headway (s)	4.7	5.9	5.4	4.9
Degree Utilization, x	0.24	0.12	0.16	0.27
Capacity (veh/h)	726	585	640	696
Control Delay (s)	9.2	8.5	8.2	9.7
Approach Delay (s)	9.2	8.3		9.7
Approach LOS	A	A		A

Intersection Summary			
Delay	9.1		
Level of Service	A		
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	223	10	60	533	1	23	0	9	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9		4.9		4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00		1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		0.98		0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00		1.00	
Frt	1.00	0.99		1.00	1.00		1.00		0.85		0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00		1.00	
Satd. Flow (prot)	1641	4668		1641	4714		1638		1444		1442	
Flt Permitted	0.95	1.00		0.95	1.00		1.00		1.00		1.00	
Satd. Flow (perm)	1641	4668		1641	4714		1724		1444		1442	
Peak-hour factor, PHF	0.69	0.69	0.69	0.94	0.94	0.94	0.62	0.62	0.62	0.38	0.38	0.38
Adj. Flow (vph)	16	323	14	64	567	1	37	0	15	0	0	8
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	14	0	8	0
Lane Group Flow (vph)	16	332	0	64	568	0	37	0	1	0	0	0
Confl. Peds. (#/hr)			90			22	4		16	16		4
Confl. Bikes (#/hr)			19			4						2
Turn Type	Prot	NA		Prot	NA		Perm		Perm		NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	0.5	13.2		1.2	13.9		1.7		1.7		1.7	
Effective Green, g (s)	0.5	13.2		1.2	13.9		1.7		1.7		1.7	
Actuated g/C Ratio	0.02	0.44		0.04	0.46		0.06		0.06		0.06	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.9		4.9		4.9	
Vehicle Extension (s)	2.0	6.1		2.0	5.1		2.0		2.0		2.0	
Lane Grp Cap (vph)	27	2033		64	2162		96		81		80	
v/s Ratio Prot	0.01	0.07		c0.04	c0.12						0.00	
v/s Ratio Perm							c0.02		0.00			
v/c Ratio	0.59	0.16		1.00	0.26		0.39		0.01		0.01	
Uniform Delay, d1	14.8	5.2		14.6	5.0		13.8		13.5		13.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00		1.00	
Incremental Delay, d2	21.0	0.1		112.5	0.1		0.9		0.0		0.0	
Delay (s)	35.8	5.3		127.0	5.2		14.7		13.5		13.5	
Level of Service	D	A		F	A		B		B		B	
Approach Delay (s)		6.7			17.5			14.4			13.5	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	30.3	Sum of lost time (s)	14.2
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	220	21	180	471	123	43	26	119	75	53	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	5.5			4.9	4.9		4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	
Frt	1.00	0.99		1.00	0.97			1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	
Satd. Flow (prot)	1641	4644		1641	4569			1672	1420		3000	
Flt Permitted	0.95	1.00		0.95	1.00			0.69	1.00		0.82	
Satd. Flow (perm)	1641	4644		1641	4569			1187	1420		2492	
Peak-hour factor, PHF	0.66	0.66	0.66	0.90	0.90	0.90	0.67	0.67	0.67	0.96	0.96	0.96
Adj. Flow (vph)	5	333	32	200	523	137	64	39	178	78	55	83
RTOR Reduction (vph)	0	11	0	0	33	0	0	0	139	0	65	0
Lane Group Flow (vph)	5	354	0	200	628	0	0	103	39	0	151	0
Confl. Peds. (#/hr)			16				11		43	43		11
Confl. Bikes (#/hr)			1						3			1
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	0.9	18.1		11.1	27.7			12.0	12.0		12.0	
Effective Green, g (s)	0.9	18.1		11.1	27.7			12.0	12.0		12.0	
Actuated g/C Ratio	0.02	0.33		0.20	0.50			0.22	0.22		0.22	
Clearance Time (s)	4.4	4.9		4.4	5.5			4.9	4.9		4.9	
Vehicle Extension (s)	2.0	8.0		2.0	6.7			4.4	4.4		4.4	
Lane Grp Cap (vph)	26	1517		328	2284			257	307		539	
v/s Ratio Prot	0.00	0.08		c0.12	c0.14							
v/s Ratio Perm								c0.09	0.03		0.06	
v/c Ratio	0.19	0.23		0.61	0.27			0.40	0.13		0.28	
Uniform Delay, d1	26.9	13.6		20.2	8.0			18.6	17.5		18.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	1.3	0.3		2.2	0.2			1.7	0.3		0.5	
Delay (s)	28.2	13.9		22.4	8.2			20.3	17.8		18.6	
Level of Service	C	B		C	A			C	B		B	
Approach Delay (s)		14.1			11.5			18.7			18.6	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	55.4	Sum of lost time (s)	14.8
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	341	73	74	774	0	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1		5.1	3.0		5.1
Lane Util. Factor	0.91		0.97	0.91		0.88
Frpb, ped/bikes	1.00		1.00	1.00		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.97		1.00	1.00		0.85
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	4578		3183	4715		2584
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	4578		3183	4715		2584
Peak-hour factor, PHF	0.80	0.80	0.91	0.91	0.87	0.87
Adj. Flow (vph)	426	91	81	851	0	486
RTOR Reduction (vph)	57	0	0	0	0	383
Lane Group Flow (vph)	460	0	81	851	0	103
Confl. Peds. (#/hr)		21				
Turn Type	NA		Prot	NA		Over
Protected Phases	2		1	6		1
Permitted Phases						1
Actuated Green, G (s)	9.2		5.2	24.6		5.2
Effective Green, g (s)	9.2		5.2	24.6		5.2
Actuated g/C Ratio	0.37		0.21	1.00		0.21
Clearance Time (s)	5.1		5.1	3.0		5.1
Vehicle Extension (s)	3.9		2.0	0.9		2.0
Lane Grp Cap (vph)	1712		672	4715		546
v/s Ratio Prot	0.10		0.03	c0.18		0.04
v/s Ratio Perm						
v/c Ratio	0.27		0.12	0.18		0.19
Uniform Delay, d1	5.4		7.8	0.0		8.0
Progression Factor	1.00		1.00	1.00		1.00
Incremental Delay, d2	0.1		0.0	0.0		0.1
Delay (s)	5.5		7.9	0.0		8.0
Level of Service	A		A	A		A
Approach Delay (s)	5.5			0.7	8.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	3.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	24.6	Sum of lost time (s)	10.2
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↱
Volume (veh/h)	0	764	514	0	0	334
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.89	0.89	0.73	0.73
Hourly flow rate (vph)	0	899	578	0	0	458
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		269	396			
pX, platoon unblocked						
vC, conflicting volume	578				877	193
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	578				877	193
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	42
cM capacity (veh/h)	939				273	792

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	300	300	300	193	193	193	458
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	458
cSH	1700	1700	1700	1700	1700	1700	792
Volume to Capacity	0.18	0.18	0.18	0.11	0.11	0.11	0.58
Queue Length 95th (ft)	0	0	0	0	0	0	94
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	15.6
Lane LOS							C
Approach Delay (s)	0.0			0.0			15.6
Approach LOS							C

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	123	641	0	0	308	411	206	3	335	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.1			5.1	5.1		5.1	5.1			
Lane Util. Factor	0.97	0.91			0.86	0.86		1.00	0.88			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			0.94	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3183	4715			4189	1263		1646	2584			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3183	4715			4189	1263		1646	2584			
Peak-hour factor, PHF	0.85	0.85	0.85	0.89	0.89	0.89	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	145	754	0	0	346	462	237	3	385	0	0	0
RTOR Reduction (vph)	0	0	0	0	163	163	0	0	262	0	0	0
Lane Group Flow (vph)	145	754	0	0	414	68	0	240	123	0	0	0
Confl. Bikes (#/hr)			4									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	7.3	26.5			14.5	14.5		12.9	12.9			
Effective Green, g (s)	7.3	26.5			14.5	14.5		12.9	12.9			
Actuated g/C Ratio	0.15	0.53			0.29	0.29		0.26	0.26			
Clearance Time (s)	4.7	5.1			5.1	5.1		5.1	5.1			
Vehicle Extension (s)	2.0	3.9			3.9	3.9		3.0	3.0			
Lane Grp Cap (vph)	468	2519			1224	369		428	672			
v/s Ratio Prot	0.05	c0.16			0.10			c0.15				
v/s Ratio Perm						0.05			0.05			
v/c Ratio	0.31	0.30			0.34	0.18		0.56	0.18			
Uniform Delay, d1	18.9	6.4			13.8	13.1		15.9	14.3			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.1	0.1			0.2	0.3		1.7	0.1			
Delay (s)	19.0	6.5			14.0	13.4		17.6	14.4			
Level of Service	B	A			B	B		B	B			
Approach Delay (s)		8.5			13.8			15.6			0.0	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	49.6	Sum of lost time (s)	14.9
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

32: Heinrich Hertz Drive/Sanyo Avenue & Airway Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	22	47	44	4	63	35	40	61	3	61	134	83
Peak Hour Factor	0.83	0.83	0.83	0.80	0.80	0.80	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	27	57	53	5	79	44	46	70	3	70	154	95

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	27	110	5	123	46	74	224	95
Volume Left (vph)	27	0	5	0	46	0	70	0
Volume Right (vph)	0	53	0	44	0	3	0	95
Hadj (s)	0.67	-0.17	0.67	-0.08	0.67	0.14	0.33	-0.53
Departure Headway (s)	6.5	5.6	6.5	5.7	6.3	5.7	5.7	4.8
Degree Utilization, x	0.05	0.17	0.01	0.19	0.08	0.12	0.35	0.13
Capacity (veh/h)	522	601	520	591	547	596	607	708
Control Delay (s)	8.6	8.6	8.3	8.9	8.6	8.3	10.6	7.3
Approach Delay (s)	8.6		8.9		8.4		9.6	
Approach LOS	A		A		A		A	

Intersection Summary			
Delay	9.1		
Level of Service	A		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	13	101	5	5	1	75	34	11	1	38	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9		4.9		4.9	4.9			5.2	
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.98		1.00		1.00	1.00			0.98	
Flpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85		0.99		1.00	0.96			0.91	
Flt Protected	0.95	0.97	1.00		0.98		0.95	1.00			1.00	
Satd. Flow (prot)	1681	1698	1547		1771		1764	1795			1510	
Flt Permitted	0.95	0.97	1.00		0.98		0.99	1.00			1.00	
Satd. Flow (perm)	1681	1698	1547		1771		1841	1795			1506	
Peak-hour factor, PHF	0.72	0.72	0.72	0.46	0.46	0.46	0.83	0.83	0.83	0.67	0.67	0.67
Adj. Flow (vph)	72	18	140	11	11	2	90	41	13	1	57	99
RTOR Reduction (vph)	0	0	89	0	2	0	0	11	0	0	84	0
Lane Group Flow (vph)	45	45	51	0	22	0	90	43	0	0	73	0
Confl. Peds. (#/hr)			1	1			7					7
Confl. Bikes (#/hr)			2			3						
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Parking (#/hr)											0	
Turn Type	Split	NA	Perm	Split	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		1	1			8			4	
Permitted Phases			2				8			4		
Actuated Green, G (s)	12.2	12.2	12.2		0.9		5.4	5.4			5.1	
Effective Green, g (s)	12.2	12.2	12.2		0.9		5.4	5.4			5.1	
Actuated g/C Ratio	0.37	0.37	0.37		0.03		0.16	0.16			0.15	
Clearance Time (s)	4.9	4.9	4.9		4.9		4.9	4.9			5.2	
Vehicle Extension (s)	2.9	2.9	2.9		2.9		3.8	3.8			4.5	
Lane Grp Cap (vph)	617	623	568		48		299	291			231	
v/s Ratio Prot	0.03	0.03			c0.01			0.02				
v/s Ratio Perm			c0.03				c0.05				0.05	
v/c Ratio	0.07	0.07	0.09		0.46		0.30	0.15			0.32	
Uniform Delay, d1	6.8	6.8	6.9		15.9		12.2	11.9			12.5	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	0.0	0.1		6.5		0.7	0.3			1.4	
Delay (s)	6.9	6.9	6.9		22.4		13.0	12.2			13.9	
Level of Service	A	A	A		C		B	B			B	
Approach Delay (s)		6.9			22.4			12.7			13.9	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	33.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	216	93	85	326	13	32	0	28	3	2	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.6		4.4		4.9	4.4	4.9	
Lane Util. Factor	1.00	0.95		0.97	0.91		1.00		1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.99		1.00		0.85	1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)	1770	3365		3433	5050		1769		1563	1768	1588	
Flt Permitted	0.95	1.00		0.95	1.00		1.00		1.00	1.00	1.00	
Satd. Flow (perm)	1770	3365		3433	5050		1862		1563	1861	1588	
Peak-hour factor, PHF	0.98	0.98	0.98	0.94	0.94	0.94	0.79	0.79	0.79	0.73	0.73	0.73
Adj. Flow (vph)	38	220	95	90	347	14	41	0	35	4	3	33
RTOR Reduction (vph)	0	43	0	0	4	0	0	0	32	0	31	0
Lane Group Flow (vph)	38	272	0	90	357	0	41	0	3	4	5	0
Confl. Peds. (#/hr)			3			6	1		3	3		1
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		pm+pt		Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	1.8	19.5		2.7	20.2		4.7		3.5	3.5	2.9	
Effective Green, g (s)	1.8	19.5		2.7	20.2		4.7		3.5	3.5	2.9	
Actuated g/C Ratio	0.04	0.43		0.06	0.44		0.10		0.08	0.08	0.06	
Clearance Time (s)	4.4	5.4		4.4	5.6		4.4		4.9	4.4	4.9	
Vehicle Extension (s)	2.0	5.4		2.0	5.4		2.0		5.6	2.0	2.0	
Lane Grp Cap (vph)	70	1445		204	2246		190		120	142	101	
v/s Ratio Prot	0.02	c0.08		c0.03	0.07		c0.01			0.00	0.00	
v/s Ratio Perm							c0.02		0.00	0.00		
v/c Ratio	0.54	0.19		0.44	0.16		0.22		0.02	0.03	0.05	
Uniform Delay, d1	21.4	8.0		20.6	7.5		18.7		19.4	19.4	20.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2	4.5	0.2		0.6	0.1		0.2		0.2	0.0	0.1	
Delay (s)	25.9	8.2		21.2	7.6		18.9		19.6	19.4	20.0	
Level of Service	C	A		C	A		B		B	B	C	
Approach Delay (s)		10.1			10.3			19.2			20.0	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	45.4	Sum of lost time (s)	19.3
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	3	8	808	10	176	1	357	259	72	161	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.6	5.2	5.2	6.7	6.7	5.2	6.3	5.2	5.2	6.3	6.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1556	3335	3539	1562	1770	3539	1538	3433	3539	1560
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1556	3335	3539	1562	1770	3539	1538	3433	3539	1560
Peak-hour factor, PHF	0.75	0.75	0.75	0.85	0.85	0.85	0.93	0.93	0.93	0.90	0.90	0.90
Adj. Flow (vph)	1	4	11	951	12	207	1	384	278	80	179	2
RTOR Reduction (vph)	0	0	10	0	0	153	0	0	135	0	0	1
Lane Group Flow (vph)	1	4	1	951	12	54	1	384	143	80	179	1
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)			5			1						4
Heavy Vehicles (%)	2%	2%	2%	5%	2%	2%	2%	2%	5%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2	3	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	1.6	1.6	3.2	18.5	17.4	17.4	1.6	15.7	34.2	8.3	22.4	22.4
Effective Green, g (s)	1.6	1.6	3.2	18.5	17.4	17.4	1.6	15.7	34.2	8.3	22.4	22.4
Actuated g/C Ratio	0.02	0.02	0.05	0.28	0.26	0.26	0.02	0.24	0.52	0.12	0.34	0.34
Clearance Time (s)	5.2	5.6	5.2	5.2	6.7	6.7	5.2	6.3	5.2	5.2	6.3	6.3
Vehicle Extension (s)	2.0	2.0	2.0	3.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	42	85	74	929	927	409	42	836	792	429	1193	526
v/s Ratio Prot	0.00	0.00	0.00	c0.29	0.00		0.00	c0.11	0.05	c0.02	0.05	
v/s Ratio Perm			0.00			c0.03			0.04			0.00
v/c Ratio	0.02	0.05	0.01	1.02	0.01	0.13	0.02	0.46	0.18	0.19	0.15	0.00
Uniform Delay, d1	31.6	31.7	30.1	24.0	18.1	18.7	31.6	21.7	8.6	26.0	15.4	14.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1	0.0	35.7	0.0	0.1	0.1	0.4	0.1	0.1	0.1	0.0
Delay (s)	31.7	31.7	30.1	59.6	18.1	18.8	31.7	22.1	8.7	26.1	15.4	14.6
Level of Service	C	C	C	E	B	B	C	C	A	C	B	B
Approach Delay (s)		30.6			52.0			16.5			18.7	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	36.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	66.4	Sum of lost time (s)	23.4
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	40	2	73	114	544	0	0	145	832
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.1	5.1	4.7	5.1			5.1	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frpb, ped/bikes					1.00	1.00	1.00	1.00			0.97	
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.87	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1727	1538	1719	4940			4191	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1727	1538	1719	4940			4191	
Peak-hour factor, PHF	0.92	0.92	0.92	0.80	0.80	0.80	0.93	0.93	0.93	0.85	0.85	0.85
Adj. Flow (vph)	0	0	0	50	2	91	123	585	0	0	171	979
RTOR Reduction (vph)	0	0	0	0	0	80	0	0	0	0	461	0
Lane Group Flow (vph)	0	0	0	0	52	11	123	585	0	0	689	0
Confl. Peds. (#/hr)												9
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					5.4	5.4	5.7	30.5			20.1	
Effective Green, g (s)					5.4	5.4	5.7	30.5			20.1	
Actuated g/C Ratio					0.12	0.12	0.12	0.66			0.44	
Clearance Time (s)					5.1	5.1	4.7	5.1			5.1	
Vehicle Extension (s)					3.0	3.0	2.0	3.0			3.0	
Lane Grp Cap (vph)					202	180	212	3268			1827	
v/s Ratio Prot							c0.07	0.12			c0.16	
v/s Ratio Perm					0.03	0.01						
v/c Ratio					0.26	0.06	0.58	0.18			0.38	
Uniform Delay, d1					18.5	18.1	19.1	3.0			8.8	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					0.7	0.1	2.6	0.0			0.1	
Delay (s)					19.2	18.2	21.7	3.0			8.9	
Level of Service					B	B	C	A			A	
Approach Delay (s)		0.0			18.6			6.3			8.9	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	46.1	Sum of lost time (s)	14.9
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	529	2	137	0	0	0	0	130	16	72	121	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1						5.1		4.7	5.1	
Lane Util. Factor	1.00	1.00						0.91		1.00	0.95	
Frpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	0.85						0.98		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1641	1472						4624		1641	3282	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1641	1472						4624		1641	3282	
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.79	0.79	0.79	0.82	0.82	0.82
Adj. Flow (vph)	557	2	144	0	0	0	0	165	20	88	148	0
RTOR Reduction (vph)	0	79	0	0	0	0	0	17	0	0	0	0
Lane Group Flow (vph)	557	67	0	0	0	0	0	168	0	88	148	0
Confl. Peds. (#/hr)									1			
Confl. Bikes (#/hr)									4			
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4											
Actuated Green, G (s)	21.9	21.9						7.6		4.0	16.3	
Effective Green, g (s)	21.9	21.9						7.6		4.0	16.3	
Actuated g/C Ratio	0.45	0.45						0.16		0.08	0.34	
Clearance Time (s)	5.1	5.1						5.1		4.7	5.1	
Vehicle Extension (s)	3.0	3.0						3.0		2.0	3.0	
Lane Grp Cap (vph)	742	666						726		135	1105	
v/s Ratio Prot		0.05						c0.04		c0.05	0.05	
v/s Ratio Perm	c0.34											
v/c Ratio	0.75	0.10						0.23		0.65	0.13	
Uniform Delay, d1	11.0	7.6						17.8		21.5	11.1	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	4.3	0.1						0.2		8.3	0.1	
Delay (s)	15.3	7.7						18.0		29.8	11.2	
Level of Service	B	A						B		C	B	
Approach Delay (s)		13.7			0.0			18.0			18.1	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	48.4	Sum of lost time (s)	14.9
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	134	0	0	0	0	8	2	13	2	5	9	271
Peak Hour Factor	0.84	0.84	0.84	0.67	0.67	0.67	0.71	0.71	0.71	0.91	0.91	0.91
Hourly flow rate (vph)	160	0	0	0	0	12	3	18	3	5	10	298

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	106	53	0	12	3	21	5	308
Volume Left (vph)	106	53	0	0	3	0	5	0
Volume Right (vph)	0	0	0	12	0	3	0	298
Hadj (s)	0.58	0.58	0.00	-0.53	0.58	0.08	0.67	-0.59
Departure Headway (s)	5.8	5.8	5.5	4.9	5.9	5.3	5.7	4.4
Degree Utilization, x	0.17	0.09	0.00	0.02	0.00	0.03	0.01	0.38
Capacity (veh/h)	582	583	624	675	587	641	607	787
Control Delay (s)	8.9	8.2	7.3	6.8	7.7	7.3	7.6	8.9
Approach Delay (s)	8.6		6.8		7.4		8.9	
Approach LOS	A		A		A		A	

Intersection Summary			
Delay	8.7		
Level of Service	A		
Intersection Capacity Utilization	34.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	309	2	0	510	57	0	0	1	0	0	99
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.92	0.92	0.92	0.25	0.25	0.25	0.62	0.62	0.62
Hourly flow rate (vph)	0	355	2	0	554	62	0	0	4	0	0	160
Pedestrians		1									1	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	617			357			702	974	120	678	913	187
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	617			357			702	974	120	678	913	187
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			100	100	100	100	100	80
cM capacity (veh/h)	905			1142			248	237	885	321	258	798

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	142	142	73	185	185	185	62	4	160
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	2	0	0	0	62	4	160
cSH	1700	1700	1700	1700	1700	1700	1700	885	798
Volume to Capacity	0.08	0.08	0.04	0.11	0.11	0.11	0.04	0.00	0.20
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	19
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	10.6
Lane LOS								A	B
Approach Delay (s)	0.0			0.0				9.1	10.6
Approach LOS								A	B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	98	54	74	141	111	189
Peak Hour Factor	0.68	0.68	0.76	0.76	0.95	0.95
Hourly flow rate (vph)	144	79	97	186	117	199

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	144	79	97	186	117	199
Volume Left (vph)	144	0	97	0	0	0
Volume Right (vph)	0	79	0	0	0	199
Hadj (s)	0.53	-0.67	0.53	0.17	0.17	-0.67
Departure Headway (s)	6.5	5.3	6.1	5.7	5.7	4.9
Degree Utilization, x	0.26	0.12	0.16	0.29	0.18	0.27
Capacity (veh/h)	523	634	570	607	603	709
Control Delay (s)	10.5	7.7	9.0	9.8	8.8	8.4
Approach Delay (s)	9.5		9.6		8.6	
Approach LOS	A		A		A	

Intersection Summary			
Delay	9.2		
Level of Service	A		
Intersection Capacity Utilization	22.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	65	168	197	140	219	71
Peak Hour Factor	0.86	0.86	0.91	0.91	0.85	0.85
Hourly flow rate (vph)	76	195	216	154	258	84

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	271	216	154	341
Volume Left (vph)	76	216	0	0
Volume Right (vph)	195	0	0	84
Hadj (s)	-0.21	0.67	0.17	0.02
Departure Headway (s)	5.5	6.4	5.9	5.4
Degree Utilization, x	0.41	0.39	0.25	0.51
Capacity (veh/h)	610	542	585	644
Control Delay (s)	12.3	12.2	9.7	13.8
Approach Delay (s)	12.3	11.2		13.8
Approach LOS	B	B		B

Intersection Summary			
Delay	12.4		
Level of Service	B		
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	118	118	74	22	194	196	140	57	48	186	51	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	1.00		1.00	1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	4715	1421	3183	4715	1424	1641	1593		1641	1727	2584
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	4715	1421	3183	4715	1424	1641	1593		1641	1727	2584
Peak-hour factor, PHF	0.88	0.88	0.88	0.76	0.76	0.76	0.93	0.93	0.93	0.70	0.70	0.70
Adj. Flow (vph)	134	134	84	29	255	258	151	61	52	266	73	333
RTOR Reduction (vph)	0	0	53	0	0	179	0	26	0	0	0	247
Lane Group Flow (vph)	134	134	31	29	255	79	151	87	0	266	73	86
Confl. Peds. (#/hr)						11			1			
Confl. Bikes (#/hr)			12			13			5			
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	8.1	32.6	32.6	2.2	27.0	27.0	17.2	13.5		18.3	14.6	22.7
Effective Green, g (s)	8.1	32.6	32.6	2.2	27.0	27.0	17.2	13.5		18.3	14.6	22.7
Actuated g/C Ratio	0.09	0.37	0.37	0.03	0.31	0.31	0.20	0.15		0.21	0.17	0.26
Clearance Time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Vehicle Extension (s)	2.0	4.1	4.1	2.0	4.5	4.5	2.0	4.3		2.0	3.7	2.0
Lane Grp Cap (vph)	293	1748	527	79	1448	437	321	244		341	286	667
v/s Ratio Prot	c0.04	0.03		0.01	0.05		0.09	c0.05		c0.16	0.04	0.01
v/s Ratio Perm			0.02			c0.06						0.02
v/c Ratio	0.46	0.08	0.06	0.37	0.18	0.18	0.47	0.36		0.78	0.26	0.13
Uniform Delay, d1	37.8	17.9	17.8	42.2	22.3	22.3	31.3	33.3		32.9	31.9	25.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	0.0	0.1	1.1	0.1	0.3	0.4	1.4		10.2	0.6	0.0
Delay (s)	38.2	17.9	17.9	43.2	22.4	22.7	31.7	34.7		43.1	32.5	25.0
Level of Service	D	B	B	D	C	C	C	C		D	C	C
Approach Delay (s)		25.6			23.7			33.0			33.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	87.9	Sum of lost time (s)	21.3
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	0	0	0	0	51	0	1	0	19	0	0
Peak Hour Factor	0.50	0.50	0.50	0.53	0.53	0.53	0.25	0.25	0.25	0.59	0.59	0.59
Hourly flow rate (vph)	8	0	0	0	0	96	0	4	0	32	0	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	8	96	4	32
Volume Left (vph)	8	0	0	32
Volume Right (vph)	0	96	0	0
Hadj (s)	0.37	-0.43	0.17	0.37
Departure Headway (s)	4.4	3.6	4.3	4.5
Degree Utilization, x	0.01	0.10	0.00	0.04
Capacity (veh/h)	796	995	805	783
Control Delay (s)	7.5	6.9	7.3	7.7
Approach Delay (s)	7.5	6.9	7.3	7.7
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.1		
Level of Service	A		
Intersection Capacity Utilization	18.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	316	37	74	387	10	41	2	87	14	5	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		4.0	6.5		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1641	4629		1641	4695		1641	1727	1468	1641	1727	1468
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1641	4629		1641	4695		1641	1727	1468	1641	1727	1468
Peak-hour factor, PHF	0.86	0.86	0.86	0.84	0.84	0.84	0.88	0.88	0.88	0.42	0.42	0.42
Adj. Flow (vph)	2	367	43	88	461	12	47	2	99	33	12	19
RTOR Reduction (vph)	0	5	0	0	1	0	0	0	94	0	0	18
Lane Group Flow (vph)	2	405	0	88	472	0	47	2	5	33	12	1
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			5			7						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	1.1	97.5		11.9	108.3		7.5	6.9	6.9	5.2	4.6	4.6
Effective Green, g (s)	1.1	97.5		11.9	108.3		7.5	6.9	6.9	5.2	4.6	4.6
Actuated g/C Ratio	0.01	0.70		0.09	0.77		0.05	0.05	0.05	0.04	0.03	0.03
Clearance Time (s)	4.0	6.5		4.0	6.5		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	5.3		2.0	5.3		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	12	3223		139	3631		87	85	72	60	56	48
v/s Ratio Prot	0.00	0.09		c0.05	c0.10		c0.03	0.00		0.02	c0.01	
v/s Ratio Perm									0.00			0.00
v/c Ratio	0.17	0.13		0.63	0.13		0.54	0.02	0.07	0.55	0.21	0.01
Uniform Delay, d1	69.0	7.1		61.9	4.0		64.6	63.3	63.5	66.2	65.9	65.5
Progression Factor	1.00	1.00		0.73	2.17		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	0.1		6.7	0.1		3.6	0.0	0.1	6.1	0.7	0.0
Delay (s)	71.4	7.2		51.7	8.7		68.2	63.4	63.6	72.3	66.6	65.5
Level of Service	E	A		D	A		E	E	E	E	E	E
Approach Delay (s)		7.5			15.5			65.1			69.2	
Approach LOS		A			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	80	4	3	127	6	1
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.86	0.86	0.58	0.58
Hourly flow rate (vph)	91	5	3	148	10	2
Pedestrians	1		1			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	0		0			
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	102	78			152	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	102	78			152	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.3	
p0 queue free %	90	100			99	
cM capacity (veh/h)	870	960			1380	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	91	5	151	12
Volume Left	91	0	0	10
Volume Right	0	5	148	0
cSH	870	960	1700	1380
Volume to Capacity	0.10	0.00	0.09	0.01
Queue Length 95th (ft)	9	0	0	1
Control Delay (s)	9.6	8.8	0.0	6.5
Lane LOS	A	A		A
Approach Delay (s)	9.6		0.0	6.5
Approach LOS	A			

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	19.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	0	1	37	0	6	1	75	112	4	55	1
Peak Hour Factor	0.25	0.25	0.25	0.60	0.60	0.60	0.85	0.85	0.85	0.68	0.68	0.68
Hourly flow rate (vph)	0	0	4	62	0	10	1	88	132	6	81	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	4	72	221	88
Volume Left (vph)	0	62	1	6
Volume Right (vph)	4	10	132	1
Hadj (s)	-0.52	0.26	-0.19	0.17
Departure Headway (s)	4.1	4.8	4.0	4.5
Degree Utilization, x	0.00	0.10	0.25	0.11
Capacity (veh/h)	788	692	875	771
Control Delay (s)	7.2	8.3	8.3	8.0
Approach Delay (s)	7.2	8.3	8.3	8.0
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.2		
Level of Service	A		
Intersection Capacity Utilization	27.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	238	179	452	287	184	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	1641	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	1641	4715	3183	1468
Peak-hour factor, PHF	0.86	0.86	0.78	0.78	0.86	0.86
Adj. Flow (vph)	277	208	579	368	214	200
RTOR Reduction (vph)	0	128	0	0	0	180
Lane Group Flow (vph)	277	80	579	368	214	20
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	53.8	53.8	57.9	115.7	13.8	13.8
Effective Green, g (s)	53.8	53.8	57.9	115.7	13.8	13.8
Actuated g/C Ratio	0.38	0.38	0.41	0.83	0.10	0.10
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	1811	564	678	3896	313	144
v/s Ratio Prot	c0.06		c0.35	0.08	c0.07	
v/s Ratio Perm		0.05				0.01
v/c Ratio	0.15	0.14	0.85	0.09	0.68	0.14
Uniform Delay, d1	28.2	28.1	37.2	2.3	61.0	57.7
Progression Factor	0.84	0.42	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.5	9.9	0.0	4.9	0.2
Delay (s)	23.9	12.3	47.1	2.3	65.8	57.8
Level of Service	C	B	D	A	E	E
Approach Delay (s)	18.9			29.7	62.0	
Approach LOS	B			C	E	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	113	1	108	496	234	0	0	229	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.1	5.1	5.1	4.7	5.1			5.1	
Lane Util. Factor				1.00	0.95	0.95	0.97	0.91			0.91	
Frpb, ped/bikes				1.00	0.99	0.99	1.00	1.00			0.99	
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	
Frt				1.00	0.85	0.85	1.00	1.00			0.91	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1641	1380	1375	3183	4715			4270	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1380	1375	3183	4715			4270	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.83	0.83	0.83	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	126	1	120	598	282	0	0	266	374
RTOR Reduction (vph)	0	0	0	0	51	51	0	0	0	0	288	0
Lane Group Flow (vph)	0	0	0	126	10	9	598	282	0	0	352	0
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)												1
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				7.3	7.3	7.3	13.9	29.3			10.7	
Effective Green, g (s)				7.3	7.3	7.3	13.9	29.3			10.7	
Actuated g/C Ratio				0.16	0.16	0.16	0.30	0.63			0.23	
Clearance Time (s)				5.1	5.1	5.1	4.7	5.1			5.1	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)				255	215	214	945	2951			976	
v/s Ratio Prot					0.01		c0.19	0.06			c0.08	
v/s Ratio Perm				c0.08		0.01						
v/c Ratio				0.49	0.05	0.04	0.63	0.10			0.36	
Uniform Delay, d1				18.1	16.8	16.8	14.2	3.5			15.2	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				1.5	0.1	0.1	1.4	0.0			0.2	
Delay (s)				19.6	16.9	16.9	15.6	3.5			15.4	
Level of Service				B	B	B	B	A			B	
Approach Delay (s)		0.0			18.3			11.7			15.4	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	46.8	Sum of lost time (s)	14.9
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	77	1	200	0	0	0	0	653	138	150	192	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1					5.1		4.7	5.1	
Lane Util. Factor		1.00	0.88					0.95		0.97	0.91	
Frt		1.00	0.85					0.97		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1646	2584					3196		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1646	2584					3196		3183	4715	
Peak-hour factor, PHF	0.87	0.87	0.87	0.92	0.92	0.92	0.84	0.84	0.84	0.92	0.92	0.92
Adj. Flow (vph)	89	1	230	0	0	0	0	777	164	163	209	0
RTOR Reduction (vph)	0	0	192	0	0	0	0	27	0	0	0	0
Lane Group Flow (vph)	0	90	38	0	0	0	0	914	0	163	209	0
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		8.3	8.3					22.6		4.1	31.4	
Effective Green, g (s)		8.3	8.3					22.6		4.1	31.4	
Actuated g/C Ratio		0.17	0.17					0.45		0.08	0.63	
Clearance Time (s)		5.1	5.1					5.1		4.7	5.1	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		273	429					1447		261	2966	
v/s Ratio Prot								c0.29		c0.05	0.04	
v/s Ratio Perm		0.05	0.01									
v/c Ratio		0.33	0.09					0.63		0.62	0.07	
Uniform Delay, d1		18.3	17.6					10.5		22.2	3.6	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.7	0.1					0.9		4.6	0.0	
Delay (s)		19.1	17.7					11.4		26.8	3.6	
Level of Service		B	B					B		C	A	
Approach Delay (s)		18.1			0.0			11.4			13.7	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	49.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	124	25	4	29	18	277	2	342	31	185	146	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98			1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1692			1676	1447	1641	3241		1641	1727	1450
Flt Permitted	0.95	1.00			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1692			1676	1447	1641	3241		1641	1727	1450
Peak-hour factor, PHF	0.89	0.89	0.89	0.79	0.79	0.79	0.79	0.79	0.79	0.89	0.89	0.89
Adj. Flow (vph)	139	28	4	37	23	351	3	433	39	208	164	92
RTOR Reduction (vph)	0	4	0	0	0	231	0	6	0	0	0	56
Lane Group Flow (vph)	139	28	0	0	60	120	3	466	0	208	164	36
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						1
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	8.3	8.3			11.5	11.5	0.6	20.0		7.1	26.3	26.3
Effective Green, g (s)	8.3	8.3			11.5	11.5	0.6	20.0		7.1	26.3	26.3
Actuated g/C Ratio	0.12	0.12			0.17	0.17	0.01	0.30		0.11	0.39	0.39
Clearance Time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Vehicle Extension (s)	2.0	2.0			3.7	3.7	2.0	3.8		2.0	3.8	3.8
Lane Grp Cap (vph)	204	210			288	249	14	971		174	680	571
v/s Ratio Prot	c0.08	0.02			0.04		0.00	c0.14		c0.13	0.09	
v/s Ratio Perm						c0.08						0.03
v/c Ratio	0.68	0.14			0.21	0.48	0.21	0.48		1.20	0.24	0.06
Uniform Delay, d1	27.9	26.0			23.7	24.9	32.8	19.1		29.8	13.5	12.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.3	0.1			0.5	1.8	2.8	0.5		130.6	0.2	0.1
Delay (s)	35.2	26.1			24.1	26.8	35.6	19.6		160.4	13.8	12.6
Level of Service	D	C			C	C	D	B		F	B	B
Approach Delay (s)		33.5			26.4			19.7			79.2	
Approach LOS		C			C			B			E	

Intersection Summary			
HCM 2000 Control Delay	41.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	66.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	27	2	6	11	24	6	105	4	22	40	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Lane Util. Factor		0.95			1.00	1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00			1.00	0.85	1.00	0.99		1.00	0.94	
Flt Protected		0.96			0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3151			1696	1436	1641	1718		3183	3039	
Flt Permitted		0.77			0.61	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2519			1047	1436	1641	1718		3183	3039	
Peak-hour factor, PHF	0.81	0.81	0.81	0.79	0.79	0.79	0.68	0.68	0.68	0.78	0.78	0.78
Adj. Flow (vph)	137	33	2	8	14	30	9	154	6	28	51	36
RTOR Reduction (vph)	0	1	0	0	0	27	0	2	0	0	28	0
Lane Group Flow (vph)	0	171	0	0	22	3	9	158	0	28	59	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						5						5
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		2			1		3	8		7	4	
Permitted Phases	2			1		1						
Actuated Green, G (s)		8.4			4.5	4.5	0.5	8.2		1.1	8.8	
Effective Green, g (s)		8.4			4.5	4.5	0.5	8.2		1.1	8.8	
Actuated g/C Ratio		0.20			0.11	0.11	0.01	0.20		0.03	0.21	
Clearance Time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Vehicle Extension (s)		4.8			4.8	4.8	2.0	3.3		2.0	4.4	
Lane Grp Cap (vph)		512			114	156	19	341		84	647	
v/s Ratio Prot							0.01	c0.09		c0.01	0.02	
v/s Ratio Perm		c0.07			c0.02	0.00						
v/c Ratio		0.33			0.19	0.02	0.47	0.46		0.33	0.09	
Uniform Delay, d1		14.1			16.7	16.4	20.3	14.6		19.7	13.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.8			1.6	0.1	6.6	1.1		0.9	0.1	
Delay (s)		14.8			18.4	16.5	26.9	15.7		20.6	13.1	
Level of Service		B			B	B	C	B		C	B	
Approach Delay (s)		14.8			17.3			16.3			15.0	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	41.3	Sum of lost time (s)	19.1
Intersection Capacity Utilization	30.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	317	42	7	353	47	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		5.7	7.2	6.1	6.1
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4633		1641	4715	1641	1468
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4633		1641	4715	1641	1468
Peak-hour factor, PHF	0.93	0.93	0.79	0.79	0.71	0.71
Adj. Flow (vph)	341	45	9	447	66	10
RTOR Reduction (vph)	12	0	0	0	0	9
Lane Group Flow (vph)	374	0	9	447	66	1
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	24.5		0.9	31.1	5.3	5.3
Effective Green, g (s)	24.5		0.9	31.1	5.3	5.3
Actuated g/C Ratio	0.49		0.02	0.63	0.11	0.11
Clearance Time (s)	7.2		5.7	7.2	6.1	6.1
Vehicle Extension (s)	6.9		2.0	6.9	2.0	2.0
Lane Grp Cap (vph)	2283		29	2950	174	156
v/s Ratio Prot	0.08		0.01	c0.09	c0.04	
v/s Ratio Perm						0.00
v/c Ratio	0.16		0.31	0.15	0.38	0.01
Uniform Delay, d1	6.9		24.1	3.8	20.7	19.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		2.2	0.1	0.5	0.0
Delay (s)	7.1		26.3	3.9	21.2	19.9
Level of Service	A		C	A	C	B
Approach Delay (s)	7.1			4.4	21.0	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	49.7	Sum of lost time (s)	19.0
Intersection Capacity Utilization	27.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	152	112	488	279	71	38	79	262	35	153	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.88		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4715	1444	1641	4572		1641	1511		3183	1695	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	4715	1444	1641	4572		1641	1511		3183	1695	
Peak-hour factor, PHF	0.86	0.86	0.86	0.76	0.76	0.76	0.72	0.72	0.72	0.88	0.88	0.88
Adj. Flow (vph)	29	177	130	642	367	93	53	110	364	40	174	25
RTOR Reduction (vph)	0	0	117	0	35	0	0	79	0	0	3	0
Lane Group Flow (vph)	29	177	13	642	425	0	53	395	0	40	196	0
Confl. Peds. (#/hr)									1			
Confl. Bikes (#/hr)			2						2			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	3.8	14.1	14.1	56.9	67.2		7.9	43.8		5.3	42.1	
Effective Green, g (s)	3.8	14.1	14.1	56.9	67.2		7.9	43.8		5.3	42.1	
Actuated g/C Ratio	0.03	0.10	0.10	0.41	0.48		0.06	0.31		0.04	0.30	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	44	474	145	666	2194		92	472		120	509	
v/s Ratio Prot	0.02	c0.04		c0.39	0.09		c0.03	c0.26		0.01	0.12	
v/s Ratio Perm			0.01									
v/c Ratio	0.66	0.37	0.09	0.96	0.19		0.58	0.84		0.33	0.38	
Uniform Delay, d1	67.5	58.8	57.1	40.5	20.9		64.4	44.8		65.6	38.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	23.9	2.2	1.2	25.9	0.2		5.3	12.3		0.6	1.1	
Delay (s)	91.4	61.1	58.4	66.4	21.1		69.7	57.1		66.2	39.8	
Level of Service	F	E	E	E	C		E	E		E	D	
Approach Delay (s)		62.6			47.5			58.4			44.2	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	52.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	74	27	13	44	207	30	245	3	182	159	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.99			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Frt		0.97			0.89			1.00		1.00	0.98	
Flt Protected		0.99			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		1652			1523			1715		1641	1681	
Flt Permitted		0.85			0.98			0.96		0.60	1.00	
Satd. Flow (perm)		1428			1495			1649		1041	1681	
Peak-hour factor, PHF	0.78	0.78	0.78	0.87	0.87	0.87	0.79	0.79	0.79	0.84	0.84	0.84
Adj. Flow (vph)	51	95	35	15	51	238	38	310	4	217	189	37
RTOR Reduction (vph)	0	26	0	0	176	0	0	1	0	0	14	0
Lane Group Flow (vph)	0	155	0	0	128	0	0	351	0	217	212	0
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			1			3						
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		9.1			9.1			18.1		18.1	18.1	
Effective Green, g (s)		9.1			9.1			18.1		18.1	18.1	
Actuated g/C Ratio		0.26			0.26			0.51		0.51	0.51	
Clearance Time (s)		4.0			4.0			4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		369			386			847		535	864	
v/s Ratio Prot											0.13	
v/s Ratio Perm		c0.11			0.09			c0.21		0.21		
v/c Ratio		0.42			0.33			0.41		0.41	0.25	
Uniform Delay, d1		10.9			10.6			5.3		5.2	4.8	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.8			0.5			1.5		2.3	0.7	
Delay (s)		11.6			11.1			6.8		7.5	5.4	
Level of Service		B			B			A		A	A	
Approach Delay (s)		11.6			11.1			6.8			6.5	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	35.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	3	35	24	26	28	85	0	62	1	71	122	5
Peak Hour Factor	0.82	0.82	0.82	0.79	0.79	0.79	0.66	0.66	0.66	0.85	0.85	0.85
Hourly flow rate (vph)	4	43	29	33	35	108	0	94	2	84	144	6

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	76	176	95	233
Volume Left (vph)	4	33	0	84
Volume Right (vph)	29	108	2	6
Hadj (s)	-0.05	-0.16	0.16	0.23
Departure Headway (s)	4.9	4.7	5.0	4.9
Degree Utilization, x	0.10	0.23	0.13	0.32
Capacity (veh/h)	666	714	673	698
Control Delay (s)	8.5	9.1	8.8	10.1
Approach Delay (s)	8.5	9.1	8.8	10.1
Approach LOS	A	A	A	B

Intersection Summary			
Delay	9.4		
Level of Service	A		
Intersection Capacity Utilization	38.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	112	337	645	94	88	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	6.2	6.2	6.2	5.1	5.1
Lane Util. Factor	0.97	0.95	0.91	1.00	0.97	0.91
Frpb, ped/bikes	1.00	1.00	1.00	0.99	0.99	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	0.92	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.98	1.00
Satd. Flow (prot)	3183	3282	4715	1447	2987	1312
Flt Permitted	0.95	1.00	1.00	1.00	0.98	1.00
Satd. Flow (perm)	3183	3282	4715	1447	2987	1312
Peak-hour factor, PHF	0.79	0.79	0.77	0.77	0.82	0.82
Adj. Flow (vph)	142	427	838	122	107	235
RTOR Reduction (vph)	0	0	0	72	101	101
Lane Group Flow (vph)	142	427	838	50	124	16
Confl. Bikes (#/hr)				4		4
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	5.1	29.2	19.4	19.4	6.6	6.6
Effective Green, g (s)	5.1	29.2	19.4	19.4	6.6	6.6
Actuated g/C Ratio	0.11	0.62	0.41	0.41	0.14	0.14
Clearance Time (s)	4.7	6.2	6.2	6.2	5.1	5.1
Vehicle Extension (s)	2.0	5.8	5.8	5.8	2.0	2.0
Lane Grp Cap (vph)	344	2034	1942	596	418	183
v/s Ratio Prot	c0.04	0.13	c0.18		c0.04	
v/s Ratio Perm				0.03		0.01
v/c Ratio	0.41	0.21	0.43	0.08	0.30	0.09
Uniform Delay, d1	19.6	3.9	9.9	8.4	18.2	17.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	0.4	0.2	0.1	0.1
Delay (s)	19.9	4.0	10.3	8.6	18.3	17.7
Level of Service	B	A	B	A	B	B
Approach Delay (s)		8.0	10.1		18.1	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	47.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	34.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	108	131	64	168	85	53
Peak Hour Factor	0.81	0.81	0.97	0.97	0.78	0.78
Hourly flow rate (vph)	133	162	66	173	109	68

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	295	66	173	177
Volume Left (vph)	0	66	0	109
Volume Right (vph)	162	0	0	68
Hadj (s)	-0.16	0.67	0.17	0.06
Departure Headway (s)	4.7	5.9	5.4	5.2
Degree Utilization, x	0.38	0.11	0.26	0.26
Capacity (veh/h)	737	579	634	626
Control Delay (s)	10.5	8.5	9.2	10.0
Approach Delay (s)	10.5	9.0		10.0
Approach LOS	B	A		B

Intersection Summary			
Delay	9.9		
Level of Service	A		
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	381	16	30	544	0	16	0	26	0	1	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.4	4.9		4.9		4.9		4.9	
Lane Util. Factor		0.91		1.00	0.91		1.00		1.00		1.00	
Frpb, ped/bikes		1.00		1.00	1.00		1.00		0.97		0.84	
Flpb, ped/bikes		1.00		1.00	1.00		1.00		1.00		1.00	
Frt		0.99		1.00	1.00		1.00		0.85		0.88	
Flt Protected		1.00		0.95	1.00		0.95		1.00		1.00	
Satd. Flow (prot)		4675		1641	4715		1641		1425		1275	
Flt Permitted		1.00		0.95	1.00		1.00		1.00		1.00	
Satd. Flow (perm)		4675		1641	4715		1727		1425		1275	
Peak-hour factor, PHF	0.74	0.74	0.74	0.94	0.94	0.94	0.81	0.81	0.81	0.60	0.60	0.60
Adj. Flow (vph)	0	515	22	32	579	0	20	0	32	0	2	18
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	30	0	17	0
Lane Group Flow (vph)	0	533	0	32	579	0	20	0	2	0	3	0
Confl. Peds. (#/hr)			49			10			6	6		
Confl. Bikes (#/hr)			3						4			25
Turn Type	Prot	NA		Prot	NA		Perm		Perm		NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		20.4		0.7	25.5		2.2		2.2		2.2	
Effective Green, g (s)		20.4		0.7	25.5		2.2		2.2		2.2	
Actuated g/C Ratio		0.54		0.02	0.68		0.06		0.06		0.06	
Clearance Time (s)		4.9		4.4	4.9		4.9		4.9		4.9	
Vehicle Extension (s)		6.1		2.0	5.1		2.0		2.0		2.0	
Lane Grp Cap (vph)		2543		30	3206		101		83		74	
v/s Ratio Prot		c0.11		c0.02	0.12						0.00	
v/s Ratio Perm							c0.01		0.00			
v/c Ratio		0.21		1.07	0.18		0.20		0.02		0.04	
Uniform Delay, d1		4.4		18.4	2.2		16.8		16.6		16.7	
Progression Factor		1.00		1.00	1.00		1.00		1.00		1.00	
Incremental Delay, d2		0.1		185.4	0.1		0.4		0.0		0.1	
Delay (s)		4.5		203.8	2.2		17.2		16.7		16.7	
Level of Service		A		F	A		B		B		B	
Approach Delay (s)		4.5			12.8			16.9			16.7	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	37.5	Sum of lost time (s)	14.2
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	259	46	154	443	125	45	49	251	138	56	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	5.5			4.9	4.9		4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	
Frt	1.00	0.98		1.00	0.97			1.00	0.85		0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.98	
Satd. Flow (prot)	1641	4608		1641	4538			1685	1419		3006	
Flt Permitted	0.95	1.00		0.95	1.00			0.72	1.00		0.78	
Satd. Flow (perm)	1641	4608		1641	4538			1235	1419		2396	
Peak-hour factor, PHF	0.69	0.69	0.69	0.93	0.93	0.93	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	75	375	67	166	476	134	53	58	295	162	66	101
RTOR Reduction (vph)	0	24	0	0	42	0	0	0	224	0	64	0
Lane Group Flow (vph)	75	418	0	166	568	0	0	111	71	0	265	0
Confl. Peds. (#/hr)						1	10		46	46		10
Confl. Bikes (#/hr)						1			3			11
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	4.7	17.3		10.1	22.1			13.3	13.3		13.3	
Effective Green, g (s)	4.7	17.3		10.1	22.1			13.3	13.3		13.3	
Actuated g/C Ratio	0.09	0.32		0.18	0.40			0.24	0.24		0.24	
Clearance Time (s)	4.4	4.9		4.4	5.5			4.9	4.9		4.9	
Vehicle Extension (s)	2.0	8.0		2.0	6.7			4.4	4.4		4.4	
Lane Grp Cap (vph)	140	1452		301	1826			299	343		580	
v/s Ratio Prot	0.05	0.09		c0.10	c0.13							
v/s Ratio Perm								0.09	0.05		c0.11	
v/c Ratio	0.54	0.29		0.55	0.31			0.37	0.21		0.46	
Uniform Delay, d1	24.1	14.2		20.3	11.2			17.3	16.6		17.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	2.0	0.5		1.2	0.3			1.3	0.5		0.9	
Delay (s)	26.0	14.6		21.6	11.5			18.6	17.1		18.7	
Level of Service	C	B		C	B			B	B		B	
Approach Delay (s)		16.3			13.7			17.5			18.7	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	54.9	Sum of lost time (s)	14.8
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	610	41	142	736	0	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1		5.1	3.0		5.1
Lane Util. Factor	0.91		0.97	0.91		0.88
Frpb, ped/bikes	1.00		1.00	1.00		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	1.00		0.85
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	4666		3183	4715		2584
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	4666		3183	4715		2584
Peak-hour factor, PHF	0.75	0.75	0.97	0.97	0.86	0.86
Adj. Flow (vph)	813	55	146	759	0	338
RTOR Reduction (vph)	20	0	0	0	0	274
Lane Group Flow (vph)	848	0	146	759	0	64
Confl. Peds. (#/hr)		20				
Turn Type	NA		Prot	NA		Over
Protected Phases	2		1	6		1
Permitted Phases						1
Actuated Green, G (s)	15.0		5.9	31.1		5.9
Effective Green, g (s)	15.0		5.9	31.1		5.9
Actuated g/C Ratio	0.48		0.19	1.00		0.19
Clearance Time (s)	5.1		5.1	3.0		5.1
Vehicle Extension (s)	3.9		2.0	0.9		2.0
Lane Grp Cap (vph)	2250		603	4715		490
v/s Ratio Prot	c0.18		0.05	c0.16		0.02
v/s Ratio Perm						
v/c Ratio	0.38		0.24	0.16		0.13
Uniform Delay, d1	5.1		10.7	0.0		10.5
Progression Factor	1.00		1.00	1.00		1.00
Incremental Delay, d2	0.1		0.1	0.0		0.0
Delay (s)	5.2		10.8	0.0		10.5
Level of Service	A		B	A		B
Approach Delay (s)	5.2			1.7	10.5	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	31.1	Sum of lost time (s)	10.2
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↱
Volume (veh/h)	0	901	491	0	0	387
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.82	0.82	0.87	0.87	0.91	0.91
Hourly flow rate (vph)	0	1099	564	0	0	425
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		269	396			
pX, platoon unblocked					0.95	
vC, conflicting volume	564				931	188
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	564				751	188
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	47
cM capacity (veh/h)	950				314	797

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	366	366	366	188	188	188	425
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	425
cSH	1700	1700	1700	1700	1700	1700	797
Volume to Capacity	0.22	0.22	0.22	0.11	0.11	0.11	0.53
Queue Length 95th (ft)	0	0	0	0	0	0	80
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	14.6
Lane LOS							B
Approach Delay (s)	0.0			0.0			14.6
Approach LOS							B

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	448	452	0	0	441	749	50	1	219	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.1			5.1	5.1		5.1	5.1			
Lane Util. Factor	0.97	0.91			0.86	0.86		1.00	0.88			
Frpb, ped/bikes	1.00	1.00			0.99	0.98		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			0.93	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3183	4715			4114	1239		1646	2584			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3183	4715			4114	1239		1646	2584			
Peak-hour factor, PHF	0.82	0.82	0.82	0.92	0.92	0.92	0.75	0.75	0.75	0.92	0.92	0.92
Adj. Flow (vph)	546	551	0	0	479	814	67	1	292	0	0	0
RTOR Reduction (vph)	0	0	0	0	233	266	0	0	249	0	0	0
Lane Group Flow (vph)	546	551	0	0	653	141	0	68	43	0	0	0
Confl. Peds. (#/hr)						2	3					
Confl. Bikes (#/hr)			3			8						
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	11.9	35.0			18.4	18.4		7.9	7.9			
Effective Green, g (s)	11.9	35.0			18.4	18.4		7.9	7.9			
Actuated g/C Ratio	0.22	0.66			0.35	0.35		0.15	0.15			
Clearance Time (s)	4.7	5.1			5.1	5.1		5.1	5.1			
Vehicle Extension (s)	2.0	3.9			3.9	3.9		3.0	3.0			
Lane Grp Cap (vph)	713	3107			1425	429		244	384			
v/s Ratio Prot	c0.17	0.12			c0.16			c0.04				
v/s Ratio Perm						0.11			0.02			
v/c Ratio	0.77	0.18			0.46	0.33		0.28	0.11			
Uniform Delay, d1	19.3	3.5			13.5	12.8		20.1	19.6			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	4.4	0.0			0.3	0.6		0.6	0.1			
Delay (s)	23.7	3.5			13.8	13.4		20.7	19.7			
Level of Service	C	A			B	B		C	B			
Approach Delay (s)		13.6			13.7			19.9			0.0	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	53.1	Sum of lost time (s)	14.9
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	37	91	44	3	128	89	53	108	0	38	73	31
Peak Hour Factor	0.91	0.91	0.91	0.90	0.90	0.90	0.81	0.81	0.81	0.89	0.89	0.89
Hourly flow rate (vph)	41	100	48	3	142	99	65	133	0	43	82	35

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	41	148	3	241	65	133	125	35
Volume Left (vph)	41	0	3	0	65	0	43	0
Volume Right (vph)	0	48	0	99	0	0	0	35
Hadj (s)	0.67	-0.06	0.67	-0.12	0.67	0.17	0.34	-0.53
Departure Headway (s)	6.5	5.8	6.5	5.7	6.6	6.1	6.3	5.4
Degree Utilization, x	0.07	0.24	0.01	0.38	0.12	0.23	0.22	0.05
Capacity (veh/h)	521	590	528	609	517	557	534	613
Control Delay (s)	8.8	9.4	8.3	10.9	9.3	9.6	9.9	7.5
Approach Delay (s)	9.3		10.8		9.5		9.4	
Approach LOS	A		B		A		A	

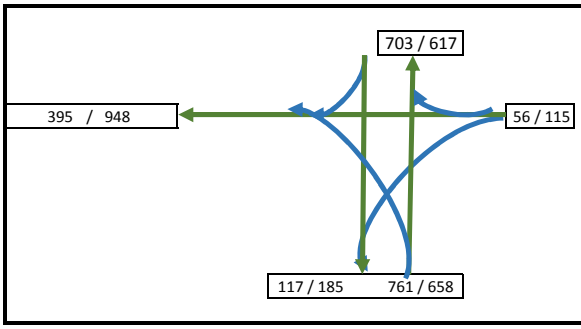
Intersection Summary			
Delay	9.8		
Level of Service	A		
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION: Caliente Avenue and 905 WB Ramps
ALTERNATIVE: Existing Conditions

DIST. CO. RTE
PM:
DATE:
TIME:

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	98	663	0
SB:	0	102	296
EB:	0	0	0
WB:	15	1	40

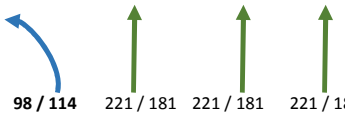
PM

	Left	Throu	Right
NB:	114	544	0
SB:	0	145	832
EB:	0	0	0
WB:	40	2	73

LANE VOLUMES (ILV/HR)

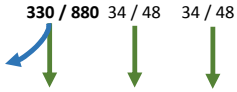
PHASE I

AM 98
PM 114



PHASE II

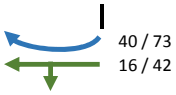
AM 330
PM 880



Remaining NB Through 123 / 67

PHASE III

AM 40
PM 73



PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PM
468	1067

TOTAL OPERATING LEVEL (ILV/HR):

AM:	468	Under Capacity
PM:	1067	Under Capacity

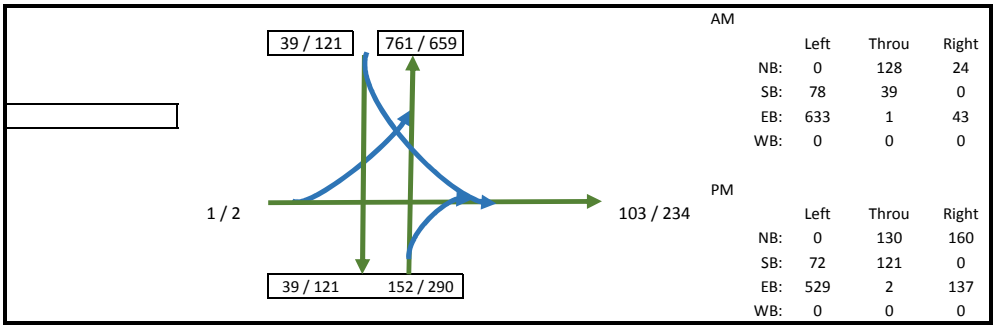
< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION: Caliente Avenue and 905 EB Ramps
ALTERNATIVE: Existing Conditions

DIST. CO. RTE
PM:
DATE:
TIME:

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	0	128	24
SB:	78	39	0
EB:	633	1	43
WB:	0	0	0

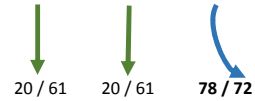
PM

	Left	Throu	Right
NB:	0	130	160
SB:	72	121	0
EB:	529	2	137
WB:	0	0	0

LANE VOLUMES (ILV/HR)

PHASE I

AM 78
PM 72



PHASE II

AM 67
PM 203

Remaining SB Through 0

PHASE III

AM 633
PM 529

PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PM
778	804

TOTAL OPERATING LEVEL (ILV/HR):

AM:	778	Under Capacity
PM:	804	Under Capacity

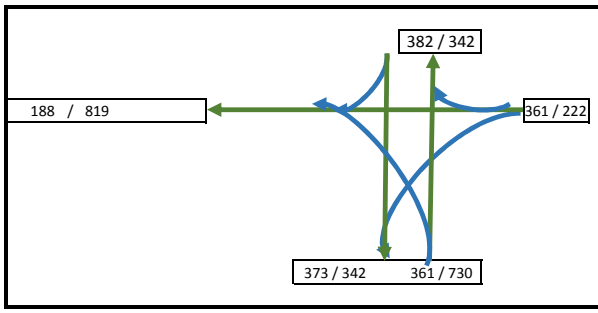
< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION: Britannia Boulevard and SR-905 WB Ramps
ALTERNATIVE: Existing Conditions

DIST. CO. RTE SR-905
PM:
DATE:
TIME:

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	143	218	0
SB:	0	176	45
EB:	0	0	0
WB:	197	0	164

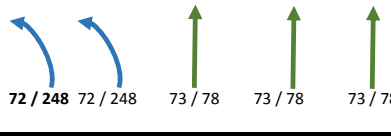
PM

	Left	Throu	Right
NB:	496	234	0
SB:	0	229	322
EB:	0	0	0
WB:	113	1	108

LANE VOLUMES (ILV/HR)

PHASE I

AM 72
PM 248



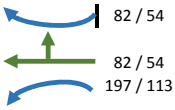
PHASE II

AM 104 **104 / 398** 59 / 76 59 / 76
PM 398

Remaining NB Through 1 / 0

PHASE III

AM 197
PM 113



PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PM
373	759

TOTAL OPERATING LEVEL (ILV/HR):

AM:	373	Under Capacity
PM:	759	Under Capacity

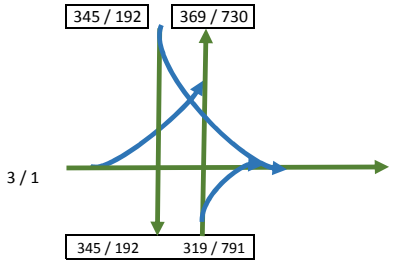
< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION: Britannia Boulevard and 905 EB Ramps
ALTERNATIVE: Existing Conditions

DIST. CO. RTE
PM:
DATE:
TIME:

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	0	203	116
SB:	28	345	0
EB:	166	3	583
WB:	0	0	0

PM

	Left	Throu	Right
NB:	0	653	138
SB:	150	192	0
EB:	77	1	200
WB:	0	0	0

LANE VOLUMES (ILV/HR)

PHASE I

AM **14**
PM **75**

115 / 64 115 / 64 115 / 64 14 / 75 **14 / 75**

PHASE II

AM 218
PM 465

Remaining SB Through 101 / 0 102 / 327 **218 / 465**

PHASE III

AM 292
PM 100

169 / 78
292 / 100
292 / 100

PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PM
523	640

TOTAL OPERATING LEVEL (ILV/HR):

AM:	523	Under Capacity
PM:	640	Under Capacity

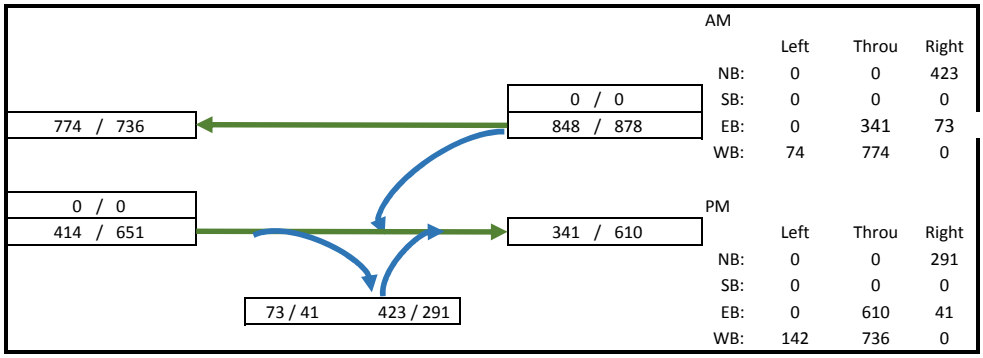
< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION: 905 / Siempre Viva Road
ALTERNATIVE: Existing Conditions

DIST. CO. RTE
PM:
DATE: 12/16/2015
TIME:

DEMAND TRAFFIC FLOWS



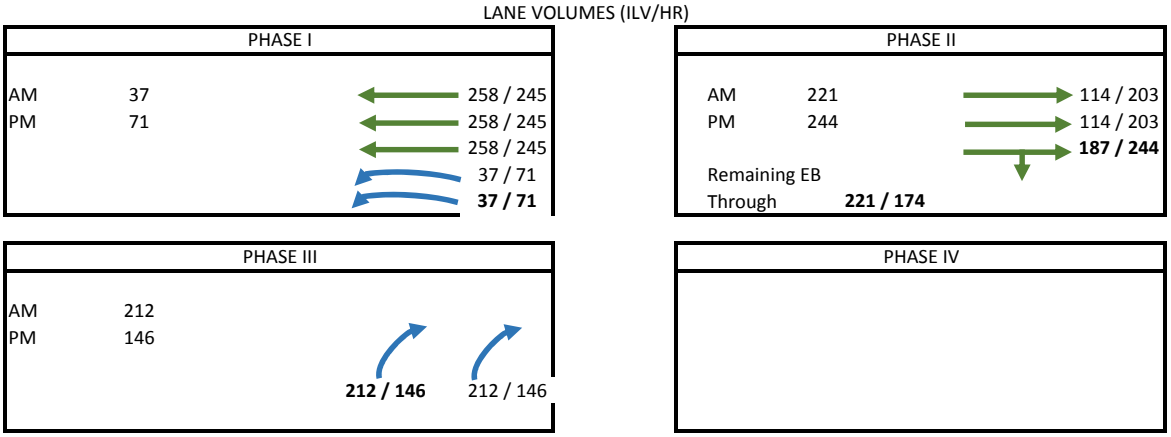
AM

	Left	Throu	Right
NB:	0	0	423
SB:	0	0	0
EB:	0	341	73
WB:	74	774	0

PM

	Left	Throu	Right
NB:	0	0	291
SB:	0	0	0
EB:	0	610	41
WB:	142	736	0

LANE VOLUMES (ILV/HR)



CRITICAL LANE VOLUMES PER HOUR

AM	PHASE II
470	461

TOTAL OPERATING LEVEL (ILV/HR):

AM:	470	Under Capacity
PM:	461	Under Capacity

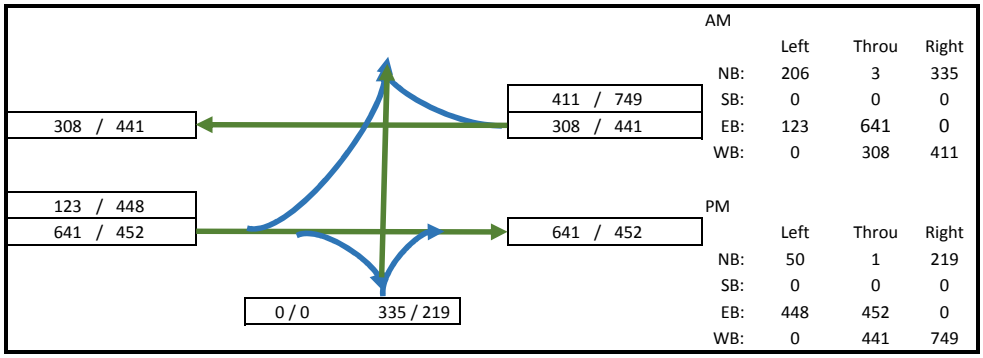
< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION: 905 / Siempre Viva Road
ALTERNATIVE: Existing Conditions

DIST. CO. RTE
PM:
DATE: 12/16/2015
TIME:

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	206	3	335
SB:	0	0	0
EB:	123	641	0
WB:	0	308	411

PM

	Left	Throu	Right
NB:	50	1	219
SB:	0	0	0
EB:	448	452	0
WB:	0	441	749

LANE VOLUMES (ILV/HR)

PHASE I

AM	62	**62 / 224**
PM	224	62 / 224
		214 / 151
		214 / 151
		214 / 151

PHASE II

AM	308	206 / 375
PM	522	**309 / 522**
		103 / 147
Remaining EB		103 / 147
Through	**151 / 0**	

PHASE III

AM	209	**209 / 51**	168 / 110	**168 / 110**
PM	110			

PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PHASE II
579	855

TOTAL OPERATING LEVEL (ILV/HR):

AM:	579	Under Capacity
PM:	855	Under Capacity

< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

Appendix E
Peak Hour Intersection LOS & ILV Worksheets – Existing Plus Project Conditions

Existing + Project AM
1: East Beyer Boulevard/Otay Mesa Road & Beyer Boulevard

11/29/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	1	92	9	5	11	36	35	3	20	62	121
Future Volume (vph)	78	1	92	9	5	11	36	35	3	20	62	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9		4.9		4.9	4.9			5.2	
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.98		0.98		1.00	1.00			0.98	
Flpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85		0.94		1.00	0.99			0.92	
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00			1.00	
Satd. Flow (prot)	1681	1686	1548		1676		1768	1836			1677	
Flt Permitted	0.95	0.95	1.00		0.98		0.71	1.00			0.97	
Satd. Flow (perm)	1681	1686	1548		1676		1320	1836			1627	
Peak-hour factor, PHF	0.53	0.53	0.53	0.67	0.67	0.67	0.77	0.77	0.77	0.85	0.85	0.85
Adj. Flow (vph)	147	2	174	13	7	16	47	45	4	24	73	142
RTOR Reduction (vph)	0	0	127	0	16	0	0	3	0	0	72	0
Lane Group Flow (vph)	75	74	47	0	20	0	47	46	0	0	167	0
Confl. Peds. (#/hr)	1		1	1		1	2					2
Confl. Bikes (#/hr)			1			4			6			5
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	Perm	Split	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		1	1			8			4	
Permitted Phases			2				8			4		
Actuated Green, G (s)	9.7	9.7	9.7		1.0		10.6	10.6			10.3	
Effective Green, g (s)	9.7	9.7	9.7		1.0		10.6	10.6			10.3	
Actuated g/C Ratio	0.27	0.27	0.27		0.03		0.29	0.29			0.29	
Clearance Time (s)	4.9	4.9	4.9		4.9		4.9	4.9			5.2	
Vehicle Extension (s)	2.9	2.9	2.9		2.9		3.8	3.8			4.5	
Lane Grp Cap (vph)	452	454	417		46		388	540			465	
v/s Ratio Prot	c0.04	0.04			c0.01			0.03				
v/s Ratio Perm			0.03				0.04				c0.10	
v/c Ratio	0.17	0.16	0.11		0.44		0.12	0.09			0.36	
Uniform Delay, d1	10.1	10.0	9.9		17.2		9.3	9.2			10.2	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.2	0.1		6.4		0.2	0.1			0.8	
Delay (s)	10.2	10.2	10.0		23.6		9.5	9.3			11.0	
Level of Service	B	B	B		C		A	A			B	
Approach Delay (s)		10.1			23.6			9.4			11.0	
Approach LOS		B			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	36.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	195	16	30	230	7	55	0	47	5	0	26
Future Volume (vph)	18	195	16	30	230	7	55	0	47	5	0	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.6		4.4		4.9	4.4	4.9	
Lane Util. Factor	1.00	0.95		0.97	0.91		1.00		1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		0.99	1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00		0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)	1770	3496		3433	5060		1770		1563	1768	1536	
Flt Permitted	0.95	1.00		0.95	1.00		1.00		1.00	1.00	1.00	
Satd. Flow (perm)	1770	3496		3433	5060		1863		1563	1861	1536	
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.75	0.75	0.75	0.97	0.97	0.97
Adj. Flow (vph)	21	224	18	35	267	8	73	0	63	5	0	27
RTOR Reduction (vph)	0	5	0	0	3	0	0	0	59	0	26	0
Lane Group Flow (vph)	21	237	0	35	272	0	73	0	4	5	1	0
Confl. Peds. (#/hr)			3						2	2		
Confl. Bikes (#/hr)			1			3						2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		pm+pt		Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	0.7	17.6		0.5	17.2		5.1		2.8	1.5	1.0	
Effective Green, g (s)	0.7	17.6		0.5	17.2		5.1		2.8	1.5	1.0	
Actuated g/C Ratio	0.02	0.43		0.01	0.42		0.13		0.07	0.04	0.02	
Clearance Time (s)	4.4	5.4		4.4	5.6		4.4		4.9	4.4	4.9	
Vehicle Extension (s)	2.0	5.4		2.0	5.4		2.0		5.6	2.0	2.0	
Lane Grp Cap (vph)	30	1519		42	2148		229		108	67	37	
v/s Ratio Prot	c0.01	c0.07		0.01	0.05		c0.02			0.00	0.00	
v/s Ratio Perm							c0.02		0.00	0.00		
v/c Ratio	0.70	0.16		0.83	0.13		0.32		0.04	0.07	0.02	
Uniform Delay, d1	19.8	6.9		20.0	7.1		16.2		17.6	18.9	19.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2	44.4	0.1		74.6	0.1		0.3		0.4	0.2	0.1	
Delay (s)	64.2	7.1		94.5	7.1		16.4		18.0	19.1	19.3	
Level of Service	E	A		F	A		B		B	B	B	
Approach Delay (s)		11.6			17.0			17.2			19.3	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	40.5	Sum of lost time (s)	19.3
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	4	221	4	154	0	105	598	174	173	1
Future Volume (vph)	0	1	4	221	4	154	0	105	598	174	173	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6	5.2	5.2	6.7	6.7		6.3	5.2	5.2	6.3	6.3
Lane Util. Factor		0.95	1.00	0.97	0.95	1.00		0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.99	1.00	1.00	0.99		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3539	1574	3335	3282	1449		3282	1538	3183	3282	1468
Flt Permitted		1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3539	1574	3335	3282	1449		3282	1538	3183	3282	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1	4	240	4	167	0	114	650	189	188	1
RTOR Reduction (vph)	0	0	4	0	0	118	0	0	359	0	0	1
Lane Group Flow (vph)	0	1	0	240	4	49	0	114	291	189	188	0
Confl. Peds. (#/hr)			1			2						
Heavy Vehicles (%)	2%	2%	2%	5%	10%	10%	10%	10%	5%	10%	10%	10%
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2	3	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		1.7	3.4	13.0	18.8	18.8		15.6	28.6	11.2	25.1	25.1
Effective Green, g (s)		1.7	3.4	13.0	18.8	18.8		15.6	28.6	11.2	25.1	25.1
Actuated g/C Ratio		0.03	0.05	0.20	0.29	0.29		0.24	0.45	0.18	0.39	0.39
Clearance Time (s)		5.6	5.2	5.2	6.7	6.7		6.3	5.2	5.2	6.3	6.3
Vehicle Extension (s)		2.0	2.0	3.0	2.0	2.0		3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)		94	83	679	967	426		802	689	558	1291	577
v/s Ratio Prot		0.00	0.00	0.07	0.00			0.03	c0.09	c0.06	0.06	
v/s Ratio Perm			0.00			c0.03			0.10			0.00
v/c Ratio		0.01	0.00	0.35	0.00	0.12		0.14	0.42	0.34	0.15	0.00
Uniform Delay, d1		30.2	28.6	21.8	15.9	16.4		18.9	12.0	23.1	12.5	11.7
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.0	0.0	0.3	0.0	0.0		0.1	0.4	0.1	0.1	0.0
Delay (s)		30.2	28.6	22.1	15.9	16.5		18.9	12.4	23.2	12.5	11.7
Level of Service		C	C	C	B	B		B	B	C	B	B
Approach Delay (s)		28.9			19.8			13.4			17.8	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	63.8	Sum of lost time (s)	23.4
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	150	1	40	98	663	0	0	102	296
Future Volume (vph)	0	0	0	150	1	40	98	663	0	0	102	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.1	5.1	4.7	5.1			5.1	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frpb, ped/bikes					1.00	1.00	1.00	1.00			0.98	
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.89	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1724	1538	1719	4940			4309	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1724	1538	1719	4940			4309	
Peak-hour factor, PHF	0.92	0.92	0.92	0.74	0.74	0.74	0.79	0.79	0.79	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	203	1	54	124	839	0	0	110	318
RTOR Reduction (vph)	0	0	0	0	0	41	0	0	0	0	233	0
Lane Group Flow (vph)	0	0	0	0	204	13	124	839	0	0	195	0
Confl. Peds. (#/hr)												4
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					10.1	10.1	6.1	22.1			11.3	
Effective Green, g (s)					10.1	10.1	6.1	22.1			11.3	
Actuated g/C Ratio					0.24	0.24	0.14	0.52			0.27	
Clearance Time (s)					5.1	5.1	4.7	5.1			5.1	
Vehicle Extension (s)					3.0	3.0	2.0	3.0			3.0	
Lane Grp Cap (vph)					410	366	247	2574			1148	
v/s Ratio Prot							c0.07	c0.17			0.05	
v/s Ratio Perm					0.12	0.01						
v/c Ratio					0.50	0.04	0.50	0.33			0.17	
Uniform Delay, d1					14.0	12.4	16.7	5.9			11.9	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					1.0	0.0	0.6	0.1			0.1	
Delay (s)					14.9	12.4	17.3	5.9			12.0	
Level of Service					B	B	B	A			B	
Approach Delay (s)		0.0			14.4			7.4			12.0	
Approach LOS		A			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	42.4	Sum of lost time (s)	14.9
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	633	1	43	0	0	0	0	128	85	78	174	0
Future Volume (vph)	633	1	43	0	0	0	0	128	85	78	174	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1						5.1		4.7	5.1	
Lane Util. Factor	1.00	1.00						0.91		1.00	0.95	
Frpb, ped/bikes	1.00	1.00						0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	0.85						0.94		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1641	1473						4392		1641	3282	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1641	1473						4392		1641	3282	
Peak-hour factor, PHF	0.76	0.76	0.76	0.92	0.92	0.92	0.73	0.73	0.73	0.66	0.66	0.66
Adj. Flow (vph)	833	1	57	0	0	0	0	175	116	118	264	0
RTOR Reduction (vph)	0	23	0	0	0	0	0	103	0	0	0	0
Lane Group Flow (vph)	833	35	0	0	0	0	0	188	0	118	264	0
Confl. Peds. (#/hr)									2			
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4											
Actuated Green, G (s)	45.5	45.5						8.7		7.3	20.7	
Effective Green, g (s)	45.5	45.5						8.7		7.3	20.7	
Actuated g/C Ratio	0.60	0.60						0.11		0.10	0.27	
Clearance Time (s)	5.1	5.1						5.1		4.7	5.1	
Vehicle Extension (s)	3.0	3.0						3.0		2.0	3.0	
Lane Grp Cap (vph)	977	877						500		156	889	
v/s Ratio Prot		0.02						0.04		c0.07	c0.08	
v/s Ratio Perm	c0.51											
v/c Ratio	0.85	0.04						0.38		0.76	0.30	
Uniform Delay, d1	12.7	6.4						31.3		33.7	22.1	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	7.3	0.0						0.5		16.8	0.2	
Delay (s)	20.0	6.4						31.8		50.5	22.3	
Level of Service	B	A						C		D	C	
Approach Delay (s)		19.1			0.0			31.8			31.0	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	76.4	Sum of lost time (s)	14.9
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	179	0	1	1	0	5	0	30	2	5	70	163
Future Volume (vph)	179	0	1	1	0	5	0	30	2	5	70	163
Peak Hour Factor	0.74	0.74	0.74	0.50	0.50	0.50	0.50	0.50	0.50	0.80	0.80	0.80
Hourly flow rate (vph)	242	0	1	2	0	10	0	60	4	6	88	204

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	161	82	2	10	0	64	6	292
Volume Left (vph)	161	81	2	0	0	0	6	0
Volume Right (vph)	0	1	0	10	0	4	0	204
Hadj (s)	0.58	0.57	0.67	-0.53	0.00	0.05	0.67	-0.38
Departure Headway (s)	6.0	6.0	6.4	5.2	5.5	5.6	6.0	4.9
Degree Utilization, x	0.27	0.14	0.00	0.01	0.00	0.10	0.01	0.40
Capacity (veh/h)	567	568	515	627	628	612	575	706
Control Delay (s)	10.1	8.8	8.3	7.1	7.3	8.0	7.8	9.9
Approach Delay (s)	9.6		7.3		8.0		9.9	
Approach LOS	A		A		A		A	

Intersection Summary			
Delay	9.5		
Level of Service	A		
Intersection Capacity Utilization	32.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	400	1	0	358	77	0	0	1	0	0	50
Future Volume (Veh/h)	0	400	1	0	358	77	0	0	1	0	0	50
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.93	0.93	0.93	0.25	0.25	0.25	0.73	0.73	0.73
Hourly flow rate (vph)	0	455	1	0	385	83	0	0	4	0	0	68
Pedestrians											6	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											4.0	
Percent Blockage											1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	474			456			652	930	152	547	847	134
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	474			456			652	930	152	547	847	134
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			100	100	100	100	100	92
cM capacity (veh/h)	1025			1047			310	251	842	398	282	861

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	182	182	92	128	128	128	83	4	68
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	1	0	0	0	83	4	68
cSH	1700	1700	1700	1700	1700	1700	1700	842	861
Volume to Capacity	0.11	0.11	0.05	0.08	0.08	0.08	0.05	0.00	0.08
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	9.5
Lane LOS								A	A
Approach Delay (s)	0.0			0.0				9.3	9.5
Approach LOS								A	A

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	18.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	131	67	10	250	239	43
Future Volume (vph)	131	67	10	250	239	43
Peak Hour Factor	0.81	0.81	0.86	0.86	0.82	0.82
Hourly flow rate (vph)	162	83	12	291	291	52

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	162	83	12	291	291	52
Volume Left (vph)	162	0	12	0	0	0
Volume Right (vph)	0	83	0	0	0	52
Hadj (s)	0.53	-0.67	0.53	0.17	0.17	-0.67
Departure Headway (s)	6.7	5.5	6.3	5.9	5.8	5.0
Degree Utilization, x	0.30	0.13	0.02	0.48	0.47	0.07
Capacity (veh/h)	501	600	551	593	597	685
Control Delay (s)	11.4	8.1	8.2	12.9	12.8	7.2
Approach Delay (s)	10.3		12.7		11.9	
Approach LOS	B		B		B	

Intersection Summary			
Delay	11.7		
Level of Service	B		
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	23	242	303	122	50	30
Future Volume (vph)	23	242	303	122	50	30
Peak Hour Factor	0.78	0.78	0.78	0.78	0.80	0.80
Hourly flow rate (vph)	29	310	388	156	63	38

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	339	388	156	101
Volume Left (vph)	29	388	0	0
Volume Right (vph)	310	0	0	38
Hadj (s)	-0.36	0.67	0.17	-0.06
Departure Headway (s)	5.2	6.3	5.8	5.7
Degree Utilization, x	0.49	0.68	0.25	0.16
Capacity (veh/h)	661	557	607	587
Control Delay (s)	13.0	20.2	9.5	9.8
Approach Delay (s)	13.0	17.1		9.8
Approach LOS	B	C		A

Intersection Summary			
Delay	15.0		
Level of Service	B		
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	212	127	147	309	325	89	32	63	187	39	37
Future Volume (vph)	80	212	127	147	309	325	89	32	63	187	39	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	1.00		1.00	1.00	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	4715	1468	3183	4715	1468	1641	1555		1641	1727	2584
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	4715	1468	3183	4715	1468	1641	1555		1641	1727	2584
Peak-hour factor, PHF	0.88	0.88	0.88	0.83	0.83	0.83	0.86	0.86	0.86	0.84	0.84	0.84
Adj. Flow (vph)	91	241	144	177	372	392	103	37	73	223	46	44
RTOR Reduction (vph)	0	0	72	0	0	184	0	66	0	0	0	36
Lane Group Flow (vph)	91	241	72	177	372	208	103	44	0	223	46	8
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	8.4	70.3	70.3	12.1	74.3	74.3	17.8	13.0		23.3	18.5	26.9
Effective Green, g (s)	8.4	70.3	70.3	12.1	74.3	74.3	17.8	13.0		23.3	18.5	26.9
Actuated g/C Ratio	0.06	0.50	0.50	0.09	0.53	0.53	0.13	0.09		0.17	0.13	0.19
Clearance Time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Vehicle Extension (s)	2.0	4.1	4.1	2.0	4.5	4.5	2.0	4.3		2.0	3.7	2.0
Lane Grp Cap (vph)	190	2367	737	275	2502	779	208	144		273	228	496
v/s Ratio Prot	0.03	0.05		c0.06	0.08		0.06	c0.03		c0.14	0.03	0.00
v/s Ratio Perm			0.05			c0.14						0.00
v/c Ratio	0.48	0.10	0.10	0.64	0.15	0.27	0.50	0.30		0.82	0.20	0.02
Uniform Delay, d1	63.7	18.3	18.2	61.9	16.7	18.0	56.9	59.3		56.3	54.2	45.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1	0.3	3.8	0.1	0.8	0.7	1.9		16.2	0.5	0.0
Delay (s)	64.4	18.4	18.5	65.7	16.9	18.8	57.6	61.2		72.5	54.7	45.8
Level of Service	E	B	B	E	B	B	E	E		E	D	D
Approach Delay (s)		27.2			26.9			59.4			66.1	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	36.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	0	0	0	0	44	0	1	0	119	0	4
Future Volume (vph)	1	0	0	0	0	44	0	1	0	119	0	4
Peak Hour Factor	0.25	0.25	0.25	0.64	0.64	0.64	0.25	0.25	0.25	0.81	0.81	0.81
Hourly flow rate (vph)	4	0	0	0	0	69	0	4	0	147	0	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	4	69	4	152
Volume Left (vph)	4	0	0	147
Volume Right (vph)	0	69	0	5
Hadj (s)	0.37	-0.43	0.17	0.34
Departure Headway (s)	4.7	3.8	4.4	4.4
Degree Utilization, x	0.01	0.07	0.00	0.19
Capacity (veh/h)	733	898	792	803
Control Delay (s)	7.7	7.1	7.4	8.4
Approach Delay (s)	7.7	7.1	7.4	8.4
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.0		
Level of Service	A		
Intersection Capacity Utilization	23.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	180	0	0	500
Future Volume (vph)	0	0	180	0	0	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.5			4.5
Lane Util. Factor			1.00			1.00
Frt			1.00			0.85
Flt Protected			0.95			1.00
Satd. Flow (prot)			1770			1583
Flt Permitted			0.76			1.00
Satd. Flow (perm)			1410			1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	196	0	0	543
RTOR Reduction (vph)	0	0	0	0	0	408
Lane Group Flow (vph)	0	0	196	0	0	135
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type			Perm		Perm	Perm
Protected Phases	4			8		
Permitted Phases			8		2	2
Actuated Green, G (s)			8.3			5.7
Effective Green, g (s)			8.3			5.7
Actuated g/C Ratio			0.36			0.25
Clearance Time (s)			4.5			4.5
Vehicle Extension (s)			3.0			3.0
Lane Grp Cap (vph)			508			392
v/s Ratio Prot						
v/s Ratio Perm			c0.14			c0.08
v/c Ratio			0.39			0.34
Uniform Delay, d1			5.5			7.1
Progression Factor			1.00			1.00
Incremental Delay, d2			0.5			0.5
Delay (s)			5.9			7.6
Level of Service			A			A
Approach Delay (s)	0.0			5.9	7.6	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	23.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	386	43	167	764	83	16	0	100	41	0	0
Future Volume (vph)	6	386	43	167	764	83	16	0	100	41	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		4.0	6.5		4.0		4.0	4.0		
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00		1.00	1.00		
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		0.99	1.00		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00	1.00		
Frt	1.00	0.98		1.00	0.99		1.00		0.85	1.00		
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00	0.95		
Satd. Flow (prot)	1641	4632		1641	4636		1641		1449	1641		
Flt Permitted	0.95	1.00		0.95	1.00		0.95		1.00	0.95		
Satd. Flow (perm)	1641	4632		1641	4636		1641		1449	1641		
Peak-hour factor, PHF	0.88	0.88	0.88	0.86	0.86	0.86	0.62	0.62	0.62	0.75	0.75	0.75
Adj. Flow (vph)	7	439	49	194	888	97	26	0	161	55	0	0
RTOR Reduction (vph)	0	12	0	0	8	0	0	0	153	0	0	0
Lane Group Flow (vph)	7	476	0	194	977	0	26	0	8	55	0	0
Confl. Peds. (#/hr)			4			2			1			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	1.2	41.7		18.5	59.0		15.3		4.5	6.8		
Effective Green, g (s)	1.2	41.7		18.5	59.0		15.3		4.5	6.8		
Actuated g/C Ratio	0.01	0.46		0.21	0.66		0.17		0.05	0.08		
Clearance Time (s)	4.0	6.5		4.0	6.5		4.0		4.0	4.0		
Vehicle Extension (s)	2.0	5.3		2.0	5.3		2.0		2.0	2.0		
Lane Grp Cap (vph)	21	2146		337	3039		278		72	123		
v/s Ratio Prot	0.00	0.10		c0.12	c0.21		c0.02			c0.03		
v/s Ratio Perm									0.01			
v/c Ratio	0.33	0.22		0.58	0.32		0.09		0.11	0.45		
Uniform Delay, d1	44.0	14.4		32.2	6.8		31.5		40.8	39.8		
Progression Factor	1.00	1.00		0.57	0.71		1.00		1.00	1.00		
Incremental Delay, d2	3.4	0.2		1.0	0.2		0.1		0.3	0.9		
Delay (s)	47.4	14.7		19.5	5.0		31.6		41.1	40.7		
Level of Service	D	B		B	A		C		D	D		
Approach Delay (s)		15.1			7.4			39.8			40.7	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	995	65	120	303	168	132	10	85	385	10	30
Future Volume (vph)	10	995	65	120	303	168	132	10	85	385	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	0.97	0.86	0.86	0.97	0.91	0.88	1.00	1.00		0.97	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.92	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4801	1362	3433	5085	2787	1770	1613		3433	3111	1441
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4801	1362	3433	5085	2787	1770	1613		3433	3111	1441
Peak-hour factor, PHF	0.92	0.92	0.92	0.84	0.92	0.84	0.92	0.78	0.78	0.69	0.69	0.92
Adj. Flow (vph)	11	1082	71	143	329	200	143	13	109	558	14	33
RTOR Reduction (vph)	0	1	39	0	0	110	0	81	0	0	14	13
Lane Group Flow (vph)	11	1088	25	143	329	90	143	41	0	558	17	3
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6						8
Actuated Green, G (s)	0.7	29.6	29.6	4.6	33.5	33.5	9.8	7.6		14.7	12.5	12.5
Effective Green, g (s)	0.7	29.6	29.6	4.6	33.5	33.5	9.8	7.6		14.7	12.5	12.5
Actuated g/C Ratio	0.01	0.40	0.40	0.06	0.45	0.45	0.13	0.10		0.20	0.17	0.17
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	32	1907	541	211	2286	1253	232	164		677	521	241
v/s Ratio Prot	0.00	c0.23		c0.04	c0.06		0.08	c0.03		c0.16	0.01	
v/s Ratio Perm			0.02			0.03						0.00
v/c Ratio	0.34	0.57	0.05	0.68	0.14	0.07	0.62	0.25		0.82	0.03	0.01
Uniform Delay, d1	36.7	17.5	13.8	34.2	12.1	11.7	30.6	30.8		28.7	25.9	25.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.3	0.4	0.0	8.3	0.0	0.0	4.8	0.8		8.1	0.0	0.0
Delay (s)	43.0	17.9	13.8	42.6	12.1	11.7	35.4	31.6		36.7	26.0	25.9
Level of Service	D	B	B	D	B	B	D	C		D	C	C
Approach Delay (s)		17.9			18.5			33.7			35.9	
Approach LOS		B			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	74.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	72	0	116	0	32	34	256	85	0
Future Volume (vph)	0	0	0	72	0	116	0	32	34	256	85	0
Peak Hour Factor	0.92	0.92	0.92	0.84	0.84	0.84	0.75	0.75	0.75	0.81	0.81	0.81
Hourly flow rate (vph)	0	0	0	86	0	138	0	43	45	316	105	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	0	224	88	421
Volume Left (vph)	0	86	0	316
Volume Right (vph)	0	138	45	0
Hadj (s)	0.00	-0.12	-0.14	0.32
Departure Headway (s)	5.6	5.1	4.9	4.9
Degree Utilization, x	0.00	0.31	0.12	0.58
Capacity (veh/h)	573	656	678	704
Control Delay (s)	8.6	10.4	8.6	14.5
Approach Delay (s)	0.0	10.4	8.6	14.5
Approach LOS	A	B	A	B

Intersection Summary			
Delay	12.5		
Level of Service	B		
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	120	405	210	140	865	522
Future Volume (vph)	120	405	210	140	865	522
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	1641	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	1641	4715	3183	1468
Peak-hour factor, PHF	0.91	0.91	0.73	0.73	0.90	0.90
Adj. Flow (vph)	132	445	288	192	961	580
RTOR Reduction (vph)	0	322	0	0	0	380
Lane Group Flow (vph)	132	123	288	192	961	200
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	24.8	24.8	19.6	48.4	31.1	31.1
Effective Green, g (s)	24.8	24.8	19.6	48.4	31.1	31.1
Actuated g/C Ratio	0.28	0.28	0.22	0.54	0.35	0.35
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	1299	404	357	2535	1099	507
v/s Ratio Prot	0.03		c0.18	0.04	c0.30	
v/s Ratio Perm		c0.08				0.14
v/c Ratio	0.10	0.30	0.81	0.08	0.87	0.40
Uniform Delay, d1	24.3	25.8	33.4	10.0	27.6	22.3
Progression Factor	1.67	6.10	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	1.9	11.9	0.1	7.7	0.2
Delay (s)	40.7	159.2	45.3	10.1	35.3	22.5
Level of Service	D	F	D	B	D	C
Approach Delay (s)	132.1			31.2	30.5	
Approach LOS	F			C	C	

Intersection Summary			
HCM 2000 Control Delay	53.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	206	0	164	529	1106	0	0	579	45
Future Volume (vph)	0	0	0	206	0	164	529	1106	0	0	579	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.1	5.1	5.1	4.7	5.1			5.1	
Lane Util. Factor				1.00	0.95	0.95	0.97	0.91			0.91	
Frt				1.00	0.85	0.85	1.00	1.00			0.99	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1641	1395	1395	3183	4715			4664	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1395	1395	3183	4715			4664	
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.82	0.82	0.82	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	251	0	200	645	1349	0	0	616	48
RTOR Reduction (vph)	0	0	0	0	77	77	0	0	0	0	15	0
Lane Group Flow (vph)	0	0	0	251	23	23	645	1349	0	0	649	0
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				13.1	13.1	13.1	14.7	34.1			14.7	
Effective Green, g (s)				13.1	13.1	13.1	14.7	34.1			14.7	
Actuated g/C Ratio				0.23	0.23	0.23	0.26	0.59			0.26	
Clearance Time (s)				5.1	5.1	5.1	4.7	5.1			5.1	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)				374	318	318	815	2801			1194	
v/s Ratio Prot					0.02		c0.20	c0.29			0.14	
v/s Ratio Perm				c0.15		0.02						
v/c Ratio				0.67	0.07	0.07	0.79	0.48			0.54	
Uniform Delay, d1				20.2	17.4	17.4	19.9	6.6			18.5	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				4.7	0.1	0.1	5.3	0.1			0.5	
Delay (s)				24.9	17.5	17.5	25.2	6.8			19.0	
Level of Service				C	B	B	C	A			B	
Approach Delay (s)		0.0			21.6			12.7			19.0	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	57.4	Sum of lost time (s)	14.9
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	3	758	0	0	0	0	1477	135	28	757	0
Future Volume (vph)	166	3	758	0	0	0	0	1477	135	28	757	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1					5.1		4.7	5.1	
Lane Util. Factor		1.00	0.88					0.95		0.97	0.91	
Frpb, ped/bikes		1.00	1.00					1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00		1.00	1.00	
Frt		1.00	0.85					0.99		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1647	2584					3241		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1647	2584					3241		3183	4715	
Peak-hour factor, PHF	0.80	0.80	0.80	0.92	0.92	0.92	0.81	0.81	0.81	0.94	0.94	0.94
Adj. Flow (vph)	208	4	948	0	0	0	0	1823	167	30	805	0
RTOR Reduction (vph)	0	0	290	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	212	658	0	0	0	0	1986	0	30	805	0
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		39.2	39.2					90.2		3.0	97.9	
Effective Green, g (s)		39.2	39.2					90.2		3.0	97.9	
Actuated g/C Ratio		0.27	0.27					0.61		0.02	0.66	
Clearance Time (s)		5.1	5.1					5.1		4.7	5.1	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		438	687					1984		64	3133	
v/s Ratio Prot								c0.61		c0.01	0.17	
v/s Ratio Perm		0.13	c0.25									
v/c Ratio		0.48	0.96					1.00		0.47	0.26	
Uniform Delay, d1		45.5	53.2					28.6		71.4	10.0	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.8	24.1					20.4		5.3	0.0	
Delay (s)		46.4	77.4					49.0		76.7	10.0	
Level of Service		D	E					D		E	B	
Approach Delay (s)		71.7			0.0			49.0			12.4	
Approach LOS		E			A			D			B	

Intersection Summary			
HCM 2000 Control Delay	47.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	147.3	Sum of lost time (s)	14.9
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1323	200	79	24	98	70	35	127	19	288	286	666
Future Volume (vph)	1323	200	79	24	98	70	35	127	19	288	286	666
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96			1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1654			1710	1449	1641	3208		1641	1727	1468
Flt Permitted	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1654			1710	1449	1641	3208		1641	1727	1468
Peak-hour factor, PHF	0.86	0.86	0.86	0.81	0.81	0.81	0.76	0.76	0.76	0.85	0.85	0.85
Adj. Flow (vph)	1538	233	92	30	121	86	46	167	25	339	336	784
RTOR Reduction (vph)	0	9	0	0	0	74	0	8	0	0	0	571
Lane Group Flow (vph)	1538	316	0	0	151	12	46	184	0	339	336	213
Confl. Peds. (#/hr)	1					1			2			
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	45.1	45.1			16.4	16.4	4.0	18.3		17.8	31.9	31.9
Effective Green, g (s)	45.1	45.1			16.4	16.4	4.0	18.3		17.8	31.9	31.9
Actuated g/C Ratio	0.38	0.38			0.14	0.14	0.03	0.16		0.15	0.27	0.27
Clearance Time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Vehicle Extension (s)	2.0	2.0			3.7	3.7	2.0	3.8		2.0	3.8	3.8
Lane Grp Cap (vph)	630	635			238	202	55	500		248	469	398
v/s Ratio Prot	c0.94	0.19			c0.09		0.03	0.06		c0.21	c0.19	
v/s Ratio Perm						0.01						0.15
v/c Ratio	2.44	0.50			0.63	0.06	0.84	0.37		1.37	0.72	0.54
Uniform Delay, d1	36.2	27.5			47.7	43.8	56.4	44.4		49.8	38.7	36.4
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	653.4	0.2			5.9	0.2	62.7	0.6		188.8	5.4	1.7
Delay (s)	689.5	27.8			53.5	44.0	119.1	45.0		238.6	44.1	38.1
Level of Service	F	C			D	D	F	D		F	D	D
Approach Delay (s)		574.1			50.1			59.3			86.1	
Approach LOS		F			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	321.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.64		
Actuated Cycle Length (s)	117.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	117.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	272	1	3	130	19	1	87	1	32	146	70
Future Volume (vph)	30	272	1	3	130	19	1	87	1	32	146	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Lane Util. Factor		0.95			1.00	1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes		1.00			1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00			1.00	0.85	1.00	1.00		1.00	0.95	
Flt Protected		1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3264			1725	1449	1641	1725		3183	3095	
Flt Permitted		0.91			0.58	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2975			1007	1449	1641	1725		3183	3095	
Peak-hour factor, PHF	0.76	0.76	0.76	0.73	0.73	0.73	0.68	0.68	0.68	0.79	0.79	0.79
Adj. Flow (vph)	39	358	1	4	178	26	1	128	1	41	185	89
RTOR Reduction (vph)	0	0	0	0	0	19	0	0	0	0	61	0
Lane Group Flow (vph)	0	398	0	0	182	7	1	129	0	41	213	0
Confl. Peds. (#/hr)			1	1								2
Confl. Bikes (#/hr)			2			1						1
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		2			1		3	8		7	4	
Permitted Phases	2			1		1						
Actuated Green, G (s)		16.9			19.0	19.0	0.6	13.7		2.0	15.1	
Effective Green, g (s)		16.9			19.0	19.0	0.6	13.7		2.0	15.1	
Actuated g/C Ratio		0.24			0.27	0.27	0.01	0.19		0.03	0.21	
Clearance Time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Vehicle Extension (s)		4.8			4.8	4.8	2.0	3.3		2.0	4.4	
Lane Grp Cap (vph)		711			270	389	13	334		90	661	
v/s Ratio Prot							0.00	c0.07		c0.01	0.07	
v/s Ratio Perm		c0.13			c0.18	0.00						
v/c Ratio		0.56			0.67	0.02	0.08	0.39		0.46	0.32	
Uniform Delay, d1		23.6			23.1	19.0	34.8	24.8		33.8	23.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.5			8.1	0.0	0.9	0.8		1.3	0.5	
Delay (s)		25.2			31.2	19.0	35.7	25.7		35.1	24.0	
Level of Service		C			C	B	D	C		D	C	
Approach Delay (s)		25.2			29.7			25.7			25.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	70.7	Sum of lost time (s)	19.1
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	422	77	3	280	60	4
Future Volume (vph)	422	77	3	280	60	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		5.7	7.2	6.1	6.1
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4606		1641	4715	1641	1450
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4606		1641	4715	1641	1450
Peak-hour factor, PHF	0.89	0.89	0.85	0.85	0.73	0.73
Adj. Flow (vph)	474	87	4	329	82	5
RTOR Reduction (vph)	20	0	0	0	0	4
Lane Group Flow (vph)	541	0	4	329	82	1
Confl. Peds. (#/hr)						2
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	23.6		0.9	30.2	7.5	7.5
Effective Green, g (s)	23.6		0.9	30.2	7.5	7.5
Actuated g/C Ratio	0.46		0.02	0.59	0.15	0.15
Clearance Time (s)	7.2		5.7	7.2	6.1	6.1
Vehicle Extension (s)	6.9		2.0	6.9	2.0	2.0
Lane Grp Cap (vph)	2131		28	2792	241	213
v/s Ratio Prot	c0.12		0.00	c0.07	c0.05	
v/s Ratio Perm						0.00
v/c Ratio	0.25		0.14	0.12	0.34	0.00
Uniform Delay, d1	8.3		24.7	4.6	19.5	18.6
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		0.9	0.1	0.3	0.0
Delay (s)	8.6		25.5	4.6	19.8	18.6
Level of Service	A		C	A	B	B
Approach Delay (s)	8.6			4.9	19.8	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	51.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	322	58	321	210	54	30	67	497	32	54	43
Future Volume (vph)	76	322	58	321	210	54	30	67	497	32	54	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.87		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4715	1441	1641	4571		1641	1478		3183	1613	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	4715	1441	1641	4571		1641	1478		3183	1613	
Peak-hour factor, PHF	0.91	0.91	0.91	0.90	0.90	0.90	0.78	0.78	0.78	0.79	0.79	0.79
Adj. Flow (vph)	84	354	64	357	233	60	38	86	637	41	68	54
RTOR Reduction (vph)	0	0	53	0	32	0	0	192	0	0	20	0
Lane Group Flow (vph)	84	354	11	357	261	0	38	531	0	41	102	0
Confl. Peds. (#/hr)			3						3			
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	11.5	24.4	24.4	35.2	48.1		6.8	55.2		5.3	54.6	
Effective Green, g (s)	11.5	24.4	24.4	35.2	48.1		6.8	55.2		5.3	54.6	
Actuated g/C Ratio	0.08	0.17	0.17	0.25	0.34		0.05	0.39		0.04	0.39	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	134	821	251	412	1570		79	582		120	629	
v/s Ratio Prot	0.05	c0.08		c0.22	0.06		c0.02	c0.36		0.01	0.06	
v/s Ratio Perm			0.01									
v/c Ratio	0.63	0.43	0.04	0.87	0.17		0.48	0.91		0.34	0.16	
Uniform Delay, d1	62.2	51.6	48.1	50.2	32.0		64.9	40.1		65.6	27.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.4	1.7	0.3	16.6	0.2		1.7	18.8		0.6	0.3	
Delay (s)	68.6	53.3	48.4	66.8	32.2		66.6	58.9		66.3	28.1	
Level of Service	E	D	D	E	C		E	E		E	C	
Approach Delay (s)		55.2			51.2			59.3			37.7	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	54.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	95	26	8	74	67	25	92	4	247	225	36
Future Volume (vph)	11	95	26	8	74	67	25	92	4	247	225	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Frt		0.97			0.94			1.00		1.00	0.98	
Flt Protected		1.00			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		1666			1618			1702		1641	1692	
Flt Permitted		0.96			0.98			0.91		0.66	1.00	
Satd. Flow (perm)		1608			1583			1566		1142	1692	
Peak-hour factor, PHF	0.77	0.77	0.77	0.88	0.88	0.88	0.80	0.80	0.80	0.76	0.76	0.76
Adj. Flow (vph)	14	123	34	9	84	76	31	115	5	325	296	47
RTOR Reduction (vph)	0	27	0	0	60	0	0	2	0	0	11	0
Lane Group Flow (vph)	0	144	0	0	109	0	0	149	0	325	332	0
Confl. Bikes (#/hr)			2									
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.1			7.1			19.0		19.0	19.0	
Effective Green, g (s)		7.1			7.1			19.0		19.0	19.0	
Actuated g/C Ratio		0.21			0.21			0.56		0.56	0.56	
Clearance Time (s)		4.0			4.0			4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		334			329			872		636	942	
v/s Ratio Prot											0.20	
v/s Ratio Perm		c0.09			0.07			0.09		c0.28		
v/c Ratio		0.43			0.33			0.17		0.51	0.35	
Uniform Delay, d1		11.7			11.5			3.7		4.7	4.2	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.9			0.6			0.4		2.9	1.0	
Delay (s)		12.6			12.1			4.1		7.6	5.2	
Level of Service		B			B			A		A	A	
Approach Delay (s)		12.6			12.1			4.1			6.4	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	34.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	61	198	4	8	110	57	3	14	3	147	45	28
Future Volume (vph)	61	198	4	8	110	57	3	14	3	147	45	28
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.83	0.83	0.83	0.82	0.82	0.82
Hourly flow rate (vph)	71	230	5	11	147	76	4	17	4	179	55	34

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	306	234	25	268
Volume Left (vph)	71	11	4	179
Volume Right (vph)	5	76	4	34
Hadj (s)	0.21	-0.02	0.11	0.23
Departure Headway (s)	5.3	5.2	6.0	5.6
Degree Utilization, x	0.45	0.34	0.04	0.42
Capacity (veh/h)	640	645	507	598
Control Delay (s)	12.7	10.9	9.3	12.6
Approach Delay (s)	12.7	10.9	9.3	12.6
Approach LOS	B	B	A	B

Intersection Summary			
Delay	12.1		
Level of Service	B		
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	198	595	451	87	67	108
Future Volume (vph)	198	595	451	87	67	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	6.2	6.2	6.2	5.1	5.1
Lane Util. Factor	0.97	0.95	0.91	1.00	0.97	0.91
Frpb, ped/bikes	1.00	1.00	1.00	0.99	0.99	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	0.93	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.97	1.00
Satd. Flow (prot)	3183	3282	4715	1448	3028	1317
Flt Permitted	0.95	1.00	1.00	1.00	0.97	1.00
Satd. Flow (perm)	3183	3282	4715	1448	3028	1317
Peak-hour factor, PHF	0.83	0.83	0.86	0.86	0.86	0.86
Adj. Flow (vph)	239	717	524	101	78	126
RTOR Reduction (vph)	0	0	0	65	53	59
Lane Group Flow (vph)	239	717	524	36	85	7
Confl. Peds. (#/hr)				3		
Confl. Bikes (#/hr)				1		1
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	5.1	24.2	14.4	14.4	4.5	4.5
Effective Green, g (s)	5.1	24.2	14.4	14.4	4.5	4.5
Actuated g/C Ratio	0.13	0.60	0.36	0.36	0.11	0.11
Clearance Time (s)	4.7	6.2	6.2	6.2	5.1	5.1
Vehicle Extension (s)	2.0	5.8	5.8	5.8	2.0	2.0
Lane Grp Cap (vph)	405	1985	1697	521	340	148
v/s Ratio Prot	c0.08	c0.22	0.11		c0.03	
v/s Ratio Perm				0.03		0.01
v/c Ratio	0.59	0.36	0.31	0.07	0.25	0.05
Uniform Delay, d1	16.5	4.0	9.2	8.4	16.2	15.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	0.3	0.3	0.2	0.1	0.1
Delay (s)	18.0	4.3	9.5	8.6	16.3	15.9
Level of Service	B	A	A	A	B	B
Approach Delay (s)		7.7	9.3		16.2	
Approach LOS		A	A		B	

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	112	69	70	112	91	52
Future Volume (vph)	112	69	70	112	91	52
Peak Hour Factor	0.88	0.88	0.94	0.94	0.72	0.72
Hourly flow rate (vph)	127	78	74	119	126	72

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	205	74	119	198
Volume Left (vph)	0	74	0	126
Volume Right (vph)	78	0	0	72
Hadj (s)	-0.06	0.67	0.17	0.08
Departure Headway (s)	4.7	5.9	5.4	5.0
Degree Utilization, x	0.27	0.12	0.18	0.27
Capacity (veh/h)	721	582	637	684
Control Delay (s)	9.5	8.5	8.4	9.8
Approach Delay (s)	9.5	8.4		9.8
Approach LOS	A	A		A

Intersection Summary			
Delay	9.2		
Level of Service	A		
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	281	49	60	559	1	41	0	9	0	0	12
Future Volume (vph)	30	281	49	60	559	1	41	0	9	0	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9		4.9		4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00		1.00		1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00		0.98		0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00		1.00	
Frt	1.00	0.98		1.00	1.00		1.00		0.85		0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00		1.00	
Satd. Flow (prot)	1641	4540		1641	4714		1638		1443		1450	
Flt Permitted	0.95	1.00		0.95	1.00		1.00		1.00		1.00	
Satd. Flow (perm)	1641	4540		1641	4714		1724		1443		1450	
Peak-hour factor, PHF	0.69	0.69	0.69	0.94	0.94	0.94	0.62	0.62	0.62	0.38	0.38	0.38
Adj. Flow (vph)	43	407	71	64	595	1	66	0	15	0	0	32
RTOR Reduction (vph)	0	27	0	0	0	0	0	0	13	0	29	0
Lane Group Flow (vph)	43	451	0	64	596	0	66	0	2	0	3	0
Confl. Peds. (#/hr)			90			22	4		16	16		4
Confl. Bikes (#/hr)			19			4						2
Turn Type	Prot	NA		Prot	NA		Perm		Perm		NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	1.8	15.2		2.1	15.5		3.6		3.6		3.6	
Effective Green, g (s)	1.8	15.2		2.1	15.5		3.6		3.6		3.6	
Actuated g/C Ratio	0.05	0.43		0.06	0.44		0.10		0.10		0.10	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.9		4.9		4.9	
Vehicle Extension (s)	2.0	6.1		2.0	5.1		2.0		2.0		2.0	
Lane Grp Cap (vph)	84	1966		98	2081		176		148		148	
v/s Ratio Prot	0.03	0.10		c0.04	c0.13						0.00	
v/s Ratio Perm							c0.04		0.00			
v/c Ratio	0.51	0.23		0.65	0.29		0.38		0.01		0.02	
Uniform Delay, d1	16.2	6.3		16.1	6.3		14.7		14.1		14.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00		1.00	
Incremental Delay, d2	2.2	0.2		11.3	0.2		0.5		0.0		0.0	
Delay (s)	18.4	6.4		27.4	6.4		15.2		14.2		14.2	
Level of Service	B	A		C	A		B		B		B	
Approach Delay (s)		7.4			8.5			15.0			14.2	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	35.1	Sum of lost time (s)	14.2
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	259	21	180	486	123	43	26	119	75	53	89
Future Volume (vph)	22	259	21	180	486	123	43	26	119	75	53	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	5.5			4.9	4.9		4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	
Frt	1.00	0.99		1.00	0.97			1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	
Satd. Flow (prot)	1641	4654		1641	4572			1672	1420		2989	
Flt Permitted	0.95	1.00		0.95	1.00			0.68	1.00		0.82	
Satd. Flow (perm)	1641	4654		1641	4572			1179	1420		2494	
Peak-hour factor, PHF	0.66	0.66	0.66	0.90	0.90	0.90	0.67	0.67	0.67	0.96	0.96	0.96
Adj. Flow (vph)	33	392	32	200	540	137	64	39	178	78	55	93
RTOR Reduction (vph)	0	9	0	0	32	0	0	0	139	0	73	0
Lane Group Flow (vph)	33	415	0	200	645	0	0	103	39	0	153	0
Confl. Peds. (#/hr)			16				11		43	43		11
Confl. Bikes (#/hr)			1						3			1
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	2.4	17.9		11.5	26.4			12.1	12.1		12.1	
Effective Green, g (s)	2.4	17.9		11.5	26.4			12.1	12.1		12.1	
Actuated g/C Ratio	0.04	0.32		0.21	0.47			0.22	0.22		0.22	
Clearance Time (s)	4.4	4.9		4.4	5.5			4.9	4.9		4.9	
Vehicle Extension (s)	2.0	8.0		2.0	6.7			4.4	4.4		4.4	
Lane Grp Cap (vph)	70	1495		338	2166			256	308		541	
v/s Ratio Prot	0.02	0.09		c0.12	c0.14							
v/s Ratio Perm								c0.09	0.03		0.06	
v/c Ratio	0.47	0.28		0.59	0.30			0.40	0.13		0.28	
Uniform Delay, d1	26.0	14.1		20.0	9.0			18.7	17.5		18.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	1.8	0.4		1.8	0.3			1.7	0.3		0.5	
Delay (s)	27.9	14.5		21.8	9.2			20.4	17.8		18.7	
Level of Service	C	B		C	A			C	B		B	
Approach Delay (s)		15.5			12.1			18.8			18.7	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	55.7	Sum of lost time (s)	14.8
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	380	73	74	789	0	423
Future Volume (vph)	380	73	74	789	0	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1		5.1	3.0		5.1
Lane Util. Factor	0.91		0.97	0.91		0.88
Frpb, ped/bikes	1.00		1.00	1.00		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.98		1.00	1.00		0.85
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	4590		3183	4715		2584
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	4590		3183	4715		2584
Peak-hour factor, PHF	0.80	0.80	0.91	0.91	0.87	0.87
Adj. Flow (vph)	475	91	81	867	0	486
RTOR Reduction (vph)	56	0	0	0	0	384
Lane Group Flow (vph)	510	0	81	867	0	102
Confl. Peds. (#/hr)		21				
Turn Type	NA		Prot	NA		Over
Protected Phases	2		1	6		1
Permitted Phases						1
Actuated Green, G (s)	9.8		5.3	25.3		5.3
Effective Green, g (s)	9.8		5.3	25.3		5.3
Actuated g/C Ratio	0.39		0.21	1.00		0.21
Clearance Time (s)	5.1		5.1	3.0		5.1
Vehicle Extension (s)	3.9		2.0	0.9		2.0
Lane Grp Cap (vph)	1777		666	4715		541
v/s Ratio Prot	c0.11		0.03	c0.18		0.04
v/s Ratio Perm						
v/c Ratio	0.29		0.12	0.18		0.19
Uniform Delay, d1	5.3		8.1	0.0		8.2
Progression Factor	1.00		1.00	1.00		1.00
Incremental Delay, d2	0.1		0.0	0.0		0.1
Delay (s)	5.5		8.1	0.0		8.3
Level of Service	A		A	A		A
Approach Delay (s)	5.5			0.7	8.3	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	3.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	25.3	Sum of lost time (s)	10.2
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↱
Traffic Volume (veh/h)	0	803	529	0	0	334
Future Volume (Veh/h)	0	803	529	0	0	334
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.89	0.89	0.73	0.73
Hourly flow rate (vph)	0	945	594	0	0	458
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		269	396			
pX, platoon unblocked						
vC, conflicting volume	594				909	198
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	594				909	198
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	42
cM capacity (veh/h)	925				260	786

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	315	315	315	198	198	198	458
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	458
cSH	1700	1700	1700	1700	1700	1700	786
Volume to Capacity	0.19	0.19	0.19	0.12	0.12	0.12	0.58
Queue Length 95th (ft)	0	0	0	0	0	0	96
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	15.8
Lane LOS							C
Approach Delay (s)	0.0			0.0			15.8
Approach LOS							C

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	680	0	0	323	411	206	3	335	0	0	0
Future Volume (vph)	123	680	0	0	323	411	206	3	335	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.1			5.1	5.1		5.1	5.1			
Lane Util. Factor	0.97	0.91			0.86	0.86		1.00	0.88			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			0.94	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3183	4715			4196	1263		1646	2584			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3183	4715			4196	1263		1646	2584			
Peak-hour factor, PHF	0.85	0.85	0.85	0.89	0.89	0.89	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	145	800	0	0	363	462	237	3	385	0	0	0
RTOR Reduction (vph)	0	0	0	0	163	163	0	0	222	0	0	0
Lane Group Flow (vph)	145	800	0	0	431	68	0	240	163	0	0	0
Confl. Bikes (#/hr)			4									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	7.3	26.7			14.7	14.7		13.2	13.2			
Effective Green, g (s)	7.3	26.7			14.7	14.7		13.2	13.2			
Actuated g/C Ratio	0.15	0.53			0.29	0.29		0.26	0.26			
Clearance Time (s)	4.7	5.1			5.1	5.1		5.1	5.1			
Vehicle Extension (s)	2.0	3.9			3.9	3.9		3.0	3.0			
Lane Grp Cap (vph)	463	2512			1231	370		433	680			
v/s Ratio Prot	0.05	c0.17			0.10			c0.15				
v/s Ratio Perm						0.05			0.06			
v/c Ratio	0.31	0.32			0.35	0.18		0.55	0.24			
Uniform Delay, d1	19.2	6.6			13.9	13.2		15.9	14.5			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.1	0.1			0.2	0.3		1.5	0.2			
Delay (s)	19.3	6.7			14.2	13.5		17.5	14.7			
Level of Service	B	A			B	B		B	B			
Approach Delay (s)		8.6			14.0			15.7			0.0	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	50.1	Sum of lost time (s)	14.9
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	22	47	63	4	63	35	49	61	3	61	134	83
Future Volume (vph)	22	47	63	4	63	35	49	61	3	61	134	83
Peak Hour Factor	0.83	0.83	0.83	0.80	0.80	0.80	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	27	57	76	5	79	44	56	70	3	70	154	95

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	27	133	5	123	56	73	224	95
Volume Left (vph)	27	0	5	0	56	0	70	0
Volume Right (vph)	0	76	0	44	0	3	0	95
Hadj (s)	0.67	-0.23	0.67	-0.08	0.67	0.14	0.33	-0.53
Departure Headway (s)	6.5	5.6	6.5	5.8	6.3	5.8	5.8	4.9
Degree Utilization, x	0.05	0.21	0.01	0.20	0.10	0.12	0.36	0.13
Capacity (veh/h)	519	604	515	584	539	586	597	695
Control Delay (s)	8.6	8.8	8.4	9.0	8.8	8.4	10.8	7.5
Approach Delay (s)	8.8		9.0		8.6		9.8	
Approach LOS	A		A		A		A	

Intersection Summary			
Delay	9.2		
Level of Service	A		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	500	0	45	180	0	70
Future Volume (vph)	500	0	45	180	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	0.91		1.00	0.91	1.00	
Frt	1.00		1.00	1.00	0.86	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	5085		1770	5085	1611	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	5085		1770	5085	1611	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	0	49	196	0	76
RTOR Reduction (vph)	0	0	0	0	70	0
Lane Group Flow (vph)	543	0	49	196	6	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases						
Actuated Green, G (s)	18.6		2.3	25.4	2.9	
Effective Green, g (s)	18.6		2.3	25.4	2.9	
Actuated g/C Ratio	0.50		0.06	0.68	0.08	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	2535		109	3462	125	
v/s Ratio Prot	c0.11		c0.03	0.04	c0.00	
v/s Ratio Perm						
v/c Ratio	0.21		0.45	0.06	0.05	
Uniform Delay, d1	5.2		16.9	2.0	15.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.0		2.9	0.0	0.2	
Delay (s)	5.3		19.8	2.0	16.1	
Level of Service	A		B	A	B	
Approach Delay (s)	5.3			5.5	16.1	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	37.3	Sum of lost time (s)	13.5
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	570	0	240	225	0	500
Future Volume (vph)	570	0	240	225	0	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	0.91		1.00	0.91	1.00	
Frt	1.00		1.00	1.00	0.86	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	5085		1770	5085	1611	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	5085		1770	5085	1611	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	620	0	261	245	0	543
RTOR Reduction (vph)	0	0	0	0	145	0
Lane Group Flow (vph)	620	0	261	245	398	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot	NA	Perm	
Protected Phases	2		1	6		
Permitted Phases					4	
Actuated Green, G (s)	12.9		7.8	25.2	17.8	
Effective Green, g (s)	12.9		7.8	25.2	17.8	
Actuated g/C Ratio	0.25		0.15	0.48	0.34	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1261		265	2464	551	
v/s Ratio Prot	c0.12		c0.15	0.05		
v/s Ratio Perm					c0.25	
v/c Ratio	0.49		0.98	0.10	0.72	
Uniform Delay, d1	16.7		22.0	7.3	14.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.3		50.7	0.0	4.7	
Delay (s)	17.0		72.7	7.3	19.6	
Level of Service	B		E	A	B	
Approach Delay (s)	17.0			41.0	19.6	
Approach LOS	B			D	B	

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	52.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	175	230	0	0	56	36	96	0	20	0
Future Volume (vph)	0	0	175	230	0	0	56	36	96	0	20	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5			4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95			1.00	
Frt		0.86			1.00		1.00	0.89			1.00	
Flt Protected		1.00			0.95		0.95	1.00			1.00	
Satd. Flow (prot)		1611			1770		1770	3153			1863	
Flt Permitted		1.00			0.64		0.95	1.00			1.00	
Satd. Flow (perm)		1611			1188		1770	3153			1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	190	250	0	0	61	39	104	0	22	0
RTOR Reduction (vph)	0	134	0	0	0	0	0	57	0	0	0	0
Lane Group Flow (vph)	0	56	0	0	250	0	61	86	0	0	22	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		10.6			10.6		1.9	16.2			9.8	
Effective Green, g (s)		10.6			10.6		1.9	16.2			9.8	
Actuated g/C Ratio		0.30			0.30		0.05	0.45			0.27	
Clearance Time (s)		4.5			4.5		4.5	4.5			4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		477			351		93	1426			509	
v/s Ratio Prot		0.03					c0.03	c0.03			0.01	
v/s Ratio Perm					c0.21							
v/c Ratio		0.12			0.71		0.66	0.06			0.04	
Uniform Delay, d1		9.2			11.2		16.6	5.5			9.6	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.1			6.7		15.4	0.0			0.0	
Delay (s)		9.3			17.9		32.1	5.5			9.6	
Level of Service		A			B		C	A			A	
Approach Delay (s)		9.3			17.9			13.5			9.6	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	35.8	Sum of lost time (s)	13.5
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	155	155	65	72	120	75
Future Volume (vph)	155	155	65	72	120	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.93		1.00	1.00	0.94	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1695		1770	1863	3334	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1695		1770	1863	3334	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	168	168	71	78	130	82
RTOR Reduction (vph)	60	0	0	0	62	0
Lane Group Flow (vph)	276	0	71	78	150	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	11.1		3.7	17.2	9.0	
Effective Green, g (s)	11.1		3.7	17.2	9.0	
Actuated g/C Ratio	0.30		0.10	0.46	0.24	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	504		175	859	804	
v/s Ratio Prot	c0.16		c0.04	0.04	c0.04	
v/s Ratio Perm						
v/c Ratio	0.55		0.41	0.09	0.19	
Uniform Delay, d1	11.0		15.8	5.7	11.2	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.2		1.5	0.0	0.1	
Delay (s)	12.2		17.3	5.7	11.4	
Level of Service	B		B	A	B	
Approach Delay (s)	12.2			11.2	11.4	
Approach LOS	B			B	B	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	37.3	Sum of lost time (s)	13.5
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	10	5	127	270	5
Future Volume (vph)	10	10	5	127	270	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.93		1.00	1.00	1.00	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1695		1770	1863	3530	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1695		1770	1863	3530	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	11	5	138	293	5
RTOR Reduction (vph)	11	0	0	0	1	0
Lane Group Flow (vph)	11	0	5	138	297	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	0.9		0.8	27.5	22.2	
Effective Green, g (s)	0.9		0.8	27.5	22.2	
Actuated g/C Ratio	0.02		0.02	0.74	0.59	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	40		37	1369	2095	
v/s Ratio Prot	c0.01		0.00	c0.07	c0.08	
v/s Ratio Perm						
v/c Ratio	0.28		0.14	0.10	0.14	
Uniform Delay, d1	17.9		18.0	1.4	3.4	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.8		1.7	0.0	0.0	
Delay (s)	21.8		19.6	1.4	3.4	
Level of Service	C		B	A	A	
Approach Delay (s)	21.8			2.1	3.4	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	3.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	37.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	18.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1465	474	28	0	19
Future Volume (Veh/h)	0	1465	474	28	0	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1592	515	30	0	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		695	660			
pX, platoon unblocked					0.61	
vC, conflicting volume	545				2122	187
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	545				2512	187
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	97
cM capacity (veh/h)	1020				14	824

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	SB 1
Volume Total	1592	206	206	133	21
Volume Left	0	0	0	0	0
Volume Right	0	0	0	30	21
cSH	1700	1700	1700	1700	824
Volume to Capacity	0.94	0.12	0.12	0.08	0.03
Queue Length 95th (ft)	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	9.5
Lane LOS					A
Approach Delay (s)	0.0	0.0			9.5
Approach LOS					A

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	100	1365	483	30	100	19
Future Volume (vph)	100	1365	483	30	100	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1641	1727	1713		1641	1468
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1641	1727	1713		1641	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	1484	525	33	109	21
RTOR Reduction (vph)	0	0	1	0	0	19
Lane Group Flow (vph)	109	1484	557	0	109	2
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	14.4	126.0	107.6		13.7	13.7
Effective Green, g (s)	14.4	126.0	107.6		13.7	13.7
Actuated g/C Ratio	0.10	0.85	0.73		0.09	0.09
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	159	1473	1247		152	136
v/s Ratio Prot	0.07	c0.86	0.32		c0.07	
v/s Ratio Perm						0.00
v/c Ratio	0.69	1.01	0.45		0.72	0.01
Uniform Delay, d1	64.5	10.8	8.1		65.1	60.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	11.6	25.3	0.3		14.9	0.0
Delay (s)	76.0	36.1	8.3		80.0	60.9
Level of Service	E	D	A		F	E
Approach Delay (s)		38.9	8.3		76.9	
Approach LOS		D	A		E	

Intersection Summary			
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	147.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Existing + Project PM
1: East Beyer Boulevard/Otay Mesa Road & Beyer Boulevard

11/29/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	13	101	5	5	23	75	56	11	14	51	93
Future Volume (vph)	96	13	101	5	5	23	75	56	11	14	51	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9		4.9		4.9	4.9			5.2	
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.98		0.99		1.00	1.00			0.99	
Flpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85		0.91		1.00	0.98			0.92	
Flt Protected	0.95	0.96	1.00		0.99		0.95	1.00			1.00	
Satd. Flow (prot)	1681	1693	1545		1646		1764	1817			1682	
Flt Permitted	0.95	0.96	1.00		0.99		0.68	1.00			0.97	
Satd. Flow (perm)	1681	1693	1545		1646		1268	1817			1634	
Peak-hour factor, PHF	0.72	0.72	0.72	0.46	0.46	0.46	0.83	0.83	0.83	0.67	0.67	0.67
Adj. Flow (vph)	133	18	140	11	11	50	90	67	13	21	76	139
RTOR Reduction (vph)	0	0	105	0	45	0	0	9	0	0	72	0
Lane Group Flow (vph)	74	77	35	0	27	0	90	71	0	0	164	0
Confl. Peds. (#/hr)			1	1			7					7
Confl. Bikes (#/hr)			2			3						
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	Perm	Split	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		1	1			8			4	
Permitted Phases			2				8			4		
Actuated Green, G (s)	9.7	9.7	9.7		3.6		10.9	10.9			10.6	
Effective Green, g (s)	9.7	9.7	9.7		3.6		10.9	10.9			10.6	
Actuated g/C Ratio	0.25	0.25	0.25		0.09		0.28	0.28			0.27	
Clearance Time (s)	4.9	4.9	4.9		4.9		4.9	4.9			5.2	
Vehicle Extension (s)	2.9	2.9	2.9		2.9		3.8	3.8			4.5	
Lane Grp Cap (vph)	419	422	385		152		355	509			445	
v/s Ratio Prot	0.04	c0.05			c0.02			0.04				
v/s Ratio Perm			0.02				0.07				c0.10	
v/c Ratio	0.18	0.18	0.09		0.18		0.25	0.14			0.37	
Uniform Delay, d1	11.5	11.5	11.2		16.3		10.8	10.5			11.4	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.2	0.1		0.5		0.5	0.2			0.9	
Delay (s)	11.7	11.7	11.3		16.8		11.3	10.6			12.3	
Level of Service	B	B	B		B		B	B			B	
Approach Delay (s)		11.5			16.8			11.0			12.3	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	38.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	304	93	98	380	13	32	0	50	3	2	24
Future Volume (vph)	37	304	93	98	380	13	32	0	50	3	2	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.6		4.4		4.9	4.4	4.9	
Lane Util. Factor	1.00	0.95		0.97	0.91		1.00		1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.99		1.00		0.85	1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)	1770	3403		3433	5055		1769		1563	1768	1588	
Flt Permitted	0.95	1.00		0.95	1.00		1.00		1.00	1.00	1.00	
Satd. Flow (perm)	1770	3403		3433	5055		1862		1563	1861	1588	
Peak-hour factor, PHF	0.98	0.98	0.98	0.94	0.94	0.94	0.79	0.79	0.79	0.73	0.73	0.73
Adj. Flow (vph)	38	310	95	104	404	14	41	0	63	4	3	33
RTOR Reduction (vph)	0	26	0	0	3	0	0	0	58	0	31	0
Lane Group Flow (vph)	38	379	0	104	415	0	41	0	5	4	5	0
Confl. Peds. (#/hr)			3			6	1		3	3		1
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		pm+pt		Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	1.7	19.2		2.7	20.0		4.6		3.4	3.4	2.8	
Effective Green, g (s)	1.7	19.2		2.7	20.0		4.6		3.4	3.4	2.8	
Actuated g/C Ratio	0.04	0.43		0.06	0.44		0.10		0.08	0.08	0.06	
Clearance Time (s)	4.4	5.4		4.4	5.6		4.4		4.9	4.4	4.9	
Vehicle Extension (s)	2.0	5.4		2.0	5.4		2.0		5.6	2.0	2.0	
Lane Grp Cap (vph)	66	1451		205	2246		187		118	139	98	
v/s Ratio Prot	0.02	c0.11		c0.03	0.08		c0.01			0.00	0.00	
v/s Ratio Perm							c0.02		0.00	0.00		
v/c Ratio	0.58	0.26		0.51	0.18		0.22		0.04	0.03	0.05	
Uniform Delay, d1	21.3	8.3		20.5	7.6		18.6		19.3	19.3	19.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2	7.3	0.2		0.7	0.1		0.2		0.4	0.0	0.1	
Delay (s)	28.6	8.6		21.2	7.7		18.8		19.6	19.3	19.9	
Level of Service	C	A		C	A		B		B	B	B	
Approach Delay (s)		10.3			10.4			19.3			19.9	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	3	8	808	10	243	1	357	259	182	161	2
Future Volume (vph)	1	3	8	808	10	243	1	357	259	182	161	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.6	5.2	5.2	6.7	6.7	5.2	6.3	5.2	5.2	6.3	6.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1555	3335	3539	1562	1770	3539	1538	3433	3539	1560
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1555	3335	3539	1562	1770	3539	1538	3433	3539	1560
Peak-hour factor, PHF	0.75	0.75	0.75	0.85	0.85	0.85	0.93	0.93	0.93	0.90	0.90	0.90
Adj. Flow (vph)	1	4	11	951	12	286	1	384	278	202	179	2
RTOR Reduction (vph)	0	0	10	0	0	211	0	0	136	0	0	1
Lane Group Flow (vph)	1	4	1	951	12	75	1	384	142	202	179	1
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)			5			1						4
Heavy Vehicles (%)	2%	2%	2%	5%	2%	2%	2%	2%	5%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2	3	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	1.7	1.7	3.4	20.1	19.0	19.0	1.7	16.9	37.0	11.2	26.4	26.4
Effective Green, g (s)	1.7	1.7	3.4	20.1	19.0	19.0	1.7	16.9	37.0	11.2	26.4	26.4
Actuated g/C Ratio	0.02	0.02	0.05	0.28	0.26	0.26	0.02	0.23	0.51	0.16	0.37	0.37
Clearance Time (s)	5.2	5.6	5.2	5.2	6.7	6.7	5.2	6.3	5.2	5.2	6.3	6.3
Vehicle Extension (s)	2.0	2.0	2.0	3.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	41	83	73	928	931	411	41	828	788	532	1294	570
v/s Ratio Prot	0.00	0.00	0.00	c0.29	0.00		0.00	c0.11	0.05	c0.06	0.05	
v/s Ratio Perm			0.00			c0.05			0.04			0.00
v/c Ratio	0.02	0.05	0.01	1.02	0.01	0.18	0.02	0.46	0.18	0.38	0.14	0.00
Uniform Delay, d1	34.4	34.5	32.8	26.1	19.7	20.6	34.4	23.8	9.5	27.4	15.3	14.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1	0.0	36.0	0.0	0.1	0.1	0.4	0.1	0.2	0.0	0.0
Delay (s)	34.5	34.5	32.8	62.0	19.7	20.7	34.5	24.2	9.6	27.5	15.3	14.5
Level of Service	C	C	C	E	B	C	C	C	A	C	B	B
Approach Delay (s)		33.3			52.2			18.1			21.8	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	37.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	23.4
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	134	2	73	114	544	0	0	145	832
Future Volume (vph)	0	0	0	134	2	73	114	544	0	0	145	832
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.1	5.1	4.7	5.1			5.1	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frpb, ped/bikes					1.00	1.00	1.00	1.00			0.97	
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.87	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1725	1538	1719	4940			4187	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1725	1538	1719	4940			4187	
Peak-hour factor, PHF	0.92	0.92	0.92	0.80	0.80	0.80	0.93	0.93	0.93	0.85	0.85	0.85
Adj. Flow (vph)	0	0	0	168	2	91	123	585	0	0	171	979
RTOR Reduction (vph)	0	0	0	0	0	76	0	0	0	0	472	0
Lane Group Flow (vph)	0	0	0	0	171	15	123	585	0	0	678	0
Confl. Peds. (#/hr)												9
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					8.4	8.4	5.7	31.4			21.0	
Effective Green, g (s)					8.4	8.4	5.7	31.4			21.0	
Actuated g/C Ratio					0.17	0.17	0.11	0.63			0.42	
Clearance Time (s)					5.1	5.1	4.7	5.1			5.1	
Vehicle Extension (s)					3.0	3.0	2.0	3.0			3.0	
Lane Grp Cap (vph)					289	258	195	3102			1758	
v/s Ratio Prot							c0.07	0.12			c0.16	
v/s Ratio Perm					0.10	0.01						
v/c Ratio					0.59	0.06	0.63	0.19			0.85dr	
Uniform Delay, d1					19.2	17.5	21.1	3.9			10.0	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					3.2	0.1	4.8	0.0			0.1	
Delay (s)					22.4	17.6	26.0	4.0			10.2	
Level of Service					C	B	C	A			B	
Approach Delay (s)		0.0			20.8			7.8			10.2	
Approach LOS		A			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	529	2	137	0	0	0	0	130	170	72	215	0
Future Volume (vph)	529	2	137	0	0	0	0	130	170	72	215	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1						5.1		4.7	5.1	
Lane Util. Factor	1.00	1.00						0.91		1.00	0.95	
Frpb, ped/bikes	1.00	1.00						0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	0.85						0.92		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1641	1472						4242		1641	3282	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1641	1472						4242		1641	3282	
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.79	0.79	0.79	0.82	0.82	0.82
Adj. Flow (vph)	557	2	144	0	0	0	0	165	215	88	262	0
RTOR Reduction (vph)	0	79	0	0	0	0	0	178	0	0	0	0
Lane Group Flow (vph)	557	67	0	0	0	0	0	202	0	88	262	0
Confl. Peds. (#/hr)									1			
Confl. Bikes (#/hr)									4			
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4											
Actuated Green, G (s)	22.6	22.6						8.5		3.9	17.1	
Effective Green, g (s)	22.6	22.6						8.5		3.9	17.1	
Actuated g/C Ratio	0.45	0.45						0.17		0.08	0.34	
Clearance Time (s)	5.1	5.1						5.1		4.7	5.1	
Vehicle Extension (s)	3.0	3.0						3.0		2.0	3.0	
Lane Grp Cap (vph)	743	666						722		128	1124	
v/s Ratio Prot		0.05						0.05		c0.05	c0.08	
v/s Ratio Perm	c0.34											
v/c Ratio	0.75	0.10						0.28		0.69	0.23	
Uniform Delay, d1	11.3	7.8						18.0		22.4	11.7	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	4.2	0.1						0.2		11.6	0.1	
Delay (s)	15.5	7.9						18.2		34.0	11.8	
Level of Service	B	A						B		C	B	
Approach Delay (s)		13.9			0.0			18.2			17.4	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	49.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	222	0	0	0	0	8	2	79	2	5	49	325
Future Volume (vph)	222	0	0	0	0	8	2	79	2	5	49	325
Peak Hour Factor	0.84	0.84	0.84	0.67	0.67	0.67	0.71	0.71	0.71	0.91	0.91	0.91
Hourly flow rate (vph)	264	0	0	0	0	12	3	111	3	5	54	357

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	176	88	0	12	3	114	5	411
Volume Left (vph)	176	88	0	0	3	0	5	0
Volume Right (vph)	0	0	0	12	0	3	0	357
Hadj (s)	0.58	0.58	0.00	-0.53	0.67	0.07	0.67	-0.51
Departure Headway (s)	6.4	6.4	6.3	5.7	6.5	5.9	6.2	5.0
Degree Utilization, x	0.31	0.16	0.00	0.02	0.01	0.19	0.01	0.57
Capacity (veh/h)	529	527	531	557	523	578	555	700
Control Delay (s)	11.2	9.4	8.1	7.6	8.3	9.0	8.1	13.3
Approach Delay (s)	10.6		7.6		9.0		13.2	
Approach LOS	B		A		A		B	

Intersection Summary			
Delay	11.7		
Level of Service	B		
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	463	2	0	604	84	0	0	1	0	0	143
Future Volume (Veh/h)	0	463	2	0	604	84	0	0	1	0	0	143
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.92	0.92	0.92	0.25	0.25	0.25	0.62	0.62	0.62
Hourly flow rate (vph)	0	532	2	0	657	91	0	0	4	0	0	231
Pedestrians		1									1	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	749			534			984	1282	178	839	1192	221
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	749			534			984	1282	178	839	1192	221
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			100	100	100	100	100	70
cM capacity (veh/h)	804			976			133	153	809	244	174	757

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	213	213	108	219	219	219	91	4	231
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	2	0	0	0	91	4	231
cSH	1700	1700	1700	1700	1700	1700	1700	809	757
Volume to Capacity	0.13	0.13	0.06	0.13	0.13	0.13	0.05	0.00	0.30
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	32
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.5	11.8
Lane LOS								A	B
Approach Delay (s)	0.0			0.0				9.5	11.8
Approach LOS								A	B

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	98	54	74	289	353	189
Future Volume (vph)	98	54	74	289	353	189
Peak Hour Factor	0.68	0.68	0.76	0.76	0.95	0.95
Hourly flow rate (vph)	144	79	97	380	372	199

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	144	79	97	380	372	199
Volume Left (vph)	144	0	97	0	0	0
Volume Right (vph)	0	79	0	0	0	199
Hadj (s)	0.53	-0.67	0.53	0.17	0.17	-0.67
Departure Headway (s)	7.5	6.3	6.6	6.2	6.1	5.3
Degree Utilization, x	0.30	0.14	0.18	0.65	0.63	0.29
Capacity (veh/h)	446	523	528	560	576	658
Control Delay (s)	12.5	9.1	9.8	19.0	17.9	9.2
Approach Delay (s)	11.3		17.1		14.9	
Approach LOS	B		C		B	

Intersection Summary			
Delay	15.1		
Level of Service	C		
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	65	399	337	140	219	71
Future Volume (vph)	65	399	337	140	219	71
Peak Hour Factor	0.86	0.86	0.91	0.91	0.85	0.85
Hourly flow rate (vph)	76	464	370	154	258	84

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	540	370	154	342
Volume Left (vph)	76	370	0	0
Volume Right (vph)	464	0	0	84
Hadj (s)	-0.32	0.67	0.17	0.02
Departure Headway (s)	6.1	7.8	7.3	6.9
Degree Utilization, x	0.91	0.80	0.31	0.66
Capacity (veh/h)	540	453	482	497
Control Delay (s)	43.6	34.0	12.3	22.1
Approach Delay (s)	43.6	27.6		22.1
Approach LOS	E	D		C

Intersection Summary			
Delay	32.4		
Level of Service	D		
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	316	74	62	315	357	140	57	114	450	51	233
Future Volume (vph)	118	316	74	62	315	357	140	57	114	450	51	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	1.00		1.00	1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	4715	1412	3183	4715	1417	1641	1533		1641	1727	2584
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	4715	1412	3183	4715	1417	1641	1533		1641	1727	2584
Peak-hour factor, PHF	0.88	0.88	0.88	0.76	0.76	0.76	0.93	0.93	0.93	0.70	0.70	0.70
Adj. Flow (vph)	134	359	84	82	414	470	151	61	123	643	73	333
RTOR Reduction (vph)	0	0	64	0	0	352	0	62	0	0	0	216
Lane Group Flow (vph)	134	359	20	82	414	118	151	122	0	643	73	117
Confl. Peds. (#/hr)						11			1			
Confl. Bikes (#/hr)			12			13			5			
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	4.0	26.7	26.7	4.7	27.7	27.7	24.4	16.3		41.1	33.0	37.0
Effective Green, g (s)	4.0	26.7	26.7	4.7	27.7	27.7	24.4	16.3		41.1	33.0	37.0
Actuated g/C Ratio	0.04	0.24	0.24	0.04	0.25	0.25	0.22	0.15		0.37	0.30	0.34
Clearance Time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Vehicle Extension (s)	2.0	4.1	4.1	2.0	4.5	4.5	2.0	4.3		2.0	3.7	2.0
Lane Grp Cap (vph)	115	1143	342	135	1186	356	363	226		612	517	868
v/s Ratio Prot	c0.04	0.08		0.03	c0.09		0.09	c0.08		c0.39	0.04	0.00
v/s Ratio Perm			0.01			0.08						0.04
v/c Ratio	1.17	0.31	0.06	0.61	0.35	0.33	0.42	0.54		1.05	0.14	0.14
Uniform Delay, d1	53.0	34.2	32.1	51.8	33.8	33.6	36.7	43.4		34.5	28.2	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	135.1	0.2	0.1	5.2	0.3	1.0	0.3	3.5		50.4	0.2	0.0
Delay (s)	188.1	34.4	32.2	57.0	34.1	34.6	37.0	47.0		84.9	28.3	25.4
Level of Service	F	C	C	E	C	C	D	D		F	C	C
Approach Delay (s)		69.8			36.3			42.5			62.1	
Approach LOS		E			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	52.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.1	Sum of lost time (s)	21.3
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	0	0	0	0	117	0	1	0	59	0	0
Future Volume (vph)	4	0	0	0	0	117	0	1	0	59	0	0
Peak Hour Factor	0.50	0.50	0.50	0.53	0.53	0.53	0.25	0.25	0.25	0.59	0.59	0.59
Hourly flow rate (vph)	8	0	0	0	0	221	0	4	0	100	0	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	8	221	4	100
Volume Left (vph)	8	0	0	100
Volume Right (vph)	0	221	0	0
Hadj (s)	0.37	-0.43	0.17	0.37
Departure Headway (s)	4.7	3.7	4.7	4.7
Degree Utilization, x	0.01	0.23	0.01	0.13
Capacity (veh/h)	731	938	725	717
Control Delay (s)	7.8	7.9	7.7	8.5
Approach Delay (s)	7.8	7.9	7.7	8.5
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.0		
Level of Service	A		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	500	0	0	360
Future Volume (vph)	0	0	500	0	0	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.5			4.5
Lane Util. Factor			1.00			1.00
Frt			1.00			0.85
Flt Protected			0.95			1.00
Satd. Flow (prot)			1770			1583
Flt Permitted			0.76			1.00
Satd. Flow (perm)			1410			1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	543	0	0	391
RTOR Reduction (vph)	0	0	0	0	0	325
Lane Group Flow (vph)	0	0	543	0	0	66
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type			Perm		Perm	Perm
Protected Phases	4			8		
Permitted Phases			8		2	2
Actuated Green, G (s)			18.4			5.6
Effective Green, g (s)			18.4			5.6
Actuated g/C Ratio			0.56			0.17
Clearance Time (s)			4.5			4.5
Vehicle Extension (s)			3.0			3.0
Lane Grp Cap (vph)			786			268
v/s Ratio Prot						
v/s Ratio Perm			c0.38			c0.04
v/c Ratio			0.69			0.25
Uniform Delay, d1			5.3			11.9
Progression Factor			1.00			1.00
Incremental Delay, d2			2.6			0.5
Delay (s)			7.9			12.4
Level of Service			A			B
Approach Delay (s)	0.0			7.9	12.4	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	33.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	31.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	844	37	141	710	64	41	2	197	102	5	8
Future Volume (vph)	2	844	37	141	710	64	41	2	197	102	5	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		4.0	6.5		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1641	4680		1641	4648		1641	1727	1468	1641	1727	1468
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1641	4680		1641	4648		1641	1727	1468	1641	1727	1468
Peak-hour factor, PHF	0.86	0.86	0.86	0.84	0.84	0.84	0.88	0.88	0.88	0.42	0.42	0.42
Adj. Flow (vph)	2	981	43	168	845	76	47	2	224	243	12	19
RTOR Reduction (vph)	0	3	0	0	5	0	0	0	212	0	0	16
Lane Group Flow (vph)	2	1021	0	168	916	0	47	2	12	243	12	3
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			5			7						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	1.1	63.9		18.7	81.5		14.6	7.6	7.6	31.3	24.3	24.3
Effective Green, g (s)	1.1	63.9		18.7	81.5		14.6	7.6	7.6	31.3	24.3	24.3
Actuated g/C Ratio	0.01	0.46		0.13	0.58		0.10	0.05	0.05	0.22	0.17	0.17
Clearance Time (s)	4.0	6.5		4.0	6.5		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	5.3		2.0	5.3		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	12	2136		219	2705		171	93	79	366	299	254
v/s Ratio Prot	0.00	c0.22		c0.10	0.20		0.03	0.00		c0.15	0.01	
v/s Ratio Perm									c0.01			0.00
v/c Ratio	0.17	0.48		0.77	0.34		0.27	0.02	0.15	0.66	0.04	0.01
Uniform Delay, d1	69.0	26.5		58.5	15.2		57.8	62.7	63.1	49.6	48.1	47.9
Progression Factor	1.00	1.00		1.21	0.56		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	0.8		9.2	0.2		0.3	0.0	0.3	3.5	0.0	0.0
Delay (s)	71.4	27.2		80.1	8.7		58.1	62.7	63.5	53.0	48.2	47.9
Level of Service	E	C		F	A		E	E	E	D	D	D
Approach Delay (s)		27.3			19.7			62.5			52.5	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	645	50	360	1156	416	50	10	247	270	10	20
Future Volume (vph)	50	645	50	360	1156	416	50	10	247	270	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	0.97	0.86	0.86	0.97	0.91	0.88	1.00	1.00		0.97	0.91	0.91
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.94	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	4452	1263	3183	4715	2584	1641	1479		3183	2969	1336
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	4452	1263	3183	4715	2584	1641	1479		3183	2969	1336
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.92	0.88	0.92	0.86	0.86	0.58	0.58	0.92
Adj. Flow (vph)	54	701	54	409	1257	473	54	12	287	466	17	22
RTOR Reduction (vph)	0	1	34	0	0	216	0	214	0	0	7	9
Lane Group Flow (vph)	54	705	15	409	1257	257	54	85	0	466	20	3
Confl. Peds. (#/hr)				1						1		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6						8
Actuated Green, G (s)	4.5	31.0	31.0	18.4	44.9	44.9	4.5	12.2		20.9	28.6	28.6
Effective Green, g (s)	4.5	31.0	31.0	18.4	44.9	44.9	4.5	12.2		20.9	28.6	28.6
Actuated g/C Ratio	0.04	0.31	0.31	0.18	0.45	0.45	0.04	0.12		0.21	0.28	0.28
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	142	1373	389	582	2106	1154	73	179		661	844	380
v/s Ratio Prot	0.02	0.16		c0.13	c0.27		0.03	c0.06		c0.15	0.01	
v/s Ratio Perm			0.01			0.10						0.00
v/c Ratio	0.38	0.51	0.04	0.70	0.60	0.22	0.74	0.48		0.70	0.02	0.01
Uniform Delay, d1	46.6	28.6	24.3	38.5	21.0	17.1	47.4	41.2		36.9	25.9	25.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.7	0.3	0.0	3.8	0.5	0.1	32.0	2.0		3.4	0.0	0.0
Delay (s)	48.3	28.9	24.4	42.3	21.4	17.2	79.4	43.2		40.4	25.9	25.8
Level of Service	D	C	C	D	C	B	E	D		D	C	C
Approach Delay (s)		29.9			24.5			48.7			39.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	1	37	0	292	1	97	112	179	68	1
Future Volume (vph)	0	0	1	37	0	292	1	97	112	179	68	1
Peak Hour Factor	0.25	0.25	0.25	0.60	0.60	0.60	0.85	0.85	0.85	0.68	0.68	0.68
Hourly flow rate (vph)	0	0	4	62	0	487	1	114	132	263	100	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	4	549	247	364
Volume Left (vph)	0	62	1	263
Volume Right (vph)	4	487	132	1
Hadj (s)	-0.52	-0.34	-0.15	0.31
Departure Headway (s)	6.5	5.4	6.1	6.3
Degree Utilization, x	0.01	0.83	0.42	0.64
Capacity (veh/h)	456	645	538	542
Control Delay (s)	9.6	29.2	13.5	19.9
Approach Delay (s)	9.6	29.2	13.5	19.9
Approach LOS	A	D	B	C

Intersection Summary			
Delay	22.9		
Level of Service	C		
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	238	905	738	287	628	347
Future Volume (vph)	238	905	738	287	628	347
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	1641	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	1641	4715	3183	1468
Peak-hour factor, PHF	0.86	0.86	0.78	0.78	0.86	0.86
Adj. Flow (vph)	277	1052	946	368	730	403
RTOR Reduction (vph)	0	320	0	0	0	303
Lane Group Flow (vph)	277	732	946	368	730	100
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	70.7	70.7	24.3	99.0	30.5	30.5
Effective Green, g (s)	70.7	70.7	24.3	99.0	30.5	30.5
Actuated g/C Ratio	0.51	0.51	0.17	0.71	0.22	0.22
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	2381	741	284	3334	693	319
v/s Ratio Prot	0.06		c0.58	0.08	c0.23	
v/s Ratio Perm		c0.50				0.07
v/c Ratio	0.12	0.99	3.33	0.11	1.05	0.31
Uniform Delay, d1	18.2	34.2	57.9	6.5	54.8	45.9
Progression Factor	1.28	3.09	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	28.3	1057.9	0.1	49.1	0.2
Delay (s)	23.5	133.9	1115.8	6.6	103.9	46.1
Level of Service	C	F	F	A	F	D
Approach Delay (s)	110.9			805.1	83.3	
Approach LOS	F			F	F	

Intersection Summary			
HCM 2000 Control Delay	344.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.46		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	105.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	135	1	108	765	853	0	0	1241	322
Future Volume (vph)	0	0	0	135	1	108	765	853	0	0	1241	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.1	5.1	5.1	4.7	5.1			5.1	
Lane Util. Factor				1.00	0.95	0.95	0.97	0.91			0.91	
Frpb, ped/bikes				1.00	0.99	0.99	1.00	1.00			1.00	
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	
Frt				1.00	0.85	0.85	1.00	1.00			0.97	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1641	1379	1375	3183	4715			4558	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1379	1375	3183	4715			4558	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.83	0.83	0.83	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	150	1	120	922	1028	0	0	1443	374
RTOR Reduction (vph)	0	0	0	0	52	52	0	0	0	0	45	0
Lane Group Flow (vph)	0	0	0	150	9	8	922	1028	0	0	1772	0
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)												1
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				13.2	13.2	13.2	29.4	73.8			39.7	
Effective Green, g (s)				13.2	13.2	13.2	29.4	73.8			39.7	
Actuated g/C Ratio				0.14	0.14	0.14	0.30	0.76			0.41	
Clearance Time (s)				5.1	5.1	5.1	4.7	5.1			5.1	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)				222	187	186	962	3579			1861	
v/s Ratio Prot					0.01		c0.29	0.22			c0.39	
v/s Ratio Perm				c0.09		0.01						
v/c Ratio				0.68	0.05	0.04	0.96	0.29			0.95	
Uniform Delay, d1				40.0	36.5	36.5	33.3	3.6			27.8	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				7.9	0.1	0.1	19.5	0.0			11.5	
Delay (s)				47.8	36.6	36.6	52.8	3.6			39.4	
Level of Service				D	D	D	D	A			D	
Approach Delay (s)		0.0			42.8			26.9			39.4	
Approach LOS		A			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	97.2	Sum of lost time (s)	14.9
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	1	640	0	0	0	0	1541	151	150	1226	0
Future Volume (vph)	77	1	640	0	0	0	0	1541	151	150	1226	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1					5.1		4.7	5.1	
Lane Util. Factor		1.00	0.88					0.95		0.97	0.91	
Frt		1.00	0.85					0.99		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1646	2584					3238		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1646	2584					3238		3183	4715	
Peak-hour factor, PHF	0.87	0.87	0.87	0.92	0.92	0.92	0.84	0.84	0.84	0.92	0.92	0.92
Adj. Flow (vph)	89	1	736	0	0	0	0	1835	180	163	1333	0
RTOR Reduction (vph)	0	0	114	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	90	622	0	0	0	0	2009	0	163	1333	0
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		29.9	29.9					77.7		7.5	89.9	
Effective Green, g (s)		29.9	29.9					77.7		7.5	89.9	
Actuated g/C Ratio		0.23	0.23					0.60		0.06	0.69	
Clearance Time (s)		5.1	5.1					5.1		4.7	5.1	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		378	594					1935		183	3260	
v/s Ratio Prot								c0.62		c0.05	0.28	
v/s Ratio Perm		0.05	c0.24									
v/c Ratio		0.24	1.05					1.04		0.89	0.41	
Uniform Delay, d1		40.8	50.1					26.1		60.8	8.6	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.3	49.9					31.2		37.5	0.1	
Delay (s)		41.1	99.9					57.4		98.3	8.7	
Level of Service		D	F					E		F	A	
Approach Delay (s)		93.5			0.0			57.4			18.5	
Approach LOS		F			A			E			B	

Intersection Summary			
HCM 2000 Control Delay	50.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1025	160	58	29	238	277	90	342	31	185	146	1556
Future Volume (vph)	1025	160	58	29	238	277	90	342	31	185	146	1556
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9			5.1	5.1	4.4	4.9		4.4	5.1	5.1
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96			1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1653			1718	1442	1641	3241		1641	1727	1437
Flt Permitted	0.95	1.00			0.94	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1653			1623	1442	1641	3241		1641	1727	1437
Peak-hour factor, PHF	0.89	0.89	0.89	0.79	0.79	0.79	0.79	0.79	0.79	0.89	0.89	0.89
Adj. Flow (vph)	1152	180	65	37	301	351	114	433	39	208	164	1748
RTOR Reduction (vph)	0	7	0	0	0	194	0	5	0	0	0	393
Lane Group Flow (vph)	1152	238	0	0	338	157	114	467	0	208	164	1355
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						1
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases						6						8
Actuated Green, G (s)	46.6	57.0			30.9	20.9	12.1	47.6		15.6	50.9	50.9
Effective Green, g (s)	46.6	57.0			30.9	20.9	12.1	47.6		15.6	50.9	50.9
Actuated g/C Ratio	0.31	0.38			0.21	0.14	0.08	0.32		0.10	0.34	0.34
Clearance Time (s)	4.4	4.9			5.1	5.1	4.4	4.9		4.4	5.1	5.1
Vehicle Extension (s)	2.0	3.8			3.8	3.8	2.0	3.8		2.0	3.8	3.8
Lane Grp Cap (vph)	511	630			341	201	132	1031		171	587	489
v/s Ratio Prot	c0.70	0.14			0.07		0.07	0.14		c0.13	0.09	
v/s Ratio Perm					c0.14	0.11						c0.94
v/c Ratio	2.25	0.38			0.99	0.78	0.86	0.45		1.22	0.28	2.77
Uniform Delay, d1	51.5	33.4			59.2	62.1	67.9	40.6		67.0	35.9	49.3
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	570.7	0.5			46.2	18.6	39.4	0.4		138.9	0.3	802.6
Delay (s)	622.2	33.9			105.4	80.7	107.2	41.0		205.8	36.3	851.9
Level of Service	F	C			F	F	F	D		F	D	F
Approach Delay (s)		519.0			92.8			53.9			725.4	
Approach LOS		F			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	492.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.18		
Actuated Cycle Length (s)	149.5	Sum of lost time (s)	19.5
Intersection Capacity Utilization	127.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	202	2	6	297	24	6	149	4	22	67	28
Future Volume (vph)	111	202	2	6	297	24	6	149	4	22	67	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Lane Util. Factor		0.95			1.00	1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes		1.00			1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00			1.00	0.85	1.00	1.00		1.00	0.96	
Flt Protected		0.98			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3222			1725	1447	1641	1720		3183	3107	
Flt Permitted		0.72			0.60	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2346			1028	1447	1641	1720		3183	3107	
Peak-hour factor, PHF	0.81	0.81	0.81	0.79	0.79	0.79	0.68	0.68	0.68	0.78	0.78	0.78
Adj. Flow (vph)	137	249	2	8	376	30	9	219	6	28	86	36
RTOR Reduction (vph)	0	0	0	0	0	17	0	1	0	0	29	0
Lane Group Flow (vph)	0	388	0	0	384	13	9	224	0	28	93	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						5						5
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		2			1		3	8		7	4	
Permitted Phases	2			1		1						
Actuated Green, G (s)		22.8			49.6	49.6	0.7	21.7		2.2	23.2	
Effective Green, g (s)		22.8			49.6	49.6	0.7	21.7		2.2	23.2	
Actuated g/C Ratio		0.20			0.43	0.43	0.01	0.19		0.02	0.20	
Clearance Time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Vehicle Extension (s)		4.8			4.8	4.8	2.0	3.3		2.0	4.4	
Lane Grp Cap (vph)		463			441	621	9	323		60	624	
v/s Ratio Prot							0.01	c0.13		c0.01	0.03	
v/s Ratio Perm		c0.17			c0.37	0.01						
v/c Ratio		0.84			0.87	0.02	1.00	0.69		0.47	0.15	
Uniform Delay, d1		44.5			30.0	18.9	57.4	43.8		56.0	38.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		13.7			18.0	0.0	300.0	6.5		2.1	0.2	
Delay (s)		58.2			48.0	19.0	357.4	50.2		58.1	38.2	
Level of Service		E			D	B	F	D		E	D	
Approach Delay (s)		58.2			45.9			62.0			41.9	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	52.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	115.4	Sum of lost time (s)	19.1
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	398	82	7	485	113	7
Future Volume (vph)	398	82	7	485	113	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		5.7	7.2	6.1	6.1
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4595		1641	4715	1641	1468
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4595		1641	4715	1641	1468
Peak-hour factor, PHF	0.93	0.93	0.79	0.79	0.71	0.71
Adj. Flow (vph)	428	88	9	614	159	10
RTOR Reduction (vph)	26	0	0	0	0	8
Lane Group Flow (vph)	490	0	9	614	159	2
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	21.9		0.9	28.5	10.8	10.8
Effective Green, g (s)	21.9		0.9	28.5	10.8	10.8
Actuated g/C Ratio	0.42		0.02	0.54	0.21	0.21
Clearance Time (s)	7.2		5.7	7.2	6.1	6.1
Vehicle Extension (s)	6.9		2.0	6.9	2.0	2.0
Lane Grp Cap (vph)	1913		28	2554	336	301
v/s Ratio Prot	0.11		0.01	c0.13	c0.10	
v/s Ratio Perm						0.00
v/c Ratio	0.26		0.32	0.24	0.47	0.01
Uniform Delay, d1	10.0		25.5	6.3	18.4	16.6
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		2.4	0.2	0.4	0.0
Delay (s)	10.3		28.0	6.5	18.8	16.6
Level of Service	B		C	A	B	B
Approach Delay (s)	10.3			6.8	18.7	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	52.6	Sum of lost time (s)	19.0
Intersection Capacity Utilization	28.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	206	112	488	367	71	38	79	262	35	153	66
Future Volume (vph)	52	206	112	488	367	71	38	79	262	35	153	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.88		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4715	1445	1641	4601		1641	1511		3183	1649	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	4715	1445	1641	4601		1641	1511		3183	1649	
Peak-hour factor, PHF	0.86	0.86	0.86	0.76	0.76	0.76	0.72	0.72	0.72	0.88	0.88	0.88
Adj. Flow (vph)	60	240	130	642	483	93	53	110	364	40	174	75
RTOR Reduction (vph)	0	0	115	0	22	0	0	80	0	0	10	0
Lane Group Flow (vph)	60	240	15	642	554	0	53	394	0	40	239	0
Confl. Peds. (#/hr)									1			
Confl. Bikes (#/hr)			2						2			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	7.4	15.7	15.7	56.1	64.4		7.9	43.0		5.3	41.3	
Effective Green, g (s)	7.4	15.7	15.7	56.1	64.4		7.9	43.0		5.3	41.3	
Actuated g/C Ratio	0.05	0.11	0.11	0.40	0.46		0.06	0.31		0.04	0.29	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	86	528	162	657	2116		92	464		120	486	
v/s Ratio Prot	0.04	c0.05		c0.39	0.12		c0.03	c0.26		0.01	0.14	
v/s Ratio Perm			0.01									
v/c Ratio	0.70	0.45	0.09	0.98	0.26		0.58	0.85		0.33	0.49	
Uniform Delay, d1	65.2	58.1	55.7	41.3	23.2		64.4	45.5		65.6	40.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.0	2.8	1.1	29.0	0.3		5.3	13.7		0.6	1.8	
Delay (s)	83.2	61.0	56.8	70.3	23.5		69.7	59.2		66.2	42.5	
Level of Service	F	E	E	E	C		E	E		E	D	
Approach Delay (s)		62.8			48.2			60.3			45.8	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	53.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	114	27	13	110	207	30	245	3	182	159	31
Future Volume (vph)	40	114	27	13	110	207	30	245	3	182	159	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.99			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Frt		0.98			0.92			1.00		1.00	0.98	
Flt Protected		0.99			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		1668			1563			1715		1641	1681	
Flt Permitted		0.78			0.98			0.96		0.56	1.00	
Satd. Flow (perm)		1315			1541			1650		975	1681	
Peak-hour factor, PHF	0.78	0.78	0.78	0.87	0.87	0.87	0.79	0.79	0.79	0.84	0.84	0.84
Adj. Flow (vph)	51	146	35	15	126	238	38	310	4	217	189	37
RTOR Reduction (vph)	0	12	0	0	110	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	220	0	0	269	0	0	352	0	217	217	0
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			1			3						
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		14.5			14.5			33.3		33.3	33.3	
Effective Green, g (s)		14.5			14.5			33.3		33.3	33.3	
Actuated g/C Ratio		0.26			0.26			0.60		0.60	0.60	
Clearance Time (s)		4.0			4.0			4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		341			400			984		581	1003	
v/s Ratio Prot											0.13	
v/s Ratio Perm		0.17			c0.17			0.21		c0.22		
v/c Ratio		0.65			0.67			0.36		0.37	0.22	
Uniform Delay, d1		18.4			18.5			5.8		5.8	5.2	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		4.2			4.4			1.0		1.8	0.5	
Delay (s)		22.5			23.0			6.8		7.7	5.7	
Level of Service		C			C			A		A	A	
Approach Delay (s)		22.5			23.0			6.8			6.7	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	55.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	43	156	24	26	226	85	0	62	1	71	122	71
Future Volume (vph)	43	156	24	26	226	85	0	62	1	71	122	71
Peak Hour Factor	0.82	0.82	0.82	0.79	0.79	0.79	0.66	0.66	0.66	0.85	0.85	0.85
Hourly flow rate (vph)	52	190	29	33	286	108	0	94	2	84	144	84

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	271	427	96	312
Volume Left (vph)	52	33	0	84
Volume Right (vph)	29	108	2	84
Hadj (s)	0.14	0.03	0.16	0.06
Departure Headway (s)	6.3	5.9	7.0	6.3
Degree Utilization, x	0.47	0.70	0.19	0.55
Capacity (veh/h)	532	591	410	529
Control Delay (s)	14.7	21.2	11.6	16.6
Approach Delay (s)	14.7	21.2	11.6	16.6
Approach LOS	B	C	B	C

Intersection Summary			
Delay	17.5		
Level of Service	C		
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	112	350	667	94	88	193
Future Volume (vph)	112	350	667	94	88	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	6.2	6.2	6.2	5.1	5.1
Lane Util. Factor	0.97	0.95	0.91	1.00	0.97	0.91
Frpb, ped/bikes	1.00	1.00	1.00	0.99	0.99	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	0.92	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.98	1.00
Satd. Flow (prot)	3183	3282	4715	1447	2987	1311
Flt Permitted	0.95	1.00	1.00	1.00	0.98	1.00
Satd. Flow (perm)	3183	3282	4715	1447	2987	1311
Peak-hour factor, PHF	0.79	0.79	0.77	0.77	0.82	0.82
Adj. Flow (vph)	142	443	866	122	107	235
RTOR Reduction (vph)	0	0	0	71	102	101
Lane Group Flow (vph)	142	443	866	51	123	16
Confl. Bikes (#/hr)				4		4
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	5.1	29.6	19.8	19.8	6.6	6.6
Effective Green, g (s)	5.1	29.6	19.8	19.8	6.6	6.6
Actuated g/C Ratio	0.11	0.62	0.42	0.42	0.14	0.14
Clearance Time (s)	4.7	6.2	6.2	6.2	5.1	5.1
Vehicle Extension (s)	2.0	5.8	5.8	5.8	2.0	2.0
Lane Grp Cap (vph)	341	2045	1965	603	415	182
v/s Ratio Prot	c0.04	0.13	c0.18		c0.04	
v/s Ratio Perm				0.04		0.01
v/c Ratio	0.42	0.22	0.44	0.08	0.30	0.09
Uniform Delay, d1	19.8	3.9	9.9	8.4	18.4	17.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	0.4	0.2	0.1	0.1
Delay (s)	20.1	4.0	10.3	8.5	18.5	17.9
Level of Service	C	A	B	A	B	B
Approach Delay (s)		7.9	10.1		18.3	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	47.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	121	131	64	190	85	53
Future Volume (vph)	121	131	64	190	85	53
Peak Hour Factor	0.81	0.81	0.97	0.97	0.78	0.78
Hourly flow rate (vph)	149	162	66	196	109	68

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	311	66	196	177
Volume Left (vph)	0	66	0	109
Volume Right (vph)	162	0	0	68
Hadj (s)	-0.14	0.67	0.17	0.06
Departure Headway (s)	4.7	6.0	5.5	5.3
Degree Utilization, x	0.41	0.11	0.30	0.26
Capacity (veh/h)	730	577	632	614
Control Delay (s)	10.9	8.5	9.6	10.2
Approach Delay (s)	10.9	9.3		10.2
Approach LOS	B	A		B

Intersection Summary			
Delay	10.2		
Level of Service	B		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	421	43	30	610	0	60	0	26	0	1	33
Future Volume (vph)	13	421	43	30	610	0	60	0	26	0	1	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9		4.9		4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00		1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00		0.98		0.91	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00		1.00	
Frt	1.00	0.99		1.00	1.00		1.00		0.85		0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00		1.00	
Satd. Flow (prot)	1641	4623		1641	4715		1641		1437		1362	
Flt Permitted	0.95	1.00		0.95	1.00		0.87		1.00		1.00	
Satd. Flow (perm)	1641	4623		1641	4715		1502		1437		1362	
Peak-hour factor, PHF	0.74	0.74	0.74	0.94	0.94	0.94	0.81	0.81	0.81	0.60	0.60	0.60
Adj. Flow (vph)	18	569	58	32	649	0	74	0	32	0	2	55
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	28	0	48	0
Lane Group Flow (vph)	18	615	0	32	649	0	74	0	4	0	9	0
Confl. Peds. (#/hr)			49			10			6	6		
Confl. Bikes (#/hr)			3						4			25
Turn Type	Prot	NA		Prot	NA		Perm		Perm		NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	0.6	18.7		0.7	18.8		4.6		4.6		4.6	
Effective Green, g (s)	0.6	18.7		0.7	18.8		4.6		4.6		4.6	
Actuated g/C Ratio	0.02	0.49		0.02	0.49		0.12		0.12		0.12	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.9		4.9		4.9	
Vehicle Extension (s)	2.0	6.1		2.0	5.1		2.0		2.0		2.0	
Lane Grp Cap (vph)	25	2263		30	2320		180		173		164	
v/s Ratio Prot	0.01	0.13		c0.02	c0.14						0.01	
v/s Ratio Perm							c0.05		0.00			
v/c Ratio	0.72	0.27		1.07	0.28		0.41		0.02		0.05	
Uniform Delay, d1	18.7	5.7		18.8	5.7		15.5		14.8		14.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00		1.00	
Incremental Delay, d2	58.2	0.2		185.4	0.1		0.6		0.0		0.0	
Delay (s)	77.0	5.9		204.1	5.9		16.1		14.8		14.9	
Level of Service	E	A		F	A		B		B		B	
Approach Delay (s)		7.9			15.2			15.7			14.9	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	38.2	Sum of lost time (s)	14.2
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	286	46	154	487	125	45	49	251	138	56	108
Future Volume (vph)	65	286	46	154	487	125	45	49	251	138	56	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	5.5			4.9	4.9		4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	
Frt	1.00	0.98		1.00	0.97			1.00	0.85		0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.98	
Satd. Flow (prot)	1641	4617		1641	4551			1685	1419		2986	
Flt Permitted	0.95	1.00		0.95	1.00			0.70	1.00		0.79	
Satd. Flow (perm)	1641	4617		1641	4551			1216	1419		2402	
Peak-hour factor, PHF	0.69	0.69	0.69	0.93	0.93	0.93	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	94	414	67	166	524	134	53	58	295	162	66	127
RTOR Reduction (vph)	0	21	0	0	40	0	0	0	223	0	96	0
Lane Group Flow (vph)	94	460	0	166	618	0	0	111	72	0	259	0
Confl. Peds. (#/hr)						1	10		46	46		10
Confl. Bikes (#/hr)						1			3			11
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	6.6	16.7		10.2	19.7			13.2	13.2		13.2	
Effective Green, g (s)	6.6	16.7		10.2	19.7			13.2	13.2		13.2	
Actuated g/C Ratio	0.12	0.31		0.19	0.36			0.24	0.24		0.24	
Clearance Time (s)	4.4	4.9		4.4	5.5			4.9	4.9		4.9	
Vehicle Extension (s)	2.0	8.0		2.0	6.7			4.4	4.4		4.4	
Lane Grp Cap (vph)	199	1419		308	1651			295	344		583	
v/s Ratio Prot	0.06	0.10		c0.10	c0.14							
v/s Ratio Perm								0.09	0.05		c0.11	
v/c Ratio	0.47	0.32		0.54	0.37			0.38	0.21		0.44	
Uniform Delay, d1	22.2	14.5		19.9	12.8			17.1	16.4		17.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.6	0.6		0.9	0.5			1.3	0.5		0.9	
Delay (s)	22.9	15.0		20.8	13.2			18.5	16.9		18.3	
Level of Service	C	B		C	B			B	B		B	
Approach Delay (s)		16.3			14.8			17.3			18.3	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	54.3	Sum of lost time (s)	14.8
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	637	41	142	780	0	291
Future Volume (vph)	637	41	142	780	0	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1		5.1	3.0		5.1
Lane Util. Factor	0.91		0.97	0.91		0.88
Frpb, ped/bikes	1.00		1.00	1.00		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	1.00		0.85
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	4667		3183	4715		2584
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	4667		3183	4715		2584
Peak-hour factor, PHF	0.75	0.75	0.97	0.97	0.86	0.86
Adj. Flow (vph)	849	55	146	804	0	338
RTOR Reduction (vph)	14	0	0	0	0	219
Lane Group Flow (vph)	890	0	146	804	0	119
Confl. Peds. (#/hr)		20				
Turn Type	NA		Prot	NA		Over
Protected Phases	2		1	6		1
Permitted Phases						1
Actuated Green, G (s)	15.6		6.2	32.0		6.2
Effective Green, g (s)	15.6		6.2	32.0		6.2
Actuated g/C Ratio	0.49		0.19	1.00		0.19
Clearance Time (s)	5.1		5.1	3.0		5.1
Vehicle Extension (s)	3.9		2.0	0.9		2.0
Lane Grp Cap (vph)	2275		616	4715		500
v/s Ratio Prot	c0.19		0.05	c0.17		0.05
v/s Ratio Perm						
v/c Ratio	0.39		0.24	0.17		0.24
Uniform Delay, d1	5.2		10.9	0.0		10.9
Progression Factor	1.00		1.00	1.00		1.00
Incremental Delay, d2	0.1		0.1	0.0		0.1
Delay (s)	5.3		11.0	0.0		11.0
Level of Service	A		B	A		B
Approach Delay (s)	5.3			1.7	11.0	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	32.0	Sum of lost time (s)	10.2
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↱
Traffic Volume (veh/h)	0	928	535	0	0	387
Future Volume (Veh/h)	0	928	535	0	0	387
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.82	0.82	0.87	0.87	0.91	0.91
Hourly flow rate (vph)	0	1132	615	0	0	425
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		269	396			
pX, platoon unblocked					0.94	
vC, conflicting volume	615				992	205
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	615				779	205
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	45
cM capacity (veh/h)	908				298	777

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	377	377	377	205	205	205	425
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	425
cSH	1700	1700	1700	1700	1700	1700	777
Volume to Capacity	0.22	0.22	0.22	0.12	0.12	0.12	0.55
Queue Length 95th (ft)	0	0	0	0	0	0	84
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	15.1
Lane LOS							C
Approach Delay (s)	0.0			0.0			15.1
Approach LOS							C

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	448	479	0	0	485	749	50	1	219	0	0	0
Future Volume (vph)	448	479	0	0	485	749	50	1	219	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.1			5.1	5.1		5.1	5.1			
Lane Util. Factor	0.97	0.91			0.86	0.86		1.00	0.88			
Frpb, ped/bikes	1.00	1.00			0.99	0.98		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			0.93	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3183	4715			4131	1239		1646	2584			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3183	4715			4131	1239		1646	2584			
Peak-hour factor, PHF	0.82	0.82	0.82	0.92	0.92	0.92	0.75	0.75	0.75	0.92	0.92	0.92
Adj. Flow (vph)	546	584	0	0	527	814	67	1	292	0	0	0
RTOR Reduction (vph)	0	0	0	0	209	263	0	0	249	0	0	0
Lane Group Flow (vph)	546	584	0	0	725	144	0	68	43	0	0	0
Confl. Peds. (#/hr)						2	3					
Confl. Bikes (#/hr)			3			8						
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	12.0	35.7			19.0	19.0		7.9	7.9			
Effective Green, g (s)	12.0	35.7			19.0	19.0		7.9	7.9			
Actuated g/C Ratio	0.22	0.66			0.35	0.35		0.15	0.15			
Clearance Time (s)	4.7	5.1			5.1	5.1		5.1	5.1			
Vehicle Extension (s)	2.0	3.9			3.9	3.9		3.0	3.0			
Lane Grp Cap (vph)	709	3128			1458	437		241	379			
v/s Ratio Prot	c0.17	0.12			c0.18			c0.04				
v/s Ratio Perm						0.12			0.02			
v/c Ratio	0.77	0.19			0.50	0.33		0.28	0.11			
Uniform Delay, d1	19.6	3.5			13.7	12.7		20.4	19.9			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	4.7	0.0			0.4	0.6		0.6	0.1			
Delay (s)	24.3	3.5			14.0	13.3		21.1	20.0			
Level of Service	C	A			B	B		C	C			
Approach Delay (s)		13.6			13.8			20.2			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	53.8	Sum of lost time (s)	14.9
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	37	91	57	3	128	89	75	108	0	38	73	31
Future Volume (vph)	37	91	57	3	128	89	75	108	0	38	73	31
Peak Hour Factor	0.91	0.91	0.91	0.90	0.90	0.90	0.81	0.81	0.81	0.89	0.89	0.89
Hourly flow rate (vph)	41	100	63	3	142	99	93	133	0	43	82	35

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	41	163	3	241	93	133	125	35
Volume Left (vph)	41	0	3	0	93	0	43	0
Volume Right (vph)	0	63	0	99	0	0	0	35
Hadj (s)	0.67	-0.10	0.67	-0.12	0.67	0.17	0.34	-0.53
Departure Headway (s)	6.6	5.8	6.6	5.8	6.6	6.1	6.4	5.5
Degree Utilization, x	0.08	0.26	0.01	0.39	0.17	0.23	0.22	0.05
Capacity (veh/h)	513	583	519	596	512	552	525	601
Control Delay (s)	8.9	9.7	8.4	11.2	9.8	9.7	10.1	7.7
Approach Delay (s)	9.6		11.1		9.8		9.5	
Approach LOS	A		B		A		A	

Intersection Summary			
Delay	10.1		
Level of Service	B		
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	360	0	183	500	0	45
Future Volume (vph)	360	0	183	500	0	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	0.91		1.00	0.91	1.00	
Frt	1.00		1.00	1.00	0.86	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	5085		1770	5085	1611	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	5085		1770	5085	1611	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	391	0	199	543	0	49
RTOR Reduction (vph)	0	0	0	0	48	0
Lane Group Flow (vph)	391	0	199	543	1	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases						
Actuated Green, G (s)	11.4		7.8	23.7	0.9	
Effective Green, g (s)	11.4		7.8	23.7	0.9	
Actuated g/C Ratio	0.34		0.23	0.71	0.03	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1725		410	3586	43	
v/s Ratio Prot	c0.08		c0.11	0.11	c0.00	
v/s Ratio Perm						
v/c Ratio	0.23		0.49	0.15	0.03	
Uniform Delay, d1	7.9		11.2	1.6	15.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.1		0.9	0.0	0.3	
Delay (s)	8.0		12.1	1.7	16.2	
Level of Service	A		B	A	B	
Approach Delay (s)	8.0			4.4	16.2	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	33.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	405	0	543	683	0	340
Future Volume (vph)	405	0	543	683	0	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	0.91		1.00	0.91	1.00	
Frt	1.00		1.00	1.00	0.86	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	5085		1770	5085	1611	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	5085		1770	5085	1611	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	440	0	590	742	0	370
RTOR Reduction (vph)	0	0	0	0	337	0
Lane Group Flow (vph)	440	0	590	742	33	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot	NA	Perm	
Protected Phases	2		1	6		
Permitted Phases					4	
Actuated Green, G (s)	11.5		30.7	46.7	5.5	
Effective Green, g (s)	11.5		30.7	46.7	5.5	
Actuated g/C Ratio	0.19		0.50	0.76	0.09	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	955		887	3880	144	
v/s Ratio Prot	c0.09		c0.33	0.15		
v/s Ratio Perm					c0.02	
v/c Ratio	0.46		0.67	0.19	0.23	
Uniform Delay, d1	22.1		11.4	2.0	25.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.4		1.9	0.0	0.8	
Delay (s)	22.4		13.3	2.0	26.7	
Level of Service	C		B	A	C	
Approach Delay (s)	22.4			7.0	26.7	
Approach LOS	C			A	C	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	61.2	Sum of lost time (s)	13.5
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	10	120	160	0	0	200	16	260	0	20	0
Future Volume (vph)	0	10	120	160	0	0	200	16	260	0	20	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5			4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95			1.00	
Frt		0.88			1.00		1.00	0.86			1.00	
Flt Protected		1.00			0.95		0.95	1.00			1.00	
Satd. Flow (prot)		1631			1770		1770	3038			1863	
Flt Permitted		1.00			0.67		0.95	1.00			1.00	
Satd. Flow (perm)		1631			1243		1770	3038			1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	11	130	174	0	0	217	17	283	0	22	0
RTOR Reduction (vph)	0	102	0	0	0	0	0	123	0	0	0	0
Lane Group Flow (vph)	0	39	0	0	174	0	217	177	0	0	22	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		9.1			9.1		8.3	23.6			10.8	
Effective Green, g (s)		9.1			9.1		8.3	23.6			10.8	
Actuated g/C Ratio		0.22			0.22		0.20	0.57			0.26	
Clearance Time (s)		4.5			4.5		4.5	4.5			4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		355			271		352	1719			482	
v/s Ratio Prot		0.02					c0.12	c0.06			0.01	
v/s Ratio Perm					c0.14							
v/c Ratio		0.11			0.64		0.62	0.10			0.05	
Uniform Delay, d1		13.1			14.8		15.2	4.2			11.6	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.1			5.1		3.2	0.0			0.0	
Delay (s)		13.2			19.9		18.4	4.2			11.6	
Level of Service		B			B		B	A			B	
Approach Delay (s)		13.2			19.9			10.2			11.6	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	41.7	Sum of lost time (s)	13.5
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	103	100	168	204	245	175
Future Volume (vph)	103	100	168	204	245	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.93		1.00	1.00	0.94	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1696		1770	1863	3318	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1696		1770	1863	3318	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	112	109	183	222	266	190
RTOR Reduction (vph)	62	0	0	0	126	0
Lane Group Flow (vph)	159	0	183	222	330	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	7.7		7.8	27.0	14.7	
Effective Green, g (s)	7.7		7.8	27.0	14.7	
Actuated g/C Ratio	0.18		0.18	0.62	0.34	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	298		315	1151	1116	
v/s Ratio Prot	c0.09		c0.10	0.12	c0.10	
v/s Ratio Perm						
v/c Ratio	0.53		0.58	0.19	0.30	
Uniform Delay, d1	16.4		16.5	3.6	10.7	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.8		2.7	0.1	0.1	
Delay (s)	18.2		19.2	3.7	10.8	
Level of Service	B		B	A	B	
Approach Delay (s)	18.2			10.7	10.8	
Approach LOS	B			B	B	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	43.7	Sum of lost time (s)	13.5
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	10	8	362	337	8
Future Volume (vph)	10	10	8	362	337	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.93		1.00	1.00	1.00	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1695		1770	1863	3526	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1695		1770	1863	3526	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	11	9	393	366	9
RTOR Reduction (vph)	11	0	0	0	2	0
Lane Group Flow (vph)	11	0	9	393	373	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	0.9		0.9	28.7	23.3	
Effective Green, g (s)	0.9		0.9	28.7	23.3	
Actuated g/C Ratio	0.02		0.02	0.74	0.60	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	39		41	1385	2128	
v/s Ratio Prot	c0.01		0.01	c0.21	0.11	
v/s Ratio Perm						
v/c Ratio	0.29		0.22	0.28	0.18	
Uniform Delay, d1	18.5		18.5	1.6	3.4	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	4.1		2.7	0.1	0.0	
Delay (s)	22.6		21.2	1.7	3.4	
Level of Service	C		C	A	A	
Approach Delay (s)	22.6			2.2	3.4	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	3.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	38.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	29.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1162	1847	84	0	15
Future Volume (Veh/h)	0	1162	1847	84	0	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1263	2008	91	0	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		695	695			
pX, platoon unblocked					0.79	
vC, conflicting volume	2099				3316	715
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2099				3798	715
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	96
cM capacity (veh/h)	259				2	373

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	SB 1
Volume Total	1263	803	803	493	16
Volume Left	0	0	0	0	0
Volume Right	0	0	0	91	16
cSH	1700	1700	1700	1700	373
Volume to Capacity	0.74	0.47	0.47	0.29	0.04
Queue Length 95th (ft)	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	15.1
Lane LOS					C
Approach Delay (s)	0.0	0.0			15.1
Approach LOS					C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	100	1062	1916	87	70	15
Future Volume (vph)	100	1062	1916	87	70	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1641	1727	1717		1641	1468
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1641	1727	1717		1641	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	1154	2083	95	76	16
RTOR Reduction (vph)	0	0	1	0	0	15
Lane Group Flow (vph)	109	1154	2177	0	76	1
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	8.0	125.1	113.1		12.0	12.0
Effective Green, g (s)	8.0	125.1	113.1		12.0	12.0
Actuated g/C Ratio	0.06	0.86	0.78		0.08	0.08
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	90	1488	1338		135	121
v/s Ratio Prot	c0.07	0.67	c1.27		c0.05	
v/s Ratio Perm						0.00
v/c Ratio	1.21	0.78	1.63		0.56	0.01
Uniform Delay, d1	68.5	4.2	16.0		64.0	61.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	162.2	2.6	285.7		5.3	0.0
Delay (s)	230.8	6.8	301.7		69.3	61.1
Level of Service	F	A	F		E	E
Approach Delay (s)		26.1	301.7		67.9	
Approach LOS		C	F		E	

Intersection Summary			
HCM 2000 Control Delay	197.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.51		
Actuated Cycle Length (s)	145.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	116.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	347	1970	95	3	1419	233	77	27	2	460	38	204
Future Volume (vph)	347	1970	95	3	1419	233	77	27	2	460	38	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	0.88	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3183	4715	1468	1641	4715	2584	1641	1727	1468	3183	1727	1468
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3183	4715	1468	1641	4715	2584	1641	1727	1468	3183	1727	1468
Peak-hour factor, PHF	0.85	0.85	0.85	0.90	0.90	0.90	0.85	0.85	0.85	0.84	0.84	0.84
Adj. Flow (vph)	408	2318	112	3	1577	259	91	32	2	548	45	243
RTOR Reduction (vph)	0	0	48	0	0	151	0	0	2	0	0	207
Lane Group Flow (vph)	408	2318	64	3	1577	108	91	32	0	548	45	36
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	12.8	46.5	46.5	0.7	34.4	34.4	7.3	4.6	4.6	15.0	12.3	12.3
Effective Green, g (s)	12.8	46.5	46.5	0.7	34.4	34.4	7.3	4.6	4.6	15.0	12.3	12.3
Actuated g/C Ratio	0.15	0.56	0.56	0.01	0.42	0.42	0.09	0.06	0.06	0.18	0.15	0.15
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	492	2647	824	13	1958	1073	144	95	81	576	256	218
v/s Ratio Prot	c0.13	c0.49		0.00	0.33		0.06	c0.02		c0.17	0.03	
v/s Ratio Perm			0.04			0.04			0.00			0.02
v/c Ratio	0.83	0.88	0.08	0.23	0.81	0.10	0.63	0.34	0.00	0.95	0.18	0.17
Uniform Delay, d1	33.9	15.7	8.3	40.8	21.3	14.8	36.5	37.6	36.9	33.5	30.8	30.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1	3.6	0.0	8.9	2.5	0.0	8.7	2.1	0.0	25.8	0.3	0.4
Delay (s)	45.0	19.2	8.4	49.7	23.8	14.8	45.2	39.7	36.9	59.4	31.1	31.1
Level of Service	D	B	A	D	C	B	D	D	D	E	C	C
Approach Delay (s)		22.5			22.6			43.7			49.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	82.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	68	8	393	40	6	413
Future Volume (Veh/h)	68	8	393	40	6	413
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.45	0.45	0.72	0.72	0.98	0.98
Hourly flow rate (vph)	151	18	546	56	6	421
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	979	546			546	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	979	546			546	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.3	
p0 queue free %	43	97			99	
cM capacity (veh/h)	267	522			984	

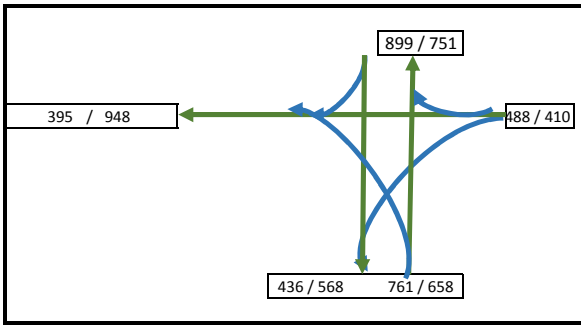
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	169	546	56	6	421
Volume Left	151	0	0	6	0
Volume Right	18	0	56	0	0
cSH	281	1700	1700	984	1700
Volume to Capacity	0.60	0.32	0.03	0.01	0.25
Queue Length 95th (ft)	90	0	0	0	0
Control Delay (s)	35.4	0.0	0.0	8.7	0.0
Lane LOS	E			A	
Approach Delay (s)	35.4	0.0		0.1	
Approach LOS	E				

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION:	Caliente Avenue and 905 WB Ramps	DIST. CO. RTE	SR-905
ALTERNATIVE:	Existing + Project Conditions	PM:	
		DATE:	
		TIME:	

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	98	663	0
SB:	0	185	296
EB:	0	0	0
WB:	251	1	236

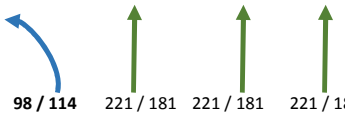
PM

	Left	Throu	Right
NB:	114	544	0
SB:	0	367	832
EB:	0	0	0
WB:	201	2	207

LANE VOLUMES (ILV/HR)

PHASE I

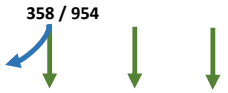
AM 98
PM 114



PHASE II

AM 358
PM 954

Remaining NB Through 123 / 67



PHASE III

AM 236
PM 207

PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PM
692	1275

TOTAL OPERATING LEVEL (ILV/HR):

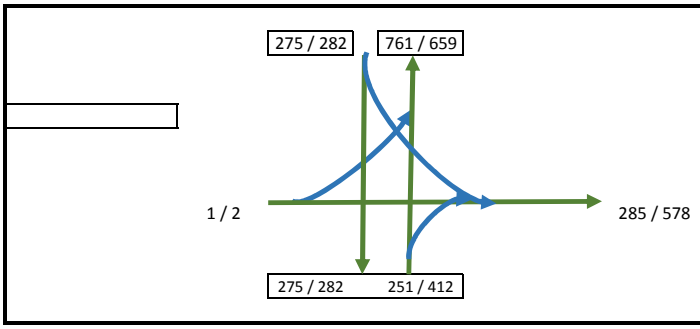
AM:	692	Under Capacity
PM:	1275	At Capacity

< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION:	Caliente Avenue and 905 EB Ramps	DIST. CO. RTE	SR-905
ALTERNATIVE:	Existing + Project Conditions	PM:	
		DATE:	
		TIME:	

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	0	128	123
SB:	161	275	0
EB:	633	1	43
WB:	0	0	0

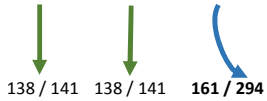
PM

	Left	Throu	Right
NB:	0	130	282
SB:	294	282	0
EB:	529	2	137
WB:	0	0	0

LANE VOLUMES (ILV/HR)

PHASE I

AM 161
PM 294



PHASE II

AM 166
PM 325

Remaining SB Through 114 / 0

PHASE III

AM 633
PM 529

PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PM
960	1148

TOTAL OPERATING LEVEL (ILV/HR):

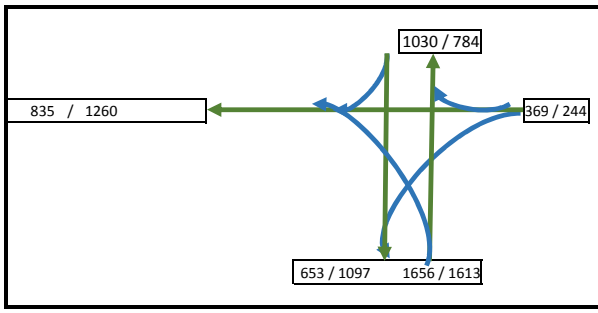
AM:	960	Under Capacity
PM:	1148	Under Capacity

< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION:	Britannia Boulevard and SR-905 WB Ramps	DIST. CO. RTE	SR-905
ALTERNATIVE:	Existing + Project Conditions	PM:	
		DATE:	
		TIME:	

DEMAND TRAFFIC FLOWS



AM

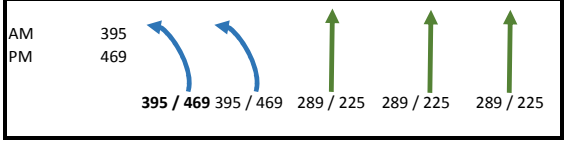
	Left	Throu	Right
NB:	790	866	0
SB:	0	448	45
EB:	0	0	0
WB:	205	0	164

PM

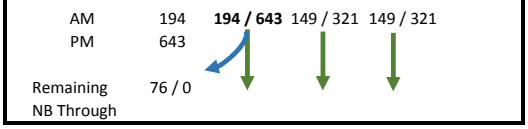
	Left	Throu	Right
NB:	937	676	0
SB:	0	962	322
EB:	0	0	0
WB:	135	1	108

LANE VOLUMES (ILV/HR)

PHASE I



PHASE II



PHASE III

PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PM
794	1246

TOTAL OPERATING LEVEL (ILV/HR):

AM:	794	Under Capacity
PM:	1246	At Capacity

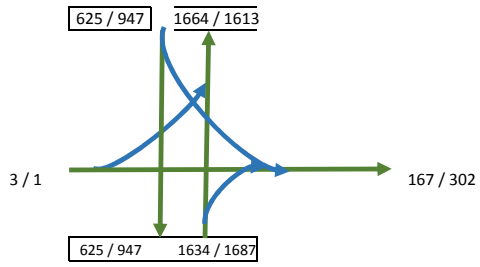
< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION: Britannia Boulevard and 905 EB Ramps
ALTERNATIVE: Existing + Project Conditions

DIST. CO. RTE: SR-905
PM:
DATE:
TIME:

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	0	1498	136
SB:	28	625	0
EB:	166	3	856
WB:	0	0	0

PM

	Left	Throu	Right
NB:	0	1536	151
SB:	150	947	0
EB:	77	1	934
WB:	0	0	0

LANE VOLUMES (ILV/HR)

PHASE I

AM **14**
PM **75**

208 / 316 208 / 316 208 / 316 14 / 75 **14 / 75**

PHASE II

AM 885
PM 919

Remaining SB Through 749 / 768 **885 / 919**

PHASE III

AM 428
PM 467

169 / 78
428 / 467
428 / 467

PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PM
1327	1461

TOTAL OPERATING LEVEL (ILV/HR):

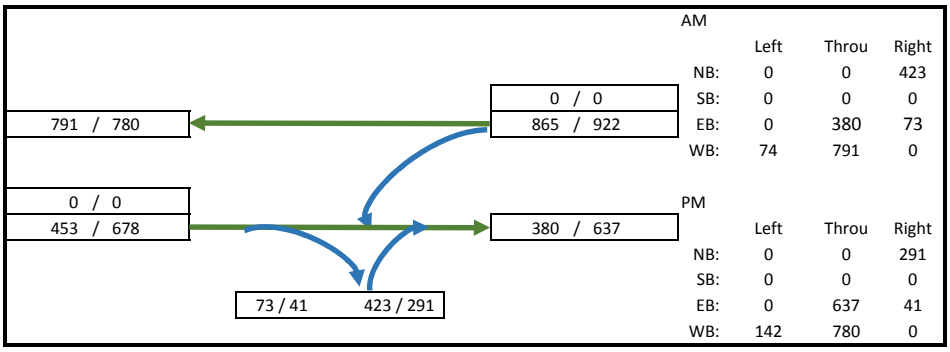
AM:	1327	At Capacity
PM:	1461	At Capacity

< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION:	905 / Siempre Viva Road	DIST. CO. RTE	SR-905
ALTERNATIVE:	Existing + Project Conditions	PM:	
		DATE:	1/27/2015
		TIME:	

DEMAND TRAFFIC FLOWS



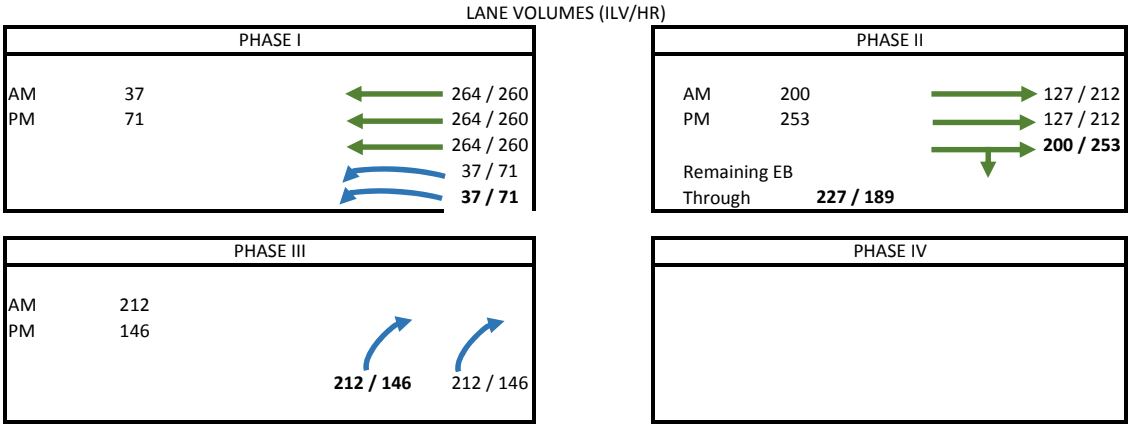
AM

	Left	Throu	Right
NB:	0	0	423
SB:	0	0	0
EB:	0	380	73
WB:	74	791	0

PM

	Left	Throu	Right
NB:	0	0	291
SB:	0	0	0
EB:	0	637	41
WB:	142	780	0

LANE VOLUMES (ILV/HR)



CRITICAL LANE VOLUMES PER HOUR

AM	PHASE II
449	470

TOTAL OPERATING LEVEL (ILV/HR):

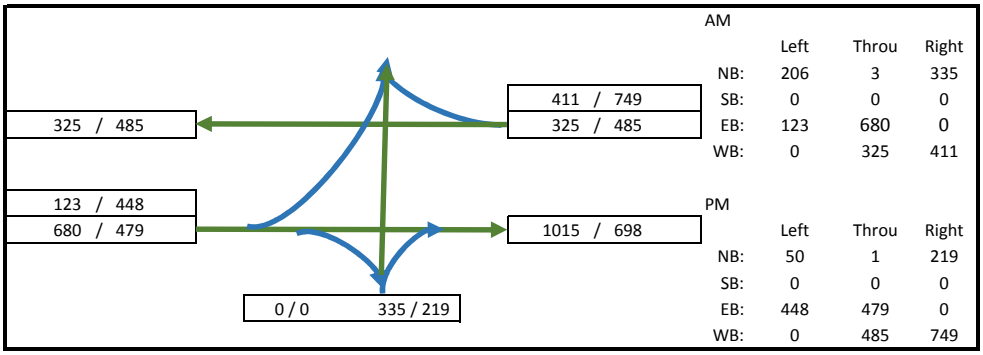
AM:	449	Under Capacity
PM:	470	Under Capacity

< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION:	905 / Siempre Viva Road	DIST. CO. RTE	SR-905
ALTERNATIVE:	Existing + Project Conditions	PM:	
		DATE:	1/27/2016
		TIME:	

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	206	3	335
SB:	0	0	0
EB:	123	680	0
WB:	0	325	411

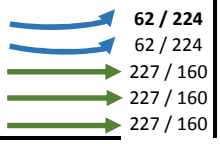
PM

	Left	Throu	Right
NB:	50	1	219
SB:	0	0	0
EB:	448	479	0
WB:	0	485	749

LANE VOLUMES (ILV/HR)

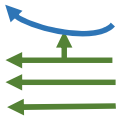
PHASE I

AM	62
PM	224



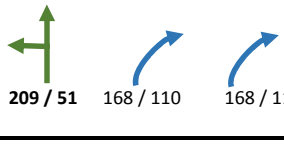
PHASE II

AM	314
PM	536
Remaining EB Through	**165/ 0**



PHASE III

AM	209
PM	110



PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PHASE II
584	870

TOTAL OPERATING LEVEL (ILV/HR):

AM:	584	Under Capacity
PM:	870	Under Capacity

< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

Appendix F
Improvements Worksheets and Triggers - Existing Plus Project Conditions

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	120	405	210	140	865	522
Future Volume (vph)	120	405	210	140	865	522
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	3183	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	3183	4715	3183	1468
Peak-hour factor, PHF	0.91	0.92	0.92	0.73	0.92	0.92
Adj. Flow (vph)	132	440	228	192	940	567
RTOR Reduction (vph)	0	285	0	0	0	358
Lane Group Flow (vph)	132	155	228	192	940	209
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	31.8	31.8	10.5	46.3	33.2	33.2
Effective Green, g (s)	31.8	31.8	10.5	46.3	33.2	33.2
Actuated g/C Ratio	0.35	0.35	0.12	0.51	0.37	0.37
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	1665	518	371	2425	1174	541
v/s Ratio Prot	0.03		c0.07	0.04	c0.30	
v/s Ratio Perm		c0.11				0.14
v/c Ratio	0.08	0.30	0.61	0.08	0.80	0.39
Uniform Delay, d1	19.4	21.1	37.8	11.1	25.4	20.9
Progression Factor	1.40	5.44	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	1.5	2.1	0.1	3.8	0.2
Delay (s)	27.1	116.0	39.9	11.1	29.2	21.1
Level of Service	C	F	D	B	C	C
Approach Delay (s)	95.5			26.8	26.2	
Approach LOS	F			C	C	

Intersection Summary			
HCM 2000 Control Delay	42.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1323	200	79	24	98	70	35	127	19	288	286	666
Future Volume (vph)	1323	200	79	24	98	70	35	127	19	288	286	666
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	5.1	4.4	4.4	4.9		4.4	5.1	4.4
Lane Util. Factor	0.97	0.91		1.00	0.95	1.00	1.00	0.95		1.00	0.95	0.88
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	4515		1641	3282	1462	1641	3212		1641	3282	2584
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	4515		1641	3282	1462	1641	3212		1641	3282	2584
Peak-hour factor, PHF	0.92	0.86	0.86	0.81	0.81	0.81	0.76	0.76	0.76	0.85	0.85	0.92
Adj. Flow (vph)	1438	233	92	30	121	86	46	167	25	339	336	724
RTOR Reduction (vph)	0	45	0	0	0	60	0	9	0	0	0	193
Lane Group Flow (vph)	1438	280	0	30	121	26	46	183	0	339	336	531
Confl. Peds. (#/hr)	1					1			2			
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases						6						4
Actuated Green, G (s)	54.6	63.7		4.1	13.0	38.6	6.6	14.1		25.6	32.9	87.5
Effective Green, g (s)	54.6	63.7		4.1	13.0	38.6	6.6	14.1		25.6	32.9	87.5
Actuated g/C Ratio	0.43	0.51		0.03	0.10	0.31	0.05	0.11		0.20	0.26	0.69
Clearance Time (s)	4.4	4.9		4.4	5.1	4.4	4.4	4.9		4.4	5.1	4.4
Vehicle Extension (s)	2.0	3.8		2.0	3.8	2.0	2.0	3.8		2.0	3.8	2.0
Lane Grp Cap (vph)	1378	2280		53	338	447	85	359		333	856	1793
v/s Ratio Prot	c0.45	0.06		0.02	c0.04	0.01	0.03	c0.06		c0.21	0.10	0.13
v/s Ratio Perm						0.01						0.08
v/c Ratio	1.04	0.12		0.57	0.36	0.06	0.54	0.51		1.02	0.39	0.30
Uniform Delay, d1	35.8	16.5		60.1	52.7	30.9	58.3	52.7		50.2	38.4	7.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	36.4	0.0		8.0	0.8	0.0	3.7	1.5		54.0	0.4	0.0
Delay (s)	72.2	16.5		68.1	53.5	30.9	62.0	54.3		104.2	38.8	7.5
Level of Service	E	B		E	D	C	E	D		F	D	A
Approach Delay (s)		61.9			47.2			55.8			38.4	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	51.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	126.1	Sum of lost time (s)	19.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	100	1365	483	30	100	19
Future Volume (vph)	100	1365	483	30	100	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00	0.91		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1641	1727	4674		1641	1468
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1641	1727	4674		1641	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	1484	525	33	109	21
RTOR Reduction (vph)	0	0	4	0	0	19
Lane Group Flow (vph)	109	1484	554	0	109	2
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	14.4	122.6	104.2		14.5	14.5
Effective Green, g (s)	14.4	122.6	104.2		14.5	14.5
Actuated g/C Ratio	0.10	0.84	0.71		0.10	0.10
Clearance Time (s)	4.0	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	161	1449	3333		162	145
v/s Ratio Prot	0.07	c0.86	0.12		c0.07	
v/s Ratio Perm						0.00
v/c Ratio	0.68	1.02	0.17		0.67	0.01
Uniform Delay, d1	63.6	11.8	6.8		63.5	59.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	10.7	30.0	0.0		10.5	0.0
Delay (s)	74.3	41.7	6.8		74.0	59.4
Level of Service	E	D	A		E	E
Approach Delay (s)		44.0	6.8		71.6	
Approach LOS		D	A		E	

Intersection Summary			
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	146.1	Sum of lost time (s)	13.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	238	905	738	287	628	347
Future Volume (vph)	238	905	738	287	628	347
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	3183	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	3183	4715	3183	1468
Peak-hour factor, PHF	0.86	0.92	0.92	0.78	0.92	0.92
Adj. Flow (vph)	277	984	802	368	683	377
RTOR Reduction (vph)	0	523	0	0	0	282
Lane Group Flow (vph)	277	461	802	368	683	95
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	32.2	32.2	20.6	56.8	22.7	22.7
Effective Green, g (s)	32.2	32.2	20.6	56.8	22.7	22.7
Actuated g/C Ratio	0.36	0.36	0.23	0.63	0.25	0.25
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	1686	525	728	2975	802	370
v/s Ratio Prot	0.06		c0.25	0.08	c0.21	
v/s Ratio Perm		c0.31				0.06
v/c Ratio	0.16	0.88	1.10	0.12	0.85	0.26
Uniform Delay, d1	19.7	27.1	34.7	6.6	32.0	26.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	18.5	64.7	0.1	8.4	0.1
Delay (s)	19.9	45.6	99.4	6.7	40.4	27.0
Level of Service	B	D	F	A	D	C
Approach Delay (s)	40.0			70.2	35.7	
Approach LOS	D			E	D	

Intersection Summary			
HCM 2000 Control Delay	48.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1025	160	58	29	238	277	90	342	31	185	146	1556
Future Volume (vph)	1025	160	58	29	238	277	90	342	31	185	146	1556
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		5.1	5.1	4.4	4.4	5.1		4.4	5.1	4.4
Lane Util. Factor	0.97	0.91		1.00	0.95	1.00	1.00	0.95		1.00	0.95	0.88
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	4513		1641	3282	1458	1641	3241		1641	3282	2574
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	4513		1641	3282	1458	1641	3241		1641	3282	2574
Peak-hour factor, PHF	0.92	0.89	0.89	0.79	0.79	0.79	0.79	0.79	0.79	0.89	0.89	0.92
Adj. Flow (vph)	1114	180	65	37	301	351	114	433	39	208	164	1691
RTOR Reduction (vph)	0	36	0	0	0	80	0	5	0	0	0	100
Lane Group Flow (vph)	1114	209	0	37	301	271	114	467	0	208	164	1591
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						1
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases						6						4
Actuated Green, G (s)	52.2	51.9		10.6	10.8	24.6	11.4	20.1		13.8	22.5	74.7
Effective Green, g (s)	52.2	51.9		10.6	10.8	24.6	11.4	20.1		13.8	22.5	74.7
Actuated g/C Ratio	0.45	0.45		0.09	0.09	0.21	0.10	0.17		0.12	0.19	0.64
Clearance Time (s)	4.4	4.9		5.1	5.1	4.4	4.4	5.1		4.4	5.1	4.4
Vehicle Extension (s)	2.0	3.8		3.8	3.8	2.0	2.0	3.8		2.0	3.8	2.0
Lane Grp Cap (vph)	1433	2020		150	305	309	161	562		195	637	1658
v/s Ratio Prot	0.35	0.05		0.02	c0.09	0.10	0.07	0.14		c0.13	0.05	c0.43
v/s Ratio Perm						0.08						0.19
v/c Ratio	0.78	0.10		0.25	0.99	0.88	0.71	0.83		1.07	0.26	0.96
Uniform Delay, d1	26.9	18.5		48.9	52.5	44.2	50.6	46.3		51.1	39.6	19.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.5	0.0		1.1	47.6	22.8	11.0	10.5		83.2	0.3	13.5
Delay (s)	29.4	18.6		50.1	100.1	67.0	61.6	56.7		134.3	39.9	32.7
Level of Service	C	B		D	F	E	E	E		F	D	C
Approach Delay (s)		27.5			80.5			57.7			43.5	
Approach LOS		C			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	115.9	Sum of lost time (s)	19.5
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	100	1062	1916	87	70	15
Future Volume (vph)	100	1062	1916	87	70	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00	0.91		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1641	1727	4685		1641	1468
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1641	1727	4685		1641	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	1154	2083	95	76	16
RTOR Reduction (vph)	0	0	5	0	0	14
Lane Group Flow (vph)	109	1154	2173	0	76	2
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	7.0	58.8	47.3		9.0	9.0
Effective Green, g (s)	7.0	58.8	47.3		9.0	9.0
Actuated g/C Ratio	0.09	0.77	0.62		0.12	0.12
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	149	1322	2885		192	172
v/s Ratio Prot	0.07	c0.67	0.46		c0.05	
v/s Ratio Perm						0.00
v/c Ratio	0.73	0.87	0.75		0.40	0.01
Uniform Delay, d1	34.0	6.4	10.6		31.4	30.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	16.8	6.6	1.2		1.3	0.0
Delay (s)	50.8	13.0	11.7		32.7	30.0
Level of Service	D	B	B		C	C
Approach Delay (s)		16.3	11.7		32.3	
Approach LOS		B	B		C	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	76.8	Sum of lost time (s)	13.5
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection No.	16	Peak:	PM		Green = Manual Input			**Control Type**		Signal	Base Delay	34.1
Project's Total Daily Trip Generation - Table 3.1 **[a]**	40126								**SI Type**	LOS D	Max Delay	55
External Peak Hour Trip Generation - Table 3.1 **[b]**	In	2201	Out	1345								
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
E + P Peak Hour Turning Movements Volumes - Figure 6-4 **[c]**	628	0	347	0	0	0	0	238	905	738	287	0
Project Trip Assignment - Figure 3-4 **[d]**	444		175						726	286		
Type of Turning Movement **[e]**	out		out						in	in		
Base Volume (c - d) **[f]**	184	0	172	0	0	0	0	238	179	452	287	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[g]**	24511		Delay (from Synchro)	54.9	LOS (from Synchro)	D						
Percent Reduction in Trip Gen. (g / a) **[h]**	38.9%											
Trip Assignment after Trip Gen reduction (d - h * d) **[i]**	271	0	107	0	0	0	0	0	443	175	0	0
Base Volume + Reduced Trip Assignment (f + i)	455	0	279	0	0	0	0	238	622	627	287	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[j]**	0	238	622	627	287	0	455	0	279	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Trigger ADT **[k]**	**24512**		Delay (from Synchro)	54.9	LOS (from Synchro)	D						
Percent Reduction in Trip Gen. (k / a) **[L]**	38.9%											
Trip Assignment after Trip Gen reduction (d - L * d) **[m]**	271	0	107	0	0	0	0	0	443	175	0	0
Base Volume + Reduced Trip Assignment (f + m)	455	0	279	0	0	0	0	238	622	627	287	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[n]**	0	238	622	627	287	0	455	0	279	0	0	0
Change when compare to previous ADT (n - j) **[o]**	0	0	0	0	0	0	0	0	0	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[p]**	24513		Delay (from Synchro)	55.0	LOS (from Synchro)	E						
Percent Reduction in Trip Gen. (p / a) **[q]**	38.9%											
Trip Assignment after Trip Gen reduction (d - q * d) **[r]**	271	0	107	0	0	0	0	0	444	175	0	0
Base Volume + Reduced Trip Assignment (f + r)	455	0	279	0	0	0	0	238	623	627	287	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[s]**	0	238	623	627	287	0	455	0	279	0	0	0
Change when compare to previous ADT (s - n) **[t]**	0	0	1	0	0	0	0	0	0	0	0	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	238	622	627	287	455	279
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	1641	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	1641	4715	3183	1468
Peak-hour factor, PHF	0.86	0.86	0.78	0.78	0.86	0.86
Adj. Flow (vph)	277	723	804	368	529	324
RTOR Reduction (vph)	0	505	0	0	0	262
Lane Group Flow (vph)	277	218	804	368	529	62
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	30.7	30.7	68.0	102.7	26.8	26.8
Effective Green, g (s)	30.7	30.7	68.0	102.7	26.8	26.8
Actuated g/C Ratio	0.22	0.22	0.49	0.73	0.19	0.19
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	1033	321	797	3458	609	281
v/s Ratio Prot	0.06		c0.49	0.08	c0.17	
v/s Ratio Perm		c0.15				0.04
v/c Ratio	0.27	0.68	1.01	0.11	0.87	0.22
Uniform Delay, d1	45.3	50.1	36.0	5.4	54.9	47.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	11.0	34.1	0.1	12.1	0.1
Delay (s)	46.0	61.1	70.1	5.5	67.0	47.9
Level of Service	D	E	E	A	E	D
Approach Delay (s)	56.9			49.8	59.8	
Approach LOS	E			D	E	

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	238	622	627	287	455	279
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	1641	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	1641	4715	3183	1468
Peak-hour factor, PHF	0.86	0.86	0.78	0.78	0.86	0.86
Adj. Flow (vph)	277	723	804	368	529	324
RTOR Reduction (vph)	0	505	0	0	0	262
Lane Group Flow (vph)	277	218	804	368	529	62
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	30.7	30.7	68.0	102.7	26.8	26.8
Effective Green, g (s)	30.7	30.7	68.0	102.7	26.8	26.8
Actuated g/C Ratio	0.22	0.22	0.49	0.73	0.19	0.19
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	1033	321	797	3458	609	281
v/s Ratio Prot	0.06		c0.49	0.08	c0.17	
v/s Ratio Perm		c0.15				0.04
v/c Ratio	0.27	0.68	1.01	0.11	0.87	0.22
Uniform Delay, d1	45.3	50.1	36.0	5.4	54.9	47.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	11.0	34.1	0.1	12.1	0.1
Delay (s)	46.0	61.1	70.1	5.5	67.0	47.9
Level of Service	D	E	E	A	E	D
Approach Delay (s)	56.9			49.8	59.8	
Approach LOS	E			D	E	

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	238	623	627	287	455	279
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	1641	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	1641	4715	3183	1468
Peak-hour factor, PHF	0.86	0.86	0.78	0.78	0.86	0.86
Adj. Flow (vph)	277	724	804	368	529	324
RTOR Reduction (vph)	0	505	0	0	0	262
Lane Group Flow (vph)	277	219	804	368	529	62
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	30.8	30.8	67.9	102.7	26.8	26.8
Effective Green, g (s)	30.8	30.8	67.9	102.7	26.8	26.8
Actuated g/C Ratio	0.22	0.22	0.49	0.73	0.19	0.19
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	1037	322	795	3458	609	281
v/s Ratio Prot	0.06		c0.49	0.08	c0.17	
v/s Ratio Perm		c0.15				0.04
v/c Ratio	0.27	0.68	1.01	0.11	0.87	0.22
Uniform Delay, d1	45.2	50.1	36.0	5.4	54.9	47.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	11.1	34.7	0.1	12.1	0.1
Delay (s)	45.9	61.2	70.8	5.5	67.0	47.9
Level of Service	D	E	E	A	E	D
Approach Delay (s)	56.9			50.3	59.8	
Approach LOS	E			D	E	

Intersection Summary			
HCM 2000 Control Delay	55.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection No.	19	Peak:	PM		Green = Manual Input			**Control Type**		Signal	Base Delay	41.2
Project's Total Daily Trip Generation - Table 3.1 **[a]**	40126								**SI Type**	LOS D	Max Delay	55
External Peak Hour Trip Generation - Table 3.1 **[b]**	In	2201	Out	1345								
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
E + P Peak Hour Turning Movements Volumes - Figure 6-4 **[c]**	90	342	31	185	146	1556	1025	160	58	29	238	277
Project Trip Assignment - Figure 3-4 **[d]**	88	0	0	0	0	1474	901	135	54	0	220	0
Type of Turning Movement **[e]**	in					in	out	out	out		in	
Base Volume (c - d) **[f]**	2	342	31	185	146	82	124	25	4	29	18	277
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[g]**	16186		Delay (from Synchro)	54.9	LOS (from Synchro)	D						
Percent Reduction in Trip Gen. (g / a) **[h]**	59.7%											
Trip Assignment after Trip Gen reduction (d - h * d) **[i]**	35	0	0	0	0	595	363	54	22	0	89	0
Base Volume + Reduced Trip Assignment (f + i)	37	342	31	185	146	677	487	79	26	29	107	277
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[j]**	487	79	26	29	107	277	37	342	31	185	146	677
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Trigger ADT **[k]**	**16187**		Delay (from Synchro)	54.9	LOS (from Synchro)	D						
Percent Reduction in Trip Gen. (k / a) **[L]**	59.7%											
Trip Assignment after Trip Gen reduction (d - L * d) **[m]**	35	0	0	0	0	595	363	54	22	0	89	0
Base Volume + Reduced Trip Assignment (f + m)	37	342	31	185	146	677	487	79	26	29	107	277
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[n]**	487	79	26	29	107	277	37	342	31	185	146	677
Change when compare to previous ADT (n - j) **[o]**	0	0	0	0	0	0	0	0	0	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[p]**	16188		Delay (from Synchro)	55.0	LOS (from Synchro)	E						
Percent Reduction in Trip Gen. (p / a) **[q]**	59.7%											
Trip Assignment after Trip Gen reduction (d - q * d) **[r]**	36	0	0	0	0	595	363	54	22	0	89	0
Base Volume + Reduced Trip Assignment (f + r)	38	342	31	185	146	677	487	79	26	29	107	277
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[s]**	487	79	26	29	107	277	38	342	31	185	146	677
Change when compare to previous ADT (s - n) **[t]**	0	0	0	0	0	0	1	0	0	0	0	0

HCM Signalized Intersection Capacity Analysis
19: Britannia Boulevard & Airway Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	487	79	26	29	107	277	37	342	31	185	146	677
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9			5.1	5.1	4.4	4.9		4.4	5.1	5.1
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99			1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96			1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1655			1709	1444	1641	3241		1641	1727	1437
Flt Permitted	0.95	1.00			0.92	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1655			1593	1444	1641	3241		1641	1727	1437
Peak-hour factor, PHF	0.89	0.89	0.89	0.79	0.79	0.79	0.79	0.79	0.79	0.89	0.89	0.89
Adj. Flow (vph)	547	89	29	37	135	351	47	433	39	208	164	761
RTOR Reduction (vph)	0	8	0	0	0	241	0	5	0	0	0	540
Lane Group Flow (vph)	547	110	0	0	172	110	47	467	0	208	164	221
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						1
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases						6						8
Actuated Green, G (s)	49.2	63.9			35.4	25.3	5.2	25.7		20.0	40.3	40.3
Effective Green, g (s)	49.2	63.9			35.4	25.3	5.2	25.7		20.0	40.3	40.3
Actuated g/C Ratio	0.35	0.46			0.25	0.18	0.04	0.18		0.14	0.29	0.29
Clearance Time (s)	4.4	4.9			5.1	5.1	4.4	4.9		4.4	5.1	5.1
Vehicle Extension (s)	2.0	3.8			3.8	3.8	2.0	3.8		2.0	3.8	3.8
Lane Grp Cap (vph)	580	760			414	262	61	599		236	500	416
v/s Ratio Prot	c0.33	0.07			0.03		0.03	c0.14		c0.13	0.09	
v/s Ratio Perm					0.08	c0.08						0.15
v/c Ratio	0.94	0.15			0.42	0.42	0.77	0.78		0.88	0.33	0.53
Uniform Delay, d1	43.5	21.7			43.2	50.3	66.3	54.0		58.3	38.7	41.4
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	23.8	0.1			0.9	1.4	41.1	6.7		28.8	0.5	1.6
Delay (s)	67.3	21.9			44.1	51.7	107.4	60.6		87.2	39.2	43.0
Level of Service	E	C			D	D	F	E		F	D	D
Approach Delay (s)		59.3			49.2			64.9			50.6	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	139.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
19: Britannia Boulevard & Airway Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	487	79	26	29	107	277	37	342	31	185	146	677
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9			5.1	5.1	4.4	4.9		4.4	5.1	5.1
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99			1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96			1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1655			1709	1444	1641	3241		1641	1727	1437
Flt Permitted	0.95	1.00			0.92	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1655			1593	1444	1641	3241		1641	1727	1437
Peak-hour factor, PHF	0.89	0.89	0.89	0.79	0.79	0.79	0.79	0.79	0.79	0.89	0.89	0.89
Adj. Flow (vph)	547	89	29	37	135	351	47	433	39	208	164	761
RTOR Reduction (vph)	0	8	0	0	0	241	0	5	0	0	0	540
Lane Group Flow (vph)	547	110	0	0	172	110	47	467	0	208	164	221
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						1
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases						6						8
Actuated Green, G (s)	49.2	63.9			35.4	25.3	5.2	25.7		20.0	40.3	40.3
Effective Green, g (s)	49.2	63.9			35.4	25.3	5.2	25.7		20.0	40.3	40.3
Actuated g/C Ratio	0.35	0.46			0.25	0.18	0.04	0.18		0.14	0.29	0.29
Clearance Time (s)	4.4	4.9			5.1	5.1	4.4	4.9		4.4	5.1	5.1
Vehicle Extension (s)	2.0	3.8			3.8	3.8	2.0	3.8		2.0	3.8	3.8
Lane Grp Cap (vph)	580	760			414	262	61	599		236	500	416
v/s Ratio Prot	c0.33	0.07			0.03		0.03	c0.14		c0.13	0.09	
v/s Ratio Perm					0.08	c0.08						0.15
v/c Ratio	0.94	0.15			0.42	0.42	0.77	0.78		0.88	0.33	0.53
Uniform Delay, d1	43.5	21.7			43.2	50.3	66.3	54.0		58.3	38.7	41.4
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	23.8	0.1			0.9	1.4	41.1	6.7		28.8	0.5	1.6
Delay (s)	67.3	21.9			44.1	51.7	107.4	60.6		87.2	39.2	43.0
Level of Service	E	C			D	D	F	E		F	D	D
Approach Delay (s)		59.3			49.2			64.9			50.6	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	139.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
19: Britannia Boulevard & Airway Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	487	79	26	29	107	277	38	342	31	185	146	677
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9			5.1	5.1	4.4	4.9		4.4	5.1	5.1
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99			1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96			1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1655			1709	1444	1641	3241		1641	1727	1437
Flt Permitted	0.95	1.00			0.92	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1655			1593	1444	1641	3241		1641	1727	1437
Peak-hour factor, PHF	0.89	0.89	0.89	0.79	0.79	0.79	0.79	0.79	0.79	0.89	0.89	0.89
Adj. Flow (vph)	547	89	29	37	135	351	48	433	39	208	164	761
RTOR Reduction (vph)	0	8	0	0	0	241	0	5	0	0	0	540
Lane Group Flow (vph)	547	110	0	0	172	110	48	467	0	208	164	221
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						1
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases						6						8
Actuated Green, G (s)	49.2	63.9			35.4	25.3	5.2	25.7		20.0	40.3	40.3
Effective Green, g (s)	49.2	63.9			35.4	25.3	5.2	25.7		20.0	40.3	40.3
Actuated g/C Ratio	0.35	0.46			0.25	0.18	0.04	0.18		0.14	0.29	0.29
Clearance Time (s)	4.4	4.9			5.1	5.1	4.4	4.9		4.4	5.1	5.1
Vehicle Extension (s)	2.0	3.8			3.8	3.8	2.0	3.8		2.0	3.8	3.8
Lane Grp Cap (vph)	580	760			414	262	61	599		236	500	416
v/s Ratio Prot	c0.33	0.07			0.03		0.03	c0.14		c0.13	0.09	
v/s Ratio Perm					0.08	c0.08						0.15
v/c Ratio	0.94	0.15			0.42	0.42	0.79	0.78		0.88	0.33	0.53
Uniform Delay, d1	43.5	21.7			43.2	50.3	66.4	54.0		58.3	38.7	41.4
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	23.8	0.1			0.9	1.4	44.6	6.7		28.8	0.5	1.6
Delay (s)	67.3	21.9			44.1	51.7	111.0	60.6		87.2	39.2	43.0
Level of Service	E	C			D	D	F	E		F	D	D
Approach Delay (s)		59.3			49.2			65.3			50.6	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	139.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Existing + Project Trigger Calculations

Roadway	From	To	Cross-Section	Threshold LOS E	Existing ADT	LOS w/o Project	Available Capacity	% of Project Trips	LOS w/ Project	Project's External Trip Generation at Time of Impact [1]	Projects Total ADT Generation at Time of Impact
Britannia Boulevard	SR-905 EB Ramps	Airway Road	5-Ln w/RM (2-NB, 3-SB)	45840	22,969	B	22,871	67%	E	34,136	37,678
Airway Road	Cactus Road	Continental Road	2-Ln	30000	2,232	A	4,268	83%	F	5,142	5,675
Airway Road	Continental Road	Britannia Blvd	2-Ln	6500	2,332	A	4,168	83%	F	5,022	5,543
Airway Road	Brittania Blvd	La Media Road	2-Ln	6500	2,927	B	3,573	10%	E	35,730	39,437
Airway Road	La Media Road	Avenida Costa Azul	2-Ln	6500	6,839	E	160	3%	E	5,333	5,886
Siempre Viva Road	Cactus Road	Britannia Blvd	2-Ln	6500	2,142	A	4,358	13%	E	33,523	37,001

Notes:

90.6% of Total Trip Generation due to internal capture.

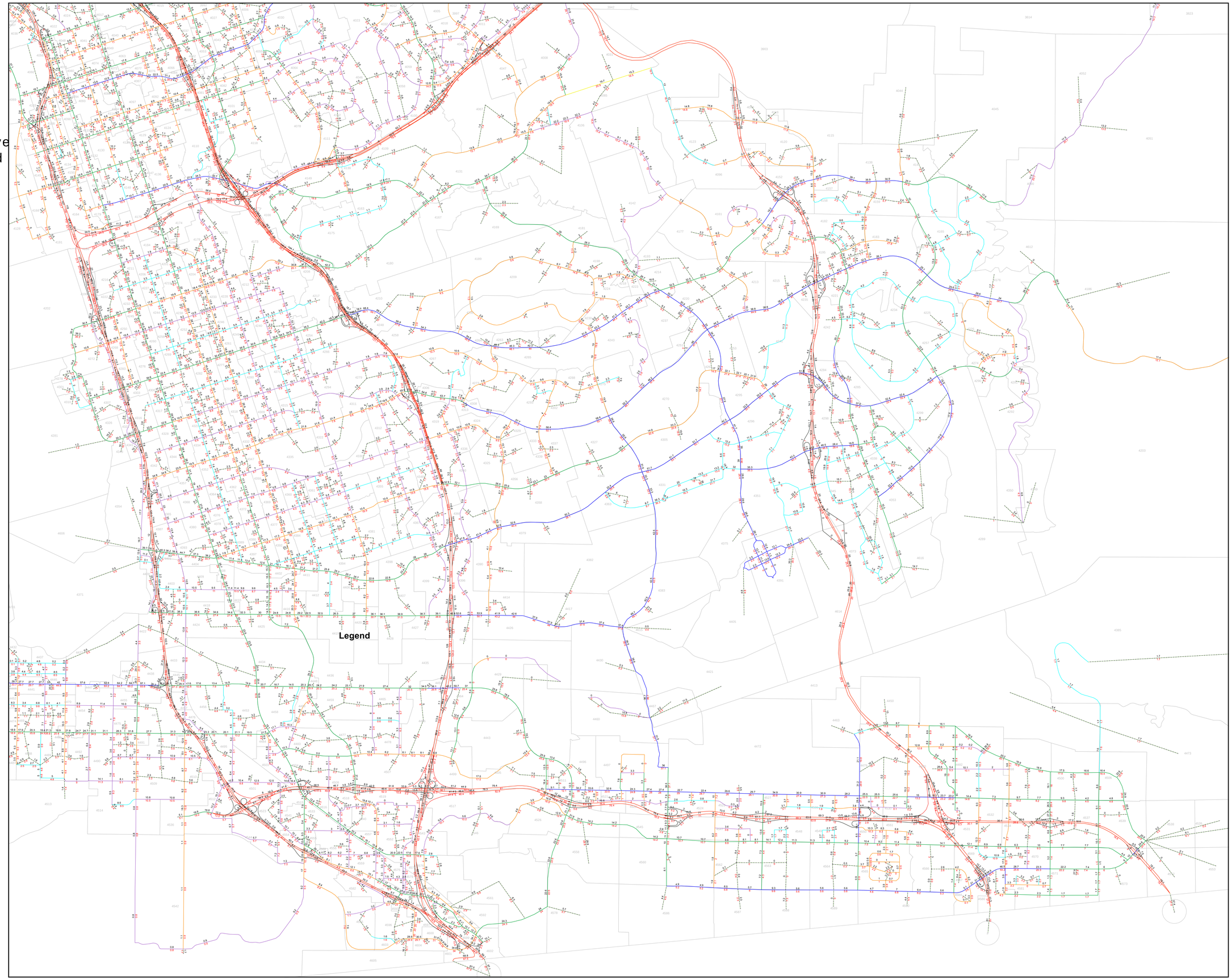
Appendix G
Cumulative Project Information

SANDAG
Series 11
Southbay2

Village 2 B&S

Otay Ranch V-13
Nearterm Cumulative
Model with Updated
Otay Mesa Land Use

2025
ADT Plot



Functional Classifications

- Freeway
- Prime
- Major
- Collector
- Light Collector
- Rural Collector
- Local
- Freeway Ramp
- Local Ramp
- Zone Connector

Traffic Analysis Zones

Unadjusted ADT(x1000)

Adjusted ADT(x1000)

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N

0 0.15 0.3 0.45
Miles

SANDAG

servicebureau

Date: May 16, 2014

CVSB(Chula Vista Southbay)- University Villages 2025
trip generation and land use by zone

Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
468	101	SINGLE FAMILY	du	1.0	16.	11.
468	4112	RIGHT-OF-WAY	acre	4.2	0.	0.
468	5007	STREETFRONT COMMERCIAL	acre	1.3	1944.	1411.
468	6002	LOW RISE OFFICE	acre	4.1	1464.	1122.
468	6003	GOV'T OFFICE OR CENTER	acre	0.6	635.	477.
468	6803	JUNIOR COLLEGE	acre	12.6	3241.	2563.
468		TOTAL			7300.	5584.
4044	4113	COMMUNICATION OR UTILITY	acre	28.3	113.	87.
4044	7204	GOLF COURSE	acre	259.4	0.	0.
4044	7205	GOLF CLUB HOUSE	acre	1.0	709.	484.
4044		TOTAL			822.	570.
4045	101	SINGLE FAMILY	du	494.5	7715.	5384.
4045	9101	INACTIVE USE	acre	434.0	0.	0.
4045		TOTAL			7715.	5384.
4089	101	SINGLE FAMILY	du	65.4	1020.	712.
4089		TOTAL			1020.	712.
4099	101	SINGLE FAMILY	du	7.0	109.	76.
4099	9101	INACTIVE USE	acre	31.3	0.	0.
4099		TOTAL			109.	76.
4115	101	SINGLE FAMILY	du	236.0	3682.	2569.
4115	1409	OTHER GROUP QUARTERS	acre	3.9	19.	13.
4115	6109	OTHER PUBLIC SERVICE	acre	0.8	309.	223.
4115	7601	ACTIVE PARK	acre	14.7	980.	645.
4115	9101	INACTIVE USE	acre	132.3	0.	0.
4115		TOTAL			4990.	3451.
4120	101	SINGLE FAMILY	du	360.0	5616.	3919.
4120	102	MULTI-FAMILY	du	305.0	3263.	2291.
4120	4113	COMMUNICATION OR UTILITY	acre	6.3	25.	19.
4120	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4120	7601	ACTIVE PARK	acre	3.5	232.	153.
4120	9101	INACTIVE USE	acre	15.9	0.	0.
4120		TOTAL			11255.	7567.
4123	101	SINGLE FAMILY	du	175.4	2736.	1909.
4123	9101	INACTIVE USE	acre	92.7	0.	0.
4123		TOTAL			2736.	1909.
4131	101	SINGLE FAMILY	du	49.0	764.	533.
4131	102	MULTI-FAMILY	du	188.0	2012.	1412.
4131	5004	NEIGHBORHOOD COMMERCIAL	acre	11.4	17353.	12278.
4131	5007	STREETFRONT COMMERCIAL	acre	4.2	6251.	4538.
4131	6002	LOW RISE OFFICE	acre	0.9	339.	260.
4131	6103	LIBRARY	acre	2.7	1180.	800.
4131	6109	OTHER PUBLIC SERVICE	acre	2.0	799.	578.
4131	6509	OTHER HEALTH CARE	acre	7.0	3433.	2547.
4131	7204	GOLF COURSE	acre	130.2	0.	0.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4131	7205	GOLF CLUB HOUSE	acre	1.0	709.	484.
4131	7601	ACTIVE PARK	acre	59.9	3987.	2624.
4131		TOTAL			36828.	26054.
4138	101	SINGLE FAMILY	du	511.0	7972.	5563.
4138	9101	INACTIVE USE	acre	11.4	0.	0.
4138		TOTAL			7972.	5563.
4141	101	SINGLE FAMILY	du	215.0	3354.	2340.
4141	9101	INACTIVE USE	acre	25.8	0.	0.
4141		TOTAL			3354.	2340.
4142	101	SINGLE FAMILY	du	460.0	7176.	5008.
4142	6102	CHURCH	acre	5.3	284.	218.
4142	6809	OTHER SCHOOL	acre	0.9	180.	148.
4142	9101	INACTIVE USE	acre	149.4	0.	0.
4142		TOTAL			7640.	5374.
4146	101	SINGLE FAMILY	du	6.0	94.	65.
4146	102	MULTI-FAMILY	du	106.0	1134.	796.
4146	5004	NEIGHBORHOOD COMMERCIAL	acre	12.3	18711.	13239.
4146	6002	LOW RISE OFFICE	acre	2.0	721.	553.
4146		TOTAL			20660.	14653.
4152	101	SINGLE FAMILY	du	166.0	2590.	1807.
4152	102	MULTI-FAMILY	du	357.0	3820.	2682.
4152	9101	INACTIVE USE	acre	27.5	0.	0.
4152		TOTAL			6409.	4489.
4157	102	MULTI-FAMILY	du	120.0	1284.	901.
4157	5003	COMMUNITY COMMERCIAL	acre	11.3	9473.	6703.
4157		TOTAL			10757.	7604.
4158	101	SINGLE FAMILY	du	380.0	5928.	4137.
4158	102	MULTI-FAMILY	du	284.0	3039.	2133.
4158	6105	FIRE OR POLICE STATION	acre	1.4	426.	314.
4158	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4158	7601	ACTIVE PARK	acre	6.8	454.	298.
4158	9101	INACTIVE USE	acre	10.4	0.	0.
4158		TOTAL			11965.	8068.
4159	101	SINGLE FAMILY	du	584.0	9110.	6357.
4159	6109	OTHER PUBLIC SERVICE	acre	2.5	982.	710.
4159	7601	ACTIVE PARK	acre	27.4	1822.	1199.
4159	9101	INACTIVE USE	acre	23.9	0.	0.
4159		TOTAL			11915.	8267.
4160	101	SINGLE FAMILY	du	233.0	3635.	2536.
4160	4113	COMMUNICATION OR UTILITY	acre	0.7	3.	2.
4160	9101	INACTIVE USE	acre	43.0	0.	0.
4160		TOTAL			3637.	2538.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4161	101	SINGLE FAMILY	du	454.0	7082.	4942.
4161	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4161	7607	RESIDENTIAL RECREATION	acre	2.5	0.	0.
4161	9101	INACTIVE USE	acre	120.2	0.	0.
4161		TOTAL			9201.	6127.
4162	4113	COMMUNICATION OR UTILITY	acre	5.4	22.	16.
4162	5004	NEIGHBORHOOD COMMERCIAL	acre	5.8	8776.	6209.
4162	9101	INACTIVE USE	acre	5.9	0.	0.
4162		TOTAL			8797.	6226.
4165	101	SINGLE FAMILY	du	411.0	6412.	4474.
4165	6105	FIRE OR POLICE STATION	acre	1.0	321.	236.
4165	6805	JUNIOR HIGH OR MIDDLE SCHOOL	acre	1.0	4206.	2586.
4165	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4165	9101	INACTIVE USE	acre	59.8	0.	0.
4165		TOTAL			13056.	8481.
4169	101	SINGLE FAMILY	du	240.0	3744.	2613.
4169	4113	COMMUNICATION OR UTILITY	acre	3.9	16.	12.
4169	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4169	9101	INACTIVE USE	acre	87.9	0.	0.
4169		TOTAL			5878.	3809.
4171	101	SINGLE FAMILY	du	237.4	3703.	2584.
4171	102	MULTI-FAMILY	du	110.0	1177.	826.
4171	6809	OTHER SCHOOL	acre	1.0	196.	162.
4171	7210	OTHER RECREATION	acre	6.4	43.	29.
4171	7601	ACTIVE PARK	acre	33.3	2220.	1461.
4171	9101	INACTIVE USE	acre	3.4	0.	0.
4171		TOTAL			7339.	5062.
4172	101	SINGLE FAMILY	du	601.0	9376.	6542.
4172	102	MULTI-FAMILY	du	766.0	8196.	5754.
4172	7602	PASSIVE PARK	acre	4.0	0.	0.
4172	9101	INACTIVE USE	acre	63.9	0.	0.
4172		TOTAL			17572.	12297.
4173	101	SINGLE FAMILY	du	249.3	3889.	2714.
4173	102	MULTI-FAMILY	du	421.8	4513.	3169.
4173	6102	CHURCH	acre	3.3	175.	134.
4173	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4173	7601	ACTIVE PARK	acre	15.6	1038.	683.
4173	9101	INACTIVE USE	acre	7.8	0.	0.
4173		TOTAL			11733.	7884.
4174	101	SINGLE FAMILY	du	10.1	157.	109.
4174	103	MOBILE HOME PARK	du	166.0	1096.	727.
4174	2103	LIGHT INDUSTRY	acre	25.0	2508.	2027.
4174	2104	WAREHOUSING OR STORAGE	acre	0.6	19.	16.
4174	5001	WHOLESALE TRADE	acre	1.5	71.	50.
4174	5009	OTHER COMMERCIAL	acre	0.2	24.	17.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4174	6002	LOW RISE OFFICE	acre	2.7	971.	744.
4174	9101	INACTIVE USE	acre	0.5	0.	0.
4174		TOTAL			4846.	3691.
4176	101	SINGLE FAMILY	du	99.4	1550.	1082.
4176	6110	CONVENTION CENTER	acre	14.4	1131.	772.
4176	9101	INACTIVE USE	acre	28.9	0.	0.
4176		TOTAL			2682.	1854.
4177	101	SINGLE FAMILY	du	202.0	3151.	2199.
4177	7601	ACTIVE PARK	acre	12.0	797.	524.
4177	9101	INACTIVE USE	acre	57.0	0.	0.
4177		TOTAL			3948.	2723.
4178	101	SINGLE FAMILY	du	223.1	3480.	2429.
4178	102	MULTI-FAMILY	du	386.3	4134.	2902.
4178	1409	OTHER GROUP QUARTERS	acre	1.2	6.	4.
4178	2103	LIGHT INDUSTRY	acre	1.1	111.	90.
4178	9101	INACTIVE USE	acre	0.3	0.	0.
4178		TOTAL			7731.	5425.
4181	101	SINGLE FAMILY	du	175.1	2731.	1906.
4181	6102	CHURCH	acre	4.2	224.	172.
4181	9101	INACTIVE USE	acre	55.6	0.	0.
4181		TOTAL			2956.	2078.
4182	2101	INDUSTRIAL PARK	acre	32.8	6306.	5169.
4182	2103	LIGHT INDUSTRY	acre	42.9	4301.	3476.
4182	2104	WAREHOUSING OR STORAGE	acre	9.4	310.	254.
4182	6104	POST OFFICE	acre	3.2	3529.	2453.
4182	7601	ACTIVE PARK	acre	7.3	487.	320.
4182	9101	INACTIVE USE	acre	1.7	0.	0.
4182		TOTAL			14933.	11672.
4183	2101	INDUSTRIAL PARK	acre	68.7	13205.	10825.
4183	2103	LIGHT INDUSTRY	acre	6.5	654.	529.
4183	5007	STREETFRONT COMMERCIAL	acre	16.8	25154.	18261.
4183	6002	LOW RISE OFFICE	acre	4.3	1531.	1173.
4183	6003	GOV'T OFFICE OR CENTER	acre	1.0	1074.	806.
4183	6509	OTHER HEALTH CARE	acre	1.0	508.	377.
4183	9101	INACTIVE USE	acre	22.4	0.	0.
4183		TOTAL			42127.	31972.
4184	2103	LIGHT INDUSTRY	acre	6.9	688.	556.
4184	2104	WAREHOUSING OR STORAGE	acre	3.0	99.	81.
4184	5003	COMMUNITY COMMERCIAL	acre	10.0	8391.	5937.
4184	5007	STREETFRONT COMMERCIAL	acre	0.9	1376.	999.
4184		TOTAL			10555.	7573.
4185	101	SINGLE FAMILY	du	254.0	3962.	2765.
4185	9101	INACTIVE USE	acre	19.5	0.	0.
4185		TOTAL			3962.	2765.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4189	101	SINGLE FAMILY	du	250.0	3900.	2721.
4189	9101	INACTIVE USE	acre	132.0	0.	0.
4189		TOTAL			3900.	2721.
4190	2103	LIGHT INDUSTRY	acre	5.1	514.	415.
4190	5003	COMMUNITY COMMERCIAL	acre	20.5	17202.	12171.
4190	5007	STREETFRONT COMMERCIAL	acre	7.9	11764.	8540.
4190	6002	LOW RISE OFFICE	acre	1.4	497.	381.
4190	9101	INACTIVE USE	acre	14.8	0.	0.
4190		TOTAL			29976.	21507.
4193	101	SINGLE FAMILY	du	342.0	5335.	3723.
4193	9101	INACTIVE USE	acre	40.7	0.	0.
4193		TOTAL			5335.	3723.
4194	5004	NEIGHBORHOOD COMMERCIAL	acre	2.6	4029.	2851.
4194	5007	STREETFRONT COMMERCIAL	acre	3.7	5503.	3995.
4194	6002	LOW RISE OFFICE	acre	4.1	1450.	1111.
4194	6003	GOV'T OFFICE OR CENTER	acre	3.6	3802.	2854.
4194		TOTAL			14785.	10812.
4195	5003	COMMUNITY COMMERCIAL	acre	48.9	41024.	29025.
4195	6509	OTHER HEALTH CARE	acre	3.1	1509.	1119.
4195	9101	INACTIVE USE	acre	2.4	0.	0.
4195		TOTAL			42532.	30145.
4197	5003	COMMUNITY COMMERCIAL	acre	9.4	7929.	5610.
4197	6002	LOW RISE OFFICE	acre	8.4	3006.	2304.
4197	6102	CHURCH	acre	8.2	436.	335.
4197	6809	OTHER SCHOOL	acre	0.4	78.	64.
4197	9101	INACTIVE USE	acre	0.3	0.	0.
4197		TOTAL			11449.	8314.
4198	101	SINGLE FAMILY	du	285.0	4446.	3102.
4198	6805	JUNIOR HIGH OR MIDDLE SCHOOL	acre	1.0	4206.	2586.
4198	9101	INACTIVE USE	acre	25.5	0.	0.
4198		TOTAL			8652.	5689.
4199	1501	LOW-RISE HOTEL OR MOTEL	acre	2.1	720.	444.
4199	5007	STREETFRONT COMMERCIAL	acre	8.5	12650.	9184.
4199	6002	LOW RISE OFFICE	acre	0.3	105.	80.
4199	7602	PASSIVE PARK	acre	0.7	0.	0.
4199	9101	INACTIVE USE	acre	18.4	0.	0.
4199		TOTAL			13475.	9708.
4201	101	SINGLE FAMILY	du	29.0	452.	316.
4201	102	MULTI-FAMILY	du	334.0	3574.	2509.
4201	6102	CHURCH	acre	1.5	81.	62.
4201	7601	ACTIVE PARK	acre	17.8	1187.	782.
4201		TOTAL			5294.	3668.
4202	102	MULTI-FAMILY	du	772.7	8268.	5805.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4202	1504	RESORT	acre	190.1	12375.	7629.
4202	1505	HIGH-RISE HOTEL	acre	1390.9	18082.	11147.
4202	4113	COMMUNICATION OR UTILITY	acre	8.1	32.	25.
4202	5012	BAYFRONT NEIGHBORHOOD COM	acre	115.9	19647.	13901.
4202	6005	BAYFRONT HIGH RISE OF	acre	46.4	992.	786.
4202	6109	OTHER PUBLIC SERVICE	acre	3.0	1199.	867.
4202	7601	ACTIVE PARK	acre	17.9	1194.	786.
4202	9101	INACTIVE USE	acre	250.9	0.	0.
4202		TOTAL			61789.	40945.
4204	101	SINGLE FAMILY	du	263.5	4111.	2868.
4204	102	MULTI-FAMILY	du	189.5	2028.	1424.
4204	1409	OTHER GROUP QUARTERS	acre	6.5	31.	22.
4204	5007	STREETFRONT COMMERCIAL	acre	2.9	4292.	3116.
4204	6002	LOW RISE OFFICE	acre	0.4	143.	109.
4204		TOTAL			10604.	7539.
4206	101	SINGLE FAMILY	du	79.0	1232.	860.
4206	102	MULTI-FAMILY	du	231.0	2472.	1735.
4206	7601	ACTIVE PARK	acre	1.9	127.	84.
4206		TOTAL			3831.	2679.
4207	101	SINGLE FAMILY	du	329.0	5132.	3581.
4207	102	MULTI-FAMILY	du	507.0	5425.	3809.
4207	4113	COMMUNICATION OR UTILITY	acre	2.3	9.	7.
4207	7204	GOLF COURSE	acre	37.2	0.	0.
4207	7601	ACTIVE PARK	acre	3.2	213.	140.
4207	9101	INACTIVE USE	acre	14.2	0.	0.
4207		TOTAL			10780.	7537.
4208	1501	LOW-RISE HOTEL OR MOTEL	acre	4.0	1365.	842.
4208	5007	STREETFRONT COMMERCIAL	acre	10.1	15069.	10939.
4208	9101	INACTIVE USE	acre	3.5	0.	0.
4208		TOTAL			16434.	11781.
4209	101	SINGLE FAMILY	du	599.0	9344.	6521.
4209	6102	CHURCH	acre	5.0	266.	205.
4209	6809	OTHER SCHOOL	acre	1.2	242.	200.
4209	7601	ACTIVE PARK	acre	5.0	334.	220.
4209	9101	INACTIVE USE	acre	77.3	0.	0.
4209		TOTAL			10186.	7144.
4210	101	SINGLE FAMILY	du	543.5	8478.	5916.
4210	102	MULTI-FAMILY	du	330.0	3531.	2479.
4210	4113	COMMUNICATION OR UTILITY	acre	3.2	13.	10.
4210	6102	CHURCH	acre	1.5	80.	62.
4210	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4210	7601	ACTIVE PARK	acre	15.0	1002.	659.
4210	9101	INACTIVE USE	acre	134.9	0.	0.
4210		TOTAL			15222.	10310.
4211	101	SINGLE FAMILY	du	4.3	67.	47.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4211	102	MULTI-FAMILY	du	482.8	5166.	3627.
4211	1501	LOW-RISE HOTEL OR MOTEL	acre	0.2	54.	33.
4211	4119	OTHER TRANSPORTATION	acre	0.9	104.	80.
4211	5007	STREETFRONT COMMERCIAL	acre	6.0	9022.	6550.
4211		TOTAL			14414.	10337.
4212	101	SINGLE FAMILY	du	438.9	6846.	4777.
4212	102	MULTI-FAMILY	du	297.0	3178.	2231.
4212	9101	INACTIVE USE	acre	0.9	0.	0.
4212		TOTAL			10024.	7009.
4213	101	SINGLE FAMILY	du	224.0	3494.	2438.
4213	103	MOBILE HOME PARK	du	196.0	1294.	858.
4213	9101	INACTIVE USE	acre	1.8	0.	0.
4213		TOTAL			4788.	3296.
4214	5004	NEIGHBORHOOD COMMERCIAL	acre	13.6	20680.	14632.
4214	6804	SENIOR HIGH SCHOOL	acre	1.0	5369.	2423.
4214		TOTAL			26049.	17054.
4215	101	SINGLE FAMILY	du	345.0	5382.	3756.
4215	4113	COMMUNICATION OR UTILITY	acre	3.6	15.	11.
4215	9101	INACTIVE USE	acre	35.9	0.	0.
4215		TOTAL			5397.	3767.
4216	101	SINGLE FAMILY	du	8.6	135.	94.
4216	102	MULTI-FAMILY	du	700.4	7494.	5261.
4216	103	MOBILE HOME PARK	du	17.0	112.	75.
4216	9101	INACTIVE USE	acre	1.5	0.	0.
4216		TOTAL			7741.	5430.
4218	102	MULTI-FAMILY	du	84.0	899.	631.
4218	6002	LOW RISE OFFICE	acre	3.0	1061.	813.
4218	9101	INACTIVE USE	acre	4.5	0.	0.
4218		TOTAL			1959.	1444.
4219	101	SINGLE FAMILY	du	93.0	1451.	1012.
4219	102	MULTI-FAMILY	du	406.0	4344.	3050.
4219	1409	OTHER GROUP QUARTERS	acre	1.1	5.	4.
4219	5007	STREETFRONT COMMERCIAL	acre	2.2	3236.	2349.
4219	6002	LOW RISE OFFICE	acre	0.1	41.	32.
4219	6102	CHURCH	acre	1.4	73.	56.
4219		TOTAL			9150.	6503.
4220	101	SINGLE FAMILY	du	512.0	7987.	5574.
4220	102	MULTI-FAMILY	du	200.0	2140.	1502.
4220	5004	NEIGHBORHOOD COMMERCIAL	acre	6.3	9676.	6846.
4220	6102	CHURCH	acre	4.6	248.	190.
4220	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4220	7601	ACTIVE PARK	acre	7.5	499.	328.
4220	9101	INACTIVE USE	acre	2.0	0.	0.
4220		TOTAL			22669.	15626.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4221	5003	COMMUNITY COMMERCIAL	acre	19.2	16086.	11381.
4221	7601	ACTIVE PARK	acre	14.9	991.	652.
4221	9101	INACTIVE USE	acre	22.2	0.	0.
4221		TOTAL			17077.	12033.
4222	101	SINGLE FAMILY	du	10.0	156.	109.
4222	102	MULTI-FAMILY	du	322.6	3452.	2423.
4222	103	MOBILE HOME PARK	du	28.9	191.	126.
4222	1501	LOW-RISE HOTEL OR MOTEL	acre	4.0	1365.	842.
4222	4112	RIGHT-OF-WAY	acre	3.1	0.	0.
4222	5007	STREETFRONT COMMERCIAL	acre	3.8	5683.	4126.
4222	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4222		TOTAL			12965.	8811.
4223	102	MULTI-FAMILY	du	94.0	1006.	706.
4223	6509	OTHER HEALTH CARE	acre	1.6	796.	590.
4223	9101	INACTIVE USE	acre	8.6	0.	0.
4223		TOTAL			1802.	1297.
4224	101	SINGLE FAMILY	du	77.0	1201.	838.
4224	102	MULTI-FAMILY	du	56.0	599.	421.
4224	7210	OTHER RECREATION	acre	0.1	1.	0.
4224	7601	ACTIVE PARK	acre	20.4	1357.	893.
4224	9101	INACTIVE USE	acre	4.9	0.	0.
4224		TOTAL			3158.	2152.
4225	101	SINGLE FAMILY	du	561.0	8752.	6107.
4225	102	MULTI-FAMILY	du	93.0	995.	699.
4225	7601	ACTIVE PARK	acre	18.3	1221.	804.
4225	9101	INACTIVE USE	acre	15.2	0.	0.
4225		TOTAL			10968.	7609.
4226	101	SINGLE FAMILY	du	777.0	12121.	8458.
4226	7601	ACTIVE PARK	acre	12.9	856.	564.
4226	9101	INACTIVE USE	acre	36.7	0.	0.
4226		TOTAL			12978.	9022.
4227	101	SINGLE FAMILY	du	80.4	1254.	875.
4227	102	MULTI-FAMILY	du	416.0	4451.	3125.
4227	6102	CHURCH	acre	1.2	64.	49.
4227	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4227		TOTAL			7888.	5235.
4228	101	SINGLE FAMILY	du	132.3	2063.	1440.
4228	102	MULTI-FAMILY	du	387.3	4144.	2910.
4228	6002	LOW RISE OFFICE	acre	1.8	632.	484.
4228		TOTAL			6840.	4834.
4232	101	SINGLE FAMILY	du	6.4	99.	69.
4232	102	MULTI-FAMILY	du	464.5	4970.	3489.
4232	103	MOBILE HOME PARK	du	10.7	71.	47.
4232	1501	LOW-RISE HOTEL OR MOTEL	acre	1.5	517.	319.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4232	5004	NEIGHBORHOOD COMMERCIAL	acre	3.1	4753.	3363.
4232	5007	STREETFRONT COMMERCIAL	acre	5.0	7534.	5470.
4232	6806	ELEMENTARY SCHOOL	acre	0.9	1941.	1085.
4232	9101	INACTIVE USE	acre	0.1	0.	0.
4232		TOTAL			19884.	13841.
4233	101	SINGLE FAMILY	du	8.2	128.	89.
4233	102	MULTI-FAMILY	du	637.6	6823.	4790.
4233	4114	PARKING	acre	0.7	0.	0.
4233	5007	STREETFRONT COMMERCIAL	acre	6.6	9857.	7156.
4233	6002	LOW RISE OFFICE	acre	3.0	1068.	819.
4233	6509	OTHER HEALTH CARE	acre	0.7	355.	263.
4233	7210	OTHER RECREATION	acre	0.0	0.	0.
4233	9101	INACTIVE USE	acre	0.1	0.	0.
4233		TOTAL			18231.	13117.
4234	101	SINGLE FAMILY	du	191.0	2980.	2079.
4234	102	MULTI-FAMILY	du	97.0	1038.	729.
4234	7204	GOLF COURSE	acre	53.4	0.	0.
4234	7205	GOLF CLUB HOUSE	acre	1.0	709.	484.
4234		TOTAL			4726.	3292.
4235	6002	LOW RISE OFFICE	acre	10.7	3825.	2931.
4235	9101	INACTIVE USE	acre	10.9	0.	0.
4235		TOTAL			3825.	2931.
4236	101	SINGLE FAMILY	du	518.0	8081.	5639.
4236	102	MULTI-FAMILY	du	119.0	1273.	894.
4236	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4236	7601	ACTIVE PARK	acre	5.6	373.	245.
4236	9101	INACTIVE USE	acre	185.6	0.	0.
4236		TOTAL			11846.	7963.
4237	6803	JUNIOR COLLEGE	acre	149.0	38313.	30299.
4237		TOTAL			38313.	30299.
4238	101	SINGLE FAMILY	du	44.3	691.	482.
4238	102	MULTI-FAMILY	du	203.6	2178.	1529.
4238	5007	STREETFRONT COMMERCIAL	acre	1.7	2533.	1839.
4238	6002	LOW RISE OFFICE	acre	0.7	265.	203.
4238	6003	GOV'T OFFICE OR CENTER	acre	7.1	7514.	5641.
4238	6103	LIBRARY	acre	4.0	1753.	1189.
4238	6105	FIRE OR POLICE STATION	acre	0.8	251.	185.
4238	7602	PASSIVE PARK	acre	4.0	0.	0.
4238		TOTAL			15185.	11068.
4239	102	MULTI-FAMILY	du	707.0	7565.	5311.
4239	6002	LOW RISE OFFICE	acre	1.8	625.	479.
4239	6102	CHURCH	acre	8.4	451.	346.
4239	6103	LIBRARY	acre	2.3	1013.	687.
4239	6105	FIRE OR POLICE STATION	acre	1.5	467.	344.
4239	7210	OTHER RECREATION	acre	4.8	31.	21.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4239	9101	INACTIVE USE	acre	21.0	0.	0.
4239		TOTAL			10152.	7189.
4240	101	SINGLE FAMILY	du	504.8	7875.	5495.
4240		TOTAL			7875.	5495.
4241	101	SINGLE FAMILY	du	944.0	14726.	10276.
4241	102	MULTI-FAMILY	du	382.0	4087.	2870.
4241	4113	COMMUNICATION OR UTILITY	acre	55.3	221.	169.
4241	6804	SENIOR HIGH SCHOOL	acre	1.0	5369.	2423.
4241	7602	PASSIVE PARK	acre	4.9	0.	0.
4241	9101	INACTIVE USE	acre	31.2	0.	0.
4241		TOTAL			24404.	15737.
4242	102	MULTI-FAMILY	du	252.0	2696.	1893.
4242	4113	COMMUNICATION OR UTILITY	acre	11.2	45.	34.
4242	6103	LIBRARY	acre	0.2	101.	68.
4242	6804	SENIOR HIGH SCHOOL	acre	1.0	5369.	2423.
4242	9101	INACTIVE USE	acre	10.5	0.	0.
4242		TOTAL			8211.	4418.
4243	101	SINGLE FAMILY	du	595.0	9282.	6477.
4243	102	MULTI-FAMILY	du	38.0	407.	285.
4243	6102	CHURCH	acre	4.1	221.	170.
4243	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4243	7601	ACTIVE PARK	acre	21.3	1419.	934.
4243	9101	INACTIVE USE	acre	5.8	0.	0.
4243		TOTAL			13448.	9051.
4244	101	SINGLE FAMILY	du	121.5	1895.	1323.
4244	102	MULTI-FAMILY	du	238.0	2547.	1788.
4244	4114	PARKING	acre	1.0	0.	0.
4244	6102	CHURCH	acre	0.8	45.	34.
4244		TOTAL			4487.	3145.
4245	101	SINGLE FAMILY	du	22.3	347.	242.
4245	102	MULTI-FAMILY	du	442.3	4733.	3323.
4245	103	MOBILE HOME PARK	du	38.4	253.	168.
4245	1409	OTHER GROUP QUARTERS	acre	1.6	8.	5.
4245	1501	LOW-RISE HOTEL OR MOTEL	acre	3.2	1104.	681.
4245	5007	STREETFRONT COMMERCIAL	acre	9.1	13564.	9847.
4245		TOTAL			20010.	14267.
4246	101	SINGLE FAMILY	du	7.3	113.	79.
4246	102	MULTI-FAMILY	du	731.9	7831.	5498.
4246	1409	OTHER GROUP QUARTERS	acre	0.2	1.	1.
4246	4114	PARKING	acre	0.9	0.	0.
4246	5007	STREETFRONT COMMERCIAL	acre	5.3	7970.	5786.
4246	6002	LOW RISE OFFICE	acre	1.8	653.	501.
4246	6102	CHURCH	acre	0.4	23.	18.
4246	6509	OTHER HEALTH CARE	acre	0.1	23.	17.
4246	7601	ACTIVE PARK	acre	7.8	517.	341.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4246	7602	PASSIVE PARK	acre	1.5	0.	0.
4246		TOTAL			17132.	12240.
4248	5003	COMMUNITY COMMERCIAL	acre	29.0	24359.	17235.
4248	6002	LOW RISE OFFICE	acre	1.5	546.	419.
4248		TOTAL			24905.	17654.
4249	101	SINGLE FAMILY	du	231.0	3603.	2514.
4249	102	MULTI-FAMILY	du	458.8	4909.	3447.
4249	6102	CHURCH	acre	2.6	141.	108.
4249		TOTAL			8653.	6069.
4250	101	SINGLE FAMILY	du	0.7	11.	7.
4250	102	MULTI-FAMILY	du	935.0	10004.	7024.
4250	1501	LOW-RISE HOTEL OR MOTEL	acre	4.3	1473.	908.
4250	4111	TRANSIT STATION	acre	1.3	373.	285.
4250	4112	RIGHT-OF-WAY	acre	1.4	0.	0.
4250	4119	OTHER TRANSPORTATION	acre	1.4	151.	115.
4250	5007	STREETFRONT COMMERCIAL	acre	7.0	10410.	7557.
4250	6001	HIGH RISE OFFICE	acre	1.8	4933.	3909.
4250	9101	INACTIVE USE	acre	0.1	0.	0.
4250		TOTAL			27355.	19806.
4251	101	SINGLE FAMILY	du	58.0	905.	631.
4251	102	MULTI-FAMILY	du	274.0	2932.	2058.
4251	9101	INACTIVE USE	acre	26.1	0.	0.
4251		TOTAL			3837.	2690.
4252	101	SINGLE FAMILY	du	12.9	202.	141.
4252	102	MULTI-FAMILY	du	294.9	3156.	2215.
4252	4113	COMMUNICATION OR UTILITY	acre	0.1	0.	0.
4252	6002	LOW RISE OFFICE	acre	0.5	181.	139.
4252	6003	GOV'T OFFICE OR CENTER	acre	4.2	4452.	3343.
4252	6105	FIRE OR POLICE STATION	acre	3.5	1080.	796.
4252	6509	OTHER HEALTH CARE	acre	0.7	331.	245.
4252	7601	ACTIVE PARK	acre	0.9	62.	41.
4252		TOTAL			9464.	6920.
4253	101	SINGLE FAMILY	du	311.0	4852.	3386.
4253	102	MULTI-FAMILY	du	117.0	1252.	879.
4253	6102	CHURCH	acre	4.6	247.	189.
4253	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4253	7601	ACTIVE PARK	acre	5.0	333.	219.
4253	9101	INACTIVE USE	acre	19.5	0.	0.
4253		TOTAL			8802.	5858.
4254	101	SINGLE FAMILY	du	136.0	2122.	1480.
4254	102	MULTI-FAMILY	du	56.0	599.	421.
4254	6109	OTHER PUBLIC SERVICE	acre	6.0	2384.	1724.
4254	6804	SENIOR HIGH SCHOOL	acre	1.0	5369.	2423.
4254	9101	INACTIVE USE	acre	1.8	0.	0.
4254		TOTAL			10474.	6047.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4255	101	SINGLE FAMILY	du	1155.0	18018.	12573.
4255	102	MULTI-FAMILY	du	78.0	835.	586.
4255	4113	COMMUNICATION OR UTILITY	acre	14.3	57.	44.
4255	6102	CHURCH	acre	12.2	653.	501.
4255	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4255	7204	GOLF COURSE	acre	58.0	0.	0.
4255	7601	ACTIVE PARK	acre	11.8	784.	516.
4255	7602	PASSIVE PARK	acre	3.2	0.	0.
4255		TOTAL			22465.	15405.
4256	101	SINGLE FAMILY	du	22.7	355.	247.
4256	102	MULTI-FAMILY	du	537.9	5755.	4040.
4256	6102	CHURCH	acre	1.2	64.	49.
4256	6109	OTHER PUBLIC SERVICE	acre	0.0	14.	10.
4256		TOTAL			6187.	4347.
4257	101	SINGLE FAMILY	du	395.0	6162.	4300.
4257	102	MULTI-FAMILY	du	96.0	1027.	721.
4257	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4257	7607	RESIDENTIAL RECREATION	acre	6.1	0.	0.
4257	9101	INACTIVE USE	acre	29.3	0.	0.
4257		TOTAL			9308.	6206.
4258	102	MULTI-FAMILY	du	409.0	4376.	3072.
4258	9101	INACTIVE USE	acre	31.2	0.	0.
4258		TOTAL			4376.	3072.
4259	2103	LIGHT INDUSTRY	acre	6.0	599.	484.
4259	5003	COMMUNITY COMMERCIAL	acre	11.4	9574.	6774.
4259	6002	LOW RISE OFFICE	acre	5.3	1910.	1464.
4259	7210	OTHER RECREATION	acre	5.1	34.	23.
4259		TOTAL			12118.	8746.
4260	101	SINGLE FAMILY	du	2.7	43.	30.
4260	102	MULTI-FAMILY	du	696.1	7448.	5229.
4260	103	MOBILE HOME PARK	du	52.7	348.	231.
4260	1501	LOW-RISE HOTEL OR MOTEL	acre	2.8	939.	579.
4260	5007	STREETFRONT COMMERCIAL	acre	4.3	6420.	4661.
4260	6109	OTHER PUBLIC SERVICE	acre	0.1	41.	29.
4260	9101	INACTIVE USE	acre	0.2	0.	0.
4260		TOTAL			15238.	10758.
4261	101	SINGLE FAMILY	du	5.9	92.	64.
4261	102	MULTI-FAMILY	du	1036.7	11092.	7788.
4261	1501	LOW-RISE HOTEL OR MOTEL	acre	0.1	17.	10.
4261	5007	STREETFRONT COMMERCIAL	acre	2.2	3371.	2447.
4261	6001	HIGH RISE OFFICE	acre	4.0	10925.	8656.
4261	6002	LOW RISE OFFICE	acre	1.4	484.	371.
4261	6102	CHURCH	acre	0.6	29.	22.
4261	6806	ELEMENTARY SCHOOL	acre	0.2	481.	269.
4261	9101	INACTIVE USE	acre	0.9	0.	0.
4261		TOTAL			26491.	19628.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4262	101	SINGLE FAMILY	du	224.0	3494.	2438.
4262	7602	PASSIVE PARK	acre	0.9	0.	0.
4262	9101	INACTIVE USE	acre	13.2	0.	0.
4262		TOTAL			3494.	2438.
4263	5003	COMMUNITY COMMERCIAL	acre	42.7	35821.	25345.
4263	9101	INACTIVE USE	acre	2.0	0.	0.
4263		TOTAL			35821.	25345.
4264	5003	COMMUNITY COMMERCIAL	acre	17.8	14953.	10580.
4264	9101	INACTIVE USE	acre	1.6	0.	0.
4264		TOTAL			14953.	10580.
4265	101	SINGLE FAMILY	du	403.0	6287.	4387.
4265	4113	COMMUNICATION OR UTILITY	acre	0.9	4.	3.
4265	9101	INACTIVE USE	acre	79.2	0.	0.
4265		TOTAL			6290.	4390.
4266	101	SINGLE FAMILY	du	413.0	6443.	4496.
4266	4113	COMMUNICATION OR UTILITY	acre	1.8	7.	5.
4266	6102	CHURCH	acre	2.3	121.	93.
4266	9101	INACTIVE USE	acre	5.2	0.	0.
4266		TOTAL			6571.	4594.
4267	101	SINGLE FAMILY	du	680.0	10608.	7402.
4267	4113	COMMUNICATION OR UTILITY	acre	1.4	6.	4.
4267	5007	STREETFRONT COMMERCIAL	acre	0.1	200.	145.
4267	6002	LOW RISE OFFICE	acre	0.7	254.	195.
4267	6509	OTHER HEALTH CARE	acre	0.1	37.	27.
4267	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4267	7602	PASSIVE PARK	acre	5.3	0.	0.
4267	9101	INACTIVE USE	acre	54.7	0.	0.
4267		TOTAL			13223.	8959.
4268	101	SINGLE FAMILY	du	0.2	4.	2.
4268	102	MULTI-FAMILY	du	1132.4	12117.	8507.
4268	103	MOBILE HOME PARK	du	73.4	484.	321.
4268	4112	RIGHT-OF-WAY	acre	2.3	0.	0.
4268	4119	OTHER TRANSPORTATION	acre	0.7	82.	62.
4268	5007	STREETFRONT COMMERCIAL	acre	1.7	2489.	1807.
4268	7601	ACTIVE PARK	acre	3.1	206.	135.
4268		TOTAL			15381.	10835.
4269	101	SINGLE FAMILY	du	15.4	241.	168.
4269	102	MULTI-FAMILY	du	706.1	7555.	5304.
4269	4114	PARKING	acre	0.3	0.	0.
4269	5007	STREETFRONT COMMERCIAL	acre	3.1	4651.	3376.
4269	6001	HIGH RISE OFFICE	acre	1.9	5114.	4052.
4269	6002	LOW RISE OFFICE	acre	1.5	540.	414.
4269	6102	CHURCH	acre	0.2	13.	10.
4269	6502	HOSPITAL	acre	13.3	4489.	3302.
4269	6509	OTHER HEALTH CARE	acre	4.1	2022.	1500.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4269	6805	JUNIOR HIGH OR MIDDLE SCHOOL	acre	1.0	4206.	2586.
4269	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4269		TOTAL			30949.	21898.
4270	101	SINGLE FAMILY	du	874.0	13634.	9514.
4270	102	MULTI-FAMILY	du	328.0	3510.	2464.
4270	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4270	7601	ACTIVE PARK	acre	11.6	771.	507.
4270	7602	PASSIVE PARK	acre	3.0	0.	0.
4270	9101	INACTIVE USE	acre	51.1	0.	0.
4270		TOTAL			20033.	13670.
4271	101	SINGLE FAMILY	du	437.0	6817.	4757.
4271	102	MULTI-FAMILY	du	9.0	96.	68.
4271	4113	COMMUNICATION OR UTILITY	acre	0.2	1.	1.
4271	6102	CHURCH	acre	7.6	405.	311.
4271	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4271	7601	ACTIVE PARK	acre	6.0	398.	262.
4271		TOTAL			9835.	6583.
4272	2001	HEAVY INDUSTRY	acre	9.5	739.	611.
4272	2103	LIGHT INDUSTRY	acre	8.7	874.	706.
4272	4113	COMMUNICATION OR UTILITY	acre	3.7	15.	11.
4272	6002	LOW RISE OFFICE	acre	11.4	4078.	3126.
4272	9101	INACTIVE USE	acre	18.2	0.	0.
4272		TOTAL			5706.	4455.
4273	101	SINGLE FAMILY	du	515.0	8034.	5606.
4273	4113	COMMUNICATION OR UTILITY	acre	4.3	17.	13.
4273	6102	CHURCH	acre	2.5	131.	100.
4273	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4273	6809	OTHER SCHOOL	acre	1.8	352.	290.
4273	7601	ACTIVE PARK	acre	5.9	393.	259.
4273	9101	INACTIVE USE	acre	22.0	0.	0.
4273		TOTAL			11045.	7454.
4274	102	MULTI-FAMILY	du	499.5	5344.	3752.
4274	5007	STREETFRONT COMMERCIAL	acre	0.2	266.	193.
4274	9101	INACTIVE USE	acre	5.5	0.	0.
4274		TOTAL			5610.	3945.
4275	101	SINGLE FAMILY	du	278.0	4337.	3026.
4275	102	MULTI-FAMILY	du	280.0	2996.	2103.
4275	6805	JUNIOR HIGH OR MIDDLE SCHOOL	acre	1.0	4206.	2586.
4275	7601	ACTIVE PARK	acre	11.2	749.	493.
4275	9101	INACTIVE USE	acre	26.1	0.	0.
4275		TOTAL			12287.	8208.
4276	101	SINGLE FAMILY	du	9.1	142.	99.
4276	102	MULTI-FAMILY	du	862.7	9231.	6481.
4276	103	MOBILE HOME PARK	du	13.9	92.	61.
4276	1501	LOW-RISE HOTEL OR MOTEL	acre	1.8	622.	383.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4276	5007	STREETFRONT COMMERCIAL	acre	13.1	19621.	14244.
4276	6001	HIGH RISE OFFICE	acre	0.2	427.	338.
4276	6002	LOW RISE OFFICE	acre	0.5	189.	145.
4276	6102	CHURCH	acre	0.1	7.	6.
4276		TOTAL			30330.	21757.
4277	101	SINGLE FAMILY	du	54.5	849.	593.
4277	102	MULTI-FAMILY	du	152.2	1628.	1143.
4277	1401	JAIL	acre	2.4	44.	32.
4277	4113	COMMUNICATION OR UTILITY	acre	0.7	3.	2.
4277	5007	STREETFRONT COMMERCIAL	acre	0.2	313.	227.
4277	6001	HIGH RISE OFFICE	acre	0.5	1452.	1151.
4277	6002	LOW RISE OFFICE	acre	2.1	753.	577.
4277	6003	GOV'T OFFICE OR CENTER	acre	12.4	13143.	9867.
4277	6509	OTHER HEALTH CARE	acre	0.3	132.	98.
4277	7210	OTHER RECREATION	acre	0.1	1.	0.
4277		TOTAL			18317.	13690.
4278	1501	LOW-RISE HOTEL OR MOTEL	acre	2.6	895.	552.
4278	2103	LIGHT INDUSTRY	acre	4.1	412.	333.
4278	4114	PARKING	acre	1.0	0.	0.
4278	5003	COMMUNITY COMMERCIAL	acre	14.9	12520.	8858.
4278	9101	INACTIVE USE	acre	9.6	0.	0.
4278		TOTAL			13827.	9743.
4279	101	SINGLE FAMILY	du	543.0	8471.	5911.
4279	102	MULTI-FAMILY	du	90.0	963.	676.
4279	5004	NEIGHBORHOOD COMMERCIAL	acre	1.8	2738.	1937.
4279	5007	STREETFRONT COMMERCIAL	acre	0.1	129.	93.
4279	9101	INACTIVE USE	acre	7.0	0.	0.
4279		TOTAL			12300.	8618.
4280	101	SINGLE FAMILY	du	298.0	4650.	3244.
4280		TOTAL			4650.	3244.
4281	5007	STREETFRONT COMMERCIAL	acre	0.3	510.	370.
4281	7207	MARINA	acre	9.7	540.	369.
4281	7601	ACTIVE PARK	acre	14.2	943.	621.
4281	9101	INACTIVE USE	acre	1.3	0.	0.
4281		TOTAL			1993.	1359.
4282	101	SINGLE FAMILY	du	67.7	1056.	737.
4282	102	MULTI-FAMILY	du	277.1	2965.	2082.
4282	5007	STREETFRONT COMMERCIAL	acre	0.3	505.	367.
4282	6002	LOW RISE OFFICE	acre	4.1	1449.	1111.
4282	6509	OTHER HEALTH CARE	acre	0.1	60.	45.
4282	6809	OTHER SCHOOL	acre	0.1	9.	7.
4282		TOTAL			6045.	4348.
4283	102	MULTI-FAMILY	du	681.2	7289.	5117.
4283	1502	HIGH-RISE HOTEL	acre	0.4	621.	383.
4283	4111	TRANSIT STATION	acre	1.1	308.	235.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4283	4112	RIGHT-OF-WAY	acre	2.5	0.	0.
4283	5007	STREETFRONT COMMERCIAL	acre	1.4	2053.	1491.
4283	6001	HIGH RISE OFFICE	acre	0.8	2114.	1675.
4283		TOTAL			12385.	8901.
4284	5003	COMMUNITY COMMERCIAL	acre	42.0	35284.	24965.
4284		TOTAL			35284.	24965.
4285	102	MULTI-FAMILY	du	704.8	7541.	5294.
4285		TOTAL			7541.	5294.
4286	2001	HEAVY INDUSTRY	acre	44.9	3495.	2889.
4286	2103	LIGHT INDUSTRY	acre	3.4	337.	272.
4286	9101	INACTIVE USE	acre	1.0	0.	0.
4286		TOTAL			3832.	3162.
4287	102	MULTI-FAMILY	du	410.3	4390.	3082.
4287	5002	REGIONAL COMMERCIAL	acre	38.2	28722.	20280.
4287	6002	LOW RISE OFFICE	acre	8.6	3054.	2341.
4287		TOTAL			36167.	25704.
4288	101	SINGLE FAMILY	du	175.0	2730.	1905.
4288	102	MULTI-FAMILY	du	76.0	813.	571.
4288	7210	OTHER RECREATION	acre	0.3	2.	1.
4288		TOTAL			3545.	2477.
4289	7601	ACTIVE PARK	acre	25.7	1709.	1124.
4289	9101	INACTIVE USE	acre	1418.0	0.	0.
4289		TOTAL			1709.	1124.
4290	102	MULTI-FAMILY	du	269.0	2878.	2021.
4290	6102	CHURCH	acre	8.9	476.	365.
4290	7607	RESIDENTIAL RECREATION	acre	4.0	0.	0.
4290	9101	INACTIVE USE	acre	4.1	0.	0.
4290		TOTAL			3354.	2386.
4291	102	MULTI-FAMILY	du	330.0	3530.	2479.
4291	9101	INACTIVE USE	acre	15.4	0.	0.
4291		TOTAL			3530.	2479.
4292	7208	OTC	acre	149.6	1002.	684.
4292		TOTAL			1002.	684.
4293	101	SINGLE FAMILY	du	319.0	4976.	3473.
4293	4113	COMMUNICATION OR UTILITY	acre	3.8	15.	12.
4293	7601	ACTIVE PARK	acre	4.5	297.	195.
4293	9101	INACTIVE USE	acre	31.6	0.	0.
4293		TOTAL			5289.	3680.
4294	5007	STREETFRONT COMMERCIAL	acre	0.9	1331.	966.
4294	6105	FIRE OR POLICE STATION	acre	0.6	187.	138.
4294	6805	JUNIOR HIGH OR MIDDLE SCHOOL	acre	1.0	4206.	2586.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4294	6807	SCHOOL DISTRICT OFFICE	acre	11.0	2772.	2125.
4294		TOTAL			8495.	5815.
4295	101	SINGLE FAMILY	du	164.0	2558.	1785.
4295	102	MULTI-FAMILY	du	710.0	7597.	5334.
4295	5007	STREETFRONT COMMERCIAL	acre	1.1	1675.	1216.
4295	7601	ACTIVE PARK	acre	5.6	372.	245.
4295	9101	INACTIVE USE	acre	22.2	0.	0.
4295		TOTAL			12202.	8579.
4296	101	SINGLE FAMILY	du	937.4	14623.	10204.
4296	102	MULTI-FAMILY	du	1346.5	14408.	10115.
4296	5007	STREETFRONT COMMERCIAL	acre	5.2	7742.	5621.
4296	6102	CHURCH	acre	13.6	724.	556.
4296	6804	SENIOR HIGH SCHOOL	acre	1.0	5369.	2423.
4296	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4296	6809	OTHER SCHOOL	acre	0.1	14.	12.
4296	7601	ACTIVE PARK	acre	7.6	505.	332.
4296	7607	RESIDENTIAL RECREATION	acre	2.9	0.	0.
4296	9101	INACTIVE USE	acre	20.7	0.	0.
4296		TOTAL			45503.	30447.
4297	101	SINGLE FAMILY	du	68.0	1061.	740.
4297	102	MULTI-FAMILY	du	190.0	2033.	1427.
4297	5007	STREETFRONT COMMERCIAL	acre	2.4	3616.	2625.
4297	6002	LOW RISE OFFICE	acre	10.3	3679.	2820.
4297		TOTAL			10389.	7612.
4298	102	MULTI-FAMILY	du	394.1	4217.	2960.
4298	5011	EASTLAKE REGIONAL COM	acre	1092.6	77359.	54622.
4298		TOTAL			81575.	57583.
4299	101	SINGLE FAMILY	du	659.0	10280.	7174.
4299	4113	COMMUNICATION OR UTILITY	acre	18.4	74.	56.
4299	7601	ACTIVE PARK	acre	3.2	216.	142.
4299	9101	INACTIVE USE	acre	14.3	0.	0.
4299		TOTAL			10570.	7372.
4300	101	SINGLE FAMILY	du	4.3	67.	47.
4300	102	MULTI-FAMILY	du	93.0	995.	698.
4300	1501	LOW-RISE HOTEL OR MOTEL	acre	2.2	737.	455.
4300	5004	NEIGHBORHOOD COMMERCIAL	acre	1.7	2573.	1821.
4300	5007	STREETFRONT COMMERCIAL	acre	10.6	15807.	11476.
4300	6001	HIGH RISE OFFICE	acre	1.1	2915.	2310.
4300		TOTAL			23095.	16806.
4301	1501	LOW-RISE HOTEL OR MOTEL	acre	5.0	1703.	1050.
4301	2103	LIGHT INDUSTRY	acre	4.8	482.	390.
4301	7601	ACTIVE PARK	acre	3.9	260.	171.
4301	9101	INACTIVE USE	acre	2.9	0.	0.
4301		TOTAL			2445.	1611.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4302	101	SINGLE FAMILY	du	372.0	5803.	4050.
4302	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4302	6809	OTHER SCHOOL	acre	1.8	358.	295.
4302	9101	INACTIVE USE	acre	56.6	0.	0.
4302		TOTAL			8280.	5530.
4303	101	SINGLE FAMILY	du	4.8	74.	52.
4303	102	MULTI-FAMILY	du	189.2	2025.	1421.
4303	103	MOBILE HOME PARK	du	17.5	115.	77.
4303	1501	LOW-RISE HOTEL OR MOTEL	acre	0.1	33.	21.
4303	5007	STREETFRONT COMMERCIAL	acre	6.8	10129.	7353.
4303	6001	HIGH RISE OFFICE	acre	2.1	5836.	4624.
4303	6002	LOW RISE OFFICE	acre	0.1	29.	22.
4303		TOTAL			18241.	13570.
4304	101	SINGLE FAMILY	du	296.0	4618.	3222.
4304	102	MULTI-FAMILY	du	21.0	225.	158.
4304		TOTAL			4842.	3380.
4305	101	SINGLE FAMILY	du	691.0	10780.	7522.
4305	102	MULTI-FAMILY	du	897.0	9598.	6738.
4305	5007	STREETFRONT COMMERCIAL	acre	3.8	5683.	4126.
4305	6102	CHURCH	acre	3.6	190.	146.
4305	6509	OTHER HEALTH CARE	acre	4.7	2280.	1692.
4305	7601	ACTIVE PARK	acre	6.7	448.	295.
4305	7602	PASSIVE PARK	acre	0.9	0.	0.
4305	9101	INACTIVE USE	acre	1.0	0.	0.
4305		TOTAL			28978.	20518.
4306	5003	COMMUNITY COMMERCIAL	acre	17.8	14961.	10585.
4306		TOTAL			14961.	10585.
4307	2001	HEAVY INDUSTRY	acre	7.7	601.	497.
4307	4113	COMMUNICATION OR UTILITY	acre	2.5	10.	8.
4307	5003	COMMUNITY COMMERCIAL	acre	8.2	6892.	4877.
4307	5007	STREETFRONT COMMERCIAL	acre	12.6	18779.	13633.
4307	6002	LOW RISE OFFICE	acre	3.3	1176.	901.
4307	7601	ACTIVE PARK	acre	1.8	118.	78.
4307	9101	INACTIVE USE	acre	9.9	0.	0.
4307		TOTAL			27576.	19993.
4308	102	MULTI-FAMILY	du	183.0	1958.	1375.
4308	6102	CHURCH	acre	3.5	190.	146.
4308	6809	OTHER SCHOOL	acre	1.1	220.	181.
4308	9101	INACTIVE USE	acre	2.3	0.	0.
4308		TOTAL			2368.	1702.
4309	101	SINGLE FAMILY	du	328.0	5117.	3571.
4309	102	MULTI-FAMILY	du	56.0	599.	421.
4309		TOTAL			5716.	3991.
4310	1501	LOW-RISE HOTEL OR MOTEL	acre	3.3	1110.	684.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4310	2103	LIGHT INDUSTRY	acre	1.3	128.	103.
4310	4114	PARKING	acre	1.1	0.	0.
4310	7210	OTHER RECREATION	acre	13.3	88.	60.
4310	7601	ACTIVE PARK	acre	5.6	373.	245.
4310		TOTAL			1698.	1093.
4311	101	SINGLE FAMILY	du	112.0	1747.	1219.
4311	102	MULTI-FAMILY	du	142.0	1519.	1067.
4311	6002	LOW RISE OFFICE	acre	0.3	96.	74.
4311	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4311	6809	OTHER SCHOOL	acre	0.1	16.	13.
4311		TOTAL			5498.	3558.
4312	101	SINGLE FAMILY	du	726.0	11326.	7903.
4312	5007	STREETFRONT COMMERCIAL	acre	0.4	598.	434.
4312	6102	CHURCH	acre	2.1	113.	87.
4312	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4312		TOTAL			14155.	9609.
4313	101	SINGLE FAMILY	du	10.8	169.	118.
4313	102	MULTI-FAMILY	du	152.0	1626.	1142.
4313	1501	LOW-RISE HOTEL OR MOTEL	acre	0.4	153.	94.
4313	5007	STREETFRONT COMMERCIAL	acre	0.8	1237.	898.
4313	6002	LOW RISE OFFICE	acre	0.1	43.	33.
4313	6509	OTHER HEALTH CARE	acre	0.1	60.	45.
4313	7210	OTHER RECREATION	acre	2.1	14.	9.
4313	9101	INACTIVE USE	acre	6.4	0.	0.
4313		TOTAL			3301.	2338.
4315	101	SINGLE FAMILY	du	406.3	6339.	4423.
4315	6102	CHURCH	acre	1.8	96.	74.
4315	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4315	7601	ACTIVE PARK	acre	3.3	220.	145.
4315	9101	INACTIVE USE	acre	2.2	0.	0.
4315		TOTAL			8773.	5827.
4316	101	SINGLE FAMILY	du	137.1	2139.	1493.
4316	102	MULTI-FAMILY	du	230.4	2465.	1730.
4316	103	MOBILE HOME PARK	du	14.3	94.	63.
4316	4112	RIGHT-OF-WAY	acre	5.6	0.	0.
4316	5007	STREETFRONT COMMERCIAL	acre	2.6	3938.	2859.
4316	6001	HIGH RISE OFFICE	acre	0.9	2401.	1902.
4316	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4316		TOTAL			13156.	9232.
4317	101	SINGLE FAMILY	du	162.1	2529.	1765.
4317	102	MULTI-FAMILY	du	107.9	1154.	810.
4317	5007	STREETFRONT COMMERCIAL	acre	4.6	6818.	4950.
4317	6002	LOW RISE OFFICE	acre	0.6	197.	151.
4317		TOTAL			10699.	7676.
4318	101	SINGLE FAMILY	du	70.0	1092.	762.

Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4318	102	MULTI-FAMILY	du	127.0	1359.	954.
4318	5004	NEIGHBORHOOD COMMERCIAL	acre	6.1	9246.	6542.
4318	5007	STREETFRONT COMMERCIAL	acre	2.5	3763.	2732.
4318	6002	LOW RISE OFFICE	acre	4.5	1615.	1238.
4318	6104	POST OFFICE	acre	4.7	5211.	3622.
4318	6109	OTHER PUBLIC SERVICE	acre	0.6	240.	173.
4318		TOTAL			22525.	16023.
4319	101	SINGLE FAMILY	du	295.0	4602.	3211.
4319	6102	CHURCH	acre	1.8	97.	75.
4319	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4319		TOTAL			6818.	4471.
4320	101	SINGLE FAMILY	du	203.0	3167.	2210.
4320	102	MULTI-FAMILY	du	611.8	6546.	4596.
4320	5004	NEIGHBORHOOD COMMERCIAL	acre	10.0	15262.	10798.
4320	6102	CHURCH	acre	7.3	388.	298.
4320	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4320	7601	ACTIVE PARK	acre	10.0	666.	438.
4320	7602	PASSIVE PARK	acre	0.8	0.	0.
4320	9101	INACTIVE USE	acre	11.2	0.	0.
4320		TOTAL			28147.	19525.
4321	101	SINGLE FAMILY	du	300.2	4683.	3268.
4321	102	MULTI-FAMILY	du	103.0	1102.	774.
4321	6002	LOW RISE OFFICE	acre	0.5	193.	148.
4321	9101	INACTIVE USE	acre	0.1	0.	0.
4321		TOTAL			5978.	4189.
4322	101	SINGLE FAMILY	du	495.5	7731.	5394.
4322	102	MULTI-FAMILY	du	4.0	43.	30.
4322	6102	CHURCH	acre	3.9	208.	160.
4322	9101	INACTIVE USE	acre	0.1	0.	0.
4322		TOTAL			7982.	5584.
4323	2103	LIGHT INDUSTRY	acre	1.0	98.	79.
4323	4113	COMMUNICATION OR UTILITY	acre	2.5	10.	8.
4323	5007	STREETFRONT COMMERCIAL	acre	1.4	2092.	1519.
4323	6002	LOW RISE OFFICE	acre	4.8	1701.	1304.
4323	7601	ACTIVE PARK	acre	1.5	98.	65.
4323	9101	INACTIVE USE	acre	0.9	0.	0.
4323		TOTAL			3999.	2974.
4324	101	SINGLE FAMILY	du	174.1	2716.	1895.
4324	7210	OTHER RECREATION	acre	2.5	16.	11.
4324	9101	INACTIVE USE	acre	0.6	0.	0.
4324		TOTAL			2732.	1906.
4325	101	SINGLE FAMILY	du	563.0	8783.	6129.
4325	6105	FIRE OR POLICE STATION	acre	1.5	476.	351.
4325	7601	ACTIVE PARK	acre	3.7	248.	163.
4325	9101	INACTIVE USE	acre	23.1	0.	0.
4325		TOTAL			9507.	6643.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4326	5003	COMMUNITY COMMERCIAL	acre	25.0	20982.	14845.
4326	9101	INACTIVE USE	acre	7.4	0.	0.
4326		TOTAL			20982.	14845.
4327	101	SINGLE FAMILY	du	400.0	6240.	4354.
4327	9101	INACTIVE USE	acre	35.0	0.	0.
4327		TOTAL			6240.	4354.
4328	101	SINGLE FAMILY	du	92.0	1435.	1002.
4328	102	MULTI-FAMILY	du	366.7	3924.	2755.
4328	1501	LOW-RISE HOTEL OR MOTEL	acre	0.2	54.	33.
4328	5007	STREETFRONT COMMERCIAL	acre	5.6	8313.	6035.
4328	6002	LOW RISE OFFICE	acre	0.8	275.	211.
4328		TOTAL			14002.	10036.
4329	102	MULTI-FAMILY	du	201.0	2151.	1510.
4329	9101	INACTIVE USE	acre	4.2	0.	0.
4329		TOTAL			2151.	1510.
4330	101	SINGLE FAMILY	du	297.0	4633.	3233.
4330	6102	CHURCH	acre	1.6	87.	66.
4330	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4330		TOTAL			6838.	4485.
4331	101	SINGLE FAMILY	du	940.7	14674.	10240.
4331	102	MULTI-FAMILY	du	2946.0	31522.	22130.
4331	2103	LIGHT INDUSTRY	acre	36.5	3657.	2956.
4331	5021	MIXED USE COMMERCIAL	acre	130.0	19669.	14279.
4331	6105	FIRE OR POLICE STATION	acre	1.7	526.	388.
4331	6109	OTHER PUBLIC SERVICE	acre	17.5	6995.	5057.
4331	6804	SENIOR HIGH SCHOOL	acre	1.0	5369.	2423.
4331	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4331	7601	ACTIVE PARK	acre	19.8	1319.	868.
4331	9101	INACTIVE USE	acre	138.7	0.	0.
4331		TOTAL			85850.	59525.
4332	101	SINGLE FAMILY	du	15.9	247.	173.
4332	102	MULTI-FAMILY	du	261.0	2793.	1961.
4332	5004	NEIGHBORHOOD COMMERCIAL	acre	5.3	8058.	5702.
4332	5007	STREETFRONT COMMERCIAL	acre	2.8	4196.	3046.
4332	6002	LOW RISE OFFICE	acre	8.7	3115.	2388.
4332	6509	OTHER HEALTH CARE	acre	0.8	410.	304.
4332	9101	INACTIVE USE	acre	0.1	0.	0.
4332		TOTAL			18820.	13573.
4333	102	MULTI-FAMILY	du	108.0	1156.	811.
4333	9101	INACTIVE USE	acre	9.4	0.	0.
4333		TOTAL			1156.	811.
4334	101	SINGLE FAMILY	du	161.0	2512.	1753.
4334	102	MULTI-FAMILY	du	14.0	150.	105.
4334	6804	SENIOR HIGH SCHOOL	acre	1.0	5369.	2423.
4334		TOTAL			8030.	4280.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4335	101	SINGLE FAMILY	du	21.0	328.	229.
4335	102	MULTI-FAMILY	du	85.0	909.	639.
4335	5007	STREETFRONT COMMERCIAL	acre	1.9	2886.	2095.
4335	7204	GOLF COURSE	acre	148.6	0.	0.
4335	7205	GOLF CLUB HOUSE	acre	1.0	709.	484.
4335	9101	INACTIVE USE	acre	1.3	0.	0.
4335		TOTAL			4832.	3446.
4336	101	SINGLE FAMILY	du	1.0	16.	11.
4336	4113	COMMUNICATION OR UTILITY	acre	0.0	0.	0.
4336	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4336	7601	ACTIVE PARK	acre	6.7	447.	294.
4336		TOTAL			2581.	1490.
4337	101	SINGLE FAMILY	du	237.0	3697.	2580.
4337	9101	INACTIVE USE	acre	16.2	0.	0.
4337		TOTAL			3697.	2580.
4338	101	SINGLE FAMILY	du	282.5	4407.	3075.
4338	102	MULTI-FAMILY	du	448.5	4799.	3369.
4338	6805	JUNIOR HIGH OR MIDDLE SCHOOL	acre	1.0	4206.	2586.
4338	9101	INACTIVE USE	acre	8.8	0.	0.
4338		TOTAL			13412.	9030.
4339	102	MULTI-FAMILY	du	132.0	1412.	992.
4339	1409	OTHER GROUP QUARTERS	acre	30.6	147.	103.
4339	6502	HOSPITAL	acre	26.5	8948.	6582.
4339	6509	OTHER HEALTH CARE	acre	13.7	6709.	4978.
4339		TOTAL			17217.	12654.
4340	101	SINGLE FAMILY	du	359.0	5600.	3908.
4340	4113	COMMUNICATION OR UTILITY	acre	7.2	29.	22.
4340	7210	OTHER RECREATION	acre	9.1	60.	41.
4340	7601	ACTIVE PARK	acre	20.0	1332.	877.
4340		TOTAL			7021.	4848.
4341	4114	PARKING	acre	0.1	0.	0.
4341	5007	STREETFRONT COMMERCIAL	acre	9.2	13751.	9983.
4341	6002	LOW RISE OFFICE	acre	1.6	559.	429.
4341	7601	ACTIVE PARK	acre	2.4	159.	105.
4341	9101	INACTIVE USE	acre	1.7	0.	0.
4341		TOTAL			14469.	10516.
4342	101	SINGLE FAMILY	du	90.0	1404.	980.
4342	102	MULTI-FAMILY	du	286.0	3060.	2148.
4342	2103	LIGHT INDUSTRY	acre	19.0	1900.	1535.
4342	2104	WAREHOUSING OR STORAGE	acre	3.6	119.	97.
4342	4112	RIGHT-OF-WAY	acre	4.2	0.	0.
4342	7210	OTHER RECREATION	acre	1.9	12.	8.
4342	9101	INACTIVE USE	acre	0.5	0.	0.
4342		TOTAL			6495.	4769.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4343	5007	STREETFRONT COMMERCIAL	acre	14.2	21275.	15445.
4343	7601	ACTIVE PARK	acre	2.7	180.	119.
4343	9101	INACTIVE USE	acre	4.2	0.	0.
4343		TOTAL			21455.	15564.
4344	101	SINGLE FAMILY	du	66.0	1030.	718.
4344	102	MULTI-FAMILY	du	275.8	2951.	2072.
4344	1501	LOW-RISE HOTEL OR MOTEL	acre	0.1	47.	29.
4344	5007	STREETFRONT COMMERCIAL	acre	4.6	6808.	4942.
4344	5009	OTHER COMMERCIAL	acre	4.1	520.	378.
4344	6002	LOW RISE OFFICE	acre	0.7	253.	194.
4344	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4344		TOTAL			13727.	9518.
4345	102	MULTI-FAMILY	du	2883.8	30857.	21663.
4345	1502	HIGH-RISE HOTEL	acre	8.5	13686.	8437.
4345	5002	REGIONAL COMMERCIAL	acre	22.7	17066.	12050.
4345	6001	HIGH RISE OFFICE	acre	8.9	24300.	19254.
4345	6002	LOW RISE OFFICE	acre	8.1	2875.	2204.
4345	6007	OFFICE	acre	370.9	5786.	4435.
4345	6105	FIRE OR POLICE STATION	acre	1.2	361.	266.
4345	6109	OTHER PUBLIC SERVICE	acre	13.1	5220.	3773.
4345	6804	SENIOR HIGH SCHOOL	acre	1.0	5369.	2423.
4345	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4345	7601	ACTIVE PARK	acre	22.3	1487.	979.
4345		TOTAL			109125.	76669.
4346	101	SINGLE FAMILY	du	509.0	7940.	5541.
4346	7601	ACTIVE PARK	acre	5.6	373.	245.
4346	9101	INACTIVE USE	acre	29.5	0.	0.
4346		TOTAL			8313.	5786.
4347	101	SINGLE FAMILY	du	1.6	25.	17.
4347	102	MULTI-FAMILY	du	384.2	4111.	2886.
4347	4113	COMMUNICATION OR UTILITY	acre	0.1	0.	0.
4347	5007	STREETFRONT COMMERCIAL	acre	2.2	3371.	2447.
4347	6102	CHURCH	acre	3.2	170.	130.
4347	6509	OTHER HEALTH CARE	acre	4.5	2188.	1623.
4347	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4347	9101	INACTIVE USE	acre	4.2	0.	0.
4347		TOTAL			11983.	8289.
4348	101	SINGLE FAMILY	du	283.0	4415.	3081.
4348	4113	COMMUNICATION OR UTILITY	acre	2.5	10.	8.
4348	6102	CHURCH	acre	1.0	51.	39.
4348	7601	ACTIVE PARK	acre	2.7	180.	119.
4348	9101	INACTIVE USE	acre	0.3	0.	0.
4348		TOTAL			4657.	3247.
4350	6811	ELEMENTARY SCHOOL	acre	60.0	6468.	3618.
4350		TOTAL			6468.	3618.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4351	101	SINGLE FAMILY	du	861.0	13431.	9372.
4351	102	MULTI-FAMILY	du	355.3	3801.	2669.
4351	5007	STREETFRONT COMMERCIAL	acre	5.6	8321.	6041.
4351	6109	OTHER PUBLIC SERVICE	acre	4.9	1946.	1407.
4351	6804	SENIOR HIGH SCHOOL	acre	1.0	5369.	2423.
4351	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4351	7601	ACTIVE PARK	acre	7.2	479.	315.
4351	9101	INACTIVE USE	acre	45.3	0.	0.
4351		TOTAL			35465.	23411.
4352	101	SINGLE FAMILY	du	211.0	3292.	2297.
4352	102	MULTI-FAMILY	du	205.5	2198.	1543.
4352	6102	CHURCH	acre	1.9	101.	78.
4352	6806	ELEMENTARY SCHOOL	acre	2.0	4237.	2370.
4352	9101	INACTIVE USE	acre	0.6	0.	0.
4352		TOTAL			9828.	6288.
4353	2101	INDUSTRIAL PARK	acre	65.7	12618.	10344.
4353	6810	UCCV	acre	200.9	36204.	28919.
4353		TOTAL			48821.	39262.
4354	2001	HEAVY INDUSTRY	acre	25.6	1994.	1648.
4354	2103	LIGHT INDUSTRY	acre	47.6	4771.	3856.
4354	2201	EXTRACTIVE INDUSTRY	acre	52.6	79.	65.
4354	4113	COMMUNICATION OR UTILITY	acre	86.9	348.	265.
4354		TOTAL			7191.	5835.
4355	101	SINGLE FAMILY	du	459.0	7160.	4997.
4355	4113	COMMUNICATION OR UTILITY	acre	0.7	3.	2.
4355	6102	CHURCH	acre	5.4	288.	221.
4355	6109	OTHER PUBLIC SERVICE	acre	2.3	931.	673.
4355	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4355		TOTAL			10502.	7079.
4356	102	MULTI-FAMILY	du	609.0	6516.	4575.
4356	5003	COMMUNITY COMMERCIAL	acre	12.4	10405.	7362.
4356	7601	ACTIVE PARK	acre	10.0	668.	440.
4356		TOTAL			17589.	12376.
4357	101	SINGLE FAMILY	du	12.7	199.	139.
4357	102	MULTI-FAMILY	du	645.6	6908.	4850.
4357	1501	LOW-RISE HOTEL OR MOTEL	acre	0.2	58.	36.
4357	2103	LIGHT INDUSTRY	acre	11.5	1149.	929.
4357	2104	WAREHOUSING OR STORAGE	acre	0.3	10.	8.
4357	5007	STREETFRONT COMMERCIAL	acre	5.9	8906.	6465.
4357	6002	LOW RISE OFFICE	acre	0.9	341.	261.
4357	7210	OTHER RECREATION	acre	1.2	8.	6.
4357	9101	INACTIVE USE	acre	0.1	0.	0.
4357		TOTAL			17578.	12693.
4358	101	SINGLE FAMILY	du	557.0	8689.	6063.
4358	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4358	9101	INACTIVE USE	acre	79.6	0.	0.
4358		TOTAL			10808.	7248.
4359	101	SINGLE FAMILY	du	3.2	50.	35.
4359	102	MULTI-FAMILY	du	312.5	3344.	2348.
4359	5003	COMMUNITY COMMERCIAL	acre	17.6	14810.	10479.
4359	5007	STREETFRONT COMMERCIAL	acre	4.1	6149.	4464.
4359		TOTAL			24353.	17325.
4360	101	SINGLE FAMILY	du	290.0	4524.	3157.
4360	102	MULTI-FAMILY	du	105.9	1133.	795.
4360	6809	OTHER SCHOOL	acre	0.2	47.	39.
4360	9101	INACTIVE USE	acre	0.1	0.	0.
4360		TOTAL			5704.	3991.
4361	101	SINGLE FAMILY	du	455.3	7103.	4957.
4361	102	MULTI-FAMILY	du	93.0	995.	699.
4361	4113	COMMUNICATION OR UTILITY	acre	2.5	10.	8.
4361	6102	CHURCH	acre	3.4	181.	139.
4361	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4361	9101	INACTIVE USE	acre	0.2	0.	0.
4361		TOTAL			10408.	6987.
4362	101	SINGLE FAMILY	du	63.3	987.	689.
4362	102	MULTI-FAMILY	du	507.7	5433.	3814.
4362	6804	SENIOR HIGH SCHOOL	acre	1.0	5369.	2423.
4362		TOTAL			11789.	6925.
4363	101	SINGLE FAMILY	du	47.9	747.	522.
4363	102	MULTI-FAMILY	du	381.0	4077.	2862.
4363	2103	LIGHT INDUSTRY	acre	53.7	5382.	4350.
4363	7601	ACTIVE PARK	acre	3.2	213.	140.
4363	9101	INACTIVE USE	acre	57.4	0.	0.
4363		TOTAL			10419.	7874.
4364	101	SINGLE FAMILY	du	95.0	1482.	1034.
4364	102	MULTI-FAMILY	du	310.0	3317.	2329.
4364		TOTAL			4799.	3363.
4365	101	SINGLE FAMILY	du	95.0	1482.	1034.
4365	103	MOBILE HOME PARK	du	133.0	878.	582.
4365	2103	LIGHT INDUSTRY	acre	9.8	986.	797.
4365	2104	WAREHOUSING OR STORAGE	acre	0.2	8.	6.
4365	4112	RIGHT-OF-WAY	acre	2.8	0.	0.
4365	5004	NEIGHBORHOOD COMMERCIAL	acre	7.7	11675.	8261.
4365		TOTAL			15029.	10680.
4366	101	SINGLE FAMILY	du	428.0	6677.	4659.
4366	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4366	9101	INACTIVE USE	acre	10.6	0.	0.
4366		TOTAL			8795.	5844.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4367	101	SINGLE FAMILY	du	342.0	5335.	3723.
4367	102	MULTI-FAMILY	du	154.0	1648.	1157.
4367	4113	COMMUNICATION OR UTILITY	acre	18.4	73.	56.
4367	5007	STREETFRONT COMMERCIAL	acre	1.2	1795.	1303.
4367		TOTAL			8851.	6239.
4368	101	SINGLE FAMILY	du	104.1	1624.	1133.
4368	102	MULTI-FAMILY	du	543.8	5818.	4085.
4368	1501	LOW-RISE HOTEL OR MOTEL	acre	0.1	39.	24.
4368	5007	STREETFRONT COMMERCIAL	acre	4.1	6052.	4394.
4368	6002	LOW RISE OFFICE	acre	0.7	237.	182.
4368	9101	INACTIVE USE	acre	0.5	0.	0.
4368		TOTAL			13771.	9818.
4369	101	SINGLE FAMILY	du	30.9	481.	336.
4369	102	MULTI-FAMILY	du	538.7	5764.	4047.
4369	103	MOBILE HOME PARK	du	29.3	193.	128.
4369	2104	WAREHOUSING OR STORAGE	acre	0.5	17.	14.
4369	5007	STREETFRONT COMMERCIAL	acre	9.5	14209.	10315.
4369	5009	OTHER COMMERCIAL	acre	0.1	18.	13.
4369	6002	LOW RISE OFFICE	acre	0.6	205.	157.
4369	6104	POST OFFICE	acre	0.2	219.	152.
4369		TOTAL			21106.	15162.
4370	101	SINGLE FAMILY	du	482.0	7519.	5247.
4370	102	MULTI-FAMILY	du	14.0	150.	105.
4370	6102	CHURCH	acre	0.7	35.	27.
4370	9101	INACTIVE USE	acre	0.0	0.	0.
4370		TOTAL			7704.	5379.
4372	101	SINGLE FAMILY	du	73.3	1143.	798.
4372	102	MULTI-FAMILY	du	447.1	4784.	3359.
4372	2104	WAREHOUSING OR STORAGE	acre	0.7	22.	18.
4372		TOTAL			5949.	4174.
4373	101	SINGLE FAMILY	du	96.6	1507.	1051.
4373	102	MULTI-FAMILY	du	2423.3	25929.	18204.
4373	5018	COMMERCIAL/RETAIL	acre	231.8	13098.	9267.
4373	6007	OFFICE	acre	556.4	8679.	6653.
4373	6109	OTHER PUBLIC SERVICE	acre	3.1	1235.	893.
4373	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4373	7601	ACTIVE PARK	acre	18.8	1251.	823.
4373		TOTAL			53817.	38076.
4374	101	SINGLE FAMILY	du	382.0	5959.	4158.
4374	4113	COMMUNICATION OR UTILITY	acre	10.8	43.	33.
4374	7601	ACTIVE PARK	acre	2.4	160.	105.
4374	9101	INACTIVE USE	acre	0.1	0.	0.
4374		TOTAL			6162.	4297.
4375	102	MULTI-FAMILY	du	425.0	4547.	3193.
4375	7601	ACTIVE PARK	acre	44.6	2970.	1955.
4375		TOTAL			7518.	5147.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4376	101	SINGLE FAMILY	du	73.1	1141.	796.
4376	102	MULTI-FAMILY	du	156.1	1671.	1173.
4376	6807	SCHOOL DISTRICT OFFICE	acre	6.4	1607.	1232.
4376	9101	INACTIVE USE	acre	0.0	0.	0.
4376		TOTAL			4419.	3201.
4377	101	SINGLE FAMILY	du	2.0	32.	22.
4377	102	MULTI-FAMILY	du	617.0	6602.	4635.
4377	5007	STREETFRONT COMMERCIAL	acre	9.7	14490.	10519.
4377	6002	LOW RISE OFFICE	acre	0.1	32.	24.
4377	6102	CHURCH	acre	0.5	26.	20.
4377	7601	ACTIVE PARK	acre	3.9	260.	171.
4377		TOTAL			21441.	15392.
4378	101	SINGLE FAMILY	du	0.2	4.	2.
4378	102	MULTI-FAMILY	du	202.0	2161.	1517.
4378	5004	NEIGHBORHOOD COMMERCIAL	acre	3.2	4826.	3414.
4378	5007	STREETFRONT COMMERCIAL	acre	2.4	3526.	2560.
4378	6002	LOW RISE OFFICE	acre	2.1	736.	564.
4378		TOTAL			11253.	8058.
4379	2101	INDUSTRIAL PARK	acre	35.5	6828.	5598.
4379	9101	INACTIVE USE	acre	100.6	0.	0.
4379		TOTAL			6828.	5598.
4380	5003	COMMUNITY COMMERCIAL	acre	31.4	26331.	18630.
4380		TOTAL			26331.	18630.
4381	101	SINGLE FAMILY	du	71.0	1108.	773.
4381	102	MULTI-FAMILY	du	13.0	139.	98.
4381	5007	STREETFRONT COMMERCIAL	acre	1.5	2213.	1607.
4381	6804	SENIOR HIGH SCHOOL	acre	1.0	5369.	2423.
4381	7601	ACTIVE PARK	acre	8.6	573.	377.
4381		TOTAL			9402.	5277.
4382	2301	JUNKYARD/DUMP/LANDFILL	acre	486.7	7690.	6338.
4382	4113	COMMUNICATION OR UTILITY	acre	5.5	22.	17.
4382	7601	ACTIVE PARK	acre	23.2	1544.	1016.
4382		TOTAL			9256.	7371.
4383	101	SINGLE FAMILY	du	744.1	11609.	8101.
4383	102	MULTI-FAMILY	du	799.8	8558.	6008.
4383	2103	LIGHT INDUSTRY	acre	17.9	1789.	1445.
4383	5021	MIXED USE COMMERCIAL	acre	15.4	2338.	1698.
4383	6002	LOW RISE OFFICE	acre	12.1	4332.	3321.
4383	6109	OTHER PUBLIC SERVICE	acre	1.5	618.	446.
4383	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4383	7601	ACTIVE PARK	acre	5.7	381.	251.
4383		TOTAL			31742.	22454.
4384	101	SINGLE FAMILY	du	56.6	884.	617.
4384	102	MULTI-FAMILY	du	850.5	9101.	6389.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4384	6805	JUNIOR HIGH OR MIDDLE SCHOOL	acre	1.0	4206.	2586.
4384		TOTAL			14190.	9592.
4386	101	SINGLE FAMILY	du	77.9	1215.	848.
4386	102	MULTI-FAMILY	du	54.4	582.	408.
4386	6102	CHURCH	acre	4.3	229.	176.
4386	6105	FIRE OR POLICE STATION	acre	0.4	137.	101.
4386	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4386	7601	ACTIVE PARK	acre	3.1	206.	135.
4386	9101	INACTIVE USE	acre	0.0	0.	0.
4386		TOTAL			4487.	2853.
4387	101	SINGLE FAMILY	du	2.5	39.	27.
4387	102	MULTI-FAMILY	du	242.8	2598.	1824.
4387	103	MOBILE HOME PARK	du	119.0	785.	521.
4387	1501	LOW-RISE HOTEL OR MOTEL	acre	0.2	66.	40.
4387	2103	LIGHT INDUSTRY	acre	0.3	26.	21.
4387	2104	WAREHOUSING OR STORAGE	acre	7.4	245.	200.
4387	4112	RIGHT-OF-WAY	acre	2.1	0.	0.
4387	5007	STREETFRONT COMMERCIAL	acre	1.5	2321.	1685.
4387	6002	LOW RISE OFFICE	acre	0.7	249.	191.
4387	6003	GOV'T OFFICE OR CENTER	acre	7.1	7488.	5621.
4387	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4387	7601	ACTIVE PARK	acre	5.2	347.	228.
4387		TOTAL			16282.	11544.
4389	101	SINGLE FAMILY	du	48.5	757.	528.
4389	102	MULTI-FAMILY	du	934.4	9998.	7019.
4389	5004	NEIGHBORHOOD COMMERCIAL	acre	2.2	3434.	2430.
4389	5007	STREETFRONT COMMERCIAL	acre	1.2	1735.	1259.
4389	6102	CHURCH	acre	0.7	36.	27.
4389	6804	SENIOR HIGH SCHOOL	acre	1.0	5369.	2423.
4389		TOTAL			21328.	13686.
4390	101	SINGLE FAMILY	du	655.6	10227.	7137.
4390	102	MULTI-FAMILY	du	279.7	2993.	2101.
4390	5007	STREETFRONT COMMERCIAL	acre	0.9	1271.	923.
4390	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4390	7601	ACTIVE PARK	acre	4.3	290.	191.
4390	7607	RESIDENTIAL RECREATION	acre	0.8	0.	0.
4390	9101	INACTIVE USE	acre	2.6	0.	0.
4390		TOTAL			16899.	11536.
4391	101	SINGLE FAMILY	du	253.5	3954.	2759.
4391	102	MULTI-FAMILY	du	1330.6	14238.	9996.
4391	4113	COMMUNICATION OR UTILITY	acre	19.6	78.	60.
4391	5017	COMMERCIAL/RETAIL	acre	193.2	21830.	15445.
4391	6006	OFFICE	acre	38.6	1005.	770.
4391	6109	OTHER PUBLIC SERVICE	acre	3.1	1235.	893.
4391	6805	JUNIOR HIGH OR MIDDLE SCHOOL	acre	1.0	4206.	2586.
4391	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4391	7601	ACTIVE PARK	acre	19.2	1276.	840.
4391		TOTAL			49940.	34534.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4392	101	SINGLE FAMILY	du	30.0	468.	327.
4392	102	MULTI-FAMILY	du	54.7	585.	411.
4392	5004	NEIGHBORHOOD COMMERCIAL	acre	20.3	30921.	21877.
4392	5007	STREETFRONT COMMERCIAL	acre	2.0	2969.	2155.
4392	9101	INACTIVE USE	acre	0.1	0.	0.
4392		TOTAL			34942.	24770.
4393	102	MULTI-FAMILY	du	365.5	3911.	2746.
4393	4112	RIGHT-OF-WAY	acre	0.7	0.	0.
4393	5003	COMMUNITY COMMERCIAL	acre	18.4	15456.	10936.
4393	5004	NEIGHBORHOOD COMMERCIAL	acre	3.2	4887.	3458.
4393	5007	STREETFRONT COMMERCIAL	acre	2.2	3257.	2365.
4393	6002	LOW RISE OFFICE	acre	1.1	389.	298.
4393	9101	INACTIVE USE	acre	0.9	0.	0.
4393		TOTAL			27900.	19802.
4394	101	SINGLE FAMILY	du	33.4	521.	364.
4394	102	MULTI-FAMILY	du	395.1	4228.	2968.
4394	103	MOBILE HOME PARK	du	296.0	1954.	1296.
4394	4113	COMMUNICATION OR UTILITY	acre	6.6	26.	20.
4394	7601	ACTIVE PARK	acre	9.2	611.	402.
4394		TOTAL			7340.	5049.
4396	101	SINGLE FAMILY	du	358.0	5585.	3897.
4396	2103	LIGHT INDUSTRY	acre	22.6	2269.	1834.
4396	9101	INACTIVE USE	acre	2.2	0.	0.
4396		TOTAL			7854.	5731.
4397	101	SINGLE FAMILY	du	192.0	2995.	2090.
4397	102	MULTI-FAMILY	du	54.0	578.	406.
4397	103	MOBILE HOME PARK	du	191.0	1261.	836.
4397	6102	CHURCH	acre	2.3	121.	93.
4397		TOTAL			4955.	3425.
4398	101	SINGLE FAMILY	du	107.5	1678.	1171.
4398	102	MULTI-FAMILY	du	201.0	2151.	1510.
4398	5004	NEIGHBORHOOD COMMERCIAL	acre	6.8	10454.	7397.
4398	7601	ACTIVE PARK	acre	19.1	1273.	838.
4398	9101	INACTIVE USE	acre	0.2	0.	0.
4398		TOTAL			15556.	10916.
4399	101	SINGLE FAMILY	du	399.0	6224.	4343.
4399	102	MULTI-FAMILY	du	118.0	1263.	886.
4399	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4399		TOTAL			9606.	6415.
4400	101	SINGLE FAMILY	du	6.1	96.	67.
4400	102	MULTI-FAMILY	du	3.4	36.	26.
4400	2103	LIGHT INDUSTRY	acre	1.2	118.	96.
4400	4113	COMMUNICATION OR UTILITY	acre	0.2	1.	1.
4400	5001	WHOLESALE TRADE	acre	0.5	22.	16.
4400	5007	STREETFRONT COMMERCIAL	acre	13.5	20240.	14694.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4400	6002	LOW RISE OFFICE	acre	31.7	11305.	8665.
4400	9101	INACTIVE USE	acre	1.5	0.	0.
4400		TOTAL			31819.	23563.
4401	102	MULTI-FAMILY	du	164.6	1761.	1236.
4401	103	MOBILE HOME PARK	du	4.1	27.	18.
4401	1501	LOW-RISE HOTEL OR MOTEL	acre	0.1	36.	22.
4401	5007	STREETFRONT COMMERCIAL	acre	1.0	1467.	1065.
4401	6002	LOW RISE OFFICE	acre	0.5	175.	134.
4401	9101	INACTIVE USE	acre	1.1	0.	0.
4401		TOTAL			3466.	2476.
4402	101	SINGLE FAMILY	du	23.9	373.	260.
4402	102	MULTI-FAMILY	du	610.1	6528.	4583.
4402	4113	COMMUNICATION OR UTILITY	acre	5.5	22.	17.
4402	5007	STREETFRONT COMMERCIAL	acre	7.0	10446.	7584.
4402	6002	LOW RISE OFFICE	acre	0.1	41.	32.
4402	6103	LIBRARY	acre	6.1	2644.	1793.
4402	9101	INACTIVE USE	acre	0.3	0.	0.
4402		TOTAL			20055.	14268.
4403	101	SINGLE FAMILY	du	21.8	340.	238.
4403	102	MULTI-FAMILY	du	969.0	10369.	7279.
4403	103	MOBILE HOME PARK	du	5.2	34.	23.
4403	2101	INDUSTRIAL PARK	acre	32.7	6281.	5149.
4403	2103	LIGHT INDUSTRY	acre	2.0	195.	158.
4403	5007	STREETFRONT COMMERCIAL	acre	2.4	3655.	2653.
4403	6002	LOW RISE OFFICE	acre	0.6	206.	158.
4403	6102	CHURCH	acre	0.3	18.	14.
4403	7601	ACTIVE PARK	acre	3.1	206.	135.
4403	9101	INACTIVE USE	acre	0.1	0.	0.
4403		TOTAL			21305.	15807.
4404	101	SINGLE FAMILY	du	0.5	7.	5.
4404	102	MULTI-FAMILY	du	82.7	885.	621.
4404	4111	TRANSIT STATION	acre	1.1	311.	237.
4404	5003	COMMUNITY COMMERCIAL	acre	15.5	12989.	9190.
4404	5007	STREETFRONT COMMERCIAL	acre	4.5	6665.	4839.
4404	5009	OTHER COMMERCIAL	acre	0.2	24.	18.
4404	6002	LOW RISE OFFICE	acre	0.2	66.	50.
4404		TOTAL			20947.	14960.
4405	101	SINGLE FAMILY	du	100.5	1567.	1094.
4405	102	MULTI-FAMILY	du	479.1	5126.	3599.
4405	2201	EXTRACTIVE INDUSTRY	acre	31.0	47.	38.
4405	7601	ACTIVE PARK	acre	4.8	320.	211.
4405		TOTAL			7060.	4942.
4406	101	SINGLE FAMILY	du	462.8	7220.	5038.
4406	102	MULTI-FAMILY	du	77.0	824.	578.
4406	5007	STREETFRONT COMMERCIAL	acre	1.0	1481.	1075.
4406	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4406	7602	PASSIVE PARK	acre	1.0	0.	0.
4406		TOTAL			11643.	7876.
4407	101	SINGLE FAMILY	du	325.1	5071.	3539.
4407	102	MULTI-FAMILY	du	90.0	963.	676.
4407	2103	LIGHT INDUSTRY	acre	0.2	19.	15.
4407	6102	CHURCH	acre	2.3	121.	93.
4407	7210	OTHER RECREATION	acre	0.5	3.	2.
4407	7601	ACTIVE PARK	acre	5.1	338.	222.
4407	7602	PASSIVE PARK	acre	1.2	0.	0.
4407	9101	INACTIVE USE	acre	1.6	0.	0.
4407		TOTAL			6515.	4548.
4408	102	MULTI-FAMILY	du	172.0	1840.	1292.
4408	103	MOBILE HOME PARK	du	7.1	46.	31.
4408	1501	LOW-RISE HOTEL OR MOTEL	acre	0.3	104.	64.
4408	2104	WAREHOUSING OR STORAGE	acre	3.0	101.	83.
4408	4113	COMMUNICATION OR UTILITY	acre	6.2	25.	19.
4408	5004	NEIGHBORHOOD COMMERCIAL	acre	11.1	16924.	11974.
4408	5007	STREETFRONT COMMERCIAL	acre	2.9	4374.	3176.
4408	5009	OTHER COMMERCIAL	acre	0.2	21.	15.
4408	6002	LOW RISE OFFICE	acre	1.5	544.	417.
4408		TOTAL			23980.	17071.
4409	101	SINGLE FAMILY	du	1.0	16.	11.
4409	102	MULTI-FAMILY	du	138.6	1483.	1041.
4409	103	MOBILE HOME PARK	du	90.0	594.	394.
4409	2101	INDUSTRIAL PARK	acre	22.2	4272.	3502.
4409	2103	LIGHT INDUSTRY	acre	23.9	2390.	1932.
4409	2104	WAREHOUSING OR STORAGE	acre	4.5	150.	123.
4409	4112	RIGHT-OF-WAY	acre	5.7	0.	0.
4409	4113	COMMUNICATION OR UTILITY	acre	7.6	31.	23.
4409	9101	INACTIVE USE	acre	0.2	0.	0.
4409		TOTAL			8936.	7026.
4410	101	SINGLE FAMILY	du	58.5	913.	637.
4410	102	MULTI-FAMILY	du	151.6	1622.	1139.
4410	103	MOBILE HOME PARK	du	502.0	3313.	2197.
4410	2103	LIGHT INDUSTRY	acre	12.6	1266.	1023.
4410	2104	WAREHOUSING OR STORAGE	acre	2.3	76.	62.
4410	4113	COMMUNICATION OR UTILITY	acre	11.4	46.	35.
4410	5007	STREETFRONT COMMERCIAL	acre	0.2	329.	239.
4410	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4410		TOTAL			9684.	6517.
4411	102	MULTI-FAMILY	du	45.0	481.	338.
4411	103	MOBILE HOME PARK	du	426.0	2812.	1865.
4411	9101	INACTIVE USE	acre	4.7	0.	0.
4411		TOTAL			3293.	2203.
4412	101	SINGLE FAMILY	du	198.5	3097.	2161.
4412	102	MULTI-FAMILY	du	38.0	407.	285.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4412	103	MOBILE HOME PARK	du	129.0	851.	565.
4412	2103	LIGHT INDUSTRY	acre	6.2	625.	505.
4412	5007	STREETFRONT COMMERCIAL	acre	0.1	194.	141.
4412	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4412	7601	ACTIVE PARK	acre	4.3	286.	188.
4412	9101	INACTIVE USE	acre	0.1	0.	0.
4412		TOTAL			7580.	5031.
4414	2103	LIGHT INDUSTRY	acre	44.1	4423.	3575.
4414	5006	AUTO COMMERCIAL	acre	1.5	720.	510.
4414	5009	OTHER COMMERCIAL	acre	1.6	199.	144.
4414	9101	INACTIVE USE	acre	5.0	0.	0.
4414		TOTAL			5342.	4229.
4415	102	MULTI-FAMILY	du	106.0	1134.	796.
4415	1501	LOW-RISE HOTEL OR MOTEL	acre	0.1	42.	26.
4415	5004	NEIGHBORHOOD COMMERCIAL	acre	10.9	16692.	11810.
4415	5007	STREETFRONT COMMERCIAL	acre	0.1	200.	145.
4415		TOTAL			18068.	12778.
4416	101	SINGLE FAMILY	du	117.7	1837.	1282.
4416	102	MULTI-FAMILY	du	95.8	1025.	720.
4416	2103	LIGHT INDUSTRY	acre	15.9	1596.	1290.
4416	5001	WHOLESALE TRADE	acre	0.2	12.	8.
4416	5007	STREETFRONT COMMERCIAL	acre	9.3	13955.	10131.
4416	6102	CHURCH	acre	2.5	132.	101.
4416	6509	OTHER HEALTH CARE	acre	0.4	195.	145.
4416	7210	OTHER RECREATION	acre	0.1	1.	0.
4416	9101	INACTIVE USE	acre	7.1	0.	0.
4416		TOTAL			18751.	13676.
4417	2103	LIGHT INDUSTRY	acre	159.7	16004.	12934.
4417	2301	JUNKYARD/DUMP/LANDFILL	acre	23.1	365.	301.
4417		TOTAL			16369.	13235.
4418	101	SINGLE FAMILY	du	0.2	4.	2.
4418	2101	INDUSTRIAL PARK	acre	3.9	744.	610.
4418	2103	LIGHT INDUSTRY	acre	1.8	184.	149.
4418	4112	RIGHT-OF-WAY	acre	1.8	0.	0.
4418	5003	COMMUNITY COMMERCIAL	acre	21.3	17883.	12653.
4418	5009	OTHER COMMERCIAL	acre	0.2	20.	15.
4418	9101	INACTIVE USE	acre	0.4	0.	0.
4418		TOTAL			18834.	13428.
4419	2103	LIGHT INDUSTRY	acre	54.0	5415.	4377.
4419	2104	WAREHOUSING OR STORAGE	acre	2.8	94.	77.
4419	2301	JUNKYARD/DUMP/LANDFILL	acre	1.1	18.	14.
4419	4113	COMMUNICATION OR UTILITY	acre	5.6	22.	17.
4419	6002	LOW RISE OFFICE	acre	0.2	56.	43.
4419	7210	OTHER RECREATION	acre	1.4	9.	6.
4419	9101	INACTIVE USE	acre	43.9	0.	0.
4419		TOTAL			5614.	4534.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4420	101	SINGLE FAMILY	du	0.5	7.	5.
4420	102	MULTI-FAMILY	du	103.5	1107.	777.
4420	2103	LIGHT INDUSTRY	acre	39.1	3922.	3170.
4420	2104	WAREHOUSING OR STORAGE	acre	9.6	316.	259.
4420	9101	INACTIVE USE	acre	1.3	0.	0.
4420		TOTAL			5352.	4210.
4421	5007	STREETFRONT COMMERCIAL	acre	6.2	9245.	6712.
4421	6002	LOW RISE OFFICE	acre	5.4	1932.	1481.
4421	7601	ACTIVE PARK	acre	68.8	4580.	3014.
4421	9101	INACTIVE USE	acre	583.3	0.	0.
4421		TOTAL			15757.	11206.
4424	101	SINGLE FAMILY	du	4.6	71.	49.
4424	2103	LIGHT INDUSTRY	acre	47.5	4758.	3845.
4424	2104	WAREHOUSING OR STORAGE	acre	7.8	257.	210.
4424	4112	RIGHT-OF-WAY	acre	4.4	0.	0.
4424	5007	STREETFRONT COMMERCIAL	acre	0.2	326.	237.
4424	6002	LOW RISE OFFICE	acre	0.0	15.	12.
4424	9101	INACTIVE USE	acre	20.9	0.	0.
4424		TOTAL			5427.	4353.
4425	102	MULTI-FAMILY	du	11.1	119.	84.
4425	2103	LIGHT INDUSTRY	acre	22.8	2285.	1847.
4425	2104	WAREHOUSING OR STORAGE	acre	4.2	141.	115.
4425	2201	EXTRACTIVE INDUSTRY	acre	9.4	14.	12.
4425	5009	OTHER COMMERCIAL	acre	0.4	50.	36.
4425	7601	ACTIVE PARK	acre	19.3	1287.	847.
4425	8002	INTENSIVE AGRICULTURE	acre	2.1	1.	1.
4425	9101	INACTIVE USE	acre	19.4	0.	0.
4425		TOTAL			3897.	2941.
4426	2103	LIGHT INDUSTRY	acre	40.5	4056.	3278.
4426	5006	AUTO COMMERCIAL	acre	5.9	2799.	1981.
4426	9101	INACTIVE USE	acre	99.2	0.	0.
4426		TOTAL			6855.	5258.
4427	102	MULTI-FAMILY	du	656.0	7019.	4928.
4427	1501	LOW-RISE HOTEL OR MOTEL	acre	1.8	598.	368.
4427	5004	NEIGHBORHOOD COMMERCIAL	acre	2.5	3831.	2710.
4427	5007	STREETFRONT COMMERCIAL	acre	2.0	3054.	2217.
4427	7601	ACTIVE PARK	acre	7.7	515.	339.
4427	9101	INACTIVE USE	acre	2.5	0.	0.
4427		TOTAL			15016.	10562.
4428	101	SINGLE FAMILY	du	234.0	3650.	2547.
4428	102	MULTI-FAMILY	du	69.0	738.	518.
4428	9101	INACTIVE USE	acre	20.1	0.	0.
4428		TOTAL			4389.	3066.
4430	7210	OTHER RECREATION	acre	103.8	685.	468.
4430	9101	INACTIVE USE	acre	159.5	0.	0.
4430		TOTAL			685.	468.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4431	2301	JUNKYARD/DUMP/LANDFILL	acre	5.3	84.	69.
4431	5003	COMMUNITY COMMERCIAL	acre	21.4	17916.	12676.
4431	6002	LOW RISE OFFICE	acre	1.1	407.	312.
4431	8002	INTENSIVE AGRICULTURE	acre	22.6	11.	9.
4431	9101	INACTIVE USE	acre	3.3	0.	0.
4431		TOTAL			18418.	13066.
4443	101	SINGLE FAMILY	du	928.0	14477.	10102.
4443	102	MULTI-FAMILY	du	2409.0	25776.	18096.
4443	4112	RIGHT-OF-WAY	acre	49.1	0.	0.
4443	7601	ACTIVE PARK	acre	9.3	619.	408.
4443	9101	INACTIVE USE	acre	271.0	0.	0.
4443		TOTAL			40872.	28606.
4450	2103	LIGHT INDUSTRY	acre	168.2	16854.	13621.
4450	9101	INACTIVE USE	acre	25.5	0.	0.
4450		TOTAL			16854.	13621.
4460	101	SINGLE FAMILY	du	535.0	8346.	5824.
4460	102	MULTI-FAMILY	du	264.0	2825.	1983.
4460	2103	LIGHT INDUSTRY	acre	24.0	2405.	1944.
4460	2301	JUNKYARD/DUMP/LANDFILL	acre	2.0	32.	26.
4460	4103	GENERAL AVIATION AIRPORT	acre	3.8	25.	19.
4460	4112	RIGHT-OF-WAY	acre	31.2	0.	0.
4460	5004	NEIGHBORHOOD COMMERCIAL	acre	6.3	9615.	6803.
4460	7601	ACTIVE PARK	acre	1.0	67.	44.
4460	9101	INACTIVE USE	acre	122.9	0.	0.
4460		TOTAL			23314.	16643.
4467	2103	LIGHT INDUSTRY	acre	30.9	3097.	2503.
4467	2104	WAREHOUSING OR STORAGE	acre	0.9	28.	23.
4467	9101	INACTIVE USE	acre	44.3	0.	0.
4467		TOTAL			3126.	2526.
4470	101	SINGLE FAMILY	du	15.0	234.	163.
4470	102	MULTI-FAMILY	du	958.0	10251.	7196.
4470	2104	WAREHOUSING OR STORAGE	acre	70.0	2317.	1894.
4470	4112	RIGHT-OF-WAY	acre	26.2	0.	0.
4470	5009	OTHER COMMERCIAL	acre	0.4	51.	37.
4470	6102	CHURCH	acre	0.6	32.	25.
4470	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4470		TOTAL			15003.	10500.
4479	2103	LIGHT INDUSTRY	acre	185.4	18577.	15014.
4479	2104	WAREHOUSING OR STORAGE	acre	3.1	103.	84.
4479	4112	RIGHT-OF-WAY	acre	23.1	0.	0.
4479	4119	OTHER TRANSPORTATION	acre	8.3	923.	705.
4479	9101	INACTIVE USE	acre	43.6	0.	0.
4479		TOTAL			19603.	15802.
4480	101	SINGLE FAMILY	du	1.0	16.	11.
4480	2101	INDUSTRIAL PARK	acre	68.5	13159.	10787.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4480	2103	LIGHT INDUSTRY	acre	44.9	4499.	3636.
4480	4112	RIGHT-OF-WAY	acre	4.7	0.	0.
4480	5003	COMMUNITY COMMERCIAL	acre	28.5	23914.	16920.
4480	8003	FIELD CROPS	acre	93.2	9.	7.
4480	9101	INACTIVE USE	acre	0.4	0.	0.
4480		TOTAL			41597.	31362.
4482	2101	INDUSTRIAL PARK	acre	289.5	55613.	45590.
4482	4112	RIGHT-OF-WAY	acre	1.7	0.	0.
4482		TOTAL			55613.	45590.
4497	101	SINGLE FAMILY	du	13.0	203.	142.
4497	102	MULTI-FAMILY	du	130.0	1391.	977.
4497	2103	LIGHT INDUSTRY	acre	86.7	8687.	7021.
4497	2104	WAREHOUSING OR STORAGE	acre	23.1	765.	625.
4497	4112	RIGHT-OF-WAY	acre	12.3	0.	0.
4497	4119	OTHER TRANSPORTATION	acre	37.1	4126.	3151.
4497	9101	INACTIVE USE	acre	103.9	0.	0.
4497		TOTAL			15171.	11915.
4500	2101	INDUSTRIAL PARK	acre	57.8	11103.	9102.
4500	2301	JUNKYARD/DUMP/LANDFILL	acre	161.0	2544.	2097.
4500	4112	RIGHT-OF-WAY	acre	5.5	0.	0.
4500	5003	COMMUNITY COMMERCIAL	acre	6.1	5119.	3622.
4500	8003	FIELD CROPS	acre	105.8	11.	8.
4500		TOTAL			18776.	14829.
4502	101	SINGLE FAMILY	du	174.0	2714.	1894.
4502	2301	JUNKYARD/DUMP/LANDFILL	acre	340.0	5372.	4428.
4502	9101	INACTIVE USE	acre	331.3	0.	0.
4502		TOTAL			8086.	6322.
4506	2101	INDUSTRIAL PARK	acre	240.6	46219.	37889.
4506	4112	RIGHT-OF-WAY	acre	1.9	0.	0.
4506	8003	FIELD CROPS	acre	81.1	8.	6.
4506	9101	INACTIVE USE	acre	49.6	0.	0.
4506		TOTAL			46227.	37896.
4534	2101	INDUSTRIAL PARK	acre	35.0	6724.	5512.
4534	4112	RIGHT-OF-WAY	acre	6.9	0.	0.
4534	8003	FIELD CROPS	acre	122.6	12.	10.
4534		TOTAL			6736.	5521.
4535	101	SINGLE FAMILY	du	19.0	296.	207.
4535	9101	INACTIVE USE	acre	81.6	0.	0.
4535		TOTAL			296.	207.
4537	4119	OTHER TRANSPORTATION	acre	119.3	13266.	10132.
4537	5004	NEIGHBORHOOD COMMERCIAL	acre	1.5	2289.	1620.
4537	8003	FIELD CROPS	acre	37.5	4.	3.
4537		TOTAL			15559.	11755.

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Zone	Code	Name	Type	Amount	Trips Person	Trips Vehicle
4545	101	SINGLE FAMILY	du	4.0	62.	44.
4545	2103	LIGHT INDUSTRY	acre	4.0	401.	324.
4545	2104	WAREHOUSING OR STORAGE	acre	21.0	695.	568.
4545	4112	RIGHT-OF-WAY	acre	6.9	0.	0.
4545	4119	OTHER TRANSPORTATION	acre	1.8	200.	153.
4545	8003	FIELD CROPS	acre	11.0	1.	1.
4545	9101	INACTIVE USE	acre	100.7	0.	0.
4545		TOTAL			1360.	1089.
4549	2103	LIGHT INDUSTRY	acre	72.3	7244.	5855.
4549	4112	RIGHT-OF-WAY	acre	10.7	0.	0.
4549		TOTAL			7244.	5855.
4550	101	SINGLE FAMILY	du	1337.0	20857.	14554.
4550	9101	INACTIVE USE	acre	41.8	0.	0.
4550		TOTAL			20857.	14554.
4558	101	SINGLE FAMILY	du	321.0	5008.	3494.
4558	102	MULTI-FAMILY	du	1211.0	12958.	9097.
4558	2301	JUNKYARD/DUMP/LANDFILL	acre	0.9	14.	12.
4558	5004	NEIGHBORHOOD COMMERCIAL	acre	18.3	27929.	19761.
4558	9101	INACTIVE USE	acre	196.8	0.	0.
4558		TOTAL			45909.	32364.
4562	101	SINGLE FAMILY	du	5.0	78.	54.
4562	2101	INDUSTRIAL PARK	acre	50.0	9605.	7874.
4562	2103	LIGHT INDUSTRY	acre	10.0	1002.	810.
4562	4112	RIGHT-OF-WAY	acre	6.9	0.	0.
4562	5001	WHOLESALE TRADE	acre	19.3	938.	664.
4562	8003	FIELD CROPS	acre	44.0	4.	3.
4562	9101	INACTIVE USE	acre	5.6	0.	0.
4562		TOTAL			11627.	9406.
4571	2101	INDUSTRIAL PARK	acre	176.2	33840.	27741.
4571	2103	LIGHT INDUSTRY	acre	32.0	3206.	2591.
4571	2104	WAREHOUSING OR STORAGE	acre	23.1	765.	625.
4571	8003	FIELD CROPS	acre	157.1	16.	12.
4571	9101	INACTIVE USE	acre	7.4	0.	0.
4571		TOTAL			37827.	30970.
4588	2101	INDUSTRIAL PARK	acre	23.2	4457.	3654.
4588	2103	LIGHT INDUSTRY	acre	47.9	4800.	3879.
4588	4112	RIGHT-OF-WAY	acre	5.7	0.	0.
4588	5001	WHOLESALE TRADE	acre	8.2	399.	282.
4588	9101	INACTIVE USE	acre	55.4	0.	0.
4588		TOTAL			9655.	7815.
4614	101	SINGLE FAMILY	du	768.1	11982.	8361.
4614	102	MULTI-FAMILY	du	1462.0	15643.	10983.
4614	5021	MIXED USE COMMERCIAL	acre	15.4	2338.	1698.
4614	6109	OTHER PUBLIC SERVICE	acre	6.4	2564.	1853.
4614	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.

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CVSB(Chula Vista Southbay)- University Villages 2025
trip generation and land use by zone

Zone	Code	Name	Type	Amount	Person	Vehicle
		Land Use			Trips	
4614	7601	ACTIVE PARK	acre	37.2	2481.	1633.
4614	9101	INACTIVE USE	acre	22.6	0.	0.
4614		TOTAL			37127.	25712.
4615	2103	LIGHT INDUSTRY	acre	9.7	968.	782.
4615		TOTAL			968.	782.
4616	101	SINGLE FAMILY	du	562.5	8776.	6124.
4616	102	MULTI-FAMILY	du	918.0	9823.	6896.
4616	6109	OTHER PUBLIC SERVICE	acre	1.5	618.	446.
4616	6806	ELEMENTARY SCHOOL	acre	1.0	2119.	1185.
4616	7601	ACTIVE PARK	acre	5.6	371.	244.
4616		TOTAL			21705.	14895.

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The following projects are included in the model developed for the Otay Ranch Resort Village 13 project. These projects were either approved, built but not fully occupied, or their schedule was tentative at the time. This model was employed for the analysis of Year 2025 Cumulative Traffic Conditions.

APPROVED / PENDING PROJECTS IN EAST OTAY MESA AND CHULA VISTA

No.	Project Name	Location	Description
County of San Diego			
1	National Enterprises Storage and Recycling Facility (MUP98-001)	East and west side of Alta Rd north of Old Otay Mesa Road	The project proposes to develop areas for interim use including automobile storage, scrap and recycling operations, and wood and green material recycling, and will include temporary office trailers of 720 s.f. each and 200 employee parking spaces. Project would provide space for approximately 11,000 vehicles.
2	Travel Plaza Truck Stop (TPM 20414; MUP 98-024)	East side of Enrico Fermi Drive north of Airway Road and south of Old Otay Mesa	Four parcels, ranging from 7.35 to 42.16 acres each. Full-service truck stop travel plaza. Driver facilities, restaurant, convenience store, service bays, fuel sales, 122-room hotel, office building, parking.
3	Otay Tech Centre - Previously Sunroad Tech Centre (TM 5139)	Northeast of Otay Mesa Road and Harvest Road	Technology business park and commercial retail on 289.5 gross acres.
4	Enrico Fermi Industrial (TM 5394)	Southwest corner of Old Otay Mesa Road and Enrico Fermi Drive	79.37 acres of industrial development
5	Aron Construction Auto Auction Park (MUP00-012)	Northwest corner of Old Otay Mesa Rd and Alta Road	38.2 acres
6	Airway Business Centre- (Saeed Industrial TM5304)	North side of Airway Drive between Michael Faraday Drive and Pasea de las	35 acres
7	PG&E Subdivision/Otay Mesa Generating Plant (TPM 2057)	East of Alta Road, btw Loop Road and Energy Centre Way	Natural gas-fired electric generating plan
8	Otay Mesa Generating Plant Industrial Outlots	East of Alta Road, btw Loop Road and Energy Centre Way	30.60 acres of industrial uses
9	Otay Hills Mineral Extraction (MUP04-004/RP04-001)	Eastern extension of Old Otay Mesa, 2.5 miles northeast of Otay Mesa crossing	Hard rock quarry on 210 acres
10	Rowland Property (MUP 03-001)	Northeast corner of Old Otay Mesa Road and Enrico Fermi Drive	Auto-storage and wrecking yard located on 40.44 acres
11	Otay 310	South of Old Otay Mesa Road, east of Alta Road	311 acres mixed industrial, rural residential and SR11

APPROVED / PENDING PROJECTS IN EAST OTAY MESA AND CHULA VISTA

No.	Project Name	Location	Description
12	Correctional Facility (Proposed Project)	West of Alta Road near existing prison facility	2,112 Bed Correctional Detention Facility
13	Otay Business Park (Paragon)	South of Airway Road, east of Enrico Fermi Drive	2202.8 KSF Business Park on 161.6 gross acres
14	Otay Logistics Industrial Park	East of Enrico Fermi Drive, btw Airway Road & Siempre Viva Road	277 ksf of warehousing
15	California Crossing (40 acres Commercial)	East of SR-125, north of Otay Mesa Road, west of Harvest Road	28.50 net acres of Community Shopping Center
16	Pilot Travel Centre	North quadrant of Piper Ranch & Otay Mesa Road	Construction of a 10,000-sq. ft. commercial center including Wendy's restaurant and driver amenities, gas station and parking (71 car and 139 truck spaces). 65 employees (18 – 20 per shift).
17	Piper Otay Park	Northeast quadrant of Piper Ranch & Otay Mesa Road	25 gross acres (19.8 net acres) of light industrial use.
18	Donovan Health Facility	480 Alta Road	15 bed facility with approx. 1,200 staff and 75-100 visitors anticipated per day
19	International Industrial Park (TM 5549)	The project site is located in the East Otay Mesa Specific Plan Area, part of the Otay Subregional Planning Area, within unincorporated San Diego County. Parcels 1-5 would be accessed via Vann Centre Blvd. Parcel 7-10 would take access off Enrico Fermi Road.	133 acres of Technology/Business Park
20	RTX (S08-022).	Immediately south of Via de la Amistad, east of Enrico Fermi Drive	18.75 acres of Truck Park and Storage
21	Jamul Casino	Southwest quadrant of SR-94 / Melody Road	Casino (unique land use)
22	Otay Ranch Resort Village	The project site is located along Otay Lakes Road, 1 mile east of the intersection of Otay Lakes Road / Wueste Road	1,881 SF dus, 57 mf dus, 200 acres resort, 40 ksf community commercial, 2.2 acres fire station, 1 elementary school, and 26.7 acres active park.
City of San Diego			
23	California Terraces	North of Otay Mesa Road, off of Ocean View Hills Parkway	Phase I = 644 MF dus, Phase II = 1585 dus, 2.4 acres commercial
24	La Media Truck Park site	Northeast corner of La Media Road & Lone Star	Industrial use (approx 70 acres)

APPROVED / PENDING PROJECTS IN EAST OTAY MESA AND CHULA VISTA

No.	Project Name	Location	Description
25	Robinhood Ridge	West side of Otay Valley Road/Heritage Road north of Otay Mesa Road	3.8 acres of neighborhood commercial, 4.6 acres of light industrial
26	La Media Truck Park II	East side of La Media Road north of Windstock Street	40 acres
27	World Petrol III	North of Otay Mesa Road, east of La Media	22 fuelling stations, 3632 sf convenience market, 2041 restaurant, 290 sf office
28	Ingalls Property	South of Vista Santo Domingo	13 SF dus, 24 townhomes, 106 apts, 19700 sf office, 20396 sf retail, 39450 industrial
29	Otay Corporate Centre N; Otay Corporate Centre S	North and south of Otay Mesa Road, west of Heritage Road	industrial park
30	San Ysidro High School (Expansion)	Southwest corner of Airway Road & Caliente Avenue	High School for 814 students
31	Semi-Trailer Storage Facility (Planned Development permit 12083)	Southwest corner of Otay Mesa Road and Innovative Drive	8.02 net acres
32	Southwestern Junior College	North of Airway Road, btw Britannia & La Media	500 Students Higher Education Center
33	Sunroad Otay Park (TM 91-0394)	South of Otay Mesa Road and west of La Media	1,337,000 square feet of Small Industrial Park, 79.3 acres
34	Esplande	Northeast of Airway Road & La Media Road	1,337 SF dus on 77.6 Acres
35	Interstate Industrial Centre (TPM 98-0759)	East side of Piper Ranch Road, South of Otay Mesa Road	453,000 square feet of Warehousing
36	Handler Otay Mesa	South off Otay Mesa Road, west of Corporate Centre Drive	mixed commercial/retail/office project
37	Pardee Commercial	Southeast corner of Otay Mesa Road/Palm Avenue	16 acre commercial
38	Candlelight Villas West	West side of Caliente Avenue, south of San Ysidro High School	223 MF dus on 23 Acres
39	Southview	Southeast of Caliente Avenue and Airway Road	553 MF dus
40	Candlelight	Southeast of Caliente Avenue and Airway Road	435 MF dus
41	Brownfield Tech park	South of Otay Mesa Road, west of Britannia Boulevard	741180 SF of business park on 50 acres

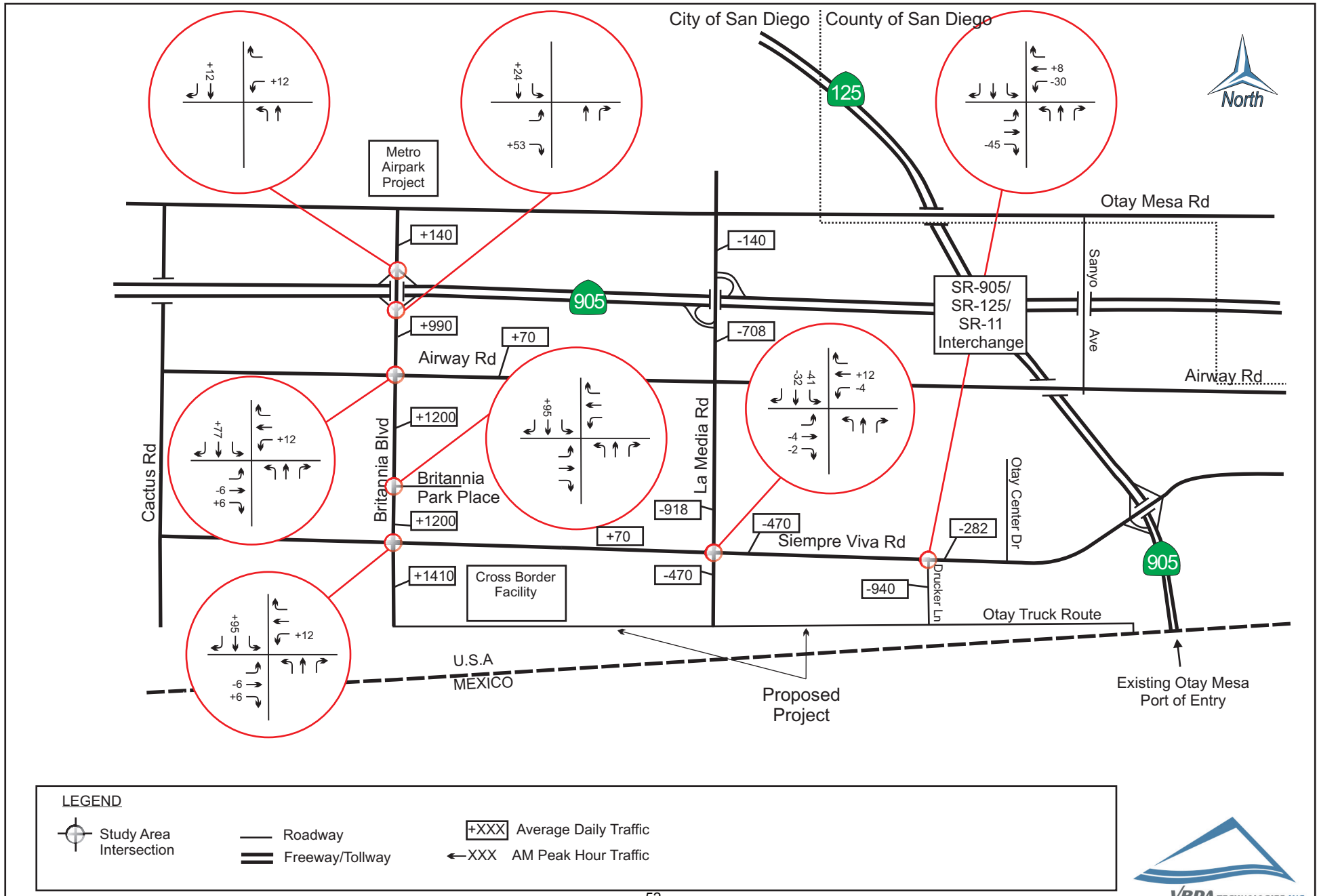
APPROVED / PENDING PROJECTS IN EAST OTAY MESA AND CHULA VISTA

No.	Project Name	Location	Description
42	Las Californias	South of Siempre Viva Road, btw Britannia & La Media	374,300 sq ft small industrial park, 305,90 sq ft large industrial park
City of Chula Vista			
43	Otay Ranch Village 2	This project is located at southwestern and southeastern quadrant of the intersection of Olympic Parkway / Heritage Road	Land use information for the various villages in Otay Ranch was provided by City of Chula Vista as direct model input. Please see Appendix G for detailed information.
44	Otay Ranch Village 3	This project is located along Heritage Road, at the northeast quadrant of the intersection of Main Street / Heritage Road.	
45	Otay Ranch Village 4	This project is located along Main Street, at the southwest quadrant of the intersection of Main Street / La Media Road	
46	Otay Ranch Village 8 west	This project is located along Otay Valley Road, at the southwest quadrant of the intersection of Main Street / La Media Road	
47	Otay Ranch Village 8 east	This project is located along Otay Valley Road, at the southeast quadrant of the intersection of Main Street / La Media Road	
48	Otay Ranch Village 9	This project is located at the southwest quadrant of the intersection of Hunte Parkway / Eastlake Parkway	
49	Otay Ranch Village 10	This project is located along Discovery Falls Drive at the southeastern and southwestern quadrant of the future Discovery Falls Drive / University Drive intersection.	
50	University Village	This project is located at the southeast quadrant of the intersection of Hunte Parkway / Eastlake Parkway	
51	Eastern Urban Center	This project is located at the southwest quadrant of the intersection of Birch Road / East Lake Parkway	Land use information for the various villages in Otay Ranch was provided by City of Chula Vista as direct model input. Please see Appendix G for detailed information.
52	Regional Technology Center	This project is located at the southeast quadrant of the intersection of Hunte Parkway / Eastlake Parkway	

The Otay Mesa Truck Route Traffic Technical Report was taken into consideration under Year 2025 Cumulative Traffic Conditions as well as under Year 2025 Cumulative Plus Project Traffic Conditions.

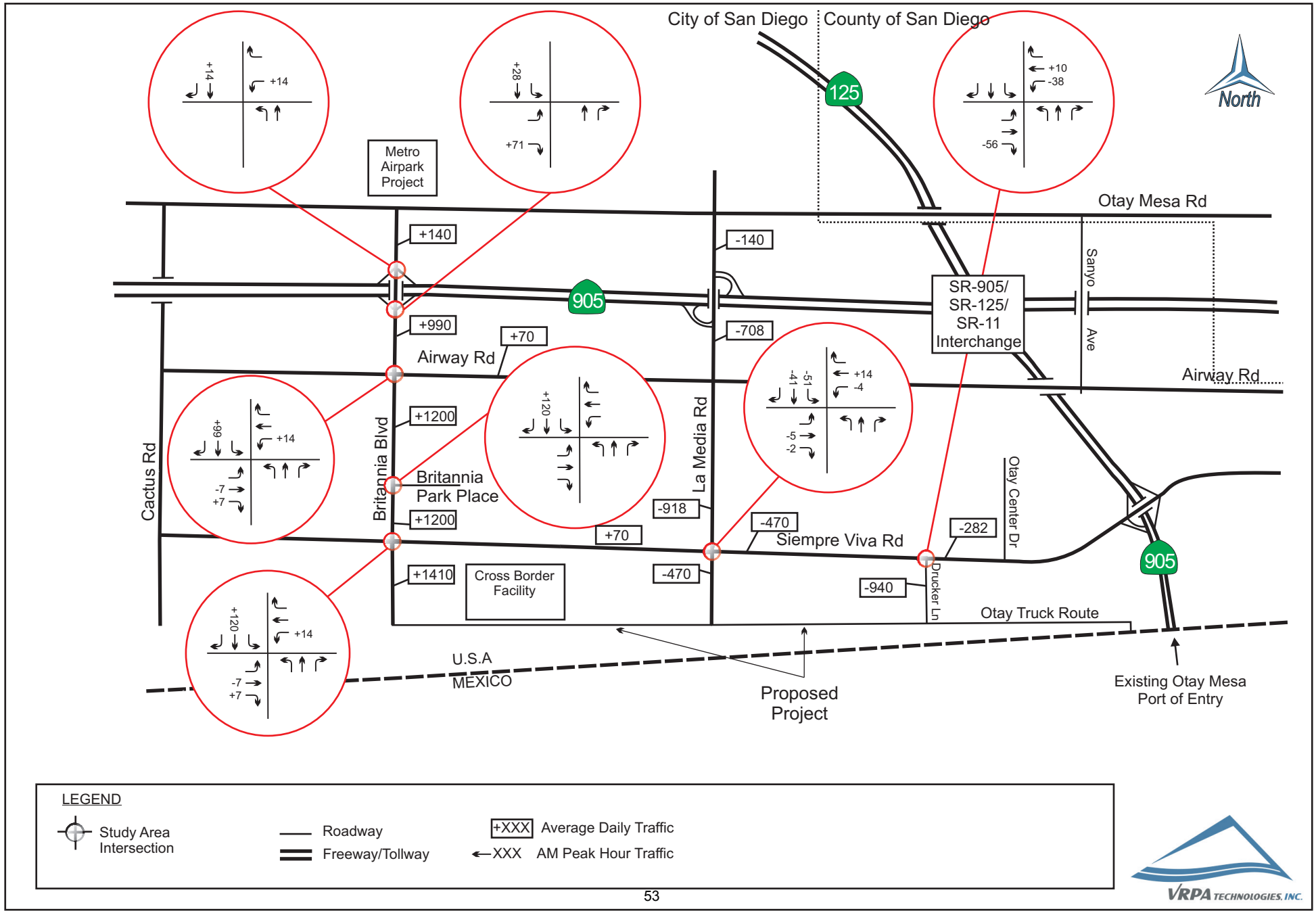
Otay Truck Route Traffic Technical Report
2035 Horizon Year Project Traffic - AM Peak Hour

Figure 5-9



Otay Truck Route Traffic Technical Report
2035 Horizon Year Project Traffic - PM Peak Hour

Figure 5-10



Appendix H
Cumulative Traffic Conditions Network Improvements - Identified Capital Improvement Projects

City of Chula Vista

2014/15-2018/19 Capital Improvement Program

Project Description Report

Project Name: Heritage Road Bridge Replacement
Project No: STM364

Project Location:	Heritage Road from Niranva Avenue/Main Street intersection to Entertainment Circle North(Amphitheater) crossing
Department Responsible:	Engineering
Project Intents:	Capacity
Project Description:	Replacement of the Heritage Road bridge. Phase I will complete: Preliminary Engineering/Environmental evaluation to determine environmental impacts and compile construction plans.

Project Information:	The City of San Diego has a share in the cost of the project. CALTRANS has designated the bridge as eligible for funding through the Highway Bridge Program.		
Justification:	The existing bridge was constructed as an interim bridge in 1993 and does not accommodate existing peak traffic, pedestrians, or a 50 year storm event. The General Plan indicates that Heritage Road is planned as a six-lane major arterial between Olympic Parkway to the boundary with the City of San Diego. This project supports Strong & Secure Neighborhoods Strategic Goal as the Eastern Territories and San Diego's Otay Mesa area develop, there will be a need for a wide and realigned bridge to accommodate projected traffic and a 50-year storm event.		
Total Estimated Cost:	$3,836,599		
Estimated Operation and Maintenance Cost:	$0	Project Type:	Major Streets

Source Of Funding

Fund No	Fund Name	Previous	2014/15	2015/16	2016/17	2017/18	2018/19	Future
73612	Highway Bridge Program	$345,267	($345,267)	$0	$0	$0	$0	$0
73610	Miscellaneous Transportation Grants (Safety Lu Demo)	$2,519,720	$0	$0	$0	$0	$0	$0
59110	Transportation Development	$2,774,510	$0	$0	$0	$1	$0	$0

Appendix I
Peak Hour Intersection LOS & ILV Worksheets
– Cumulative (Existing Plus Cumulative Projects) Conditions

Near-Term AM
1: East Beyer Boulevard/Otay Mesa Road & Beyer Boulevard

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	290	220	40	50	20	80	50	60	70	70	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9		4.9		4.9	4.9			5.2	
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.98		1.00		1.00	0.99			0.99	
Flpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85		0.98		1.00	0.92			0.94	
Flt Protected	0.95	1.00	1.00		0.98		0.95	1.00			0.99	
Satd. Flow (prot)	1681	1717	1547		1754		1767	1695			1696	
Flt Permitted	0.95	1.00	1.00		0.98		0.54	1.00			0.88	
Satd. Flow (perm)	1681	1717	1547		1754		1003	1695			1518	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	315	239	43	54	22	87	54	65	76	76	141
RTOR Reduction (vph)	0	0	166	0	10	0	0	45	0	0	38	0
Lane Group Flow (vph)	157	332	73	0	109	0	87	74	0	0	255	0
Confl. Peds. (#/hr)	1		1	1		1	2					2
Confl. Bikes (#/hr)			1			4			6			5
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	Perm	Split	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		1	1			8			4	
Permitted Phases			2				8			4		
Actuated Green, G (s)	17.4	17.4	17.4		7.5		17.7	17.7			17.4	
Effective Green, g (s)	17.4	17.4	17.4		7.5		17.7	17.7			17.4	
Actuated g/C Ratio	0.30	0.30	0.30		0.13		0.31	0.31			0.30	
Clearance Time (s)	4.9	4.9	4.9		4.9		4.9	4.9			5.2	
Vehicle Extension (s)	2.9	2.9	2.9		2.9		3.8	3.8			4.5	
Lane Grp Cap (vph)	510	521	469		229		309	523			460	
v/s Ratio Prot	0.09	c0.19			c0.06			0.04				
v/s Ratio Perm			0.05				0.09				c0.17	
v/c Ratio	0.31	0.64	0.15		0.48		0.28	0.14			0.56	
Uniform Delay, d1	15.3	17.2	14.6		23.1		15.0	14.3			16.7	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.3	2.5	0.1		1.5		0.6	0.2			2.1	
Delay (s)	15.7	19.7	14.7		24.6		15.6	14.5			18.8	
Level of Service	B	B	B		C		B	B			B	
Approach Delay (s)		17.2			24.6			15.0			18.8	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	57.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	240	40	120	320	120	60	0	50	15	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.6		4.4		4.9	4.4	4.9	
Lane Util. Factor	1.00	0.95		0.97	0.91		1.00		1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00		0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00		0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)	1770	3457		3433	4848		1770		1563	1768	1630	
Flt Permitted	0.95	1.00		0.95	1.00		1.00		1.00	1.00	1.00	
Satd. Flow (perm)	1770	3457		3433	4848		1863		1563	1861	1630	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	261	43	130	348	130	65	0	54	16	11	33
RTOR Reduction (vph)	0	12	0	0	56	0	0	0	50	0	31	0
Lane Group Flow (vph)	54	292	0	130	422	0	65	0	4	16	13	0
Confl. Peds. (#/hr)			3						2	2		
Confl. Bikes (#/hr)			1			3						2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		pm+pt		Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	2.0	18.9		4.1	20.8		4.5		3.4	3.5	2.9	
Effective Green, g (s)	2.0	18.9		4.1	20.8		4.5		3.4	3.5	2.9	
Actuated g/C Ratio	0.04	0.41		0.09	0.45		0.10		0.07	0.08	0.06	
Clearance Time (s)	4.4	5.4		4.4	5.6		4.4		4.9	4.4	4.9	
Vehicle Extension (s)	2.0	5.4		2.0	5.4		2.0		5.6	2.0	2.0	
Lane Grp Cap (vph)	76	1417		305	2187		179		115	140	102	
v/s Ratio Prot	0.03	0.08		c0.04	c0.09		c0.01			0.00	0.01	
v/s Ratio Perm							c0.03		0.00	0.01		
v/c Ratio	0.71	0.21		0.43	0.19		0.36		0.03	0.11	0.13	
Uniform Delay, d1	21.8	8.8		19.9	7.6		19.3		19.8	19.9	20.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2	22.8	0.2		0.4	0.1		0.5		0.3	0.1	0.2	
Delay (s)	44.5	8.9		20.2	7.7		19.8		20.1	20.0	20.6	
Level of Service	D	A		C	A		B		C	C	C	
Approach Delay (s)		14.3			10.4			19.9			20.5	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	46.1	Sum of lost time (s)	19.3
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

3: Caliente Avenue/Ocean View Hills Parkway & Otay Mesa Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	770	110	500	10	130	790	210	410	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.6	5.2	5.2	6.7	6.7	5.2	6.3	5.2	5.2	6.3	6.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1576	3335	3539	1563	1770	3539	1538	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1576	3335	3539	1563	1770	3539	1538	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	11	11	837	120	543	11	141	859	228	446	43
RTOR Reduction (vph)	0	0	10	0	0	425	0	0	444	0	0	27
Lane Group Flow (vph)	11	11	1	837	120	118	11	141	415	228	446	16
Confl. Peds. (#/hr)			1			2						
Heavy Vehicles (%)	2%	2%	2%	5%	2%	2%	2%	2%	5%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2	3	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	1.6	2.3	6.1	15.3	14.9	14.9	3.8	17.3	32.6	11.6	25.1	25.1
Effective Green, g (s)	1.6	2.3	6.1	15.3	14.9	14.9	3.8	17.3	32.6	11.6	25.1	25.1
Actuated g/C Ratio	0.02	0.03	0.09	0.22	0.22	0.22	0.06	0.25	0.47	0.17	0.36	0.36
Clearance Time (s)	5.2	5.6	5.2	5.2	6.7	6.7	5.2	6.3	5.2	5.2	6.3	6.3
Vehicle Extension (s)	2.0	2.0	2.0	3.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	41	118	139	741	766	338	97	889	728	578	1291	577
v/s Ratio Prot	0.01	0.00	0.00	c0.25	0.03		0.01	0.04	c0.13	c0.07	0.13	
v/s Ratio Perm			0.00			c0.08			0.14			0.01
v/c Ratio	0.27	0.09	0.01	1.13	0.16	0.35	0.11	0.16	0.57	0.39	0.35	0.03
Uniform Delay, d1	33.0	32.2	28.6	26.8	21.9	22.8	30.9	20.1	13.0	25.5	15.9	14.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.1	0.0	74.8	0.0	0.2	0.2	0.1	1.0	0.2	0.2	0.0
Delay (s)	34.3	32.4	28.6	101.6	21.9	23.1	31.1	20.2	14.1	25.6	16.0	14.0
Level of Service	C	C	C	F	C	C	C	C	B	C	B	B
Approach Delay (s)		31.8			66.8			15.1			19.0	
Approach LOS		C			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	68.8	Sum of lost time (s)	23.4
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	400	10	60	160	870	0	0	400	790
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.1	5.1	4.7	5.1			5.1	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frpb, ped/bikes					1.00	1.00	1.00	1.00			0.98	
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.90	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1725	1538	1719	4940			4371	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1725	1538	1719	4940			4371	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	435	11	65	174	946	0	0	435	859
RTOR Reduction (vph)	0	0	0	0	0	45	0	0	0	0	526	0
Lane Group Flow (vph)	0	0	0	0	446	20	174	946	0	0	768	0
Confl. Peds. (#/hr)												4
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					19.1	19.1	8.3	33.3			20.3	
Effective Green, g (s)					19.1	19.1	8.3	33.3			20.3	
Actuated g/C Ratio					0.31	0.31	0.13	0.53			0.32	
Clearance Time (s)					5.1	5.1	4.7	5.1			5.1	
Vehicle Extension (s)					3.0	3.0	2.0	3.0			3.0	
Lane Grp Cap (vph)					526	469	227	2627			1417	
v/s Ratio Prot							c0.10	0.19			c0.18	
v/s Ratio Perm					0.26	0.01						
v/c Ratio					0.85	0.04	0.77	0.36			0.54	
Uniform Delay, d1					20.4	15.3	26.2	8.5			17.3	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					12.1	0.0	13.0	0.1			0.4	
Delay (s)					32.5	15.3	39.2	8.6			17.8	
Level of Service					C	B	D	A			B	
Approach Delay (s)		0.0			30.3			13.3			17.8	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	62.6	Sum of lost time (s)	14.9
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	770	10	70	0	0	0	0	260	130	300	500	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1						5.1		4.7	5.1	
Lane Util. Factor	1.00	1.00						0.91		1.00	0.95	
Frpb, ped/bikes	1.00	1.00						0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	0.87						0.95		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1641	1501						4443		1641	3282	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1641	1501						4443		1641	3282	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	837	11	76	0	0	0	0	283	141	326	543	0
RTOR Reduction (vph)	0	37	0	0	0	0	0	90	0	0	0	0
Lane Group Flow (vph)	837	50	0	0	0	0	0	334	0	326	543	0
Confl. Peds. (#/hr)									2			
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4											
Actuated Green, G (s)	51.9	51.9						13.0		20.3	38.0	
Effective Green, g (s)	51.9	51.9						13.0		20.3	38.0	
Actuated g/C Ratio	0.52	0.52						0.13		0.20	0.38	
Clearance Time (s)	5.1	5.1						5.1		4.7	5.1	
Vehicle Extension (s)	3.0	3.0						3.0		2.0	3.0	
Lane Grp Cap (vph)	850	778						577		332	1245	
v/s Ratio Prot		0.03						c0.08		c0.20	0.17	
v/s Ratio Perm	c0.51											
v/c Ratio	0.98	0.06						0.58		0.98	0.44	
Uniform Delay, d1	23.7	12.0						41.0		39.7	23.1	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	26.9	0.0						1.4		44.2	0.2	
Delay (s)	50.6	12.0						42.4		83.9	23.3	
Level of Service	D	B						D		F	C	
Approach Delay (s)		47.0			0.0			42.4			46.0	
Approach LOS		D			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	45.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.1	Sum of lost time (s)	14.9
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	170	10	150	100	10	120	20	100	50	100	220	250
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	185	11	163	109	11	130	22	109	54	109	239	272

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	123	236	109	141	22	163	109	511
Volume Left (vph)	123	62	109	0	22	0	109	0
Volume Right (vph)	0	163	0	130	0	54	0	272
Hadj (s)	0.58	-0.27	0.67	-0.48	0.58	-0.06	0.67	-0.25
Departure Headway (s)	7.9	7.1	8.2	7.1	8.1	7.4	7.4	6.5
Degree Utilization, x	0.27	0.46	0.25	0.28	0.05	0.34	0.22	0.92
Capacity (veh/h)	439	491	421	486	425	463	469	547
Control Delay (s)	12.7	14.9	12.7	11.6	10.3	12.9	11.4	46.0
Approach Delay (s)	14.1		12.1		12.6		39.9	
Approach LOS	B		B		B		E	

Intersection Summary			
Delay	24.9		
Level of Service	C		
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	800	90	0	420	260	0	0	0	0	0	60
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	870	98	0	457	283	0	0	0	0	0	65
Pedestrians											6	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											4.0	
Percent Blockage											1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	745			967			1136	1664	339	752	1430	158
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	745			967			1136	1664	339	752	1430	158
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			100	100	100	100	100	92
cM capacity (veh/h)	804			661			135	88	634	282	124	830

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	348	348	272	152	152	152	283	0	65
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	98	0	0	0	283	0	65
cSH	1700	1700	1700	1700	1700	1700	1700	1700	830
Volume to Capacity	0.20	0.20	0.16	0.09	0.09	0.09	0.17	0.00	0.08
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.7
Lane LOS								A	A
Approach Delay (s)	0.0			0.0				0.0	9.7
Approach LOS								A	A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	20.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	200	100	100	600	1670	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	217	109	109	652	1815	65

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	217	109	109	652	1815	65
Volume Left (vph)	217	0	109	0	0	0
Volume Right (vph)	0	109	0	0	0	65
Hadj (s)	0.67	-0.53	0.67	0.17	0.17	-0.53
Departure Headway (s)	8.3	7.1	7.3	6.8	6.9	6.2
Degree Utilization, x	0.50	0.21	0.22	1.0	1.0	0.11
Capacity (veh/h)	430	500	484	535	528	567
Control Delay (s)	18.1	10.8	11.2	142.2	1130.7	8.8
Approach Delay (s)	15.7		123.4		1091.8	
Approach LOS	C		F		F	

Intersection Summary			
Delay	725.3		
Level of Service	F		
Intersection Capacity Utilization	105.6%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	30	160	520	850	60	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	174	565	924	65	43

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	207	565	924	109
Volume Left (vph)	33	565	0	0
Volume Right (vph)	174	0	0	43
Hadj (s)	-0.30	0.67	0.17	-0.07
Departure Headway (s)	5.6	5.9	5.4	5.5
Degree Utilization, x	0.32	0.93	1.0	0.16
Capacity (veh/h)	619	596	666	636
Control Delay (s)	11.3	44.8	202.5	9.5
Approach Delay (s)	11.3	142.7		9.5
Approach LOS	B	F		A

Intersection Summary			
Delay	119.6		
Level of Service	F		
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	1000	150	150	950	300	200	50	100	400	100	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	1.00		1.00	1.00	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	4715	1468	3183	4715	1468	1641	1554		1641	1727	2584
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	4715	1468	3183	4715	1468	1641	1554		1641	1727	2584
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	1087	163	163	1033	326	217	54	109	435	109	326
RTOR Reduction (vph)	0	0	113	0	0	225	0	75	0	0	0	145
Lane Group Flow (vph)	217	1087	50	163	1033	101	217	88	0	435	109	181
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	6.0	28.3	28.3	6.0	28.6	28.6	16.4	12.5		24.1	20.2	26.2
Effective Green, g (s)	6.0	28.3	28.3	6.0	28.6	28.6	16.4	12.5		24.1	20.2	26.2
Actuated g/C Ratio	0.07	0.31	0.31	0.07	0.31	0.31	0.18	0.14		0.26	0.22	0.28
Clearance Time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Vehicle Extension (s)	2.0	4.1	4.1	2.0	4.5	4.5	2.0	4.3		2.0	3.7	2.0
Lane Grp Cap (vph)	207	1447	450	207	1462	455	291	210		428	378	734
v/s Ratio Prot	c0.07	c0.23		0.05	0.22		0.13	c0.06		c0.27	0.06	0.02
v/s Ratio Perm			0.03			0.07						0.05
v/c Ratio	1.05	0.75	0.11	0.79	0.71	0.22	0.75	0.42		1.02	0.29	0.25
Uniform Delay, d1	43.1	28.8	22.9	42.5	28.1	23.6	35.9	36.5		34.0	30.0	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	75.8	2.4	0.2	16.5	1.8	0.4	8.8	2.1		47.7	0.5	0.1
Delay (s)	118.9	31.2	23.1	59.0	29.9	24.0	44.7	38.6		81.7	30.5	25.5
Level of Service	F	C	C	E	C	C	D	D		F	C	C
Approach Delay (s)		43.3			31.8			42.1			54.2	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	41.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	92.2	Sum of lost time (s)	21.3
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	0	0	0	0	20	0	190	0	80	0	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	0	0	0	0	22	0	207	0	87	0	22

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	22	207	109
Volume Left (vph)	11	0	0	87
Volume Right (vph)	0	22	0	22
Hadj (s)	0.37	-0.43	0.17	0.21
Departure Headway (s)	5.0	4.2	4.3	4.4
Degree Utilization, x	0.02	0.03	0.24	0.13
Capacity (veh/h)	664	786	828	804
Control Delay (s)	8.1	7.3	8.6	8.1
Approach Delay (s)	8.1	7.3	8.6	8.1
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.4		
Level of Service	A		
Intersection Capacity Utilization	32.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	1700	100	150	1450	30	100	25	100	30	20	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		4.0	6.5		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1641	4676		1641	4699		1641	1727	1468	1641	1727	1468
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1641	4676		1641	4699		1641	1727	1468	1641	1727	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1848	109	163	1576	33	109	27	109	33	22	43
RTOR Reduction (vph)	0	4	0	0	1	0	0	0	97	0	0	41
Lane Group Flow (vph)	43	1953	0	163	1608	0	109	27	12	33	22	2
Confl. Peds. (#/hr)						2						
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	7.2	74.2		26.5	93.5		14.6	15.6	15.6	5.2	6.2	6.2
Effective Green, g (s)	7.2	74.2		26.5	93.5		14.6	15.6	15.6	5.2	6.2	6.2
Actuated g/C Ratio	0.05	0.53		0.19	0.67		0.10	0.11	0.11	0.04	0.04	0.04
Clearance Time (s)	4.0	6.5		4.0	6.5		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	5.3		3.0	5.3		3.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	84	2478		310	3138		171	192	163	60	76	65
v/s Ratio Prot	0.03	c0.42		c0.10	0.34		c0.07	0.02		0.02	c0.01	
v/s Ratio Perm									0.01			0.00
v/c Ratio	0.51	0.79		0.53	0.51		0.64	0.14	0.07	0.55	0.29	0.03
Uniform Delay, d1	64.7	26.6		51.1	11.7		60.2	56.1	55.7	66.2	64.8	64.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	2.6		1.6	0.6		7.6	0.1	0.1	6.1	0.8	0.1
Delay (s)	66.9	29.2		52.7	12.3		67.7	56.3	55.8	72.3	65.5	64.1
Level of Service	E	C		D	B		E	E	E	E	E	E
Approach Delay (s)		30.0			16.1			61.2			67.2	
Approach LOS		C			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	110	310	10	30	250	10
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	337	11	33	272	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	582	27			43	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	582	27			43	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.3	
p0 queue free %	68	67			82	
cM capacity (veh/h)	380	1026			1515	

Direction, Lane #	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	120	168	168	43	283
Volume Left	120	0	0	0	272
Volume Right	0	168	168	33	0
cSH	380	1026	1026	1700	1515
Volume to Capacity	0.32	0.16	0.16	0.03	0.18
Queue Length 95th (ft)	33	15	15	0	16
Control Delay (s)	18.8	9.2	9.2	0.0	7.6
Lane LOS	C	A	A		A
Approach Delay (s)	11.7			0.0	7.6
Approach LOS	B				

Intersection Summary			
Average Delay	9.6		
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	0	0	60	0	10	0	40	50	30	90	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	65	0	11	0	43	54	33	98	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	0	76	98	130
Volume Left (vph)	0	65	0	33
Volume Right (vph)	0	11	54	0
Hadj (s)	0.00	0.26	-0.16	0.22
Departure Headway (s)	4.5	4.7	4.1	4.4
Degree Utilization, x	0.00	0.10	0.11	0.16
Capacity (veh/h)	765	726	856	798
Control Delay (s)	7.5	8.2	7.6	8.2
Approach Delay (s)	0.0	8.2	7.6	8.2
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.0		
Level of Service	A		
Intersection Capacity Utilization	23.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1620	440	120	1370	310	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	1641	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	1641	4715	3183	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1761	478	130	1489	337	174
RTOR Reduction (vph)	0	206	0	0	0	147
Lane Group Flow (vph)	1761	272	130	1489	337	27
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	51.3	51.3	10.3	65.6	13.9	13.9
Effective Green, g (s)	51.3	51.3	10.3	65.6	13.9	13.9
Actuated g/C Ratio	0.57	0.57	0.11	0.73	0.15	0.15
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	2687	836	187	3436	491	226
v/s Ratio Prot	c0.37		c0.08	0.32	c0.11	
v/s Ratio Perm		0.19				0.02
v/c Ratio	0.66	0.33	0.70	0.43	0.69	0.12
Uniform Delay, d1	13.3	10.2	38.3	4.8	36.0	32.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	1.0	8.7	0.4	3.2	0.1
Delay (s)	14.5	11.3	47.1	5.2	39.2	32.9
Level of Service	B	B	D	A	D	C
Approach Delay (s)	13.8			8.6	37.0	
Approach LOS	B			A	D	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	260	0	610	180	330	0	0	530	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.1	5.1	5.1	4.7	5.1			5.1	5.1
Lane Util. Factor				1.00	0.95	0.95	0.97	0.91			0.91	1.00
Frt				1.00	0.85	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1641	1395	1395	3183	4715			4715	1468
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1641	1395	1395	3183	4715			4715	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	283	0	663	196	359	0	0	576	478
RTOR Reduction (vph)	0	0	0	0	241	240	0	0	0	0	0	325
Lane Group Flow (vph)	0	0	0	283	91	91	196	359	0	0	576	153
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				13.6	13.6	13.6	5.1	25.6			15.8	15.8
Effective Green, g (s)				13.6	13.6	13.6	5.1	25.6			15.8	15.8
Actuated g/C Ratio				0.28	0.28	0.28	0.10	0.52			0.32	0.32
Clearance Time (s)				5.1	5.1	5.1	4.7	5.1			5.1	5.1
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				451	384	384	328	2443			1508	469
v/s Ratio Prot					0.07		c0.06	0.08			c0.12	
v/s Ratio Perm				c0.17		0.07						0.10
v/c Ratio				0.63	0.24	0.24	0.60	0.15			0.38	0.33
Uniform Delay, d1				15.7	13.9	13.9	21.2	6.2			13.0	12.8
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				2.7	0.3	0.3	2.9	0.0			0.2	0.4
Delay (s)				18.4	14.2	14.2	24.1	6.2			13.2	13.2
Level of Service				B	B	B	C	A			B	B
Approach Delay (s)		0.0			15.5			12.5			13.2	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	49.4	Sum of lost time (s)	14.9
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	5	750	0	0	0	0	310	130	140	650	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1					5.1		4.7	5.1	
Lane Util. Factor		1.00	0.88					0.95		0.97	0.91	
Frpb, ped/bikes		1.00	1.00					1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00		1.00	1.00	
Frt		1.00	0.85					0.96		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1647	2584					3137		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1647	2584					3137		3183	4715	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	5	815	0	0	0	0	337	141	152	707	0
RTOR Reduction (vph)	0	0	250	0	0	0	0	93	0	0	0	0
Lane Group Flow (vph)	0	222	565	0	0	0	0	385	0	152	707	0
Confl. Bikes (#/hr)												2
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		14.6	14.6					11.7		3.9	20.3	
Effective Green, g (s)		14.6	14.6					11.7		3.9	20.3	
Actuated g/C Ratio		0.32	0.32					0.26		0.09	0.45	
Clearance Time (s)		5.1	5.1					5.1		4.7	5.1	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		533	836					813		275	2122	
v/s Ratio Prot								c0.12		c0.05	0.15	
v/s Ratio Perm		0.13	c0.22									
v/c Ratio		0.42	0.68					0.47		0.55	0.33	
Uniform Delay, d1		11.9	13.2					14.1		19.8	8.0	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.5	2.2					0.4		2.4	0.1	
Delay (s)		12.4	15.4					14.5		22.2	8.1	
Level of Service		B	B					B		C	A	
Approach Delay (s)		14.7			0.0			14.5			10.6	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	45.1	Sum of lost time (s)	14.9
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	80	25	110	270	160	30	230	30	480	625	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96			1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1666			1703	1449	1641	3215		1641	1727	1468
Flt Permitted	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1666			1703	1449	1641	3215		1641	1727	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	87	27	120	293	174	33	250	33	522	679	326
RTOR Reduction (vph)	0	8	0	0	0	111	0	8	0	0	0	133
Lane Group Flow (vph)	54	106	0	0	413	63	33	275	0	522	679	193
Confl. Peds. (#/hr)	1					1			2			
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	12.2	12.2			35.0	35.0	4.1	20.7		45.9	62.3	62.3
Effective Green, g (s)	12.2	12.2			35.0	35.0	4.1	20.7		45.9	62.3	62.3
Actuated g/C Ratio	0.09	0.09			0.26	0.26	0.03	0.15		0.34	0.47	0.47
Clearance Time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Vehicle Extension (s)	2.0	2.0			3.7	3.7	2.0	3.8		2.0	3.8	3.8
Lane Grp Cap (vph)	149	152			446	379	50	498		563	805	684
v/s Ratio Prot	0.03	c0.06			c0.24		0.02	0.09		c0.32	c0.39	
v/s Ratio Perm						0.04						0.13
v/c Ratio	0.36	0.70			0.93	0.17	0.66	0.55		0.93	0.84	0.28
Uniform Delay, d1	57.0	58.9			48.0	38.0	64.1	52.2		42.2	31.4	21.9
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	10.6			25.4	0.3	22.4	1.6		21.2	8.3	0.3
Delay (s)	57.6	69.5			73.5	38.3	86.5	53.7		63.4	39.7	22.2
Level of Service	E	E			E	D	F	D		E	D	C
Approach Delay (s)		65.7			63.0			57.2			44.1	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	51.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	133.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	90	25	70	140	70	10	70	10	40	205	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Lane Util. Factor		0.95			1.00	1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes		1.00			1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected		0.99			0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3152			1699	1450	1641	1695		3183	3118	
Flt Permitted		0.79			0.14	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2528			234	1450	1641	1695		3183	3118	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	98	27	76	152	76	11	76	11	43	223	87
RTOR Reduction (vph)	0	10	0	0	0	33	0	3	0	0	30	0
Lane Group Flow (vph)	0	169	0	0	228	43	11	84	0	43	280	0
Confl. Peds. (#/hr)			1	1								2
Confl. Bikes (#/hr)			2			1						1
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		2			1		3	8		7	4	
Permitted Phases	2			1		1						
Actuated Green, G (s)		15.3			70.6	70.6	1.5	17.1		3.1	18.7	
Effective Green, g (s)		15.3			70.6	70.6	1.5	17.1		3.1	18.7	
Actuated g/C Ratio		0.12			0.56	0.56	0.01	0.14		0.02	0.15	
Clearance Time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Vehicle Extension (s)		4.8			4.8	4.8	2.0	3.3		2.0	4.4	
Lane Grp Cap (vph)		308			131	817	19	231		78	465	
v/s Ratio Prot							0.01	0.05		c0.01	c0.09	
v/s Ratio Perm		c0.07			c0.97	0.03						
v/c Ratio		0.55			1.74	0.05	0.58	0.36		0.55	0.60	
Uniform Delay, d1		51.7			27.3	12.3	61.5	49.1		60.4	49.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.3			362.9	0.1	23.8	1.1		4.7	2.8	
Delay (s)		55.0			390.2	12.3	85.4	50.2		65.1	52.6	
Level of Service		E			F	B	F	D		E	D	
Approach Delay (s)		55.0			295.7			54.1			54.1	
Approach LOS		E			F			D			D	

Intersection Summary			
HCM 2000 Control Delay	132.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	125.2	Sum of lost time (s)	19.1
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	780	170	250	800	40	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		5.7	7.2	6.1	6.1
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4589		1641	4715	1641	1449
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4589		1641	4715	1641	1449
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	848	185	272	870	43	11
RTOR Reduction (vph)	27	0	0	0	0	10
Lane Group Flow (vph)	1006	0	272	870	43	1
Confl. Peds. (#/hr)						2
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	24.9		8.8	39.4	5.1	5.1
Effective Green, g (s)	24.9		8.8	39.4	5.1	5.1
Actuated g/C Ratio	0.43		0.15	0.68	0.09	0.09
Clearance Time (s)	7.2		5.7	7.2	6.1	6.1
Vehicle Extension (s)	6.9		2.0	6.9	2.0	2.0
Lane Grp Cap (vph)	1976		249	3214	144	127
v/s Ratio Prot	c0.22		c0.17	0.18	c0.03	
v/s Ratio Perm						0.00
v/c Ratio	0.51		1.09	0.27	0.30	0.01
Uniform Delay, d1	12.0		24.5	3.6	24.7	24.0
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7		83.9	0.2	0.4	0.0
Delay (s)	12.7		108.4	3.8	25.1	24.0
Level of Service	B		F	A	C	C
Approach Delay (s)	12.7			28.7	24.9	
Approach LOS	B			C	C	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	57.8	Sum of lost time (s)	19.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	430	260	400	240	170	100	250	840	100	400	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.88		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4715	1441	1641	4422		1641	1509		3183	1641	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	4715	1441	1641	4422		1641	1509		3183	1641	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	326	467	283	435	261	185	109	272	913	109	435	217
RTOR Reduction (vph)	0	0	241	0	95	0	0	71	0	0	11	0
Lane Group Flow (vph)	326	467	42	435	351	0	109	1114	0	109	641	0
Confl. Peds. (#/hr)			3						3			
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	29.2	20.9	20.9	31.0	22.7		13.2	59.0		9.2	55.9	
Effective Green, g (s)	29.2	20.9	20.9	31.0	22.7		13.2	59.0		9.2	55.9	
Actuated g/C Ratio	0.21	0.15	0.15	0.22	0.16		0.09	0.42		0.07	0.40	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	342	703	215	363	716		154	635		209	655	
v/s Ratio Prot	0.20	c0.10		c0.27	0.08		c0.07	c0.74		0.03	0.39	
v/s Ratio Perm			0.03									
v/c Ratio	0.95	0.66	0.20	1.20	0.49		0.71	1.75		0.52	0.98	
Uniform Delay, d1	54.7	56.2	52.2	54.5	53.4		61.5	40.5		63.3	41.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	36.0	4.9	2.0	112.9	2.4		11.5	346.2		1.1	29.7	
Delay (s)	90.7	61.1	54.2	167.4	55.8		73.0	386.7		64.4	71.2	
Level of Service	F	E	D	F	E		E	F		E	E	
Approach Delay (s)		68.3			110.9			360.3			70.2	
Approach LOS		E			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	172.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	128.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	100	70	20	90	90	30	100	10	370	255	280
Future Volume (vph)	80	100	70	20	90	90	30	100	10	370	255	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Frt		0.96			0.94			0.99		1.00	0.92	
Flt Protected		0.98			0.99			0.99		0.95	1.00	
Satd. Flow (prot)		1625			1614			1692		1641	1592	
Flt Permitted		0.80			0.96			0.87		0.66	1.00	
Satd. Flow (perm)		1323			1560			1480		1140	1592	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	109	76	22	98	98	33	109	11	402	277	304
RTOR Reduction (vph)	0	24	0	0	50	0	0	4	0	0	53	0
Lane Group Flow (vph)	0	248	0	0	168	0	0	149	0	402	528	0
Confl. Bikes (#/hr)			2									
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		15.0			15.0			36.5		36.5	36.5	
Effective Green, g (s)		15.0			15.0			36.5		36.5	36.5	
Actuated g/C Ratio		0.25			0.25			0.61		0.61	0.61	
Clearance Time (s)		4.0			4.0			4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		333			393			907		699	976	
v/s Ratio Prot											0.33	
v/s Ratio Perm		c0.19			0.11			0.10		c0.35		
v/c Ratio		0.74			0.43			0.16		0.58	0.54	
Uniform Delay, d1		20.5			18.6			4.9		6.9	6.7	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		8.7			0.7			0.4		3.4	2.2	
Delay (s)		29.2			19.4			5.3		10.3	8.8	
Level of Service		C			B			A		B	A	
Approach Delay (s)		29.2			19.4			5.3			9.4	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	59.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	40	50	20	20	60	80	10	20	10	160	60	100
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	54	22	22	65	87	11	22	11	174	65	109

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	120	174	43	348
Volume Left (vph)	43	22	11	174
Volume Right (vph)	22	87	11	109
Hadj (s)	0.13	-0.10	0.07	0.08
Departure Headway (s)	5.3	5.0	5.2	4.8
Degree Utilization, x	0.18	0.24	0.06	0.47
Capacity (veh/h)	623	666	625	712
Control Delay (s)	9.4	9.5	8.6	11.9
Approach Delay (s)	9.4	9.5	8.6	11.9
Approach LOS	A	A	A	B

Intersection Summary			
Delay	10.7		
Level of Service	B		
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	340	710	460	100	70	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	6.2	6.2	6.2	5.1	5.1
Lane Util. Factor	0.97	0.95	0.91	1.00	0.97	0.91
Frpb, ped/bikes	1.00	1.00	1.00	0.99	0.99	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	0.93	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.97	1.00
Satd. Flow (prot)	3183	3282	4715	1448	3019	1317
Flt Permitted	0.95	1.00	1.00	1.00	0.97	1.00
Satd. Flow (perm)	3183	3282	4715	1448	3019	1317
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	370	772	500	109	76	130
RTOR Reduction (vph)	0	0	0	72	57	59
Lane Group Flow (vph)	370	772	500	37	83	7
Confl. Peds. (#/hr)				3		
Confl. Bikes (#/hr)				1		1
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	5.2	23.2	13.3	13.3	4.4	4.4
Effective Green, g (s)	5.2	23.2	13.3	13.3	4.4	4.4
Actuated g/C Ratio	0.13	0.60	0.34	0.34	0.11	0.11
Clearance Time (s)	4.7	6.2	6.2	6.2	5.1	5.1
Vehicle Extension (s)	2.0	5.8	5.8	5.8	2.0	2.0
Lane Grp Cap (vph)	425	1957	1612	495	341	148
v/s Ratio Prot	c0.12	c0.24	0.11		c0.03	
v/s Ratio Perm				0.03		0.01
v/c Ratio	0.87	0.39	0.31	0.08	0.24	0.05
Uniform Delay, d1	16.5	4.1	9.4	8.6	15.7	15.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.9	0.4	0.3	0.2	0.1	0.1
Delay (s)	33.4	4.5	9.7	8.8	15.9	15.4
Level of Service	C	A	A	A	B	B
Approach Delay (s)		13.9	9.6		15.7	
Approach LOS		B	A		B	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	38.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	37.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	270	130	150	300	100	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	293	141	163	326	109	65

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	435	163	326	174
Volume Left (vph)	0	163	0	109
Volume Right (vph)	141	0	0	65
Hadj (s)	-0.03	0.67	0.17	0.07
Departure Headway (s)	5.2	6.2	5.7	6.1
Degree Utilization, x	0.62	0.28	0.52	0.30
Capacity (veh/h)	675	562	614	530
Control Delay (s)	16.4	10.5	13.5	11.7
Approach Delay (s)	16.4	12.5		11.7
Approach LOS	C	B		B

Intersection Summary			
Delay	13.9		
Level of Service	B		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	350	20	200	730	0	50	0	50	0	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9		4.9		4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00		1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00		0.98		0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00		1.00	
Frt	1.00	0.99		1.00	1.00		1.00		0.85		0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00		1.00	
Satd. Flow (prot)	1641	4645		1641	4715		1636		1440		1451	
Flt Permitted	0.95	1.00		0.95	1.00		0.74		1.00		1.00	
Satd. Flow (perm)	1641	4645		1641	4715		1275		1440		1451	
Peak-hour factor, PHF	0.69	0.69	0.69	0.94	0.94	0.94	0.62	0.62	0.62	0.38	0.38	0.38
Adj. Flow (vph)	29	507	29	213	777	0	81	0	81	0	0	26
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	71	0	23	0
Lane Group Flow (vph)	29	529	0	213	777	0	81	0	10	0	3	0
Confl. Peds. (#/hr)			90			22	4		16	16		4
Confl. Bikes (#/hr)			19			4						2
Turn Type	Prot	NA		Prot	NA		Perm		Perm		NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	0.9	16.8		10.1	26.0		6.1		6.1		6.1	
Effective Green, g (s)	0.9	16.8		10.1	26.0		6.1		6.1		6.1	
Actuated g/C Ratio	0.02	0.36		0.21	0.55		0.13		0.13		0.13	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.9		4.9		4.9	
Vehicle Extension (s)	2.0	6.1		2.0	5.1		2.0		2.0		2.0	
Lane Grp Cap (vph)	31	1653		351	2597		164		186		187	
v/s Ratio Prot	0.02	0.11		c0.13	c0.16						0.00	
v/s Ratio Perm							c0.06		0.01			
v/c Ratio	0.94	0.32		0.61	0.30		0.49		0.06		0.02	
Uniform Delay, d1	23.1	11.0		16.8	5.7		19.1		18.0		17.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00		1.00	
Incremental Delay, d2	132.4	0.3		2.0	0.1		0.9		0.0		0.0	
Delay (s)	155.5	11.4		18.8	5.8		20.0		18.1		17.9	
Level of Service	F	B		B	A		B		B		B	
Approach Delay (s)		18.8			8.6			19.0			17.9	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	47.2	Sum of lost time (s)	14.2
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	350	40	250	840	180	50	30	130	80	60	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	5.5			4.9	4.9		4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.96		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	
Frt	1.00	0.98		1.00	0.97			1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	
Satd. Flow (prot)	1641	4631		1641	4591			1671	1415		2984	
Flt Permitted	0.95	1.00		0.95	1.00			0.66	1.00		0.82	
Satd. Flow (perm)	1641	4631		1641	4591			1144	1415		2477	
Peak-hour factor, PHF	0.66	0.66	0.66	0.90	0.90	0.90	0.67	0.67	0.67	0.96	0.96	0.96
Adj. Flow (vph)	15	530	61	278	933	200	75	45	194	83	62	104
RTOR Reduction (vph)	0	13	0	0	21	0	0	0	154	0	83	0
Lane Group Flow (vph)	15	578	0	278	1112	0	0	120	40	0	166	0
Confl. Peds. (#/hr)			16				11		43	43		11
Confl. Bikes (#/hr)			1						3			1
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	1.1	21.3		16.6	36.2			13.5	13.5		13.5	
Effective Green, g (s)	1.1	21.3		16.6	36.2			13.5	13.5		13.5	
Actuated g/C Ratio	0.02	0.32		0.25	0.55			0.21	0.21		0.21	
Clearance Time (s)	4.4	4.9		4.4	5.5			4.9	4.9		4.9	
Vehicle Extension (s)	2.0	8.0		2.0	6.7			4.4	4.4		4.4	
Lane Grp Cap (vph)	27	1503		415	2533			235	291		509	
v/s Ratio Prot	0.01	0.12		c0.17	c0.24							
v/s Ratio Perm								c0.10	0.03		0.07	
v/c Ratio	0.56	0.38		0.67	0.44			0.51	0.14		0.33	
Uniform Delay, d1	32.0	17.1		22.0	8.7			23.1	21.3		22.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	13.3	0.7		3.2	0.4			3.0	0.4		0.6	
Delay (s)	45.3	17.8		25.2	9.1			26.1	21.6		22.8	
Level of Service	D	B		C	A			C	C		C	
Approach Delay (s)		18.5			12.3			23.3			22.8	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	65.6	Sum of lost time (s)	14.8
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	460	100	160	1270	0	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1		5.1	3.0		5.1
Lane Util. Factor	0.91		0.97	0.91		0.88
Frpb, ped/bikes	1.00		1.00	1.00		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.97		1.00	1.00		0.85
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	4575		3183	4715		2584
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	4575		3183	4715		2584
Peak-hour factor, PHF	0.80	0.80	0.91	0.91	0.87	0.87
Adj. Flow (vph)	575	125	176	1396	0	575
RTOR Reduction (vph)	74	0	0	0	0	448
Lane Group Flow (vph)	626	0	176	1396	0	127
Confl. Peds. (#/hr)		21				
Turn Type	NA		Prot	NA		Over
Protected Phases	2		1	6		1
Permitted Phases						1
Actuated Green, G (s)	11.3		6.1	27.6		6.1
Effective Green, g (s)	11.3		6.1	27.6		6.1
Actuated g/C Ratio	0.41		0.22	1.00		0.22
Clearance Time (s)	5.1		5.1	3.0		5.1
Vehicle Extension (s)	3.9		2.0	0.9		2.0
Lane Grp Cap (vph)	1873		703	4715		571
v/s Ratio Prot	0.14		0.06	c0.30		0.05
v/s Ratio Perm						
v/c Ratio	0.33		0.25	0.30		0.22
Uniform Delay, d1	5.6		8.9	0.0		8.8
Progression Factor	1.00		1.00	1.00		1.00
Incremental Delay, d2	0.1		0.1	0.0		0.1
Delay (s)	5.7		8.9	0.0		8.9
Level of Service	A		A	A		A
Approach Delay (s)	5.7			1.0	8.9	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	3.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	27.6	Sum of lost time (s)	10.2
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↱
Volume (veh/h)	0	960	930	0	0	500
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.89	0.89	0.73	0.73
Hourly flow rate (vph)	0	1129	1045	0	0	685
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		269	396			
pX, platoon unblocked						
vC, conflicting volume	1045				1421	348
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1045				1421	348
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	0
cM capacity (veh/h)	616				118	625

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	376	376	376	348	348	348	685
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	685
cSH	1700	1700	1700	1700	1700	1700	625
Volume to Capacity	0.22	0.22	0.22	0.20	0.20	0.20	1.10
Queue Length 95th (ft)	0	0	0	0	0	0	505
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	89.8
Lane LOS							F
Approach Delay (s)	0.0			0.0			89.8
Approach LOS							F

Intersection Summary			
Average Delay	21.5		
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	760	0	0	710	640	220	10	350	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.1			5.1	5.1		5.1	5.1			
Lane Util. Factor	0.97	0.91			0.86	0.86		1.00	0.88			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			0.95	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3183	4715			4249	1263		1648	2584			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3183	4715			4249	1263		1648	2584			
Peak-hour factor, PHF	0.85	0.85	0.85	0.89	0.89	0.89	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	235	894	0	0	798	719	253	11	402	0	0	0
RTOR Reduction (vph)	0	0	0	0	124	233	0	0	183	0	0	0
Lane Group Flow (vph)	235	894	0	0	1034	126	0	264	219	0	0	0
Confl. Bikes (#/hr)			4									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	10.1	36.2			21.4	21.4		14.8	14.8			
Effective Green, g (s)	10.1	36.2			21.4	21.4		14.8	14.8			
Actuated g/C Ratio	0.17	0.59			0.35	0.35		0.24	0.24			
Clearance Time (s)	4.7	5.1			5.1	5.1		5.1	5.1			
Vehicle Extension (s)	2.0	3.9			3.9	3.9		3.0	3.0			
Lane Grp Cap (vph)	525	2788			1485	441		398	624			
v/s Ratio Prot	c0.07	0.19			c0.24			c0.16				
v/s Ratio Perm						0.10			0.08			
v/c Ratio	0.45	0.32			0.70	0.28		0.66	0.35			
Uniform Delay, d1	23.0	6.3			17.1	14.4		21.0	19.2			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.2	0.1			1.5	0.5		4.1	0.3			
Delay (s)	23.3	6.4			18.7	14.8		25.1	19.6			
Level of Service	C	A			B	B		C	B			
Approach Delay (s)		9.9			17.8			21.8			0.0	
Approach LOS		A			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	61.2	Sum of lost time (s)	14.9
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

32: Heinrich Hertz Drive/Sanyo Avenue & Airway Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	110	240	200	10	70	50	50	70	10	70	140	100
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	261	217	11	76	54	54	76	11	76	152	109

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	120	478	11	130	54	87	228	109
Volume Left (vph)	120	0	11	0	54	0	76	0
Volume Right (vph)	0	217	0	54	0	11	0	109
Hadj (s)	0.67	-0.15	0.67	-0.12	0.67	0.08	0.34	-0.53
Departure Headway (s)	6.9	6.1	7.5	6.8	7.8	7.2	7.1	6.3
Degree Utilization, x	0.23	0.81	0.02	0.24	0.12	0.17	0.45	0.19
Capacity (veh/h)	504	580	446	499	429	462	480	540
Control Delay (s)	10.7	28.3	9.5	10.7	10.6	10.5	14.7	9.5
Approach Delay (s)	24.8		10.6		10.6		13.0	
Approach LOS	C		B		B		B	

Intersection Summary			
Delay	18.2		
Level of Service	C		
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		

Near-Term PM
1: East Beyer Boulevard/Otay Mesa Road & Beyer Boulevard

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	320	240	30	40	20	150	70	110	60	60	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9		4.9		4.9	4.9			5.2	
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.98		1.00		1.00	1.00			0.99	
Flpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85		0.97		1.00	0.91			0.94	
Flt Protected	0.95	1.00	1.00		0.98		0.95	1.00			0.99	
Satd. Flow (prot)	1681	1717	1546		1747		1762	1692			1698	
Flt Permitted	0.95	1.00	1.00		0.98		0.59	1.00			0.86	
Satd. Flow (perm)	1681	1717	1546		1747		1088	1692			1478	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	348	261	33	43	22	163	76	120	65	65	120
RTOR Reduction (vph)	0	0	177	0	15	0	0	79	0	0	46	0
Lane Group Flow (vph)	157	365	84	0	83	0	163	117	0	0	204	0
Confl. Peds. (#/hr)			1	1			7					7
Confl. Bikes (#/hr)			2			3						
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	Perm	Split	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		1	1			8			4	
Permitted Phases			2				8			4		
Actuated Green, G (s)	17.2	17.2	17.2		6.4		15.0	15.0			14.7	
Effective Green, g (s)	17.2	17.2	17.2		6.4		15.0	15.0			14.7	
Actuated g/C Ratio	0.32	0.32	0.32		0.12		0.28	0.28			0.28	
Clearance Time (s)	4.9	4.9	4.9		4.9		4.9	4.9			5.2	
Vehicle Extension (s)	2.9	2.9	2.9		2.9		3.8	3.8			4.5	
Lane Grp Cap (vph)	542	554	498		209		306	476			407	
v/s Ratio Prot	0.09	c0.21			c0.05			0.07				
v/s Ratio Perm			0.05				c0.15				0.14	
v/c Ratio	0.29	0.66	0.17		0.40		0.53	0.25			0.50	
Uniform Delay, d1	13.5	15.5	12.9		21.7		16.2	14.8			16.2	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.3	2.8	0.2		1.2		2.2	0.3			1.7	
Delay (s)	13.8	18.3	13.1		22.8		18.4	15.1			17.9	
Level of Service	B	B	B		C		B	B			B	
Approach Delay (s)		15.7			22.8			16.6			17.9	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	53.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	350	140	350	730	280	40	10	30	10	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.6		4.4	4.9	4.9	4.4	4.9	
Lane Util. Factor	1.00	0.95		0.97	0.91		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3374		3433	4833		1769	1863	1562	1767	1638	
Flt Permitted	0.95	1.00		0.95	1.00		1.00	1.00	1.00	1.00	1.00	
Satd. Flow (perm)	1770	3374		3433	4833		1862	1863	1562	1860	1638	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	380	152	380	793	304	43	11	33	11	11	33
RTOR Reduction (vph)	0	38	0	0	57	0	0	0	31	0	31	0
Lane Group Flow (vph)	87	494	0	380	1040	0	43	11	2	11	13	0
Confl. Peds. (#/hr)			3			6	1		3	3		1
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	3.7	21.1		5.4	22.6		4.5	3.4	3.4	3.3	2.8	
Effective Green, g (s)	3.7	21.1		5.4	22.6		4.5	3.4	3.4	3.3	2.8	
Actuated g/C Ratio	0.07	0.43		0.11	0.46		0.09	0.07	0.07	0.07	0.06	
Clearance Time (s)	4.4	5.4		4.4	5.6		4.4	4.9	4.9	4.4	4.9	
Vehicle Extension (s)	2.0	5.4		2.0	5.4		2.0	5.6	5.6	2.0	2.0	
Lane Grp Cap (vph)	132	1438		374	2206		167	127	107	123	92	
v/s Ratio Prot	0.05	0.15		c0.11	c0.22		c0.01	0.01		0.00	0.01	
v/s Ratio Perm							c0.02		0.00	0.01		
v/c Ratio	0.66	0.34		1.02	0.47		0.26	0.09	0.02	0.09	0.14	
Uniform Delay, d1	22.3	9.5		22.1	9.3		21.0	21.6	21.5	21.7	22.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.7	0.3		50.7	0.4		0.3	0.7	0.2	0.1	0.3	
Delay (s)	31.0	9.9		72.7	9.7		21.3	22.3	21.7	21.8	22.5	
Level of Service	C	A		E	A		C	C	C	C	C	
Approach Delay (s)		12.9			25.9			21.6			22.3	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	49.5	Sum of lost time (s)	19.3
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	10	10	980	390	680	10	600	440	200	290	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.6	5.2	5.2	6.7	6.7	5.2	6.3	5.2	5.2	6.3	6.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1559	3335	3539	1562	1770	3539	1538	3433	3539	1560
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1559	3335	3539	1562	1770	3539	1538	3433	3539	1560
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	11	11	1065	424	739	11	652	478	217	315	33
RTOR Reduction (vph)	0	0	10	0	0	228	0	0	177	0	0	21
Lane Group Flow (vph)	11	11	1	1065	424	511	11	652	301	217	315	12
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)			5			1						4
Heavy Vehicles (%)	2%	2%	2%	5%	2%	2%	2%	2%	5%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2	3	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	1.7	7.6	11.3	39.1	43.9	43.9	3.7	30.4	69.5	12.7	39.4	39.4
Effective Green, g (s)	1.7	7.6	11.3	39.1	43.9	43.9	3.7	30.4	69.5	12.7	39.4	39.4
Actuated g/C Ratio	0.02	0.07	0.10	0.35	0.39	0.39	0.03	0.27	0.62	0.11	0.35	0.35
Clearance Time (s)	5.2	5.6	5.2	5.2	6.7	6.7	5.2	6.3	5.2	5.2	6.3	6.3
Vehicle Extension (s)	2.0	2.0	2.0	3.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	26	239	157	1163	1385	611	58	959	953	388	1243	548
v/s Ratio Prot	0.01	0.00	0.00	c0.32	0.12		0.01	c0.18	0.11	c0.06	0.09	
v/s Ratio Perm			0.00			c0.33			0.09			0.01
v/c Ratio	0.42	0.05	0.01	0.92	0.31	0.84	0.19	0.68	0.32	0.56	0.25	0.02
Uniform Delay, d1	54.7	48.9	45.4	34.9	23.6	30.8	52.7	36.5	10.1	47.1	25.9	23.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.0	0.0	0.0	11.1	0.0	9.3	0.6	1.9	0.2	1.0	0.1	0.0
Delay (s)	58.7	48.9	45.4	46.1	23.6	40.1	53.3	38.4	10.3	48.0	26.0	23.8
Level of Service	E	D	D	D	C	D	D	D	B	D	C	C
Approach Delay (s)		51.0			39.8			26.8			34.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	112.1	Sum of lost time (s)	23.4
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	150	10	350	220	700	0	0	280	1000
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.1	5.1	4.7	5.1			5.1	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frpb, ped/bikes					1.00	1.00	1.00	1.00			0.97	
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.88	
Flt Protected					0.96	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1729	1538	1719	4940			4241	
Flt Permitted					0.96	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1729	1538	1719	4940			4241	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	163	11	380	239	761	0	0	304	1087
RTOR Reduction (vph)	0	0	0	0	0	162	0	0	0	0	438	0
Lane Group Flow (vph)	0	0	0	0	174	218	239	761	0	0	953	0
Confl. Peds. (#/hr)												9
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					12.3	12.3	9.1	35.6			21.8	
Effective Green, g (s)					12.3	12.3	9.1	35.6			21.8	
Actuated g/C Ratio					0.21	0.21	0.16	0.61			0.38	
Clearance Time (s)					5.1	5.1	4.7	5.1			5.1	
Vehicle Extension (s)					3.0	3.0	2.0	3.0			3.0	
Lane Grp Cap (vph)					366	325	269	3026			1591	
v/s Ratio Prot							c0.14	0.15			c0.22	
v/s Ratio Perm					0.10	c0.14						
v/c Ratio					0.48	0.67	0.89	0.25			1.08dr	
Uniform Delay, d1					20.1	21.0	24.0	5.2			14.6	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					1.0	5.2	27.1	0.0			0.6	
Delay (s)					21.0	26.2	51.1	5.2			15.2	
Level of Service					C	C	D	A			B	
Approach Delay (s)		0.0			24.6			16.2			15.2	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	14.9
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	540	10	250	0	0	0	0	380	400	110	320	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1						5.1		4.7	5.1	
Lane Util. Factor	1.00	1.00						0.91		1.00	0.95	
Frpb, ped/bikes	1.00	1.00						0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	0.86						0.92		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1641	1478						4291		1641	3282	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1641	1478						4291		1641	3282	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	587	11	272	0	0	0	0	413	435	120	348	0
RTOR Reduction (vph)	0	159	0	0	0	0	0	301	0	0	0	0
Lane Group Flow (vph)	587	124	0	0	0	0	0	547	0	120	348	0
Confl. Peds. (#/hr)									1			
Confl. Bikes (#/hr)									4			
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4											
Actuated Green, G (s)	25.7	25.7						14.9		6.4	26.0	
Effective Green, g (s)	25.7	25.7						14.9		6.4	26.0	
Actuated g/C Ratio	0.42	0.42						0.24		0.10	0.42	
Clearance Time (s)	5.1	5.1						5.1		4.7	5.1	
Vehicle Extension (s)	3.0	3.0						3.0		2.0	3.0	
Lane Grp Cap (vph)	681	613						1032		169	1378	
v/s Ratio Prot		0.08						c0.13		c0.07	0.11	
v/s Ratio Perm	c0.36											
v/c Ratio	0.86	0.20						0.53		0.71	0.25	
Uniform Delay, d1	16.5	11.6						20.5		26.9	11.6	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	10.9	0.2						0.5		11.1	0.1	
Delay (s)	27.4	11.7						20.9		37.9	11.7	
Level of Service	C	B						C		D	B	
Approach Delay (s)		22.3			0.0			20.9			18.5	
Approach LOS		C			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	61.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	211	10	100	100	10	300	40	281	40	100	150	325
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	229	11	109	109	11	326	43	305	43	109	163	353

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	153	196	109	337	43	349	109	516
Volume Left (vph)	153	76	109	0	43	0	109	0
Volume Right (vph)	0	109	0	326	0	43	0	353
Hadj (s)	0.58	-0.11	0.67	-0.51	0.58	0.08	0.67	-0.37
Departure Headway (s)	9.2	8.5	9.0	7.9	8.9	8.5	8.8	7.8
Degree Utilization, x	0.39	0.46	0.27	0.74	0.11	0.82	0.27	1.0
Capacity (veh/h)	373	403	388	444	392	418	400	473
Control Delay (s)	16.7	17.4	14.2	29.0	11.8	38.6	13.7	102.2
Approach Delay (s)	17.1		25.4		35.6		86.8	
Approach LOS	C		D		E		F	

Intersection Summary			
Delay	47.2		
Level of Service	E		
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	520	80	0	940	530	0	0	10	0	0	60
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	565	87	0	1022	576	0	0	11	0	0	65
Pedestrians		1									1	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1599			652			1015	2208	232	1222	1675	343
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1599			652			1015	2208	232	1222	1675	343
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			100	100	99	100	100	90
cM capacity (veh/h)	370			878			162	39	746	125	87	630

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	226	226	200	341	341	341	576	11	65
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	87	0	0	0	576	11	65
cSH	1700	1700	1700	1700	1700	1700	1700	746	630
Volume to Capacity	0.13	0.13	0.12	0.20	0.20	0.20	0.34	0.01	0.10
Queue Length 95th (ft)	0	0	0	0	0	0	0	1	9
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.9	11.4
Lane LOS								A	B
Approach Delay (s)	0.0			0.0				9.9	11.4
Approach LOS								A	B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	110	90	320	1160	1090	330
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	98	348	1261	1185	359

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	120	98	348	1261	1185	359
Volume Left (vph)	120	0	348	0	0	0
Volume Right (vph)	0	98	0	0	0	359
Hadj (s)	0.53	-0.67	0.53	0.17	0.17	-0.67
Departure Headway (s)	8.7	7.5	7.1	6.8	6.8	6.0
Degree Utilization, x	0.29	0.20	0.69	1.0	1.0	0.60
Capacity (veh/h)	399	459	493	543	537	580
Control Delay (s)	14.0	11.3	23.3	636.8	584.1	16.4
Approach Delay (s)	12.8		504.2		452.2	
Approach LOS	B		F		F	

Intersection Summary			
Delay	448.6		
Level of Service	F		
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	70	280	700	260	240	80
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	304	761	283	261	87

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	380	761	283	348
Volume Left (vph)	76	761	0	0
Volume Right (vph)	304	0	0	87
Hadj (s)	-0.27	0.67	0.17	0.02
Departure Headway (s)	6.2	7.1	6.6	6.3
Degree Utilization, x	0.66	1.0	0.52	0.61
Capacity (veh/h)	566	509	541	548
Control Delay (s)	20.5	254.5	15.3	18.9
Approach Delay (s)	20.5	189.7		18.9
Approach LOS	C	F		C

Intersection Summary			
Delay	119.8		
Level of Service	F		
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	1100	150	250	1200	600	200	100	100	300	100	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	1.00		1.00	1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	4715	1418	3183	4715	1420	1641	1582		1641	1727	2584
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	4715	1418	3183	4715	1420	1641	1582		1641	1727	2584
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	1196	163	272	1304	652	217	109	109	326	109	435
RTOR Reduction (vph)	0	0	112	0	0	371	0	31	0	0	0	138
Lane Group Flow (vph)	272	1196	51	272	1304	281	217	187	0	326	109	297
Confl. Peds. (#/hr)						11			1			
Confl. Bikes (#/hr)			12			13			5			
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	11.0	35.8	35.8	12.0	37.1	37.1	19.0	19.6		25.1	25.7	36.7
Effective Green, g (s)	11.0	35.8	35.8	12.0	37.1	37.1	19.0	19.6		25.1	25.7	36.7
Actuated g/C Ratio	0.10	0.31	0.31	0.11	0.33	0.33	0.17	0.17		0.22	0.23	0.32
Clearance Time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Vehicle Extension (s)	2.0	4.1	4.1	2.0	4.5	4.5	2.0	4.3		2.0	3.7	2.0
Lane Grp Cap (vph)	307	1483	446	335	1537	462	273	272		361	390	833
v/s Ratio Prot	c0.09	0.25		0.09	c0.28		0.13	c0.12		c0.20	0.06	0.03
v/s Ratio Perm			0.04			0.20						0.08
v/c Ratio	0.89	0.81	0.11	0.81	0.85	0.61	0.79	0.69		0.90	0.28	0.36
Uniform Delay, d1	50.8	35.8	27.7	49.8	35.7	32.2	45.5	44.2		43.2	36.4	29.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	24.3	3.5	0.2	13.2	4.9	3.0	13.8	7.9		24.4	0.5	0.1
Delay (s)	75.0	39.4	27.9	63.0	40.7	35.2	59.3	52.1		67.6	36.9	29.6
Level of Service	E	D	C	E	D	D	E	D		E	D	C
Approach Delay (s)		44.2			41.8			55.7			44.7	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	44.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	113.8	Sum of lost time (s)	21.3
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	0	0	0	0	60	0	190	0	30	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	0	0	0	0	65	0	207	0	33	0	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	65	207	33
Volume Left (vph)	11	0	0	33
Volume Right (vph)	0	65	0	0
Hadj (s)	0.37	-0.43	0.17	0.37
Departure Headway (s)	4.9	4.0	4.3	4.7
Degree Utilization, x	0.01	0.07	0.25	0.04
Capacity (veh/h)	685	842	822	741
Control Delay (s)	8.0	7.3	8.7	7.9
Approach Delay (s)	8.0	7.3	8.7	7.9
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.3		
Level of Service	A		
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1520	100	100	1980	40	100	40	100	40	30	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		4.0	6.5		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1641	4664		1641	4699		1641	1727	1468	1641	1727	1468
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1641	4664		1641	4699		1641	1727	1468	1641	1727	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1652	109	109	2152	43	109	43	109	43	33	43
RTOR Reduction (vph)	0	4	0	0	1	0	0	0	99	0	0	41
Lane Group Flow (vph)	54	1757	0	109	2194	0	109	43	10	43	33	2
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			5			7						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	8.3	90.0		19.7	101.4		15.3	14.4	14.4	7.4	6.5	6.5
Effective Green, g (s)	8.3	90.0		19.7	101.4		15.3	14.4	14.4	7.4	6.5	6.5
Actuated g/C Ratio	0.06	0.60		0.13	0.68		0.10	0.10	0.10	0.05	0.04	0.04
Clearance Time (s)	4.0	6.5		4.0	6.5		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	5.3		2.0	5.3		3.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	90	2798		215	3176		167	165	140	80	74	63
v/s Ratio Prot	0.03	0.38		c0.07	c0.47		c0.07	0.02		0.03	c0.02	
v/s Ratio Perm									0.01			0.00
v/c Ratio	0.60	0.63		0.51	0.69		0.65	0.26	0.07	0.54	0.45	0.03
Uniform Delay, d1	69.2	19.3		60.6	14.8		64.8	62.9	61.7	69.6	70.0	68.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.0	1.1		0.7	1.3		8.8	0.3	0.1	3.4	1.6	0.1
Delay (s)	76.2	20.3		61.3	16.0		73.6	63.2	61.8	73.1	71.5	68.8
Level of Service	E	C		E	B		E	E	E	E	E	E
Approach Delay (s)		22.0			18.2			67.0			71.1	
Approach LOS		C			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	90	250	10	130	160	40
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	272	11	141	174	43
Pedestrians	1		1			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	0		0			
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	475	83			153	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	475	83			153	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.3	
p0 queue free %	79	72			87	
cM capacity (veh/h)	466	955			1379	

Direction, Lane #	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	98	136	136	152	217
Volume Left	98	0	0	0	174
Volume Right	0	136	136	141	0
cSH	466	955	955	1700	1379
Volume to Capacity	0.21	0.14	0.14	0.09	0.13
Queue Length 95th (ft)	20	12	12	0	11
Control Delay (s)	14.8	9.4	9.4	0.0	6.6
Lane LOS	B	A	A		A
Approach Delay (s)	10.8			0.0	6.6
Approach LOS	B				

Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	34.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	0	10	20	0	10	10	100	120	20	70	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	11	22	0	11	11	109	130	22	76	11

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	33	250	109
Volume Left (vph)	0	22	11	22
Volume Right (vph)	11	11	130	11
Hadj (s)	-0.52	0.10	-0.14	0.14
Departure Headway (s)	4.2	4.8	4.0	4.4
Degree Utilization, x	0.01	0.04	0.28	0.13
Capacity (veh/h)	776	690	885	803
Control Delay (s)	7.2	8.0	8.5	8.1
Approach Delay (s)	7.2	8.0	8.5	8.1
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.3		
Level of Service	A		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1560	490	380	1700	660	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	1641	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	1641	4715	3183	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1696	533	413	1848	717	293
RTOR Reduction (vph)	0	345	0	0	0	219
Lane Group Flow (vph)	1696	188	413	1848	717	74
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	31.8	31.8	21.0	56.8	22.7	22.7
Effective Green, g (s)	31.8	31.8	21.0	56.8	22.7	22.7
Actuated g/C Ratio	0.35	0.35	0.23	0.63	0.25	0.25
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	1665	518	382	2975	802	370
v/s Ratio Prot	c0.36		c0.25	0.39	c0.23	
v/s Ratio Perm		0.13				0.05
v/c Ratio	1.02	0.36	1.08	0.62	0.89	0.20
Uniform Delay, d1	29.1	21.6	34.5	10.1	32.5	26.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.8	2.0	69.5	1.0	12.1	0.1
Delay (s)	55.9	23.6	104.0	11.1	44.6	26.6
Level of Service	E	C	F	B	D	C
Approach Delay (s)	48.2			28.0	39.4	
Approach LOS	D			C	D	

Intersection Summary			
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	135	10	140	645	250	0	0	535	700
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.1	5.1	5.1	4.7	5.1			5.1	5.1
Lane Util. Factor				1.00	0.95	0.95	0.97	0.91			0.91	1.00
Frpb, ped/bikes				1.00	0.99	0.99	1.00	1.00			1.00	0.99
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	0.87	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1641	1411	1375	3183	4715			4715	1450
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1641	1411	1375	3183	4715			4715	1450
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	147	11	152	701	272	0	0	582	761
RTOR Reduction (vph)	0	0	0	0	60	68	0	0	0	0	0	406
Lane Group Flow (vph)	0	0	0	147	22	13	701	272	0	0	582	355
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)												1
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				8.4	8.4	8.4	10.1	34.5			19.7	19.7
Effective Green, g (s)				8.4	8.4	8.4	10.1	34.5			19.7	19.7
Actuated g/C Ratio				0.16	0.16	0.16	0.19	0.65			0.37	0.37
Clearance Time (s)				5.1	5.1	5.1	4.7	5.1			5.1	5.1
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				259	223	217	605	3063			1749	537
v/s Ratio Prot					0.02		c0.22	0.06			0.12	
v/s Ratio Perm				c0.09		0.01						c0.24
v/c Ratio				0.57	0.10	0.06	1.16	0.09			0.33	0.66
Uniform Delay, d1				20.7	19.1	19.0	21.5	3.5			12.0	13.9
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				2.8	0.2	0.1	88.9	0.0			0.1	3.0
Delay (s)				23.5	19.3	19.1	110.4	3.5			12.1	17.0
Level of Service				C	B	B	F	A			B	B
Approach Delay (s)		0.0			21.2			80.5			14.9	
Approach LOS		A			C			F			B	

Intersection Summary			
HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	53.1	Sum of lost time (s)	14.9
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	10	515	0	0	0	0	670	260	180	490	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1					5.1		4.7	5.1	
Lane Util. Factor		1.00	0.88					0.95		0.97	0.91	
Frt		1.00	0.85					0.96		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1648	2584					3144		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1648	2584					3144		3183	4715	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	11	560	0	0	0	0	728	283	196	533	0
RTOR Reduction (vph)	0	0	423	0	0	0	0	69	0	0	0	0
Lane Group Flow (vph)	0	256	137	0	0	0	0	942	0	196	533	0
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		13.6	13.6					21.3		5.6	31.6	
Effective Green, g (s)		13.6	13.6					21.3		5.6	31.6	
Actuated g/C Ratio		0.25	0.25					0.38		0.10	0.57	
Clearance Time (s)		5.1	5.1					5.1		4.7	5.1	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		404	634					1208		321	2689	
v/s Ratio Prot								c0.30		c0.06	0.11	
v/s Ratio Perm		0.16	0.05									
v/c Ratio		0.63	0.22					0.78		0.61	0.20	
Uniform Delay, d1		18.7	16.7					15.0		23.9	5.8	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		3.2	0.2					3.3		3.4	0.0	
Delay (s)		21.9	16.8					18.2		27.3	5.8	
Level of Service		C	B					B		C	A	
Approach Delay (s)		18.4			0.0			18.2			11.6	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	55.4	Sum of lost time (s)	14.9
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	100	60	215	200	370	10	360	50	220	585	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99			1.00	0.99	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94			1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1622			1684	1447	1641	3222		1641	1727	1450
Flt Permitted	0.95	1.00			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1622			1684	1447	1641	3222		1641	1727	1450
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	109	65	234	217	402	11	391	54	239	636	217
RTOR Reduction (vph)	0	19	0	0	0	252	0	9	0	0	0	113
Lane Group Flow (vph)	217	155	0	0	451	150	11	436	0	239	636	104
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						1
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	15.9	15.9			31.9	31.9	0.9	25.3		17.4	41.6	41.6
Effective Green, g (s)	15.9	15.9			31.9	31.9	0.9	25.3		17.4	41.6	41.6
Actuated g/C Ratio	0.14	0.14			0.29	0.29	0.01	0.23		0.16	0.38	0.38
Clearance Time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Vehicle Extension (s)	2.0	2.0			3.7	3.7	2.0	3.8		2.0	3.8	3.8
Lane Grp Cap (vph)	236	233			487	418	13	739		258	651	546
v/s Ratio Prot	c0.13	0.10			c0.27		0.01	0.14		c0.15	c0.37	
v/s Ratio Perm						0.10						0.07
v/c Ratio	0.92	0.67			0.93	0.36	0.85	0.59		0.93	0.98	0.19
Uniform Delay, d1	46.6	44.7			38.1	31.1	54.6	37.9		45.8	33.9	23.1
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	36.4	5.5			23.9	0.7	162.2	1.4		36.0	29.3	0.2
Delay (s)	83.0	50.2			62.0	31.7	216.8	39.2		81.8	63.2	23.3
Level of Service	F	D			E	C	F	D		F	E	C
Approach Delay (s)		68.4			47.7			43.5			59.3	
Approach LOS		E			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	54.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	110.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	210	35	75	150	80	10	120	10	30	180	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Lane Util. Factor		0.95			1.00	1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes		1.00			1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected		0.98			0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3179			1699	1447	1641	1707		3183	3173	
Flt Permitted		0.76			0.11	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2447			197	1447	1641	1707		3183	3173	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	228	38	82	163	87	11	130	11	33	196	43
RTOR Reduction (vph)	0	5	0	0	0	44	0	3	0	0	15	0
Lane Group Flow (vph)	0	413	0	0	245	43	11	138	0	33	224	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						5						5
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		2			1		3	8		7	4	
Permitted Phases	2			1		1						
Actuated Green, G (s)		22.9			60.3	60.3	0.8	17.2		2.3	18.7	
Effective Green, g (s)		22.9			60.3	60.3	0.8	17.2		2.3	18.7	
Actuated g/C Ratio		0.19			0.50	0.50	0.01	0.14		0.02	0.15	
Clearance Time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Vehicle Extension (s)		4.8			4.8	4.8	2.0	3.3		2.0	4.4	
Lane Grp Cap (vph)		460			97	716	10	241		60	487	
v/s Ratio Prot							0.01	c0.08		c0.01	0.07	
v/s Ratio Perm		c0.17			c1.25	0.03						
v/c Ratio		0.90			2.53	0.06	1.10	0.57		0.55	0.46	
Uniform Delay, d1		48.3			30.8	16.0	60.5	48.9		59.2	46.9	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		20.9			716.1	0.1	321.8	3.4		6.1	1.1	
Delay (s)		69.2			746.8	16.1	382.3	52.3		65.3	48.1	
Level of Service		E			F	B	F	D		E	D	
Approach Delay (s)		69.2			555.3			76.2			50.2	
Approach LOS		E			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	203.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.78		
Actuated Cycle Length (s)	121.8	Sum of lost time (s)	19.1
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	840	210	230	940	50	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		5.7	7.2	6.1	6.1
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4574		1641	4715	1641	1468
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4574		1641	4715	1641	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	913	228	250	1022	54	11
RTOR Reduction (vph)	33	0	0	0	0	10
Lane Group Flow (vph)	1108	0	250	1022	54	1
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	27.2		8.8	41.7	5.1	5.1
Effective Green, g (s)	27.2		8.8	41.7	5.1	5.1
Actuated g/C Ratio	0.45		0.15	0.69	0.08	0.08
Clearance Time (s)	7.2		5.7	7.2	6.1	6.1
Vehicle Extension (s)	6.9		2.0	6.9	2.0	2.0
Lane Grp Cap (vph)	2070		240	3271	139	124
v/s Ratio Prot	c0.24		c0.15	0.22	c0.03	
v/s Ratio Perm						0.00
v/c Ratio	0.54		1.04	0.31	0.39	0.01
Uniform Delay, d1	11.9		25.6	3.6	26.0	25.2
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8		69.4	0.2	0.7	0.0
Delay (s)	12.7		95.1	3.8	26.7	25.2
Level of Service	B		F	A	C	C
Approach Delay (s)	12.7			21.7	26.4	
Approach LOS	B			C	C	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	60.1	Sum of lost time (s)	19.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	250	200	550	400	150	100	200	600	100	350	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.89		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4715	1444	1641	4523		1641	1516		3183	1649	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	4715	1444	1641	4523		1641	1516		3183	1649	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	272	217	598	435	163	109	217	652	109	380	163
RTOR Reduction (vph)	0	0	194	0	49	0	0	69	0	0	10	0
Lane Group Flow (vph)	109	272	23	598	549	0	109	800	0	109	533	0
Confl. Peds. (#/hr)									1			
Confl. Bikes (#/hr)			2						2			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	13.6	15.9	15.9	39.0	41.3		15.3	62.7		12.5	60.8	
Effective Green, g (s)	13.6	15.9	15.9	39.0	41.3		15.3	62.7		12.5	60.8	
Actuated g/C Ratio	0.09	0.11	0.11	0.26	0.28		0.10	0.42		0.08	0.41	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	148	499	153	426	1245		167	633		265	668	
v/s Ratio Prot	0.07	c0.06		c0.36	0.12		c0.07	c0.53		0.03	0.32	
v/s Ratio Perm			0.02									
v/c Ratio	0.74	0.55	0.15	1.40	0.44		0.65	1.26		0.41	0.80	
Uniform Delay, d1	66.5	63.6	60.9	55.5	44.8		64.8	43.6		65.3	39.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.1	4.2	2.1	195.4	1.1		6.8	130.9		0.4	7.7	
Delay (s)	81.5	67.9	63.0	250.9	46.0		71.6	174.5		65.6	46.9	
Level of Service	F	E	E	F	D		E	F		E	D	
Approach Delay (s)		68.6			148.4			163.1			50.1	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	119.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	106.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	180	100	40	120	250	40	260	10	370	270	280
Future Volume (vph)	160	180	100	40	120	250	40	260	10	370	270	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.99			1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Frt		0.97			0.92			1.00		1.00	0.92	
Flt Protected		0.98			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		1637			1564			1709		1641	1585	
Flt Permitted		0.66			0.93			0.77		0.52	1.00	
Satd. Flow (perm)		1106			1463			1318		890	1585	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	196	109	43	130	272	43	283	11	402	293	304
RTOR Reduction (vph)	0	18	0	0	94	0	0	2	0	0	62	0
Lane Group Flow (vph)	0	461	0	0	351	0	0	335	0	402	535	0
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			1			3						
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		26.0			26.0			26.0		26.0	26.0	
Effective Green, g (s)		26.0			26.0			26.0		26.0	26.0	
Actuated g/C Ratio		0.43			0.43			0.43		0.43	0.43	
Clearance Time (s)		4.0			4.0			4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		479			633			571		385	686	
v/s Ratio Prot											0.34	
v/s Ratio Perm		c0.42			0.24			0.25		c0.45		
v/c Ratio		0.96			0.55			0.59		1.04	0.78	
Uniform Delay, d1		16.5			12.7			12.9		17.0	14.5	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		31.7			1.1			4.4		57.8	8.5	
Delay (s)		48.2			13.7			17.3		74.8	23.1	
Level of Service		D			B			B		E	C	
Approach Delay (s)		48.2			13.7			17.3			43.9	
Approach LOS		D			B			B			D	

Intersection Summary			
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	109.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	90	50	35	90	110	0	70	10	120	90	100
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	98	54	38	98	120	0	76	11	130	98	109

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	163	255	87	337
Volume Left (vph)	11	38	0	130
Volume Right (vph)	54	120	11	109
Hadj (s)	-0.02	-0.08	0.09	0.05
Departure Headway (s)	5.5	5.3	5.7	5.3
Degree Utilization, x	0.25	0.37	0.14	0.49
Capacity (veh/h)	596	633	550	646
Control Delay (s)	10.3	11.4	9.6	13.2
Approach Delay (s)	10.3	11.4	9.6	13.2
Approach LOS	B	B	A	B

Intersection Summary			
Delay	11.7		
Level of Service	B		
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	190	420	670	110	100	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	6.2	6.2	6.2	5.1	5.1
Lane Util. Factor	0.97	0.95	0.91	1.00	0.97	0.91
Frpb, ped/bikes	1.00	1.00	1.00	0.99	0.99	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	0.93	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.98	1.00
Satd. Flow (prot)	3183	3282	4715	1447	2997	1312
Flt Permitted	0.95	1.00	1.00	1.00	0.98	1.00
Satd. Flow (perm)	3183	3282	4715	1447	2997	1312
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	207	457	728	120	109	217
RTOR Reduction (vph)	0	0	0	74	93	92
Lane Group Flow (vph)	207	457	728	46	125	16
Confl. Bikes (#/hr)				4		4
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	5.1	26.8	17.0	17.0	6.5	6.5
Effective Green, g (s)	5.1	26.8	17.0	17.0	6.5	6.5
Actuated g/C Ratio	0.11	0.60	0.38	0.38	0.15	0.15
Clearance Time (s)	4.7	6.2	6.2	6.2	5.1	5.1
Vehicle Extension (s)	2.0	5.8	5.8	5.8	2.0	2.0
Lane Grp Cap (vph)	363	1972	1797	551	436	191
v/s Ratio Prot	c0.07	0.14	c0.15		c0.04	
v/s Ratio Perm				0.03		0.01
v/c Ratio	0.57	0.23	0.41	0.08	0.29	0.08
Uniform Delay, d1	18.7	4.1	10.1	8.8	17.0	16.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.2	0.4	0.2	0.1	0.1
Delay (s)	20.1	4.3	10.5	9.0	17.1	16.5
Level of Service	C	A	B	A	B	B
Approach Delay (s)		9.2	10.3		16.9	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	44.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	360	220	170	430	90	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	391	239	185	467	98	65

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	630	185	467	163
Volume Left (vph)	0	185	0	98
Volume Right (vph)	239	0	0	65
Hadj (s)	-0.06	0.67	0.17	0.05
Departure Headway (s)	5.4	6.5	6.0	6.9
Degree Utilization, x	0.94	0.33	0.78	0.31
Capacity (veh/h)	664	544	589	509
Control Delay (s)	44.0	11.5	25.6	12.9
Approach Delay (s)	44.0	21.6		12.9
Approach LOS	E	C		B

Intersection Summary			
Delay	30.4		
Level of Service	D		
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	500	20	40	780	0	30	0	40	10	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9		4.4	4.9		4.9		4.9		4.9	
Lane Util. Factor		0.91		1.00	0.91		1.00		1.00		1.00	
Frpb, ped/bikes		1.00		1.00	1.00		1.00		0.98		0.94	
Flpb, ped/bikes		1.00		1.00	1.00		1.00		1.00		1.00	
Frt		0.99		1.00	1.00		1.00		0.85		0.93	
Flt Protected		1.00		0.95	1.00		0.95		1.00		0.99	
Satd. Flow (prot)		4678		1641	4715		1641		1434		1499	
Flt Permitted		1.00		0.95	1.00		1.00		1.00		0.91	
Satd. Flow (perm)		4678		1641	4715		1727		1434		1385	
Peak-hour factor, PHF	0.74	0.74	0.74	0.94	0.94	0.94	0.81	0.81	0.81	0.60	0.60	0.60
Adj. Flow (vph)	0	676	27	43	830	0	37	0	49	17	17	33
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	44	0	30	0
Lane Group Flow (vph)	0	698	0	43	830	0	37	0	5	0	37	0
Confl. Peds. (#/hr)			49			10			6	6		
Confl. Bikes (#/hr)			3						4			25
Turn Type	Prot	NA		Prot	NA		Perm		Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		14.3		1.3	20.0		3.1		3.1		3.1	
Effective Green, g (s)		14.3		1.3	20.0		3.1		3.1		3.1	
Actuated g/C Ratio		0.43		0.04	0.61		0.09		0.09		0.09	
Clearance Time (s)		4.9		4.4	4.9		4.9		4.9		4.9	
Vehicle Extension (s)		6.1		2.0	5.1		2.0		2.0		2.0	
Lane Grp Cap (vph)		2033		64	2866		162		135		130	
v/s Ratio Prot		c0.15		0.03	c0.18							
v/s Ratio Perm							0.02		0.00		c0.03	
v/c Ratio		0.34		0.67	0.29		0.23		0.03		0.29	
Uniform Delay, d1		6.2		15.6	3.1		13.8		13.5		13.9	
Progression Factor		1.00		1.00	1.00		1.00		1.00		1.00	
Incremental Delay, d2		0.3		19.6	0.1		0.3		0.0		0.4	
Delay (s)		6.5		35.2	3.2		14.1		13.6		14.3	
Level of Service		A		D	A		B		B		B	
Approach Delay (s)		6.5			4.8			13.8			14.3	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	32.9	Sum of lost time (s)	14.2
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	400	70	250	660	150	60	60	280	190	70	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	5.5			4.9	4.9		4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.96		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	
Frt	1.00	0.98		1.00	0.97			1.00	0.85		0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.97	
Satd. Flow (prot)	1641	4611		1641	4566			1683	1412		3009	
Flt Permitted	0.95	1.00		0.95	1.00			0.63	1.00		0.75	
Satd. Flow (perm)	1641	4611		1641	4566			1087	1412		2321	
Peak-hour factor, PHF	0.69	0.69	0.69	0.93	0.93	0.93	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	116	580	101	269	710	161	71	71	329	224	82	118
RTOR Reduction (vph)	0	23	0	0	30	0	0	0	242	0	49	0
Lane Group Flow (vph)	116	658	0	269	841	0	0	142	87	0	375	0
Confl. Peds. (#/hr)						1	10		46	46		10
Confl. Bikes (#/hr)						1			3			11
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	8.0	20.8		16.3	28.5			18.3	18.3		18.3	
Effective Green, g (s)	8.0	20.8		16.3	28.5			18.3	18.3		18.3	
Actuated g/C Ratio	0.11	0.30		0.23	0.41			0.26	0.26		0.26	
Clearance Time (s)	4.4	4.9		4.4	5.5			4.9	4.9		4.9	
Vehicle Extension (s)	2.0	8.0		2.0	6.7			4.4	4.4		4.4	
Lane Grp Cap (vph)	188	1378		384	1869			285	371		610	
v/s Ratio Prot	0.07	0.14		c0.16	c0.18							
v/s Ratio Perm								0.13	0.06		c0.16	
v/c Ratio	0.62	0.48		0.70	0.45			0.50	0.23		0.61	
Uniform Delay, d1	29.3	20.0		24.4	14.9			21.8	20.1		22.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	4.2	1.1		4.7	0.6			2.3	0.5		2.3	
Delay (s)	33.5	21.1		29.1	15.5			24.0	20.7		24.9	
Level of Service	C	C		C	B			C	C		C	
Approach Delay (s)		22.9			18.7			21.7			24.9	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	69.6	Sum of lost time (s)	14.8
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	800	70	410	1060	0	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1		5.1	3.0		5.1
Lane Util. Factor	0.91		0.97	0.91		0.88
Frpb, ped/bikes	1.00		1.00	1.00		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	1.00		0.85
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	4652		3183	4715		2584
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	4652		3183	4715		2584
Peak-hour factor, PHF	0.75	0.75	0.97	0.97	0.86	0.86
Adj. Flow (vph)	1067	93	423	1093	0	395
RTOR Reduction (vph)	22	0	0	0	0	149
Lane Group Flow (vph)	1138	0	423	1093	0	246
Confl. Peds. (#/hr)		20				
Turn Type	NA		Prot	NA		Over
Protected Phases	2		1	6		1
Permitted Phases						1
Actuated Green, G (s)	20.3		8.9	39.4		8.9
Effective Green, g (s)	20.3		8.9	39.4		8.9
Actuated g/C Ratio	0.52		0.23	1.00		0.23
Clearance Time (s)	5.1		5.1	3.0		5.1
Vehicle Extension (s)	3.9		2.0	0.9		2.0
Lane Grp Cap (vph)	2396		719	4715		583
v/s Ratio Prot	c0.24		c0.13	0.23		0.10
v/s Ratio Perm						
v/c Ratio	0.48		0.59	0.23		0.42
Uniform Delay, d1	6.1		13.6	0.0		13.1
Progression Factor	1.00		1.00	1.00		1.00
Incremental Delay, d2	0.2		0.8	0.0		0.2
Delay (s)	6.3		14.4	0.0		13.2
Level of Service	A		B	A		B
Approach Delay (s)	6.3			4.0	13.2	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	39.4	Sum of lost time (s)	10.2
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↱
Volume (veh/h)	0	1140	1070	0	0	400
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.82	0.82	0.87	0.87	0.91	0.91
Hourly flow rate (vph)	0	1390	1230	0	0	440
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		269	396			
pX, platoon unblocked					0.89	
vC, conflicting volume	1230				1693	410
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1230				1343	410
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	23
cM capacity (veh/h)	520				119	569

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	463	463	463	410	410	410	440
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	440
cSH	1700	1700	1700	1700	1700	1700	569
Volume to Capacity	0.27	0.27	0.27	0.24	0.24	0.24	0.77
Queue Length 95th (ft)	0	0	0	0	0	0	177
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	29.6
Lane LOS							D
Approach Delay (s)	0.0			0.0			29.6
Approach LOS							D

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	540	600	0	0	1010	1120	60	10	230	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.1			5.1	5.1		5.1	5.1			
Lane Util. Factor	0.97	0.91			0.86	0.86		1.00	0.88			
Frpb, ped/bikes	1.00	1.00			0.99	0.98		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			0.95	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (prot)	3183	4715			4191	1240		1656	2584			
Flt Permitted	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (perm)	3183	4715			4191	1240		1656	2584			
Peak-hour factor, PHF	0.82	0.82	0.82	0.92	0.92	0.92	0.75	0.75	0.75	0.92	0.92	0.92
Adj. Flow (vph)	659	732	0	0	1098	1217	80	13	307	0	0	0
RTOR Reduction (vph)	0	0	0	0	125	304	0	0	264	0	0	0
Lane Group Flow (vph)	659	732	0	0	1582	304	0	93	43	0	0	0
Confl. Peds. (#/hr)						2	3					
Confl. Bikes (#/hr)			3			8						
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	14.3	48.9			29.9	29.9		9.7	9.7			
Effective Green, g (s)	14.3	48.9			29.9	29.9		9.7	9.7			
Actuated g/C Ratio	0.21	0.71			0.43	0.43		0.14	0.14			
Clearance Time (s)	4.7	5.1			5.1	5.1		5.1	5.1			
Vehicle Extension (s)	2.0	3.9			3.9	3.9		3.0	3.0			
Lane Grp Cap (vph)	661	3351			1821	538		233	364			
v/s Ratio Prot	c0.21	0.16			c0.38			c0.06				
v/s Ratio Perm						0.25			0.02			
v/c Ratio	1.00	0.22			0.87	0.56		0.40	0.12			
Uniform Delay, d1	27.2	3.4			17.7	14.6		26.9	25.8			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	34.0	0.0			4.9	1.6		1.1	0.1			
Delay (s)	61.2	3.5			22.5	16.2		28.0	26.0			
Level of Service	E	A			C	B		C	C			
Approach Delay (s)		30.8			20.9			26.4			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	68.8	Sum of lost time (s)	14.9
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

32: Heinrich Hertz Drive/Sanyo Avenue & Airway Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	170	180	100	10	190	100	60	120	10	40	80	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	185	196	109	11	207	109	65	130	11	43	87	43

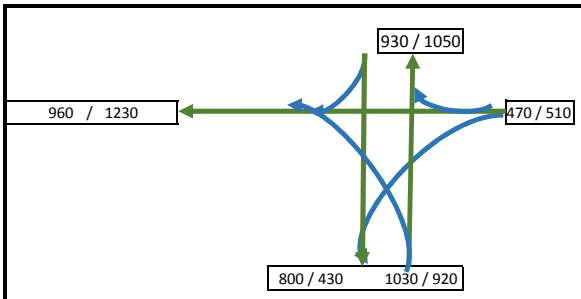
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	185	304	11	315	65	141	130	43
Volume Left (vph)	185	0	11	0	65	0	43	0
Volume Right (vph)	0	109	0	109	0	11	0	43
Hadj (s)	0.67	-0.08	0.67	-0.07	0.67	0.12	0.34	-0.53
Departure Headway (s)	6.9	6.2	7.1	6.4	7.7	7.1	7.4	6.6
Degree Utilization, x	0.36	0.52	0.02	0.56	0.14	0.28	0.27	0.08
Capacity (veh/h)	500	564	478	543	438	472	451	505
Control Delay (s)	12.5	14.5	9.1	16.0	10.7	11.7	11.9	8.9
Approach Delay (s)	13.7		15.8		11.4		11.2	
Approach LOS	B		C		B		B	

Intersection Summary			
Delay	13.5		
Level of Service	B		
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION:	Caliente Avenue and 905 WB Ramps	DIST. CO. RTE	SR-905
ALTERNATIVE:	Near-Term Conditions	PM:	
		DATE:	1/27/2016
		TIME:	

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	160	870	0
SB:	0	400	790
EB:	0	0	0
WB:	400	10	60

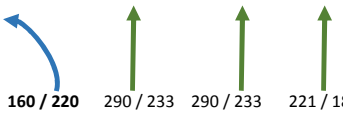
PM

	Left	Throu	Right
NB:	220	700	0
SB:	0	280	1000
EB:	0	0	0
WB:	150	10	350

LANE VOLUMES (ILV/HR)

PHASE I

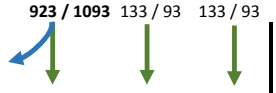
AM 160
PM 220



PHASE II

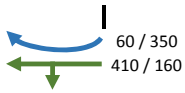
AM 923
PM 1093

Remaining NB Through 130 / 13



PHASE III

AM 410
PM 350



PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PM
1493	1663

TOTAL OPERATING LEVEL (ILV/HR):

AM:	1493	At Capacity
PM:	1663	**Over Capacity**

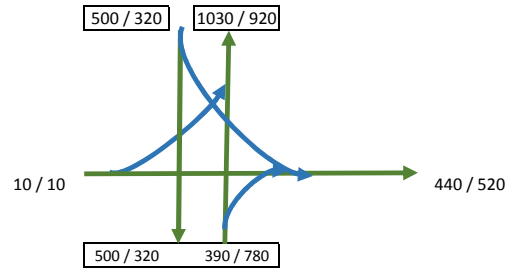
< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION: Caliente Avenue and 905 EB Ramps
ALTERNATIVE: Near-Term Conditions

DIST. CO. RTE: SR-905
PM:
DATE: 1/27/2016
TIME:

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	0	260	130
SB:	300	500	0
EB:	770	10	70
WB:	0	0	0

PM

	Left	Throu	Right
NB:	0	380	400
SB:	110	320	0
EB:	540	10	250
WB:	0	0	0

LANE VOLUMES (ILV/HR)

PHASE I

AM 300
PM 110

250 / 160 250 / 160 **300 / 110**

PHASE II

AM 217
PM 527

Remaining SB Through 0 / 50

87 / 127 87 / 127 **217 / 527**

PHASE III

AM 770
PM 540

770 / 540

80 / 260

PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PM
1287	1177

TOTAL OPERATING LEVEL (ILV/HR):

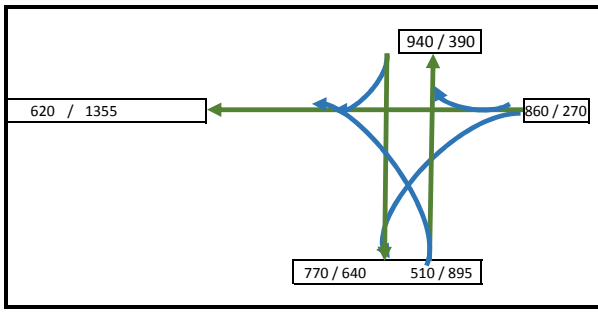
AM:	1287	At Capacity
PM:	1177	Under Capacity

< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION:	Britannia Boulevard and SR-905 WB Ramps	DIST. CO. RTE	SR-905
ALTERNATIVE:	Near-Term Conditions	PM:	
		DATE:	1/27/2016
		TIME:	

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	180	330	0
SB:	0	520	440
EB:	0	0	0
WB:	250	0	610

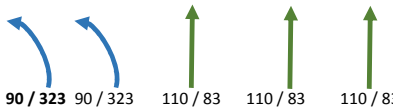
PM

	Left	Throu	Right
NB:	645	250	0
SB:	0	520	700
EB:	0	0	0
WB:	120	10	140

LANE VOLUMES (ILV/HR)

PHASE I

AM 90
PM 323



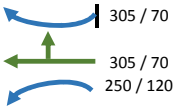
PHASE II

AM 613
PM 873

Remaining NB Through 20 / 0

PHASE III

AM 305
PM 120



PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PM
1008	1316

TOTAL OPERATING LEVEL (ILV/HR):

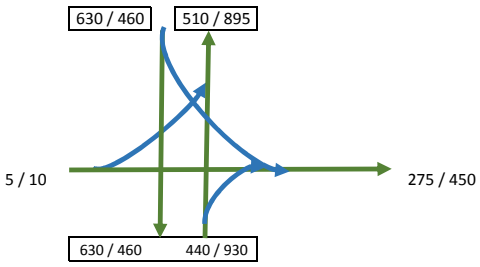
AM:	1008	Under Capacity
PM:	1316	At Capacity

< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION:	Britannia Boulevard and 905 EB Ramps	DIST. CO. RTE	SR-905
ALTERNATIVE:	Near-Term Conditions	PM:	
		DATE:	1/27/2016
		TIME:	

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	0	310	130
SB:	140	630	0
EB:	200	5	700
WB:	0	0	0

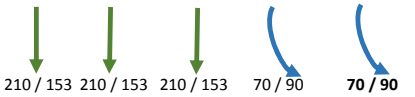
PM

	Left	Throu	Right
NB:	0	670	260
SB:	180	460	0
EB:	225	10	445
WB:	0	0	0

LANE VOLUMES (ILV/HR)

PHASE I

AM **70**
PM **90**



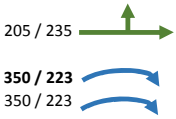
PHASE II

AM 285
PM 595

Remaining SB Through 140 / 63

PHASE III

AM 350
PM 223



PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PM
705	908

TOTAL OPERATING LEVEL (ILV/HR):

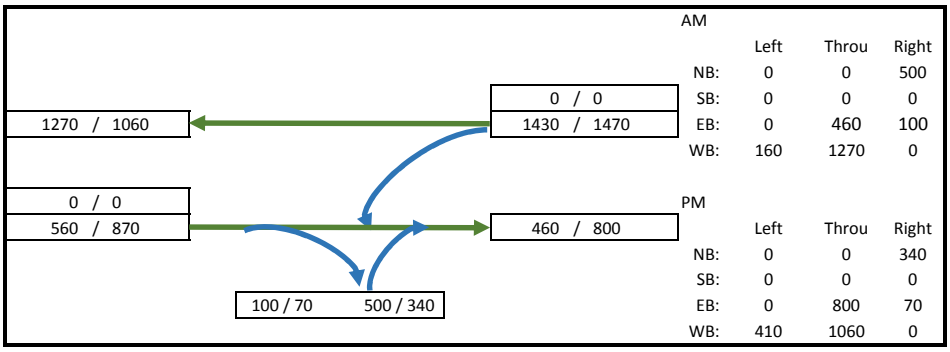
AM:	705	Under Capacity
PM:	908	Under Capacity

< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION:	905 / Siempre Viva Road	DIST. CO. RTE	SR-905
ALTERNATIVE:	Near-Term Conditions	PM:	
		DATE:	1/27/2016
		TIME:	

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	0	0	500
SB:	0	0	0
EB:	0	460	100
WB:	160	1270	0

PM

	Left	Throu	Right
NB:	0	0	340
SB:	0	0	0
EB:	0	800	70
WB:	410	1060	0

LANE VOLUMES (ILV/HR)

PHASE I

AM	80	423 / 353
PM	205	423 / 353
		423 / 353
		80 / 205
		80 / 205

PHASE II

AM	343	153 / 267
PM	337	153 / 267
		253 / 337
Remaining WB Through		**343 / 148**

PHASE III

AM	250		
PM	170		
		250 / 170	250 / 170

PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PHASE II
673	712

TOTAL OPERATING LEVEL (ILV/HR):

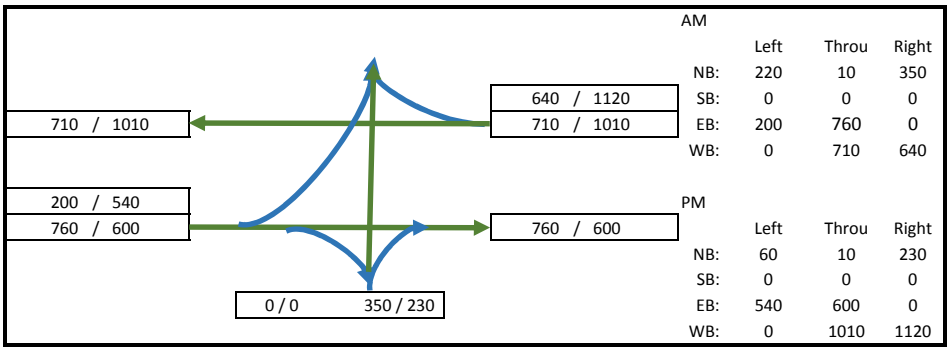
AM:	673	Under Capacity
PM:	712	Under Capacity

< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION:	905 / Siempre Viva Road	DIST. CO. RTE	SR-905
ALTERNATIVE:	Near-Term Conditions	PM:	
		DATE:	1/27/2016
		TIME:	

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	220	10	350
SB:	0	0	0
EB:	200	760	0
WB:	0	710	640

PM

	Left	Throu	Right
NB:	60	10	230
SB:	0	0	0
EB:	540	600	0
WB:	0	1010	1120

LANE VOLUMES (ILV/HR)

PHASE I

AM	100	**100 / 270**
PM	270	100 / 270
		253 / 200
		253 / 200
		253 / 200

PHASE II

AM	557	320 / 560
PM	897	**557 / 897**
		237 / 337
Remaining EB		237 / 337
Through	**153 / 0**	

PHASE III

AM	230			
PM	115			
		230 / 70	175 / 115	**175 / 115**

PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PHASE II
887	1282

TOTAL OPERATING LEVEL (ILV/HR):

AM:	887	Under Capacity	< 1,200 ILV/HR	**Under Capacity**
PM:	1282	At Capacity	> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
			> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

Appendix J
Peak Hour Intersection LOS & ILV Worksheets – Cumulative Plus Project Conditions

Near-Term AM + Project
1: East Beyer Boulevard/Otay Mesa Road & Beyer Boulevard

11/29/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	290	220	40	50	29	80	59	60	89	89	169
Future Volume (vph)	178	290	220	40	50	29	80	59	60	89	89	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9		4.9		4.9	4.9			5.2	
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.98		1.00		1.00	0.99			0.99	
Flpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85		0.97		1.00	0.92			0.93	
Flt Protected	0.95	1.00	1.00		0.98		0.95	1.00			0.99	
Satd. Flow (prot)	1681	1717	1547		1741		1768	1708			1695	
Flt Permitted	0.95	1.00	1.00		0.98		0.48	1.00			0.88	
Satd. Flow (perm)	1681	1717	1547		1741		885	1708			1507	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	193	315	239	43	54	32	87	64	65	97	97	184
RTOR Reduction (vph)	0	0	171	0	17	0	0	43	0	0	44	0
Lane Group Flow (vph)	174	334	68	0	112	0	87	86	0	0	334	0
Confl. Peds. (#/hr)	1		1	1		1	2					2
Confl. Bikes (#/hr)			1			4			6			5
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	Perm	Split	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		1	1			8			4	
Permitted Phases			2				8			4		
Actuated Green, G (s)	16.6	16.6	16.6		7.5		19.7	19.7			19.4	
Effective Green, g (s)	16.6	16.6	16.6		7.5		19.7	19.7			19.4	
Actuated g/C Ratio	0.28	0.28	0.28		0.13		0.34	0.34			0.33	
Clearance Time (s)	4.9	4.9	4.9		4.9		4.9	4.9			5.2	
Vehicle Extension (s)	2.9	2.9	2.9		2.9		3.8	3.8			4.5	
Lane Grp Cap (vph)	477	487	438		223		298	575			499	
v/s Ratio Prot	0.10	c0.19			c0.06			0.05				
v/s Ratio Perm			0.04				0.10				c0.22	
v/c Ratio	0.36	0.69	0.15		0.50		0.29	0.15			0.67	
Uniform Delay, d1	16.7	18.6	15.7		23.8		14.3	13.5			16.8	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.5	3.9	0.2		1.7		0.7	0.2			4.1	
Delay (s)	17.2	22.6	15.9		25.5		15.0	13.7			20.9	
Level of Service	B	C	B		C		B	B			C	
Approach Delay (s)		19.2			25.5			14.2			20.9	
Approach LOS		B			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	58.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	275	40	139	397	120	60	0	59	15	10	30
Future Volume (vph)	50	275	40	139	397	120	60	0	59	15	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.6		4.4		4.9	4.4	4.9	
Lane Util. Factor	1.00	0.95		0.97	0.91		1.00		1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00		0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00		0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)	1770	3466		3433	4883		1770		1563	1768	1629	
Flt Permitted	0.95	1.00		0.95	1.00		1.00		1.00	1.00	1.00	
Satd. Flow (perm)	1770	3466		3433	4883		1863		1563	1861	1629	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	299	43	151	432	130	65	0	64	16	11	33
RTOR Reduction (vph)	0	11	0	0	43	0	0	0	59	0	31	0
Lane Group Flow (vph)	54	331	0	151	519	0	65	0	5	16	13	0
Confl. Peds. (#/hr)			3						2	2		
Confl. Bikes (#/hr)			1			3						2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		pm+pt		Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	2.1	19.8		5.3	22.8		4.8		3.6	3.6	3.0	
Effective Green, g (s)	2.1	19.8		5.3	22.8		4.8		3.6	3.6	3.0	
Actuated g/C Ratio	0.04	0.41		0.11	0.47		0.10		0.07	0.07	0.06	
Clearance Time (s)	4.4	5.4		4.4	5.6		4.4		4.9	4.4	4.9	
Vehicle Extension (s)	2.0	5.4		2.0	5.4		2.0		5.6	2.0	2.0	
Lane Grp Cap (vph)	76	1417		375	2300		182		116	137	100	
v/s Ratio Prot	0.03	0.10		c0.04	c0.11		c0.01			0.00	0.01	
v/s Ratio Perm							c0.03		0.00	0.01		
v/c Ratio	0.71	0.23		0.40	0.23		0.36		0.04	0.12	0.13	
Uniform Delay, d1	22.8	9.3		20.1	7.6		20.3		20.8	20.9	21.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2	22.8	0.2		0.3	0.1		0.4		0.4	0.1	0.2	
Delay (s)	45.6	9.5		20.3	7.7		20.7		21.2	21.1	21.7	
Level of Service	D	A		C	A		C		C	C	C	
Approach Delay (s)		14.5			10.4			20.9			21.5	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	48.4	Sum of lost time (s)	19.3
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	10	10	770	110	597	10	130	790	254	410	40
Future Volume (vph)	10	10	10	770	110	597	10	130	790	254	410	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.6	5.2	5.2	6.7	6.7	5.2	6.3	5.2	5.2	6.3	6.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1575	3335	3539	1563	1770	3539	1538	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1575	3335	3539	1563	1770	3539	1538	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	11	11	837	120	649	11	141	859	276	446	43
RTOR Reduction (vph)	0	0	10	0	0	503	0	0	429	0	0	27
Lane Group Flow (vph)	11	11	1	837	120	146	11	141	430	276	446	16
Confl. Peds. (#/hr)			1			2						
Heavy Vehicles (%)	2%	2%	2%	5%	2%	2%	2%	2%	5%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2	3	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	1.5	2.8	6.6	15.5	15.7	15.7	3.8	17.3	32.8	12.1	25.6	25.6
Effective Green, g (s)	1.5	2.8	6.6	15.5	15.7	15.7	3.8	17.3	32.8	12.1	25.6	25.6
Actuated g/C Ratio	0.02	0.04	0.09	0.22	0.22	0.22	0.05	0.25	0.47	0.17	0.37	0.37
Clearance Time (s)	5.2	5.6	5.2	5.2	6.7	6.7	5.2	6.3	5.2	5.2	6.3	6.3
Vehicle Extension (s)	2.0	2.0	2.0	3.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	37	141	148	738	793	350	96	874	720	593	1294	578
v/s Ratio Prot	0.01	0.00	0.00	c0.25	0.03		0.01	0.04	c0.13	c0.08	0.13	
v/s Ratio Perm			0.00			c0.09			0.15			0.01
v/c Ratio	0.30	0.08	0.01	1.13	0.15	0.42	0.11	0.16	0.60	0.47	0.34	0.03
Uniform Delay, d1	33.7	32.4	28.7	27.2	21.8	23.2	31.5	20.7	13.7	26.0	16.1	14.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.1	0.0	76.6	0.0	0.3	0.2	0.1	1.3	0.2	0.2	0.0
Delay (s)	35.4	32.4	28.7	103.9	21.8	23.5	31.7	20.7	15.1	26.3	16.3	14.2
Level of Service	D	C	C	F	C	C	C	C	B	C	B	B
Approach Delay (s)		32.2			65.3			16.0			19.8	
Approach LOS		C			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	40.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	23.4
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	535	10	60	160	870	0	0	400	790
Future Volume (vph)	0	0	0	535	10	60	160	870	0	0	400	790
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.1	5.1	4.7	5.1			5.1	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frpb, ped/bikes					1.00	1.00	1.00	1.00			0.98	
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.90	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1725	1538	1719	4940			4368	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1725	1538	1719	4940			4368	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	582	11	65	174	946	0	0	435	859
RTOR Reduction (vph)	0	0	0	0	0	40	0	0	0	0	461	0
Lane Group Flow (vph)	0	0	0	0	593	25	174	946	0	0	833	0
Confl. Peds. (#/hr)												4
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					28.2	28.2	9.2	36.1			22.2	
Effective Green, g (s)					28.2	28.2	9.2	36.1			22.2	
Actuated g/C Ratio					0.38	0.38	0.12	0.48			0.30	
Clearance Time (s)					5.1	5.1	4.7	5.1			5.1	
Vehicle Extension (s)					3.0	3.0	2.0	3.0			3.0	
Lane Grp Cap (vph)					652	582	212	2393			1301	
v/s Ratio Prot							c0.10	0.19			c0.19	
v/s Ratio Perm					0.34	0.02						
v/c Ratio					0.91	0.04	0.82	0.40			0.94dr	
Uniform Delay, d1					21.9	14.6	31.8	12.2			22.7	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					16.6	0.0	20.9	0.1			1.1	
Delay (s)					38.5	14.7	52.7	12.3			23.8	
Level of Service					D	B	D	B			C	
Approach Delay (s)		0.0			36.2			18.6			23.8	
Approach LOS		A			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	74.5	Sum of lost time (s)	14.9
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	770	10	70	0	0	0	0	260	191	300	635	0
Future Volume (vph)	770	10	70	0	0	0	0	260	191	300	635	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1						5.1		4.7	5.1	
Lane Util. Factor	1.00	1.00						0.91		1.00	0.95	
Frpb, ped/bikes	1.00	1.00						0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	0.87						0.94		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1641	1501						4368		1641	3282	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1641	1501						4368		1641	3282	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	837	11	76	0	0	0	0	283	208	326	690	0
RTOR Reduction (vph)	0	36	0	0	0	0	0	118	0	0	0	0
Lane Group Flow (vph)	837	51	0	0	0	0	0	373	0	326	690	0
Confl. Peds. (#/hr)									2			
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4											
Actuated Green, G (s)	60.0	60.0						15.5		23.6	43.8	
Effective Green, g (s)	60.0	60.0						15.5		23.6	43.8	
Actuated g/C Ratio	0.53	0.53						0.14		0.21	0.38	
Clearance Time (s)	5.1	5.1						5.1		4.7	5.1	
Vehicle Extension (s)	3.0	3.0						3.0		2.0	3.0	
Lane Grp Cap (vph)	863	790						593		339	1260	
v/s Ratio Prot		0.03						0.09		c0.20	c0.21	
v/s Ratio Perm	c0.51											
v/c Ratio	0.97	0.06						0.63		0.96	0.55	
Uniform Delay, d1	26.1	13.2						46.5		44.8	27.4	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	23.2	0.0						2.1		38.3	0.5	
Delay (s)	49.3	13.3						48.6		83.1	27.9	
Level of Service	D	B						D		F	C	
Approach Delay (s)		45.9			0.0			48.6			45.6	
Approach LOS		D			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	46.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	114.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	205	10	150	100	10	120	20	126	50	100	278	327
Future Volume (vph)	205	10	150	100	10	120	20	126	50	100	278	327
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	223	11	163	109	11	130	22	137	54	109	302	355

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	149	248	109	141	22	191	109	657
Volume Left (vph)	149	74	109	0	22	0	109	0
Volume Right (vph)	0	163	0	130	0	54	0	355
Hadj (s)	0.58	-0.22	0.67	-0.48	0.58	-0.03	0.67	-0.25
Departure Headway (s)	8.1	7.3	8.5	7.3	8.3	7.7	7.7	6.7
Degree Utilization, x	0.33	0.50	0.26	0.29	0.05	0.41	0.23	1.23
Capacity (veh/h)	435	483	412	474	418	454	458	541
Control Delay (s)	13.9	16.3	13.2	12.1	10.5	14.6	11.7	139.5
Approach Delay (s)	15.4		12.6		14.2		121.3	
Approach LOS	C		B		B		F	

Intersection Summary			
Delay	64.7		
Level of Service	F		
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	861	90	0	555	299	0	0	0	0	0	80
Future Volume (Veh/h)	0	861	90	0	555	299	0	0	0	0	0	80
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	936	98	0	603	325	0	0	0	0	0	87
Pedestrians											6	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											4.0	
Percent Blockage											1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	934			1034			1273	1919	361	921	1643	207
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	934			1034			1273	1919	361	921	1643	207
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			100	100	100	100	100	89
cM capacity (veh/h)	678			622			103	60	613	212	91	771

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	374	374	285	201	201	201	325	0	87
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	98	0	0	0	325	0	87
cSH	1700	1700	1700	1700	1700	1700	1700	1700	771
Volume to Capacity	0.22	0.22	0.17	0.12	0.12	0.12	0.19	0.00	0.11
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	9
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.3
Lane LOS								A	B
Approach Delay (s)	0.0			0.0				0.0	10.3
Approach LOS								A	B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	22.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	200	100	100	812	1766	60
Future Volume (vph)	200	100	100	812	1766	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	217	109	109	883	1920	65

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	217	109	109	883	1920	65
Volume Left (vph)	217	0	109	0	0	0
Volume Right (vph)	0	109	0	0	0	65
Hadj (s)	0.53	-0.67	0.53	0.17	0.17	-0.67
Departure Headway (s)	8.1	7.0	7.1	6.8	6.9	6.0
Degree Utilization, x	0.49	0.21	0.22	1.66	3.66	0.11
Capacity (veh/h)	437	510	494	536	530	582
Control Delay (s)	17.5	10.6	10.9	323.7	1214.6	8.6
Approach Delay (s)	15.2		289.3		1175.2	
Approach LOS	C		F		F	

Intersection Summary			
Delay	794.6		
Level of Service	F		
Intersection Capacity Utilization	110.7%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	30	256	732	850	60	40
Future Volume (vph)	30	256	732	850	60	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	278	796	924	65	43

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	311	796	924	108
Volume Left (vph)	33	796	0	0
Volume Right (vph)	278	0	0	43
Hadj (s)	-0.35	0.67	0.17	-0.07
Departure Headway (s)	5.6	6.3	5.8	5.8
Degree Utilization, x	0.49	1.39	1.49	0.18
Capacity (veh/h)	625	576	627	590
Control Delay (s)	13.9	204.4	242.5	10.1
Approach Delay (s)	13.9	224.9		10.1
Approach LOS	B	F		B

Intersection Summary			
Delay	183.3		
Level of Service	F		
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	1079	150	208	1124	532	200	50	126	505	100	300
Future Volume (vph)	200	1079	150	208	1124	532	200	50	126	505	100	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	1.00		1.00	1.00	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	4715	1468	3183	4715	1468	1641	1541		1641	1727	2584
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	4715	1468	3183	4715	1468	1641	1541		1641	1727	2584
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	1173	163	226	1222	578	217	54	137	549	109	326
RTOR Reduction (vph)	0	0	114	0	0	327	0	77	0	0	0	144
Lane Group Flow (vph)	217	1173	49	226	1222	251	217	114	0	549	109	182
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	8.0	35.8	35.8	8.0	36.1	36.1	19.7	15.4		39.1	34.8	42.8
Effective Green, g (s)	8.0	35.8	35.8	8.0	36.1	36.1	19.7	15.4		39.1	34.8	42.8
Actuated g/C Ratio	0.07	0.30	0.30	0.07	0.30	0.30	0.16	0.13		0.33	0.29	0.36
Clearance Time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Vehicle Extension (s)	2.0	4.1	4.1	2.0	4.5	4.5	2.0	4.3		2.0	3.7	2.0
Lane Grp Cap (vph)	212	1411	439	212	1423	443	270	198		536	502	924
v/s Ratio Prot	0.07	0.25		c0.07	c0.26		0.13	c0.07		c0.33	0.06	0.01
v/s Ratio Perm			0.03			0.17						0.06
v/c Ratio	1.02	0.83	0.11	1.07	0.86	0.57	0.80	0.58		1.02	0.22	0.20
Uniform Delay, d1	55.8	39.1	30.4	55.8	39.3	35.1	48.1	49.0		40.2	32.1	26.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	68.1	4.6	0.2	80.4	5.8	2.4	14.9	5.3		45.2	0.3	0.0
Delay (s)	123.9	43.6	30.5	136.2	45.1	37.5	63.0	54.3		85.4	32.4	26.6
Level of Service	F	D	C	F	D	D	E	D		F	C	C
Approach Delay (s)		53.5			53.1			59.0			60.0	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	55.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	119.6	Sum of lost time (s)	21.3
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	0	0	0	0	46	0	190	0	138	0	20
Future Volume (vph)	10	0	0	0	0	46	0	190	0	138	0	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	0	0	0	0	50	0	207	0	150	0	22

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	50	207	172
Volume Left (vph)	11	0	0	150
Volume Right (vph)	0	50	0	22
Hadj (s)	0.37	-0.43	0.17	0.27
Departure Headway (s)	5.2	4.4	4.4	4.5
Degree Utilization, x	0.02	0.06	0.25	0.22
Capacity (veh/h)	631	751	797	768
Control Delay (s)	8.3	7.6	8.9	8.8
Approach Delay (s)	8.3	7.6	8.9	8.8
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.7		
Level of Service	A		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	180	0	0	500
Future Volume (vph)	0	0	180	0	0	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.5			4.5
Lane Util. Factor			1.00			1.00
Frt			1.00			0.85
Flt Protected			0.95			1.00
Satd. Flow (prot)			1770			1583
Flt Permitted			0.76			1.00
Satd. Flow (perm)			1410			1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	196	0	0	543
RTOR Reduction (vph)	0	0	0	0	0	408
Lane Group Flow (vph)	0	0	196	0	0	135
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type			Perm		Perm	Perm
Protected Phases	4			8		
Permitted Phases			8		2	2
Actuated Green, G (s)			8.3			5.7
Effective Green, g (s)			8.3			5.7
Actuated g/C Ratio			0.36			0.25
Clearance Time (s)			4.5			4.5
Vehicle Extension (s)			3.0			3.0
Lane Grp Cap (vph)			508			392
v/s Ratio Prot						
v/s Ratio Perm			c0.14			c0.08
v/c Ratio			0.39			0.34
Uniform Delay, d1			5.5			7.1
Progression Factor			1.00			1.00
Incremental Delay, d2			0.5			0.5
Delay (s)			5.9			7.6
Level of Service			A			A
Approach Delay (s)	0.0			5.9	7.6	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	23.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	1910	100	247	1913	107	100	25	144	65	20	40
Future Volume (vph)	40	1910	100	247	1913	107	100	25	144	65	20	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		4.5	6.5		4.5	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1641	4680		1641	4673		1641	1727	1468	1641	1727	1468
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1641	4680		1641	4673		1641	1727	1468	1641	1727	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	2076	109	268	2079	116	109	27	157	71	22	43
RTOR Reduction (vph)	0	4	0	0	3	0	0	0	141	0	0	41
Lane Group Flow (vph)	43	2181	0	268	2192	0	109	27	16	71	22	2
Confl. Peds. (#/hr)						2						
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	7.3	68.2		31.7	93.1		15.2	14.1	14.1	7.0	5.4	5.4
Effective Green, g (s)	7.3	68.2		31.7	93.1		15.2	14.1	14.1	7.0	5.4	5.4
Actuated g/C Ratio	0.05	0.49		0.23	0.66		0.11	0.10	0.10	0.05	0.04	0.04
Clearance Time (s)	4.0	6.5		4.5	6.5		4.5	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	5.3		3.0	5.3		3.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	85	2279		371	3107		178	173	147	82	66	56
v/s Ratio Prot	0.03	c0.47		c0.16	0.47		c0.07	0.02		c0.04	c0.01	
v/s Ratio Perm									0.01			0.00
v/c Ratio	0.51	0.96		0.72	0.71		0.61	0.16	0.11	0.87	0.33	0.03
Uniform Delay, d1	64.6	34.5		50.1	14.8		59.6	57.5	57.2	66.0	65.5	64.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	11.2		6.8	1.4		6.1	0.2	0.1	55.3	1.1	0.1
Delay (s)	66.3	45.7		56.9	16.2		65.7	57.7	57.3	121.3	66.6	64.9
Level of Service	E	D		E	B		E	E	E	F	E	E
Approach Delay (s)		46.1			20.6			60.5			94.6	
Approach LOS		D			C			E			F	

Intersection Summary			
HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	995	65	132	303	472	132	19	85	624	20	30
Future Volume (vph)	10	995	65	132	303	472	132	19	85	624	20	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	0.97	0.86	0.86	0.97	0.91	0.88	1.00	1.00		0.97	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.94	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4801	1362	3433	5085	2787	1770	1635		3433	3176	1441
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4801	1362	3433	5085	2787	1770	1635		3433	3176	1441
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1082	71	143	329	513	143	21	92	678	22	33
RTOR Reduction (vph)	0	1	41	0	0	283	0	70	0	0	14	15
Lane Group Flow (vph)	11	1088	23	143	329	230	143	43	0	678	24	2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6						8
Actuated Green, G (s)	0.7	32.6	32.6	8.1	40.0	40.0	19.5	9.8		20.8	11.1	11.1
Effective Green, g (s)	0.7	32.6	32.6	8.1	40.0	40.0	19.5	9.8		20.8	11.1	11.1
Actuated g/C Ratio	0.01	0.37	0.37	0.09	0.45	0.45	0.22	0.11		0.23	0.12	0.12
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	26	1752	497	311	2277	1248	386	179		799	394	179
v/s Ratio Prot	0.00	c0.23		c0.04	0.06		0.08	c0.03		c0.20	0.01	
v/s Ratio Perm			0.02			0.08						0.00
v/c Ratio	0.42	0.62	0.05	0.46	0.14	0.18	0.37	0.24		0.85	0.06	0.01
Uniform Delay, d1	44.1	23.3	18.3	38.5	14.6	14.8	29.7	36.3		32.7	34.5	34.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.7	0.7	0.0	1.1	0.0	0.1	0.6	0.7		8.4	0.1	0.0
Delay (s)	54.8	24.0	18.4	39.6	14.6	14.9	30.3	37.0		41.1	34.6	34.3
Level of Service	D	C	B	D	B	B	C	D		D	C	C
Approach Delay (s)		24.0			18.4			33.3			40.6	
Approach LOS		C			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	89.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	60	0	124	0	49	50	281	109	0
Future Volume (vph)	0	0	0	60	0	124	0	49	50	281	109	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	65	0	135	0	53	54	305	118	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	0	200	107	423
Volume Left (vph)	0	65	0	305
Volume Right (vph)	0	135	54	0
Hadj (s)	0.00	-0.17	-0.13	0.31
Departure Headway (s)	5.6	5.0	4.9	4.9
Degree Utilization, x	0.00	0.28	0.14	0.58
Capacity (veh/h)	572	653	693	712
Control Delay (s)	8.6	10.0	8.7	14.3
Approach Delay (s)	0.0	10.0	8.7	14.3
Approach LOS	A	A	A	B

Intersection Summary			
Delay	12.3		
Level of Service	B		
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1620	729	234	1370	947	411
Future Volume (vph)	1620	729	234	1370	947	411
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	1641	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	1641	4715	3183	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1761	792	254	1489	1029	447
RTOR Reduction (vph)	0	500	0	0	0	187
Lane Group Flow (vph)	1761	292	254	1489	1029	260
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	29.5	29.5	12.0	45.5	24.0	24.0
Effective Green, g (s)	29.5	29.5	12.0	45.5	24.0	24.0
Actuated g/C Ratio	0.37	0.37	0.15	0.57	0.30	0.30
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	1738	541	246	2681	954	440
v/s Ratio Prot	c0.37		c0.15	0.32	c0.32	
v/s Ratio Perm		0.20				0.18
v/c Ratio	1.01	0.54	1.03	0.56	1.08	0.59
Uniform Delay, d1	25.2	19.9	34.0	10.9	28.0	23.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	24.9	3.8	66.1	0.8	52.7	1.4
Delay (s)	50.2	23.7	100.1	11.7	80.7	25.2
Level of Service	D	C	F	B	F	C
Approach Delay (s)	42.0			24.6	63.9	
Approach LOS	D			C	E	

Intersection Summary			
HCM 2000 Control Delay	42.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	269	0	610	566	1218	0	0	933	440
Future Volume (vph)	0	0	0	269	0	610	566	1218	0	0	933	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.1	5.1	5.1	4.7	5.1			5.1	5.1
Lane Util. Factor				1.00	0.95	0.95	0.97	0.91			0.91	1.00
Frt				1.00	0.85	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1641	1395	1395	3183	4715			4715	1468
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1641	1395	1395	3183	4715			4715	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	292	0	663	615	1324	0	0	1014	478
RTOR Reduction (vph)	0	0	0	0	76	76	0	0	0	0	0	320
Lane Group Flow (vph)	0	0	0	292	256	255	615	1324	0	0	1014	158
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				16.6	16.6	16.6	16.5	44.8			23.6	23.6
Effective Green, g (s)				16.6	16.6	16.6	16.5	44.8			23.6	23.6
Actuated g/C Ratio				0.23	0.23	0.23	0.23	0.63			0.33	0.33
Clearance Time (s)				5.1	5.1	5.1	4.7	5.1			5.1	5.1
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				380	323	323	733	2950			1554	483
v/s Ratio Prot					c0.18		c0.19	0.28			c0.22	
v/s Ratio Perm				0.18		0.18						0.11
v/c Ratio				0.77	0.79	0.79	0.84	0.45			0.65	0.33
Uniform Delay, d1				25.7	25.9	25.9	26.3	7.0			20.5	18.0
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				9.0	12.5	12.1	8.4	0.1			1.0	0.4
Delay (s)				34.7	38.4	37.9	34.6	7.1			21.5	18.4
Level of Service				C	D	D	C	A			C	B
Approach Delay (s)		0.0			37.1			15.8			20.5	
Approach LOS		A			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	71.6	Sum of lost time (s)	14.9
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	5	925	0	0	0	0	1584	149	140	1062	0
Future Volume (vph)	200	5	925	0	0	0	0	1584	149	140	1062	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1					5.1		4.7	5.1	
Lane Util. Factor		1.00	0.88					0.95		0.97	0.91	
Frpb, ped/bikes		1.00	1.00					1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00		1.00	1.00	
Frt		1.00	0.85					0.99		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1647	2584					3239		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1647	2584					3239		3183	4715	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	5	1005	0	0	0	0	1722	162	152	1154	0
RTOR Reduction (vph)	0	0	108	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	222	897	0	0	0	0	1879	0	152	1154	0
Confl. Bikes (#/hr)												2
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		43.9	43.9					74.9		6.3	85.9	
Effective Green, g (s)		43.9	43.9					74.9		6.3	85.9	
Actuated g/C Ratio		0.31	0.31					0.54		0.04	0.61	
Clearance Time (s)		5.1	5.1					5.1		4.7	5.1	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		516	810					1732		143	2892	
v/s Ratio Prot								c0.58		c0.05	0.24	
v/s Ratio Perm		0.13	c0.35									
v/c Ratio		0.43	1.11					1.08		1.06	0.40	
Uniform Delay, d1		38.1	48.1					32.5		66.8	13.8	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.6	65.1					48.6		93.0	0.1	
Delay (s)		38.7	113.1					81.2		159.9	13.9	
Level of Service		D	F					F		F	B	
Approach Delay (s)		99.7			0.0			81.2			30.9	
Approach LOS		F			A			F			C	

Intersection Summary			
HCM 2000 Control Delay	71.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1344	273	102	110	358	160	65	230	30	480	625	887
Future Volume (vph)	1344	273	102	110	358	160	65	230	30	480	625	887
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96			1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1657			1707	1449	1641	3215		1641	1727	1468
Flt Permitted	0.95	1.00			0.79	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1657			1372	1449	1641	3215		1641	1727	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1461	297	111	120	389	174	71	250	33	522	679	964
RTOR Reduction (vph)	0	6	0	0	0	123	0	7	0	0	0	388
Lane Group Flow (vph)	1461	402	0	0	509	51	71	276	0	522	679	576
Confl. Peds. (#/hr)	1					1			2			
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	46.7	85.9			34.0	34.0	4.6	28.9		15.6	39.7	39.7
Effective Green, g (s)	46.7	85.9			34.0	34.0	4.6	28.9		15.6	39.7	39.7
Actuated g/C Ratio	0.32	0.59			0.23	0.23	0.03	0.20		0.11	0.27	0.27
Clearance Time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Vehicle Extension (s)	2.0	2.0			3.7	3.7	2.0	3.8		2.0	3.8	3.8
Lane Grp Cap (vph)	528	981			321	339	52	640		176	472	401
v/s Ratio Prot	c0.89	0.24					0.04	0.09		c0.32	c0.39	
v/s Ratio Perm					c0.37	0.04						0.39
v/c Ratio	2.77	0.41			1.59	0.15	1.37	0.43		2.97	1.44	1.44
Uniform Delay, d1	49.1	15.9			55.5	44.0	70.2	50.8		64.7	52.6	52.6
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	800.5	0.1			277.9	0.3	249.6	0.6		899.8	209.2	210.4
Delay (s)	849.6	16.0			333.4	44.3	319.8	51.5		964.5	261.8	263.1
Level of Service	F	B			F	D	F	D		F	F	F
Approach Delay (s)		667.6			259.8			105.3			431.8	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	472.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.19		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	152.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	341	25	70	254	70	10	88	10	40	244	80
Future Volume (vph)	50	341	25	70	254	70	10	88	10	40	244	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Lane Util. Factor		0.95			1.00	1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes		1.00			1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected		0.99			0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3230			1709	1450	1641	1701		3183	3138	
Flt Permitted		0.85			0.13	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2759			219	1450	1641	1701		3183	3138	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	371	27	76	276	76	11	96	11	43	265	87
RTOR Reduction (vph)	0	3	0	0	0	39	0	3	0	0	25	0
Lane Group Flow (vph)	0	449	0	0	352	37	11	104	0	43	327	0
Confl. Peds. (#/hr)			1	1								2
Confl. Bikes (#/hr)			2			1						1
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		2			1		3	8		7	4	
Permitted Phases	2			1		1						
Actuated Green, G (s)		22.9			60.3	60.3	0.7	17.8		3.2	20.3	
Effective Green, g (s)		22.9			60.3	60.3	0.7	17.8		3.2	20.3	
Actuated g/C Ratio		0.19			0.49	0.49	0.01	0.14		0.03	0.16	
Clearance Time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Vehicle Extension (s)		4.8			4.8	4.8	2.0	3.3		2.0	4.4	
Lane Grp Cap (vph)		512			107	709	9	245		82	516	
v/s Ratio Prot							0.01	0.06		c0.01	c0.10	
v/s Ratio Perm		c0.16			c1.61	0.03						
v/c Ratio		0.88			3.29	0.05	1.22	0.42		0.52	0.63	
Uniform Delay, d1		48.8			31.5	16.5	61.3	48.1		59.3	48.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		16.5			1054.0	0.1	385.4	1.3		2.8	3.1	
Delay (s)		65.3			1085.5	16.6	446.7	49.4		62.1	51.1	
Level of Service		E			F	B	F	D		E	D	
Approach Delay (s)		65.3			895.7			86.4			52.3	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	318.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.23		
Actuated Cycle Length (s)	123.3	Sum of lost time (s)	19.1
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	896	228	250	853	66	10
Future Volume (vph)	896	228	250	853	66	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		5.7	7.2	6.1	6.1
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4572		1641	4715	1641	1449
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4572		1641	4715	1641	1449
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	974	248	272	927	72	11
RTOR Reduction (vph)	32	0	0	0	0	10
Lane Group Flow (vph)	1190	0	272	927	72	1
Confl. Peds. (#/hr)						2
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	30.9		18.7	55.3	7.6	7.6
Effective Green, g (s)	30.9		18.7	55.3	7.6	7.6
Actuated g/C Ratio	0.41		0.25	0.73	0.10	0.10
Clearance Time (s)	7.2		5.7	7.2	6.1	6.1
Vehicle Extension (s)	6.9		2.0	6.9	2.0	2.0
Lane Grp Cap (vph)	1854		402	3421	163	144
v/s Ratio Prot	c0.26		c0.17	0.20	c0.04	
v/s Ratio Perm						0.00
v/c Ratio	0.64		0.68	0.27	0.44	0.01
Uniform Delay, d1	18.2		26.0	3.6	32.3	30.9
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4		3.5	0.1	0.7	0.0
Delay (s)	19.6		29.5	3.7	33.0	30.9
Level of Service	B		C	A	C	C
Approach Delay (s)	19.6			9.6	32.7	
Approach LOS	B			A	C	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	76.2	Sum of lost time (s)	19.0
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	339	507	260	400	275	170	100	250	840	100	400	218
Future Volume (vph)	339	507	260	400	275	170	100	250	840	100	400	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.88		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4715	1441	1641	4445		1641	1509		3183	1636	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	4715	1441	1641	4445		1641	1509		3183	1636	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	368	551	283	435	299	185	109	272	913	109	435	237
RTOR Reduction (vph)	0	0	236	0	84	0	0	86	0	0	13	0
Lane Group Flow (vph)	368	551	47	435	400	0	109	1099	0	109	659	0
Confl. Peds. (#/hr)			3						3			
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	19.0	23.2	23.2	22.0	26.2		12.4	66.8		8.1	63.4	
Effective Green, g (s)	19.0	23.2	23.2	22.0	26.2		12.4	66.8		8.1	63.4	
Actuated g/C Ratio	0.14	0.17	0.17	0.16	0.19		0.09	0.48		0.06	0.45	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	222	781	238	257	831		145	720		184	740	
v/s Ratio Prot	0.22	c0.12		c0.27	c0.09		c0.07	c0.73		0.03	0.40	
v/s Ratio Perm			0.03									
v/c Ratio	1.66	0.71	0.20	1.69	0.48		0.75	1.53		0.59	0.89	
Uniform Delay, d1	60.5	55.2	50.4	59.0	50.8		62.3	36.6		64.3	35.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	315.1	5.3	1.8	327.9	2.0		17.5	243.7		3.4	13.9	
Delay (s)	375.6	60.5	52.2	386.9	52.8		79.8	280.3		67.7	49.0	
Level of Service	F	E	D	F	D		E	F		E	D	
Approach Delay (s)		155.0			211.0			263.5			51.6	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	181.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	128.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	158	70	20	116	90	30	100	10	370	255	280
Future Volume (vph)	80	158	70	20	116	90	30	100	10	370	255	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Frt		0.97			0.95			0.99		1.00	0.92	
Flt Protected		0.99			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		1644			1627			1692		1641	1592	
Flt Permitted		0.84			0.96			0.86		0.71	1.00	
Satd. Flow (perm)		1391			1572			1477		1227	1592	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	172	76	22	126	98	33	109	11	402	277	304
RTOR Reduction (vph)	0	18	0	0	39	0	0	4	0	0	55	0
Lane Group Flow (vph)	0	317	0	0	207	0	0	149	0	402	526	0
Confl. Bikes (#/hr)			2									
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		17.2			17.2			35.2		35.2	35.2	
Effective Green, g (s)		17.2			17.2			35.2		35.2	35.2	
Actuated g/C Ratio		0.28			0.28			0.58		0.58	0.58	
Clearance Time (s)		4.0			4.0			4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		396			447			860		715	927	
v/s Ratio Prot											c0.33	
v/s Ratio Perm		c0.23			0.13			0.10		0.33		
v/c Ratio		0.80			0.46			0.17		0.56	0.57	
Uniform Delay, d1		20.0			17.8			5.8		7.8	7.9	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		11.1			0.8			0.4		3.2	2.5	
Delay (s)		31.1			18.6			6.3		11.0	10.4	
Level of Service		C			B			A		B	B	
Approach Delay (s)		31.1			18.6			6.3			10.6	
Approach LOS		C			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	60.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	98	224	20	20	139	80	10	20	10	160	60	126
Future Volume (vph)	98	224	20	20	139	80	10	20	10	160	60	126
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	107	243	22	22	151	87	11	22	11	174	65	137

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	372	260	44	376
Volume Left (vph)	107	22	11	174
Volume Right (vph)	22	87	11	137
Hadj (s)	0.19	-0.01	0.07	0.04
Departure Headway (s)	5.9	5.9	6.8	5.9
Degree Utilization, x	0.61	0.43	0.08	0.62
Capacity (veh/h)	582	564	422	578
Control Delay (s)	17.8	13.3	10.4	17.9
Approach Delay (s)	17.8	13.3	10.4	17.9
Approach LOS	C	B	B	C

Intersection Summary			
Delay	16.4		
Level of Service	C		
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	340	729	469	100	70	120
Future Volume (vph)	340	729	469	100	70	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	6.2	6.2	6.2	5.1	5.1
Lane Util. Factor	0.97	0.95	0.91	1.00	0.97	0.91
Frpb, ped/bikes	1.00	1.00	1.00	0.99	0.99	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	0.93	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.97	1.00
Satd. Flow (prot)	3183	3282	4715	1448	3019	1317
Flt Permitted	0.95	1.00	1.00	1.00	0.97	1.00
Satd. Flow (perm)	3183	3282	4715	1448	3019	1317
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	370	792	510	109	76	130
RTOR Reduction (vph)	0	0	0	72	57	59
Lane Group Flow (vph)	370	792	510	37	83	7
Confl. Peds. (#/hr)				3		
Confl. Bikes (#/hr)				1		1
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	5.2	23.3	13.4	13.4	4.4	4.4
Effective Green, g (s)	5.2	23.3	13.4	13.4	4.4	4.4
Actuated g/C Ratio	0.13	0.60	0.34	0.34	0.11	0.11
Clearance Time (s)	4.7	6.2	6.2	6.2	5.1	5.1
Vehicle Extension (s)	2.0	5.8	5.8	5.8	2.0	2.0
Lane Grp Cap (vph)	424	1960	1620	497	340	148
v/s Ratio Prot	c0.12	c0.24	0.11		c0.03	
v/s Ratio Perm				0.03		0.01
v/c Ratio	0.87	0.40	0.31	0.08	0.24	0.05
Uniform Delay, d1	16.6	4.2	9.4	8.6	15.8	15.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.1	0.4	0.3	0.2	0.1	0.1
Delay (s)	33.7	4.5	9.7	8.8	15.9	15.5
Level of Service	C	A	A	A	B	B
Approach Delay (s)		13.8	9.6		15.8	
Approach LOS		B	A		B	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	39.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	289	130	150	309	100	60
Future Volume (vph)	289	130	150	309	100	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	314	141	163	336	109	65

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	455	163	336	174
Volume Left (vph)	0	163	0	109
Volume Right (vph)	141	0	0	65
Hadj (s)	-0.02	0.67	0.17	0.07
Departure Headway (s)	5.2	6.3	5.8	6.2
Degree Utilization, x	0.66	0.28	0.54	0.30
Capacity (veh/h)	672	559	611	524
Control Delay (s)	17.6	10.5	14.0	11.8
Approach Delay (s)	17.6	12.9		11.8
Approach LOS	C	B		B

Intersection Summary			
Delay	14.6		
Level of Service	B		
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	408	59	200	756	0	68	0	50	0	0	19
Future Volume (vph)	39	408	59	200	756	0	68	0	50	0	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9		4.9		4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00		1.00		1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00		0.98		0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00		1.00	
Frt	1.00	0.98		1.00	1.00		1.00		0.85		0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00		1.00	
Satd. Flow (prot)	1641	4548		1641	4715		1636		1440		1453	
Flt Permitted	0.95	1.00		0.95	1.00		0.72		1.00		1.00	
Satd. Flow (perm)	1641	4548		1641	4715		1248		1440		1453	
Peak-hour factor, PHF	0.69	0.69	0.69	0.94	0.94	0.94	0.62	0.62	0.62	0.38	0.38	0.38
Adj. Flow (vph)	57	591	86	213	804	0	110	0	81	0	0	50
RTOR Reduction (vph)	0	22	0	0	0	0	0	0	69	0	42	0
Lane Group Flow (vph)	57	655	0	213	804	0	110	0	12	0	8	0
Confl. Peds. (#/hr)			90			22	4		16	16		4
Confl. Bikes (#/hr)			19			4						2
Turn Type	Prot	NA		Prot	NA		Perm		Perm		NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	3.7	16.9		10.1	23.3		7.3		7.3		7.3	
Effective Green, g (s)	3.7	16.9		10.1	23.3		7.3		7.3		7.3	
Actuated g/C Ratio	0.08	0.35		0.21	0.48		0.15		0.15		0.15	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.9		4.9		4.9	
Vehicle Extension (s)	2.0	6.1		2.0	5.1		2.0		2.0		2.0	
Lane Grp Cap (vph)	125	1584		341	2265		187		216		218	
v/s Ratio Prot	0.03	c0.14		c0.13	0.17						0.01	
v/s Ratio Perm							c0.09		0.01			
v/c Ratio	0.46	0.41		0.62	0.35		0.59		0.06		0.03	
Uniform Delay, d1	21.4	12.0		17.5	7.9		19.2		17.6		17.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00		1.00	
Incremental Delay, d2	1.0	0.5		2.6	0.2		3.0		0.0		0.0	
Delay (s)	22.4	12.5		20.0	8.1		22.2		17.7		17.6	
Level of Service	C	B		C	A		C		B		B	
Approach Delay (s)		13.3			10.6			20.3			17.6	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	48.5	Sum of lost time (s)	14.2
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	389	40	250	855	180	50	30	130	80	60	109
Future Volume (vph)	29	389	40	250	855	180	50	30	130	80	60	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	5.5			4.9	4.9		4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.96		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	
Frt	1.00	0.99		1.00	0.97			1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	
Satd. Flow (prot)	1641	4638		1641	4592			1671	1415		2976	
Flt Permitted	0.95	1.00		0.95	1.00			0.66	1.00		0.82	
Satd. Flow (perm)	1641	4638		1641	4592			1134	1415		2480	
Peak-hour factor, PHF	0.66	0.66	0.66	0.90	0.90	0.90	0.67	0.67	0.67	0.96	0.96	0.96
Adj. Flow (vph)	44	589	61	278	950	200	75	45	194	83	62	114
RTOR Reduction (vph)	0	12	0	0	23	0	0	0	153	0	90	0
Lane Group Flow (vph)	44	638	0	278	1127	0	0	120	41	0	170	0
Confl. Peds. (#/hr)			16				11		43	43		11
Confl. Bikes (#/hr)			1						3			1
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	4.1	20.5		16.7	32.5			13.7	13.7		13.7	
Effective Green, g (s)	4.1	20.5		16.7	32.5			13.7	13.7		13.7	
Actuated g/C Ratio	0.06	0.31		0.26	0.50			0.21	0.21		0.21	
Clearance Time (s)	4.4	4.9		4.4	5.5			4.9	4.9		4.9	
Vehicle Extension (s)	2.0	8.0		2.0	6.7			4.4	4.4		4.4	
Lane Grp Cap (vph)	103	1460		420	2292			238	297		521	
v/s Ratio Prot	0.03	0.14		c0.17	c0.25							
v/s Ratio Perm								c0.11	0.03		0.07	
v/c Ratio	0.43	0.44		0.66	0.49			0.50	0.14		0.33	
Uniform Delay, d1	29.4	17.7		21.7	10.8			22.7	20.9		21.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	1.0	0.9		3.0	0.6			2.8	0.4		0.6	
Delay (s)	30.4	18.6		24.7	11.4			25.5	21.2		22.4	
Level of Service	C	B		C	B			C	C		C	
Approach Delay (s)		19.4			14.0			22.9			22.4	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	65.1	Sum of lost time (s)	14.8
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	499	100	160	1285	0	500
Future Volume (vph)	499	100	160	1285	0	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1		5.1	3.0		5.1
Lane Util. Factor	0.91		0.97	0.91		0.88
Frpb, ped/bikes	1.00		1.00	1.00		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.97		1.00	1.00		0.85
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	4584		3183	4715		2584
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	4584		3183	4715		2584
Peak-hour factor, PHF	0.80	0.80	0.91	0.91	0.87	0.87
Adj. Flow (vph)	624	125	176	1412	0	575
RTOR Reduction (vph)	61	0	0	0	0	317
Lane Group Flow (vph)	688	0	176	1412	0	258
Confl. Peds. (#/hr)		21				
Turn Type	NA		Prot	NA		Over
Protected Phases	2		1	6		1
Permitted Phases						1
Actuated Green, G (s)	13.1		7.3	30.6		7.3
Effective Green, g (s)	13.1		7.3	30.6		7.3
Actuated g/C Ratio	0.43		0.24	1.00		0.24
Clearance Time (s)	5.1		5.1	3.0		5.1
Vehicle Extension (s)	3.9		2.0	0.9		2.0
Lane Grp Cap (vph)	1962		759	4715		616
v/s Ratio Prot	0.15		0.06	c0.30		0.10
v/s Ratio Perm						
v/c Ratio	0.35		0.23	0.30		0.42
Uniform Delay, d1	5.9		9.4	0.0		9.9
Progression Factor	1.00		1.00	1.00		1.00
Incremental Delay, d2	0.1		0.1	0.0		0.2
Delay (s)	6.0		9.4	0.0		10.0
Level of Service	A		A	A		B
Approach Delay (s)	6.0			1.1	10.0	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	30.6	Sum of lost time (s)	10.2
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↱
Traffic Volume (veh/h)	0	999	945	0	0	500
Future Volume (Veh/h)	0	999	945	0	0	500
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.89	0.89	0.73	0.73
Hourly flow rate (vph)	0	1175	1062	0	0	685
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		269	396			
pX, platoon unblocked					1.00	
vC, conflicting volume	1062				1454	354
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1062				1439	354
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	0
cM capacity (veh/h)	606				114	620

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	392	392	392	354	354	354	685
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	685
cSH	1700	1700	1700	1700	1700	1700	620
Volume to Capacity	0.23	0.23	0.23	0.21	0.21	0.21	1.11
Queue Length 95th (ft)	0	0	0	0	0	0	515
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	93.3
Lane LOS							F
Approach Delay (s)	0.0			0.0			93.3
Approach LOS							F

Intersection Summary			
Average Delay	21.9		
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	799	0	0	725	640	220	10	350	0	0	0
Future Volume (vph)	200	799	0	0	725	640	220	10	350	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.1			5.1	5.1		5.1	5.1			
Lane Util. Factor	0.97	0.91			0.86	0.86		1.00	0.88			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			0.95	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3183	4715			4252	1263		1648	2584			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3183	4715			4252	1263		1648	2584			
Peak-hour factor, PHF	0.85	0.85	0.85	0.89	0.89	0.89	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	235	940	0	0	815	719	253	11	402	0	0	0
RTOR Reduction (vph)	0	0	0	0	122	230	0	0	175	0	0	0
Lane Group Flow (vph)	235	940	0	0	1053	129	0	264	227	0	0	0
Confl. Bikes (#/hr)			4									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	10.1	37.0			22.2	22.2		14.4	14.4			
Effective Green, g (s)	10.1	37.0			22.2	22.2		14.4	14.4			
Actuated g/C Ratio	0.16	0.60			0.36	0.36		0.23	0.23			
Clearance Time (s)	4.7	5.1			5.1	5.1		5.1	5.1			
Vehicle Extension (s)	2.0	3.9			3.9	3.9		3.0	3.0			
Lane Grp Cap (vph)	521	2832			1532	455		385	604			
v/s Ratio Prot	c0.07	0.20			c0.25			c0.16				
v/s Ratio Perm						0.10			0.09			
v/c Ratio	0.45	0.33			0.69	0.28		0.69	0.38			
Uniform Delay, d1	23.2	6.1			16.8	14.0		21.5	19.8			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.2	0.1			1.4	0.5		5.0	0.4			
Delay (s)	23.5	6.2			18.2	14.5		26.5	20.2			
Level of Service	C	A			B	B		C	C			
Approach Delay (s)		9.7			17.3			22.7			0.0	
Approach LOS		A			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	61.6	Sum of lost time (s)	14.9
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	110	240	219	10	70	50	59	70	10	70	140	100
Future Volume (vph)	110	240	219	10	70	50	59	70	10	70	140	100
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	261	238	11	76	54	64	76	11	76	152	109

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	120	499	11	130	64	87	228	109
Volume Left (vph)	120	0	11	0	64	0	76	0
Volume Right (vph)	0	238	0	54	0	11	0	109
Hadj (s)	0.67	-0.16	0.67	-0.12	0.67	0.08	0.34	-0.53
Departure Headway (s)	6.9	6.1	7.6	6.8	7.9	7.3	7.2	6.3
Degree Utilization, x	0.23	0.85	0.02	0.25	0.14	0.18	0.46	0.19
Capacity (veh/h)	501	580	441	493	430	462	475	533
Control Delay (s)	10.8	32.5	9.6	10.9	10.9	10.6	14.9	9.7
Approach Delay (s)	28.3		10.8		10.8		13.2	
Approach LOS	D		B		B		B	

Intersection Summary			
Delay	20.1		
Level of Service	C		
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	500	0	45	180	0	70
Future Volume (vph)	500	0	45	180	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	0.91		1.00	0.91	1.00	
Frt	1.00		1.00	1.00	0.86	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	5085		1770	5085	1611	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	5085		1770	5085	1611	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	0	49	196	0	76
RTOR Reduction (vph)	0	0	0	0	70	0
Lane Group Flow (vph)	543	0	49	196	6	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases						
Actuated Green, G (s)	17.4		2.4	24.3	3.0	
Effective Green, g (s)	17.4		2.4	24.3	3.0	
Actuated g/C Ratio	0.48		0.07	0.67	0.08	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	2437		117	3404	133	
v/s Ratio Prot	c0.11		c0.03	0.04	c0.00	
v/s Ratio Perm						
v/c Ratio	0.22		0.42	0.06	0.05	
Uniform Delay, d1	5.5		16.3	2.1	15.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.0		2.4	0.0	0.1	
Delay (s)	5.6		18.7	2.1	15.5	
Level of Service	A		B	A	B	
Approach Delay (s)	5.6			5.4	15.5	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	36.3	Sum of lost time (s)	13.5
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	570	0	240	225	0	500
Future Volume (vph)	570	0	240	225	0	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	0.91		1.00	0.91	1.00	
Frt	1.00		1.00	1.00	0.86	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	5085		1770	5085	1611	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	5085		1770	5085	1611	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	620	0	261	245	0	543
RTOR Reduction (vph)	0	0	0	0	145	0
Lane Group Flow (vph)	620	0	261	245	398	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot	NA	Perm	
Protected Phases	2		1	6		
Permitted Phases					4	
Actuated Green, G (s)	12.9		7.8	25.2	17.8	
Effective Green, g (s)	12.9		7.8	25.2	17.8	
Actuated g/C Ratio	0.25		0.15	0.48	0.34	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1261		265	2464	551	
v/s Ratio Prot	c0.12		c0.15	0.05		
v/s Ratio Perm					c0.25	
v/c Ratio	0.49		0.98	0.10	0.72	
Uniform Delay, d1	16.7		22.0	7.3	14.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.3		50.7	0.0	4.7	
Delay (s)	17.0		72.7	7.3	19.6	
Level of Service	B		E	A	B	
Approach Delay (s)	17.0			41.0	19.6	
Approach LOS	B			D	B	

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	52.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	5	175	230	0	0	56	36	96	0	20	0
Future Volume (vph)	0	5	175	230	0	0	56	36	96	0	20	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5			4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95			1.00	
Frt		0.87			1.00		1.00	0.89			1.00	
Flt Protected		1.00			0.95		0.95	1.00			1.00	
Satd. Flow (prot)		1618			1770		1770	3153			1863	
Flt Permitted		1.00			0.64		0.95	1.00			1.00	
Satd. Flow (perm)		1618			1183		1770	3153			1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	5	190	250	0	0	61	39	104	0	22	0
RTOR Reduction (vph)	0	133	0	0	0	0	0	57	0	0	0	0
Lane Group Flow (vph)	0	62	0	0	250	0	61	86	0	0	22	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		10.7			10.7		1.9	16.2			9.8	
Effective Green, g (s)		10.7			10.7		1.9	16.2			9.8	
Actuated g/C Ratio		0.30			0.30		0.05	0.45			0.27	
Clearance Time (s)		4.5			4.5		4.5	4.5			4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		482			352		93	1422			508	
v/s Ratio Prot		0.04					c0.03	c0.03			0.01	
v/s Ratio Perm					c0.21							
v/c Ratio		0.13			0.71		0.66	0.06			0.04	
Uniform Delay, d1		9.2			11.2		16.7	5.6			9.6	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.1			6.6		15.4	0.0			0.0	
Delay (s)		9.3			17.8		32.1	5.6			9.6	
Level of Service		A			B		C	A			A	
Approach Delay (s)		9.3			17.8			13.5			9.6	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	35.9	Sum of lost time (s)	13.5
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	155	155	65	72	120	75
Future Volume (vph)	155	155	65	72	120	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.93		1.00	1.00	0.94	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1695		1770	1863	3334	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1695		1770	1863	3334	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	168	168	71	78	130	82
RTOR Reduction (vph)	60	0	0	0	62	0
Lane Group Flow (vph)	276	0	71	78	150	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	11.1		3.7	17.2	9.0	
Effective Green, g (s)	11.1		3.7	17.2	9.0	
Actuated g/C Ratio	0.30		0.10	0.46	0.24	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	504		175	859	804	
v/s Ratio Prot	c0.16		c0.04	0.04	c0.04	
v/s Ratio Perm						
v/c Ratio	0.55		0.41	0.09	0.19	
Uniform Delay, d1	11.0		15.8	5.7	11.2	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.2		1.5	0.0	0.1	
Delay (s)	12.2		17.3	5.7	11.4	
Level of Service	B		B	A	B	
Approach Delay (s)	12.2			11.2	11.4	
Approach LOS	B			B	B	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	37.3	Sum of lost time (s)	13.5
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	10	5	127	270	5
Future Volume (vph)	10	10	5	127	270	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.93		1.00	1.00	1.00	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1695		1770	1863	3530	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1695		1770	1863	3530	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	11	5	138	293	5
RTOR Reduction (vph)	11	0	0	0	1	0
Lane Group Flow (vph)	11	0	5	138	297	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	0.9		0.8	27.5	22.2	
Effective Green, g (s)	0.9		0.8	27.5	22.2	
Actuated g/C Ratio	0.02		0.02	0.74	0.59	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	40		37	1369	2095	
v/s Ratio Prot	c0.01		0.00	c0.07	c0.08	
v/s Ratio Perm						
v/c Ratio	0.28		0.14	0.10	0.14	
Uniform Delay, d1	17.9		18.0	1.4	3.4	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.8		1.7	0.0	0.0	
Delay (s)	21.8		19.6	1.4	3.4	
Level of Service	C		B	A	A	
Approach Delay (s)	21.8			2.1	3.4	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	3.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	37.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	18.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1465	474	28	0	19
Future Volume (Veh/h)	0	1465	474	28	0	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1592	515	30	0	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		725	660			
pX, platoon unblocked					0.65	
vC, conflicting volume	545				2122	187
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	545				2460	187
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	97
cM capacity (veh/h)	1020				16	824

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	SB 1
Volume Total	1592	206	206	133	21
Volume Left	0	0	0	0	0
Volume Right	0	0	0	30	21
cSH	1700	1700	1700	1700	824
Volume to Capacity	0.94	0.12	0.12	0.08	0.03
Queue Length 95th (ft)	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	9.5
Lane LOS					A
Approach Delay (s)	0.0	0.0			9.5
Approach LOS					A

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	100	1365	483	30	100	19
Future Volume (vph)	100	1365	483	30	100	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1641	1727	1713		1641	1468
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1641	1727	1713		1641	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	1484	525	33	109	21
RTOR Reduction (vph)	0	0	1	0	0	19
Lane Group Flow (vph)	109	1484	557	0	109	2
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	14.4	126.0	107.6		13.7	13.7
Effective Green, g (s)	14.4	126.0	107.6		13.7	13.7
Actuated g/C Ratio	0.10	0.85	0.73		0.09	0.09
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	159	1473	1247		152	136
v/s Ratio Prot	0.07	c0.86	0.32		c0.07	
v/s Ratio Perm						0.00
v/c Ratio	0.69	1.01	0.45		0.72	0.01
Uniform Delay, d1	64.5	10.8	8.1		65.1	60.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	11.6	25.3	0.3		14.9	0.0
Delay (s)	76.0	36.1	8.3		80.0	60.9
Level of Service	E	D	A		F	E
Approach Delay (s)		38.9	8.3		76.9	
Approach LOS		D	A		E	

Intersection Summary			
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	147.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Near-Term PM + Project
1: East Beyer Boulevard/Otay Mesa Road & Beyer Boulevard

11/29/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	204	320	240	30	40	42	150	92	110	73	73	137
Future Volume (vph)	204	320	240	30	40	42	150	92	110	73	73	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9		4.9		4.9	4.9			5.2	
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.98		0.99		1.00	1.00			0.99	
Flpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85		0.95		1.00	0.92			0.93	
Flt Protected	0.95	1.00	1.00		0.99		0.95	1.00			0.99	
Satd. Flow (prot)	1681	1717	1546		1715		1762	1710			1696	
Flt Permitted	0.95	1.00	1.00		0.99		0.52	1.00			0.85	
Satd. Flow (perm)	1681	1717	1546		1715		972	1710			1462	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	222	348	261	33	43	46	163	100	120	79	79	149
RTOR Reduction (vph)	0	0	178	0	31	0	0	59	0	0	46	0
Lane Group Flow (vph)	200	370	83	0	91	0	163	161	0	0	261	0
Confl. Peds. (#/hr)			1	1			7					7
Confl. Bikes (#/hr)			2			3						
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	Perm	Split	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		1	1			8			4	
Permitted Phases			2				8			4		
Actuated Green, G (s)	17.8	17.8	17.8		6.8		17.0	17.0			16.7	
Effective Green, g (s)	17.8	17.8	17.8		6.8		17.0	17.0			16.7	
Actuated g/C Ratio	0.32	0.32	0.32		0.12		0.30	0.30			0.30	
Clearance Time (s)	4.9	4.9	4.9		4.9		4.9	4.9			5.2	
Vehicle Extension (s)	2.9	2.9	2.9		2.9		3.8	3.8			4.5	
Lane Grp Cap (vph)	531	542	488		207		293	516			433	
v/s Ratio Prot	0.12	c0.22			c0.05			0.09				
v/s Ratio Perm			0.05				0.17				c0.18	
v/c Ratio	0.38	0.68	0.17		0.44		0.56	0.31			0.60	
Uniform Delay, d1	14.9	16.8	13.9		23.0		16.5	15.1			17.0	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.4	3.5	0.2		1.4		2.7	0.5			3.1	
Delay (s)	15.4	20.3	14.1		24.4		19.2	15.6			20.1	
Level of Service	B	C	B		C		B	B			C	
Approach Delay (s)		17.1			24.4			17.1			20.1	
Approach LOS		B			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	56.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	438	140	363	784	280	40	10	52	10	10	30
Future Volume (vph)	80	438	140	363	784	280	40	10	52	10	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.6		4.4	4.9	4.9	4.4	4.9	
Lane Util. Factor	1.00	0.95		0.97	0.91		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3399		3433	4846		1769	1863	1562	1768	1638	
Flt Permitted	0.95	1.00		0.95	1.00		0.77	1.00	1.00	0.87	1.00	
Satd. Flow (perm)	1770	3399		3433	4846		1432	1863	1562	1618	1638	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	476	152	395	852	304	43	11	57	11	11	33
RTOR Reduction (vph)	0	29	0	0	59	0	0	0	51	0	30	0
Lane Group Flow (vph)	87	599	0	395	1097	0	43	11	6	11	14	0
Confl. Peds. (#/hr)			3			6	1		3	3		1
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	4.5	19.7		5.3	20.3		6.4	5.2	5.2	5.2	4.6	
Effective Green, g (s)	4.5	19.7		5.3	20.3		6.4	5.2	5.2	5.2	4.6	
Actuated g/C Ratio	0.09	0.39		0.11	0.41		0.13	0.10	0.10	0.10	0.09	
Clearance Time (s)	4.4	5.4		4.4	5.6		4.4	4.9	4.9	4.4	4.9	
Vehicle Extension (s)	2.0	5.4		2.0	5.4		2.0	5.6	5.6	2.0	2.0	
Lane Grp Cap (vph)	159	1341		364	1971		191	194	162	170	150	
v/s Ratio Prot	0.05	0.18		c0.12	c0.23		c0.01	0.01		0.00	0.01	
v/s Ratio Perm							c0.02		0.00	0.01		
v/c Ratio	0.55	0.45		1.09	0.56		0.23	0.06	0.04	0.06	0.09	
Uniform Delay, d1	21.7	11.1		22.3	11.3		19.4	20.1	20.1	20.1	20.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.1	0.6		71.9	0.6		0.2	0.3	0.2	0.1	0.1	
Delay (s)	23.8	11.7		94.2	12.0		19.7	20.4	20.3	20.2	20.8	
Level of Service	C	B		F	B		B	C	C	C	C	
Approach Delay (s)		13.1			32.9			20.1			20.7	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	49.9	Sum of lost time (s)	19.3
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	10	10	980	390	747	10	600	440	310	290	30
Future Volume (vph)	10	10	10	980	390	747	10	600	440	310	290	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.6	5.2	5.2	6.7	6.7	5.2	6.3	5.2	5.2	6.3	6.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1559	3335	3539	1562	1770	3539	1538	3433	3539	1560
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1559	3335	3539	1562	1770	3539	1538	3433	3539	1560
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	11	11	1065	424	812	11	652	478	337	315	33
RTOR Reduction (vph)	0	0	10	0	0	207	0	0	174	0	0	22
Lane Group Flow (vph)	11	11	1	1065	424	605	11	652	304	337	315	11
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)			5			1						4
Heavy Vehicles (%)	2%	2%	2%	5%	2%	2%	2%	2%	5%	2%	2%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2	3	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	1.8	7.7	11.7	45.1	49.9	49.9	4.0	30.1	75.2	12.9	39.0	39.0
Effective Green, g (s)	1.8	7.7	11.7	45.1	49.9	49.9	4.0	30.1	75.2	12.9	39.0	39.0
Actuated g/C Ratio	0.02	0.07	0.10	0.38	0.42	0.42	0.03	0.25	0.64	0.11	0.33	0.33
Clearance Time (s)	5.2	5.6	5.2	5.2	6.7	6.7	5.2	6.3	5.2	5.2	6.3	6.3
Vehicle Extension (s)	2.0	2.0	2.0	3.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	26	230	154	1273	1495	659	59	901	979	374	1168	515
v/s Ratio Prot	0.01	0.00	0.00	c0.32	0.12		0.01	c0.18	0.12	c0.10	0.09	
v/s Ratio Perm			0.00			c0.39			0.08			0.01
v/c Ratio	0.42	0.05	0.01	0.84	0.28	0.92	0.19	0.72	0.31	0.90	0.27	0.02
Uniform Delay, d1	57.6	51.8	48.0	33.2	22.4	32.2	55.5	40.2	9.7	52.0	29.1	26.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.0	0.0	0.0	4.9	0.0	17.5	0.6	2.9	0.2	23.5	0.1	0.0
Delay (s)	61.6	51.8	48.0	38.1	22.4	49.6	56.0	43.1	9.9	75.5	29.2	26.7
Level of Service	E	D	D	D	C	D	E	D	A	E	C	C
Approach Delay (s)		53.8			39.3			29.3			51.9	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	118.1	Sum of lost time (s)	23.4
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	244	10	350	220	700	0	0	280	1000
Future Volume (vph)	0	0	0	244	10	350	220	700	0	0	280	1000
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.1	5.1	4.7	5.1			5.1	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frpb, ped/bikes					1.00	1.00	1.00	1.00			0.97	
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.88	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1727	1538	1719	4940			4235	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1727	1538	1719	4940			4235	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	265	11	380	239	761	0	0	304	1087
RTOR Reduction (vph)	0	0	0	0	0	150	0	0	0	0	461	0
Lane Group Flow (vph)	0	0	0	0	276	230	239	761	0	0	930	0
Confl. Peds. (#/hr)												9
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					16.2	16.2	11.7	39.7			23.3	
Effective Green, g (s)					16.2	16.2	11.7	39.7			23.3	
Actuated g/C Ratio					0.25	0.25	0.18	0.60			0.35	
Clearance Time (s)					5.1	5.1	4.7	5.1			5.1	
Vehicle Extension (s)					3.0	3.0	2.0	3.0			3.0	
Lane Grp Cap (vph)					423	376	304	2966			1492	
v/s Ratio Prot							c0.14	0.15			c0.22	
v/s Ratio Perm					0.16	0.15						
v/c Ratio					0.65	0.61	0.79	0.26			1.10dr	
Uniform Delay, d1					22.4	22.2	26.0	6.2			17.8	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					3.6	2.9	11.7	0.0			0.8	
Delay (s)					26.0	25.1	37.7	6.3			18.6	
Level of Service					C	C	D	A			B	
Approach Delay (s)		0.0			25.5			13.8			18.6	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	66.1	Sum of lost time (s)	14.9
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	540	10	250	0	0	0	0	380	554	110	414	0
Future Volume (vph)	540	10	250	0	0	0	0	380	554	110	414	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1						5.1		4.7	5.1	
Lane Util. Factor	1.00	1.00						0.91		1.00	0.95	
Frpb, ped/bikes	1.00	1.00						0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	0.86						0.91		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1641	1478						4227		1641	3282	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1641	1478						4227		1641	3282	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	587	11	272	0	0	0	0	413	602	120	450	0
RTOR Reduction (vph)	0	160	0	0	0	0	0	367	0	0	0	0
Lane Group Flow (vph)	587	123	0	0	0	0	0	648	0	120	450	0
Confl. Peds. (#/hr)									1			
Confl. Bikes (#/hr)									4			
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4											
Actuated Green, G (s)	27.9	27.9						17.8		7.1	29.6	
Effective Green, g (s)	27.9	27.9						17.8		7.1	29.6	
Actuated g/C Ratio	0.41	0.41						0.26		0.10	0.44	
Clearance Time (s)	5.1	5.1						5.1		4.7	5.1	
Vehicle Extension (s)	3.0	3.0						3.0		2.0	3.0	
Lane Grp Cap (vph)	676	609						1111		172	1434	
v/s Ratio Prot		0.08						c0.15		c0.07	0.14	
v/s Ratio Perm	c0.36											
v/c Ratio	0.87	0.20						0.58		0.70	0.31	
Uniform Delay, d1	18.2	12.8						21.7		29.3	12.4	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	11.4	0.2						0.8		9.5	0.1	
Delay (s)	29.6	12.9						22.5		38.8	12.6	
Level of Service	C	B						C		D	B	
Approach Delay (s)		24.2			0.0			22.5			18.1	
Approach LOS		C			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	67.7	Sum of lost time (s)	14.9
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	299	10	100	100	10	300	40	347	40	100	190	379
Future Volume (vph)	299	10	100	100	10	300	40	347	40	100	190	379
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	325	11	109	109	11	326	43	377	43	109	207	412

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	217	228	109	337	43	420	109	619
Volume Left (vph)	217	108	109	0	43	0	109	0
Volume Right (vph)	0	109	0	326	0	43	0	412
Hadj (s)	0.58	-0.01	0.67	-0.51	0.67	0.02	0.67	-0.35
Departure Headway (s)	9.6	9.1	9.7	8.5	9.4	8.8	9.3	8.4
Degree Utilization, x	0.58	0.57	0.29	0.80	0.11	1.02	0.28	1.44
Capacity (veh/h)	363	385	366	415	375	410	380	442
Control Delay (s)	23.9	22.4	15.4	36.7	12.4	79.9	14.8	230.9
Approach Delay (s)	23.2		31.5		73.7		198.6	
Approach LOS	C		D		F		F	

Intersection Summary			
Delay	97.5		
Level of Service	F		
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	674	80	0	1034	557	0	0	10	0	0	100
Future Volume (Veh/h)	0	674	80	0	1034	557	0	0	10	0	0	100
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	733	87	0	1124	605	0	0	11	0	0	109
Pedestrians		1									1	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1730			820			1261	2506	288	1380	1945	377
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1730			820			1261	2506	288	1380	1945	377
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			100	100	98	100	100	82
cM capacity (veh/h)	327			755			97	25	685	95	58	598

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	293	293	234	375	375	375	605	11	109
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	87	0	0	0	605	11	109
cSH	1700	1700	1700	1700	1700	1700	1700	685	598
Volume to Capacity	0.17	0.17	0.14	0.22	0.22	0.22	0.36	0.02	0.18
Queue Length 95th (ft)	0	0	0	0	0	0	0	1	17
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.3	12.4
Lane LOS								B	B
Approach Delay (s)	0.0			0.0				10.3	12.4
Approach LOS								B	B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	37.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	110	90	320	1308	1332	330
Future Volume (vph)	110	90	320	1308	1332	330
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	98	348	1422	1448	359

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	120	98	348	1422	1448	359
Volume Left (vph)	120	0	348	0	0	0
Volume Right (vph)	0	98	0	0	0	359
Hadj (s)	0.53	-0.67	0.53	0.17	0.17	-0.67
Departure Headway (s)	8.7	7.5	7.1	6.8	6.8	6.0
Degree Utilization, x	0.29	0.21	0.69	2.67	2.75	0.60
Capacity (veh/h)	399	459	493	535	530	580
Control Delay (s)	14.1	11.3	23.3	772.9	808.4	16.4
Approach Delay (s)	12.8		625.5		651.0	
Approach LOS	B		F		F	

Intersection Summary			
Delay	602.5		
Level of Service	F		
Intersection Capacity Utilization	103.9%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	70	511	840	260	240	80
Future Volume (vph)	70	511	840	260	240	80
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	555	913	283	261	87

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	631	913	283	348
Volume Left (vph)	76	913	0	0
Volume Right (vph)	555	0	0	87
Hadj (s)	-0.33	0.67	0.17	0.02
Departure Headway (s)	6.3	7.9	7.4	7.1
Degree Utilization, x	1.10	2.00	0.58	0.69
Capacity (veh/h)	565	464	475	498
Control Delay (s)	91.1	473.8	18.9	24.1
Approach Delay (s)	91.1	366.2		24.1
Approach LOS	F	F		C

Intersection Summary			
Delay	231.7		
Level of Service	F		
Intersection Capacity Utilization	109.7%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	1298	150	290	1321	761	200	100	166	564	100	400
Future Volume (vph)	250	1298	150	290	1321	761	200	100	166	564	100	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	1.00		1.00	1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	4715	1417	3183	4715	1417	1641	1548		1641	1727	2584
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	4715	1417	3183	4715	1417	1641	1548		1641	1727	2584
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	1411	163	315	1436	827	217	109	180	613	109	435
RTOR Reduction (vph)	0	0	115	0	0	410	0	45	0	0	0	137
Lane Group Flow (vph)	272	1411	48	315	1436	417	217	244	0	613	109	298
Confl. Peds. (#/hr)						11			1			
Confl. Bikes (#/hr)			12			13			5			
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	8.0	38.8	38.8	10.0	41.1	41.1	21.2	26.4		34.1	39.3	47.3
Effective Green, g (s)	8.0	38.8	38.8	10.0	41.1	41.1	21.2	26.4		34.1	39.3	47.3
Actuated g/C Ratio	0.06	0.30	0.30	0.08	0.31	0.31	0.16	0.20		0.26	0.30	0.36
Clearance Time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Vehicle Extension (s)	2.0	4.1	4.1	2.0	4.5	4.5	2.0	4.3		2.0	3.7	2.0
Lane Grp Cap (vph)	194	1400	420	243	1483	445	266	312		428	519	935
v/s Ratio Prot	0.09	0.30		c0.10	c0.30		0.13	c0.16		c0.37	0.06	0.02
v/s Ratio Perm			0.03			0.29						0.10
v/c Ratio	1.40	1.01	0.12	1.30	0.97	0.94	0.82	0.78		1.43	0.21	0.32
Uniform Delay, d1	61.3	45.9	33.4	60.3	44.1	43.5	52.8	49.4		48.2	34.1	30.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	208.9	26.0	0.2	160.3	16.4	27.6	16.5	13.0		207.6	0.3	0.1
Delay (s)	270.2	71.9	33.6	220.6	60.5	71.1	69.3	62.3		255.8	34.3	30.1
Level of Service	F	E	C	F	E	E	E	E		F	C	C
Approach Delay (s)		97.7			83.5			65.3			150.1	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	99.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	130.6	Sum of lost time (s)	21.3
Intersection Capacity Utilization	98.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	0	0	0	0	126	0	190	0	70	0	0
Future Volume (vph)	10	0	0	0	0	126	0	190	0	70	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	0	0	0	0	137	0	207	0	76	0	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	137	207	76
Volume Left (vph)	11	0	0	76
Volume Right (vph)	0	137	0	0
Hadj (s)	0.37	-0.43	0.17	0.37
Departure Headway (s)	5.1	4.2	4.5	4.8
Degree Utilization, x	0.02	0.16	0.26	0.10
Capacity (veh/h)	648	804	772	705
Control Delay (s)	8.2	7.9	9.1	8.4
Approach Delay (s)	8.2	7.9	9.1	8.4
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.6		
Level of Service	A		
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	500	0	0	360
Future Volume (vph)	0	0	500	0	0	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.5			4.5
Lane Util. Factor			1.00			1.00
Frt			1.00			0.85
Flt Protected			0.95			1.00
Satd. Flow (prot)			1770			1583
Flt Permitted			0.76			1.00
Satd. Flow (perm)			1410			1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	543	0	0	391
RTOR Reduction (vph)	0	0	0	0	0	325
Lane Group Flow (vph)	0	0	543	0	0	66
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type			Perm		Perm	Perm
Protected Phases	4			8		
Permitted Phases			8		2	2
Actuated Green, G (s)			18.4			5.6
Effective Green, g (s)			18.4			5.6
Actuated g/C Ratio			0.56			0.17
Clearance Time (s)			4.5			4.5
Vehicle Extension (s)			3.0			3.0
Lane Grp Cap (vph)			786			268
v/s Ratio Prot						
v/s Ratio Perm			c0.38			c0.04
v/c Ratio			0.69			0.25
Uniform Delay, d1			5.3			11.9
Progression Factor			1.00			1.00
Incremental Delay, d2			2.6			0.5
Delay (s)			7.9			12.4
Level of Service			A			B
Approach Delay (s)	0.0			7.9	12.4	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	33.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	31.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	2048	100	167	2303	94	100	40	210	128	30	40
Future Volume (vph)	50	2048	100	167	2303	94	100	40	210	128	30	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5		4.0	6.5		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1641	4677		1641	4683		1641	1727	1468	1641	1727	1468
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1641	4677		1641	4683		1641	1727	1468	1641	1727	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	2226	109	182	2503	102	109	43	228	139	33	43
RTOR Reduction (vph)	0	3	0	0	2	0	0	0	140	0	0	40
Lane Group Flow (vph)	54	2332	0	182	2603	0	109	43	88	139	33	3
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			5			7						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	9.9	79.6		24.0	93.7		17.2	14.1	14.1	13.8	10.7	10.7
Effective Green, g (s)	9.9	79.6		24.0	93.7		17.2	14.1	14.1	13.8	10.7	10.7
Actuated g/C Ratio	0.07	0.53		0.16	0.62		0.11	0.09	0.09	0.09	0.07	0.07
Clearance Time (s)	4.0	6.5		4.0	6.5		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	5.3		2.0	5.3		3.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	108	2481		262	2925		188	162	137	150	123	104
v/s Ratio Prot	0.03	c0.50		c0.11	c0.56		0.07	0.02		c0.08	0.02	
v/s Ratio Perm									c0.06			0.00
v/c Ratio	0.50	0.94		0.69	0.89		0.58	0.27	0.64	0.93	0.27	0.03
Uniform Delay, d1	67.7	33.0		59.5	23.8		63.0	63.1	65.5	67.6	65.9	64.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	8.6		6.3	4.6		4.3	0.3	7.0	51.0	0.4	0.0
Delay (s)	69.0	41.6		65.8	28.3		67.3	63.5	72.5	118.6	66.4	64.9
Level of Service	E	D		E	C		E	E	E	F	E	E
Approach Delay (s)		42.2			30.8			70.0			99.8	
Approach LOS		D			C			E			F	

Intersection Summary			
HCM 2000 Control Delay	40.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	645	50	370	1156	662	50	17	250	424	49	20
Future Volume (vph)	50	645	50	370	1156	662	50	17	250	424	49	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	0.97	0.86	0.86	0.97	0.91	0.88	1.00	1.00		0.97	0.91	0.91
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.99	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4801	1362	3433	5085	2787	1770	1601		3433	3372	1441
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4801	1362	3433	5085	2787	1770	1601		3433	3372	1441
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	701	54	402	1257	720	54	18	272	461	53	22
RTOR Reduction (vph)	0	1	31	0	0	334	0	176	0	0	2	15
Lane Group Flow (vph)	54	705	18	402	1257	386	54	114	0	461	53	5
Confl. Peds. (#/hr)				1						1		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6						8
Actuated Green, G (s)	4.1	33.9	33.9	14.0	43.8	43.8	4.5	12.8		14.5	22.8	22.8
Effective Green, g (s)	4.1	33.9	33.9	14.0	43.8	43.8	4.5	12.8		14.5	22.8	22.8
Actuated g/C Ratio	0.04	0.36	0.36	0.15	0.47	0.47	0.05	0.14		0.16	0.24	0.24
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	151	1746	495	515	2389	1309	85	219		534	824	352
v/s Ratio Prot	0.02	0.15		c0.12	c0.25		0.03	c0.07		c0.13	0.02	
v/s Ratio Perm			0.01			0.14						0.00
v/c Ratio	0.36	0.40	0.04	0.78	0.53	0.29	0.64	0.52		0.86	0.06	0.01
Uniform Delay, d1	43.3	22.1	19.1	38.1	17.4	15.2	43.5	37.3		38.4	27.0	26.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	0.2	0.0	7.5	0.2	0.1	14.5	2.2		13.5	0.0	0.0
Delay (s)	44.7	22.3	19.1	45.7	17.6	15.3	58.1	39.6		51.9	27.1	26.7
Level of Service	D	C	B	D	B	B	E	D		D	C	C
Approach Delay (s)		23.6			21.7			42.5			48.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	93.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	10	20	0	296	10	122	120	195	83	10
Future Volume (vph)	0	0	10	20	0	296	10	122	120	195	83	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	11	22	0	322	11	133	130	212	90	11

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	344	274	313
Volume Left (vph)	0	22	11	212
Volume Right (vph)	11	322	130	11
Hadj (s)	-0.52	-0.38	-0.11	0.28
Departure Headway (s)	5.6	5.1	5.3	5.6
Degree Utilization, x	0.02	0.49	0.40	0.48
Capacity (veh/h)	510	656	633	612
Control Delay (s)	8.7	12.9	11.7	13.7
Approach Delay (s)	8.7	12.9	11.7	13.7
Approach LOS	A	B	B	B

Intersection Summary			
Delay	12.8		
Level of Service	B		
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1560	1200	650	1700	1100	445
Future Volume (vph)	1560	1200	650	1700	1100	445
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	1641	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	1641	4715	3183	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1696	1304	707	1848	1196	484
RTOR Reduction (vph)	0	456	0	0	0	291
Lane Group Flow (vph)	1696	848	707	1848	1196	194
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	28.5	28.5	20.0	52.5	27.0	27.0
Effective Green, g (s)	28.5	28.5	20.0	52.5	27.0	27.0
Actuated g/C Ratio	0.32	0.32	0.22	0.58	0.30	0.30
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	1493	464	364	2750	954	440
v/s Ratio Prot	0.36		c0.43	0.39	c0.38	
v/s Ratio Perm		c0.58				0.13
v/c Ratio	1.14	1.83	1.94	0.67	1.25	0.44
Uniform Delay, d1	30.8	30.8	35.0	12.8	31.5	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	70.0	381.0	434.0	1.3	122.8	0.3
Delay (s)	100.7	411.7	469.0	14.2	154.3	25.7
Level of Service	F	F	F	B	F	C
Approach Delay (s)	235.9			140.0	117.3	
Approach LOS	F			F	F	

Intersection Summary			
HCM 2000 Control Delay	174.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	119.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	157	10	140	914	869	0	0	1547	700
Future Volume (vph)	0	0	0	157	10	140	914	869	0	0	1547	700
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.1	5.1	5.1	4.7	5.1			5.1	5.1
Lane Util. Factor				1.00	0.95	0.95	0.97	0.91			0.91	1.00
Frpb, ped/bikes				1.00	0.99	0.99	1.00	1.00			1.00	0.99
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	0.87	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1641	1410	1375	3183	4715			4715	1450
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1641	1410	1375	3183	4715			4715	1450
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	171	11	152	993	945	0	0	1682	761
RTOR Reduction (vph)	0	0	0	0	61	70	0	0	0	0	0	187
Lane Group Flow (vph)	0	0	0	171	21	11	993	945	0	0	1682	574
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)												1
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				14.6	14.6	14.6	34.3	83.8			44.8	44.8
Effective Green, g (s)				14.6	14.6	14.6	34.3	83.8			44.8	44.8
Actuated g/C Ratio				0.13	0.13	0.13	0.32	0.77			0.41	0.41
Clearance Time (s)				5.1	5.1	5.1	4.7	5.1			5.1	5.1
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				220	189	184	1005	3638			1945	598
v/s Ratio Prot					0.01		c0.31	0.20			0.36	
v/s Ratio Perm				c0.10		0.01						c0.40
v/c Ratio				0.78	0.11	0.06	0.99	0.26			0.86	0.96
Uniform Delay, d1				45.4	41.3	41.0	36.9	3.5			29.1	31.0
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				15.7	0.3	0.1	25.2	0.0			4.3	26.6
Delay (s)				61.2	41.5	41.1	62.2	3.6			33.4	57.6
Level of Service				E	D	D	E	A			C	E
Approach Delay (s)		0.0			51.5			33.6			41.0	
Approach LOS		A			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	108.6	Sum of lost time (s)	14.9
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	10	955	0	0	0	0	1558	273	180	1524	0
Future Volume (vph)	225	10	955	0	0	0	0	1558	273	180	1524	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1					5.1		4.7	5.1	
Lane Util. Factor		1.00	0.88					0.95		0.97	0.91	
Frt		1.00	0.85					0.98		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1648	2584					3208		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1648	2584					3208		3183	4715	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	11	1038	0	0	0	0	1693	297	196	1657	0
RTOR Reduction (vph)	0	0	36	0	0	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	256	1002	0	0	0	0	1980	0	196	1657	0
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		43.9	43.9					73.9		7.3	85.9	
Effective Green, g (s)		43.9	43.9					73.9		7.3	85.9	
Actuated g/C Ratio		0.31	0.31					0.53		0.05	0.61	
Clearance Time (s)		5.1	5.1					5.1		4.7	5.1	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		516	810					1693		165	2892	
v/s Ratio Prot								c0.62		c0.06	0.35	
v/s Ratio Perm		0.16	c0.39									
v/c Ratio		0.50	1.24					1.17		1.19	0.57	
Uniform Delay, d1		39.1	48.1					33.0		66.3	16.1	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.8	117.0					82.9		129.6	0.3	
Delay (s)		39.8	165.1					116.0		195.9	16.4	
Level of Service		D	F					F		F	B	
Approach Delay (s)		140.3			0.0			116.0			35.4	
Approach LOS		F			A			F			D	

Intersection Summary			
HCM 2000 Control Delay	93.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1101	235	114	215	420	370	98	360	50	220	585	1674
Future Volume (vph)	1101	235	114	215	420	370	98	360	50	220	585	1674
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95			1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1636			1699	1446	1641	3222		1641	1727	1437
Flt Permitted	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1636			1699	1446	1641	3222		1641	1727	1437
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1197	255	124	234	457	402	107	391	54	239	636	1820
RTOR Reduction (vph)	0	12	0	0	0	107	0	8	0	0	0	417
Lane Group Flow (vph)	1197	367	0	0	691	295	107	437	0	239	636	1403
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						1
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	39.7	39.7			41.8	41.8	7.6	33.1		10.6	35.9	35.9
Effective Green, g (s)	39.7	39.7			41.8	41.8	7.6	33.1		10.6	35.9	35.9
Actuated g/C Ratio	0.27	0.27			0.29	0.29	0.05	0.23		0.07	0.25	0.25
Clearance Time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Vehicle Extension (s)	2.0	2.0			3.7	3.7	2.0	3.8		2.0	3.8	3.8
Lane Grp Cap (vph)	449	447			489	416	86	735		119	427	355
v/s Ratio Prot	c0.73	0.22			c0.41		0.07	0.14		c0.15	0.37	
v/s Ratio Perm						0.20						c0.98
v/c Ratio	2.67	0.82			1.41	0.71	1.24	0.59		2.01	1.49	3.95
Uniform Delay, d1	52.6	49.3			51.6	46.1	68.7	50.0		67.2	54.5	54.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	756.0	10.9			197.7	5.7	176.3	1.5		482.1	232.4	1335.4
Delay (s)	808.7	60.3			249.3	51.9	245.0	51.4		549.3	287.0	1390.0
Level of Service	F	E			F	D	F	D		F	F	F
Approach Delay (s)		628.7			176.7			89.0			1055.1	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	689.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.60		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	155.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	385	35	75	436	80	10	164	10	30	207	40
Future Volume (vph)	140	385	35	75	436	80	10	164	10	30	207	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Lane Util. Factor		0.95			1.00	1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes		1.00			1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.99			0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3211			1715	1447	1641	1712		3183	3185	
Flt Permitted		0.71			0.10	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2298			173	1447	1641	1712		3183	3185	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	418	38	82	474	87	11	178	11	33	225	43
RTOR Reduction (vph)	0	3	0	0	0	41	0	2	0	0	12	0
Lane Group Flow (vph)	0	605	0	0	556	46	11	187	0	33	256	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						5						5
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		2			1		3	8		7	4	
Permitted Phases	2			1		1						
Actuated Green, G (s)		26.9			66.4	66.4	1.5	21.0		2.3	21.8	
Effective Green, g (s)		26.9			66.4	66.4	1.5	21.0		2.3	21.8	
Actuated g/C Ratio		0.20			0.49	0.49	0.01	0.15		0.02	0.16	
Clearance Time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Vehicle Extension (s)		4.8			4.8	4.8	2.0	3.3		2.0	4.4	
Lane Grp Cap (vph)		455			84	708	18	264		53	511	
v/s Ratio Prot							0.01	c0.11		c0.01	0.08	
v/s Ratio Perm		c0.26			c3.21	0.03						
v/c Ratio		1.33			6.62	0.06	0.61	0.71		0.62	0.50	
Uniform Delay, d1		54.4			34.6	18.3	66.8	54.5		66.3	52.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		162.7			2553.6	0.1	36.2	8.6		15.2	1.3	
Delay (s)		217.1			2588.2	18.3	103.0	63.1		81.5	53.3	
Level of Service		F			F	B	F	E		F	D	
Approach Delay (s)		217.1			2240.5			65.3			56.4	
Approach LOS		F			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	914.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	4.19		
Actuated Cycle Length (s)	135.7	Sum of lost time (s)	19.1
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	921	250	230	1072	116	10
Future Volume (vph)	921	250	230	1072	116	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		5.7	7.2	6.1	6.1
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4564		1641	4715	1641	1468
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4564		1641	4715	1641	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1001	272	250	1165	126	11
RTOR Reduction (vph)	38	0	0	0	0	9
Lane Group Flow (vph)	1235	0	250	1165	126	2
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	30.4		8.3	44.4	10.9	10.9
Effective Green, g (s)	30.4		8.3	44.4	10.9	10.9
Actuated g/C Ratio	0.44		0.12	0.65	0.16	0.16
Clearance Time (s)	7.2		5.7	7.2	6.1	6.1
Vehicle Extension (s)	6.9		2.0	6.9	2.0	2.0
Lane Grp Cap (vph)	2022		198	3051	260	233
v/s Ratio Prot	c0.27		c0.15	0.25	c0.08	
v/s Ratio Perm						0.00
v/c Ratio	0.61		1.26	0.38	0.48	0.01
Uniform Delay, d1	14.6		30.1	5.7	26.3	24.3
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1		152.1	0.3	0.5	0.0
Delay (s)	15.7		182.3	5.9	26.8	24.3
Level of Service	B		F	A	C	C
Approach Delay (s)	15.7			37.1	26.6	
Approach LOS	B			D	C	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	68.6	Sum of lost time (s)	19.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	304	200	550	488	150	100	200	600	100	350	194
Future Volume (vph)	127	304	200	550	488	150	100	200	600	100	350	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.89		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4715	1445	1641	4549		1641	1516		3183	1635	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	4715	1445	1641	4549		1641	1516		3183	1635	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	330	217	598	530	163	109	217	652	109	380	211
RTOR Reduction (vph)	0	0	192	0	39	0	0	70	0	0	13	0
Lane Group Flow (vph)	138	330	25	598	654	0	109	799	0	109	578	0
Confl. Peds. (#/hr)									1			
Confl. Bikes (#/hr)			2						2			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	16.2	17.6	17.6	39.0	40.4		16.6	61.3		12.2	57.8	
Effective Green, g (s)	16.2	17.6	17.6	39.0	40.4		16.6	61.3		12.2	57.8	
Actuated g/C Ratio	0.11	0.12	0.12	0.26	0.27		0.11	0.41		0.08	0.39	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	177	553	169	426	1225		181	619		258	630	
v/s Ratio Prot	0.08	0.07		c0.36	c0.14		c0.07	c0.53		0.03	0.35	
v/s Ratio Perm			0.02									
v/c Ratio	0.78	0.60	0.15	1.40	0.53		0.60	1.29		0.42	0.92	
Uniform Delay, d1	65.2	62.8	59.5	55.5	46.8		63.6	44.4		65.5	43.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.7	4.7	1.9	195.4	1.7		3.8	142.4		0.4	19.3	
Delay (s)	82.9	67.5	61.4	250.9	48.4		67.4	186.8		66.0	63.1	
Level of Service	F	E	E	F	D		E	F		E	E	
Approach Delay (s)		68.7			142.2			173.5			63.6	
Approach LOS		E			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	121.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	106.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	220	100	40	186	250	40	260	10	370	270	280
Future Volume (vph)	160	220	100	40	186	250	40	260	10	370	270	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.99			1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Frt		0.97			0.93			1.00		1.00	0.92	
Flt Protected		0.98			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		1644			1587			1709		1641	1585	
Flt Permitted		0.61			0.94			0.76		0.52	1.00	
Satd. Flow (perm)		1019			1495			1306		896	1585	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	239	109	43	202	272	43	283	11	402	293	304
RTOR Reduction (vph)	0	14	0	0	62	0	0	2	0	0	57	0
Lane Group Flow (vph)	0	508	0	0	455	0	0	335	0	402	540	0
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			1			3						
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		27.5			27.5			28.5		28.5	28.5	
Effective Green, g (s)		27.5			27.5			28.5		28.5	28.5	
Actuated g/C Ratio		0.42			0.42			0.44		0.44	0.44	
Clearance Time (s)		4.5			4.5			4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		431			632			572		392	694	
v/s Ratio Prot											0.34	
v/s Ratio Perm		c0.50			0.30			0.26		c0.45		
v/c Ratio		1.18			0.72			0.59		1.03	0.78	
Uniform Delay, d1		18.8			15.6			13.8		18.2	15.6	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		101.7			4.0			4.4		52.1	8.4	
Delay (s)		120.5			19.6			18.1		70.4	23.9	
Level of Service		F			B			B		E	C	
Approach Delay (s)		120.5			19.6			18.1			42.6	
Approach LOS		F			B			B			D	

Intersection Summary			
HCM 2000 Control Delay	51.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	116.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	50	211	50	35	288	110	0	70	10	120	90	166
Future Volume (vph)	50	211	50	35	288	110	0	70	10	120	90	166
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	229	54	38	313	120	0	76	11	130	98	180

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	337	471	87	408
Volume Left (vph)	54	38	0	130
Volume Right (vph)	54	120	11	180
Hadj (s)	0.11	0.03	0.09	-0.03
Departure Headway (s)	7.0	6.6	8.1	6.8
Degree Utilization, x	0.65	0.87	0.20	0.77
Capacity (veh/h)	480	527	377	496
Control Delay (s)	22.3	38.5	13.1	29.4
Approach Delay (s)	22.3	38.5	13.1	29.4
Approach LOS	C	E	B	D

Intersection Summary			
Delay	29.8		
Level of Service	D		
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	190	433	692	110	100	200
Future Volume (vph)	190	433	692	110	100	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	6.2	6.2	6.2	5.1	5.1
Lane Util. Factor	0.97	0.95	0.91	1.00	0.97	0.91
Frpb, ped/bikes	1.00	1.00	1.00	0.99	0.99	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	0.93	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.98	1.00
Satd. Flow (prot)	3183	3282	4715	1447	2997	1312
Flt Permitted	0.95	1.00	1.00	1.00	0.98	1.00
Satd. Flow (perm)	3183	3282	4715	1447	2997	1312
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	207	471	752	120	109	217
RTOR Reduction (vph)	0	0	0	73	93	92
Lane Group Flow (vph)	207	471	752	47	125	16
Confl. Bikes (#/hr)				4		4
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	5.1	27.4	17.6	17.6	6.5	6.5
Effective Green, g (s)	5.1	27.4	17.6	17.6	6.5	6.5
Actuated g/C Ratio	0.11	0.61	0.39	0.39	0.14	0.14
Clearance Time (s)	4.7	6.2	6.2	6.2	5.1	5.1
Vehicle Extension (s)	2.0	5.8	5.8	5.8	2.0	2.0
Lane Grp Cap (vph)	359	1989	1835	563	430	188
v/s Ratio Prot	c0.07	0.14	c0.16		c0.04	
v/s Ratio Perm				0.03		0.01
v/c Ratio	0.58	0.24	0.41	0.08	0.29	0.08
Uniform Delay, d1	19.0	4.1	10.0	8.7	17.3	16.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.2	0.4	0.2	0.1	0.1
Delay (s)	20.4	4.3	10.4	8.9	17.4	16.8
Level of Service	C	A	B	A	B	B
Approach Delay (s)		9.2	10.2		17.2	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	45.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	373	220	170	452	90	60
Future Volume (vph)	373	220	170	452	90	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	405	239	185	491	98	65

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	644	185	491	163
Volume Left (vph)	0	185	0	98
Volume Right (vph)	239	0	0	65
Hadj (s)	-0.05	0.67	0.17	0.05
Departure Headway (s)	5.4	6.5	6.0	6.9
Degree Utilization, x	0.97	0.34	0.82	0.31
Capacity (veh/h)	660	542	588	508
Control Delay (s)	49.7	11.6	29.6	13.1
Approach Delay (s)	49.7	24.7		13.1
Approach LOS	E	C		B

Intersection Summary			
Delay	34.2		
Level of Service	D		
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	540	47	40	846	0	74	0	40	10	10	42
Future Volume (vph)	13	540	47	40	846	0	74	0	40	10	10	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.9		4.9		4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00		1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		0.98		0.93	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00		1.00		1.00	
Frt	1.00	0.99		1.00	1.00		1.00		0.85		0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95		1.00		0.99	
Satd. Flow (prot)	1641	4636		1641	4715		1641		1437		1453	
Flt Permitted	0.95	1.00		0.95	1.00		0.91		1.00		0.94	
Satd. Flow (perm)	1641	4636		1641	4715		1570		1437		1380	
Peak-hour factor, PHF	0.74	0.74	0.74	0.94	0.94	0.94	0.81	0.81	0.81	0.60	0.60	0.60
Adj. Flow (vph)	18	730	64	43	900	0	91	0	49	17	17	70
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	43	0	62	0
Lane Group Flow (vph)	18	783	0	43	900	0	91	0	6	0	42	0
Confl. Peds. (#/hr)			49			10			6	6		4
Confl. Bikes (#/hr)			3						4			25
Turn Type	Prot	NA		Prot	NA		Perm		Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	0.5	16.9		1.2	17.6		4.4		4.4		4.4	
Effective Green, g (s)	0.5	16.9		1.2	17.6		4.4		4.4		4.4	
Actuated g/C Ratio	0.01	0.46		0.03	0.48		0.12		0.12		0.12	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.9		4.9		4.9	
Vehicle Extension (s)	2.0	6.1		2.0	5.1		2.0		2.0		2.0	
Lane Grp Cap (vph)	22	2134		53	2261		188		172		165	
v/s Ratio Prot	0.01	0.17		c0.03	c0.19							
v/s Ratio Perm							c0.06		0.00		0.03	
v/c Ratio	0.82	0.37		0.81	0.40		0.48		0.03		0.26	
Uniform Delay, d1	18.1	6.4		17.6	6.1		15.1		14.3		14.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00		1.00	
Incremental Delay, d2	105.7	0.3		57.4	0.3		0.7		0.0		0.3	
Delay (s)	123.8	6.7		75.0	6.4		15.8		14.3		15.0	
Level of Service	F	A		E	A		B		B		B	
Approach Delay (s)		9.3			9.5			15.3			15.0	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	36.7	Sum of lost time (s)	14.2
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	427	70	250	704	150	60	60	280	190	70	122
Future Volume (vph)	93	427	70	250	704	150	60	60	280	190	70	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	5.5			4.9	4.9		4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.96		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	
Frt	1.00	0.98		1.00	0.97			1.00	0.85		0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.98	
Satd. Flow (prot)	1641	4616		1641	4573			1683	1412		2992	
Flt Permitted	0.95	1.00		0.95	1.00			0.61	1.00		0.76	
Satd. Flow (perm)	1641	4616		1641	4573			1047	1412		2327	
Peak-hour factor, PHF	0.69	0.69	0.69	0.93	0.93	0.93	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	135	619	101	269	757	161	71	71	329	224	82	144
RTOR Reduction (vph)	0	22	0	0	28	0	0	0	242	0	68	0
Lane Group Flow (vph)	135	698	0	269	890	0	0	142	87	0	382	0
Confl. Peds. (#/hr)						1	10		46	46		10
Confl. Bikes (#/hr)						1			3			11
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	10.4	20.3		16.5	25.8			18.4	18.4		18.4	
Effective Green, g (s)	10.4	20.3		16.5	25.8			18.4	18.4		18.4	
Actuated g/C Ratio	0.15	0.29		0.24	0.37			0.27	0.27		0.27	
Clearance Time (s)	4.4	4.9		4.4	5.5			4.9	4.9		4.9	
Vehicle Extension (s)	2.0	8.0		2.0	6.7			4.4	4.4		4.4	
Lane Grp Cap (vph)	245	1350		390	1700			277	374		616	
v/s Ratio Prot	0.08	0.15		c0.16	c0.19							
v/s Ratio Perm								0.14	0.06		c0.16	
v/c Ratio	0.55	0.52		0.69	0.52			0.51	0.23		0.62	
Uniform Delay, d1	27.3	20.5		24.1	17.0			21.7	20.0		22.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	1.5	1.3		4.0	0.9			2.5	0.5		2.3	
Delay (s)	28.9	21.8		28.1	17.9			24.2	20.5		24.8	
Level of Service	C	C		C	B			C	C		C	
Approach Delay (s)		22.9			20.2			21.6			24.8	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	69.4	Sum of lost time (s)	14.8
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	827	70	410	1104	0	340
Future Volume (vph)	827	70	410	1104	0	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1		5.1	3.0		5.1
Lane Util. Factor	0.91		0.97	0.91		0.88
Frpb, ped/bikes	1.00		1.00	1.00		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	1.00		0.85
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	4653		3183	4715		2584
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	4653		3183	4715		2584
Peak-hour factor, PHF	0.75	0.75	0.97	0.97	0.86	0.86
Adj. Flow (vph)	1103	93	423	1138	0	395
RTOR Reduction (vph)	17	0	0	0	0	107
Lane Group Flow (vph)	1179	0	423	1138	0	288
Confl. Peds. (#/hr)		20				
Turn Type	NA		Prot	NA		Over
Protected Phases	2		1	6		1
Permitted Phases						1
Actuated Green, G (s)	22.6		10.5	43.3		10.5
Effective Green, g (s)	22.6		10.5	43.3		10.5
Actuated g/C Ratio	0.52		0.24	1.00		0.24
Clearance Time (s)	5.1		5.1	3.0		5.1
Vehicle Extension (s)	3.9		2.0	0.9		2.0
Lane Grp Cap (vph)	2428		771	4715		626
v/s Ratio Prot	c0.25		c0.13	0.24		0.11
v/s Ratio Perm						
v/c Ratio	0.49		0.55	0.24		0.46
Uniform Delay, d1	6.6		14.3	0.0		14.0
Progression Factor	1.00		1.00	1.00		1.00
Incremental Delay, d2	0.2		0.4	0.0		0.2
Delay (s)	6.8		14.8	0.0		14.2
Level of Service	A		B	A		B
Approach Delay (s)	6.8			4.0	14.2	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	43.3	Sum of lost time (s)	10.2
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↱
Traffic Volume (veh/h)	0	1167	1114	0	0	400
Future Volume (Veh/h)	0	1167	1114	0	0	400
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.82	0.82	0.87	0.87	0.91	0.91
Hourly flow rate (vph)	0	1423	1280	0	0	440
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		269	396			
pX, platoon unblocked					0.88	
vC, conflicting volume	1280				1754	427
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1280				1375	427
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	21
cM capacity (veh/h)	497				112	555

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	474	474	474	427	427	427	440
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	440
cSH	1700	1700	1700	1700	1700	1700	555
Volume to Capacity	0.28	0.28	0.28	0.25	0.25	0.25	0.79
Queue Length 95th (ft)	0	0	0	0	0	0	189
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	31.9
Lane LOS							D
Approach Delay (s)	0.0			0.0			31.9
Approach LOS							D

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	540	627	0	0	1054	1120	60	10	230	0	0	0
Future Volume (vph)	540	627	0	0	1054	1120	60	10	230	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	5.1			5.1	5.1		5.1	5.1			
Lane Util. Factor	0.97	0.91			0.86	0.86		1.00	0.88			
Frpb, ped/bikes	1.00	1.00			0.99	0.98		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			0.95	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (prot)	3183	4715			4198	1240		1656	2584			
Flt Permitted	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (perm)	3183	4715			4198	1240		1656	2584			
Peak-hour factor, PHF	0.82	0.82	0.82	0.92	0.92	0.92	0.75	0.75	0.75	0.92	0.92	0.92
Adj. Flow (vph)	659	765	0	0	1146	1217	80	13	307	0	0	0
RTOR Reduction (vph)	0	0	0	0	100	241	0	0	269	0	0	0
Lane Group Flow (vph)	659	765	0	0	1655	367	0	93	38	0	0	0
Confl. Peds. (#/hr)						2	3					
Confl. Bikes (#/hr)			3			8						
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	19.6	63.2			38.9	38.9		10.4	10.4			
Effective Green, g (s)	19.6	63.2			38.9	38.9		10.4	10.4			
Actuated g/C Ratio	0.23	0.75			0.46	0.46		0.12	0.12			
Clearance Time (s)	4.7	5.1			5.1	5.1		5.1	5.1			
Vehicle Extension (s)	2.0	3.9			3.9	3.9		3.0	3.0			
Lane Grp Cap (vph)	744	3555			1948	575		205	320			
v/s Ratio Prot	c0.21	0.16			c0.39			c0.06				
v/s Ratio Perm						0.30			0.01			
v/c Ratio	0.89	0.22			0.85	0.64		0.45	0.12			
Uniform Delay, d1	31.0	3.0			19.9	17.1		34.1	32.6			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	11.9	0.0			3.8	2.6		1.6	0.2			
Delay (s)	43.0	3.1			23.7	19.7		35.7	32.8			
Level of Service	D	A			C	B		D	C			
Approach Delay (s)		21.5			22.6			33.5			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	83.8	Sum of lost time (s)	14.9
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	170	180	113	10	190	100	82	120	10	40	80	40
Future Volume (vph)	170	180	113	10	190	100	82	120	10	40	80	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	185	196	123	11	207	109	89	130	11	43	87	43

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	185	319	11	316	89	141	130	43
Volume Left (vph)	185	0	11	0	89	0	43	0
Volume Right (vph)	0	123	0	109	0	11	0	43
Hadj (s)	0.67	-0.10	0.67	-0.07	0.67	0.12	0.34	-0.53
Departure Headway (s)	7.0	6.2	7.3	6.5	7.7	7.2	7.5	6.7
Degree Utilization, x	0.36	0.55	0.02	0.57	0.19	0.28	0.27	0.08
Capacity (veh/h)	492	558	470	524	436	469	445	496
Control Delay (s)	12.7	15.5	9.2	16.6	11.4	11.8	12.1	9.0
Approach Delay (s)	14.5		16.4		11.6		11.3	
Approach LOS	B		C		B		B	

Intersection Summary			
Delay	14.0		
Level of Service	B		
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	360	0	183	500	0	45
Future Volume (vph)	360	0	183	500	0	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	0.91		1.00	0.91	1.00	
Frt	1.00		1.00	1.00	0.86	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	5085		1770	5085	1611	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	5085		1770	5085	1611	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	391	0	199	543	0	49
RTOR Reduction (vph)	0	0	0	0	48	0
Lane Group Flow (vph)	391	0	199	543	1	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot	NA	Prot	
Protected Phases	2		1	6	4	
Permitted Phases						
Actuated Green, G (s)	11.4		7.8	23.7	0.9	
Effective Green, g (s)	11.4		7.8	23.7	0.9	
Actuated g/C Ratio	0.34		0.23	0.71	0.03	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1725		410	3586	43	
v/s Ratio Prot	c0.08		c0.11	0.11	c0.00	
v/s Ratio Perm						
v/c Ratio	0.23		0.49	0.15	0.03	
Uniform Delay, d1	7.9		11.2	1.6	15.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.1		0.9	0.0	0.3	
Delay (s)	8.0		12.1	1.7	16.2	
Level of Service	A		B	A	B	
Approach Delay (s)	8.0			4.4	16.2	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	33.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	405	0	543	683	0	340
Future Volume (vph)	405	0	543	683	0	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	0.91		1.00	0.91	1.00	
Frt	1.00		1.00	1.00	0.86	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	5085		1770	5085	1611	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	5085		1770	5085	1611	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	440	0	590	742	0	370
RTOR Reduction (vph)	0	0	0	0	337	0
Lane Group Flow (vph)	440	0	590	742	33	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot	NA	Perm	
Protected Phases	2		1	6		
Permitted Phases					4	
Actuated Green, G (s)	11.5		30.7	46.7	5.5	
Effective Green, g (s)	11.5		30.7	46.7	5.5	
Actuated g/C Ratio	0.19		0.50	0.76	0.09	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	955		887	3880	144	
v/s Ratio Prot	c0.09		c0.33	0.15		
v/s Ratio Perm					c0.02	
v/c Ratio	0.46		0.67	0.19	0.23	
Uniform Delay, d1	22.1		11.4	2.0	25.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.4		1.9	0.0	0.8	
Delay (s)	22.4		13.3	2.0	26.7	
Level of Service	C		B	A	C	
Approach Delay (s)	22.4			7.0	26.7	
Approach LOS	C			A	C	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	61.2	Sum of lost time (s)	13.5
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	10	120	160	0	0	200	216	260	0	213	0
Future Volume (vph)	0	10	120	160	0	0	200	216	260	0	213	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5			4.5	
Lane Util. Factor		1.00			1.00		1.00	0.95			1.00	
Frt		0.88			1.00		1.00	0.92			1.00	
Flt Protected		1.00			0.95		0.95	1.00			1.00	
Satd. Flow (prot)		1631			1770		1770	3249			1863	
Flt Permitted		1.00			0.67		0.95	1.00			1.00	
Satd. Flow (perm)		1631			1243		1770	3249			1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	11	130	174	0	0	217	235	283	0	232	0
RTOR Reduction (vph)	0	104	0	0	0	0	0	108	0	0	0	0
Lane Group Flow (vph)	0	37	0	0	174	0	217	410	0	0	232	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		9.6			9.6		8.8	30.0			16.7	
Effective Green, g (s)		9.6			9.6		8.8	30.0			16.7	
Actuated g/C Ratio		0.20			0.20		0.18	0.62			0.34	
Clearance Time (s)		4.5			4.5		4.5	4.5			4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		322			245		320	2005			640	
v/s Ratio Prot		0.02					c0.12	0.13			c0.12	
v/s Ratio Perm					c0.14							
v/c Ratio		0.11			0.71		0.68	0.20			0.36	
Uniform Delay, d1		16.0			18.2		18.6	4.1			12.0	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.2			9.3		5.6	0.1			0.4	
Delay (s)		16.2			27.5		24.2	4.1			12.3	
Level of Service		B			C		C	A			B	
Approach Delay (s)		16.2			27.5			10.0			12.3	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	48.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	103	100	168	204	245	175
Future Volume (vph)	103	100	168	204	245	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.93		1.00	1.00	0.94	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1696		1770	1863	3318	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1696		1770	1863	3318	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	112	109	183	222	266	190
RTOR Reduction (vph)	62	0	0	0	126	0
Lane Group Flow (vph)	159	0	183	222	330	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	7.7		7.8	27.0	14.7	
Effective Green, g (s)	7.7		7.8	27.0	14.7	
Actuated g/C Ratio	0.18		0.18	0.62	0.34	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	298		315	1151	1116	
v/s Ratio Prot	c0.09		c0.10	0.12	c0.10	
v/s Ratio Perm						
v/c Ratio	0.53		0.58	0.19	0.30	
Uniform Delay, d1	16.4		16.5	3.6	10.7	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.8		2.7	0.1	0.1	
Delay (s)	18.2		19.2	3.7	10.8	
Level of Service	B		B	A	B	
Approach Delay (s)	18.2			10.7	10.8	
Approach LOS	B			B	B	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	43.7	Sum of lost time (s)	13.5
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	10	8	362	337	8
Future Volume (vph)	10	10	8	362	337	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.93		1.00	1.00	1.00	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1695		1770	1863	3526	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1695		1770	1863	3526	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	11	9	393	366	9
RTOR Reduction (vph)	11	0	0	0	2	0
Lane Group Flow (vph)	11	0	9	393	373	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	0.9		0.9	28.7	23.3	
Effective Green, g (s)	0.9		0.9	28.7	23.3	
Actuated g/C Ratio	0.02		0.02	0.74	0.60	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	39		41	1385	2128	
v/s Ratio Prot	c0.01		0.01	c0.21	0.11	
v/s Ratio Perm						
v/c Ratio	0.29		0.22	0.28	0.18	
Uniform Delay, d1	18.5		18.5	1.6	3.4	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	4.1		2.7	0.1	0.0	
Delay (s)	22.6		21.2	1.7	3.4	
Level of Service	C		C	A	A	
Approach Delay (s)	22.6			2.2	3.4	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	3.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	38.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	29.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1162	1847	84	0	15
Future Volume (Veh/h)	0	1162	1847	84	0	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1263	2008	91	0	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		775	610			
pX, platoon unblocked					0.79	
vC, conflicting volume	2099				3316	715
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2099				3791	715
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	96
cM capacity (veh/h)	259				2	373

Direction, Lane #	EB 1	WB 1	WB 2	WB 3	SB 1
Volume Total	1263	803	803	493	16
Volume Left	0	0	0	0	0
Volume Right	0	0	0	91	16
cSH	1700	1700	1700	1700	373
Volume to Capacity	0.74	0.47	0.47	0.29	0.04
Queue Length 95th (ft)	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	15.1
Lane LOS					C
Approach Delay (s)	0.0	0.0			15.1
Approach LOS					C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	100	1062	1916	87	70	15
Future Volume (vph)	100	1062	1916	87	70	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1641	1727	1717		1641	1468
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1641	1727	1717		1641	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	1154	2083	95	76	16
RTOR Reduction (vph)	0	0	1	0	0	15
Lane Group Flow (vph)	109	1154	2177	0	76	1
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	8.0	125.1	113.1		12.0	12.0
Effective Green, g (s)	8.0	125.1	113.1		12.0	12.0
Actuated g/C Ratio	0.06	0.86	0.78		0.08	0.08
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	90	1488	1338		135	121
v/s Ratio Prot	c0.07	0.67	c1.27		c0.05	
v/s Ratio Perm						0.00
v/c Ratio	1.21	0.78	1.63		0.56	0.01
Uniform Delay, d1	68.5	4.2	16.0		64.0	61.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	162.2	2.6	285.7		5.3	0.0
Delay (s)	230.8	6.8	301.7		69.3	61.1
Level of Service	F	A	F		E	E
Approach Delay (s)		26.1	301.7		67.9	
Approach LOS		C	F		E	

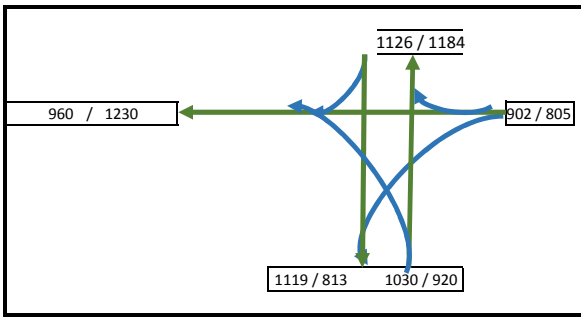
Intersection Summary			
HCM 2000 Control Delay	197.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.51		
Actuated Cycle Length (s)	145.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	116.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION:	Caliente Avenue and 905 WB Ramps	DIST. CO. RTE	SR-905
ALTERNATIVE:	Near-Term + Project Conditions	PM:	
		DATE:	1/27/2016
		TIME:	

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	160	870	0
SB:	0	483	790
EB:	0	0	0
WB:	636	10	256

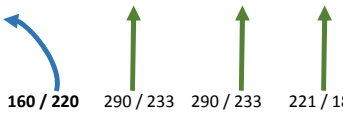
PM

	Left	Throu	Right
NB:	220	700	0
SB:	0	502	1000
EB:	0	0	0
WB:	311	10	484

LANE VOLUMES (ILV/HR)

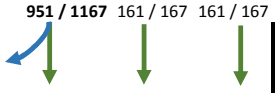
PHASE I

AM 160
PM 220



PHASE II

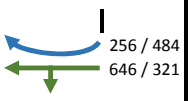
AM 951
PM 1167



Remaining NB Through 130 / 13

PHASE III

AM 646
PM 484



PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PM
1757	1871

TOTAL OPERATING LEVEL (ILV/HR):

AM:	1757	Over Capacity
PM:	1871	Over Capacity

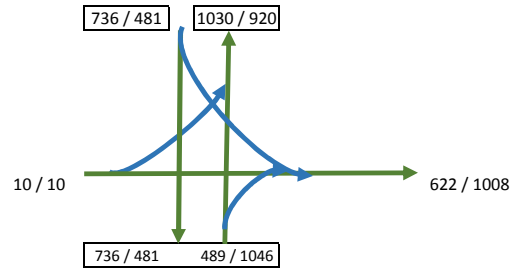
< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION: Caliente Avenue and 905 EB Ramps
ALTERNATIVE: Near-Term + Project Conditions

DIST. CO. RTE: SR-905
PM:
DATE: 1/27/2016
TIME:

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	0	260	229
SB:	383	736	0
EB:	770	10	70
WB:	0	0	0

PM

	Left	Throu	Right
NB:	0	380	666
SB:	332	481	0
EB:	540	10	250
WB:	0	0	0

LANE VOLUMES (ILV/HR)

PHASE I

AM 383
PM 332

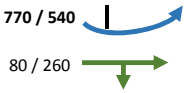
PHASE II

AM 316
PM 793

Remaining SB Through 0 / 91

PHASE III

AM 770
PM 540



PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PM
1469	1665

TOTAL OPERATING LEVEL (ILV/HR):

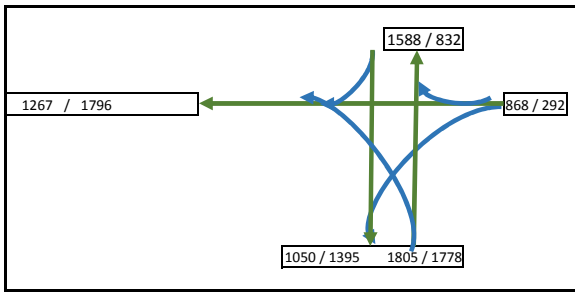
AM:	1469	At Capacity
PM:	1665	Over Capacity

< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION:	Britannia Boulevard and SR-905 WB Ramps	DIST. CO. RTE	SR-905
ALTERNATIVE:	Near-Term + Project Conditions	PM:	
		DATE:	1/27/2016
		TIME:	

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	827	978	0
SB:	0	792	440
EB:	0	0	0
WB:	258	0	610

PM

	Left	Throu	Right
NB:	1086	692	0
SB:	0	1253	700
EB:	0	0	0
WB:	142	10	140

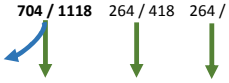
LANE VOLUMES (ILV/HR)

PHASE I

AM 414
PM 543

PHASE II

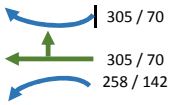
AM 704 **704 / 1118** 264 / 418 264 / 418
PM 1118



Remaining NB Through 0 / 0

PHASE III

AM 258
PM 142



PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PM
1376	1803

TOTAL OPERATING LEVEL (ILV/HR):

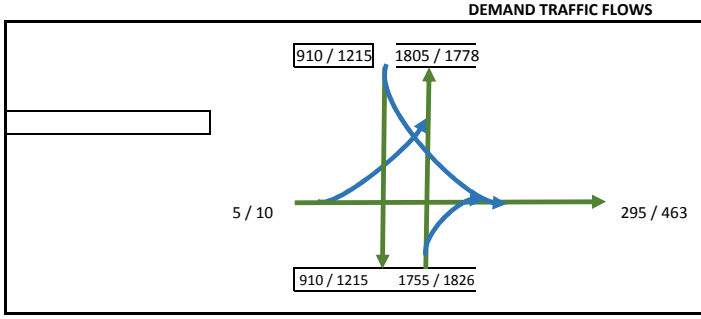
AM:	1376	At Capacity
PM:	1803	Over Capacity

< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION:	Britannia Boulevard and 905 EB Ramps	DIST. CO. RTE	SR-905
ALTERNATIVE:	Near-Term + Project Conditions	PM:	
		DATE:	1/27/2016
		TIME:	

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	0	1605	150
SB:	140	910	0
EB:	200	5	973
WB:	0	0	0

PM

	Left	Throu	Right
NB:	0	1553	273
SB:	180	1215	0
EB:	225	10	1309
WB:	0	0	0

LANE VOLUMES (ILV/HR)

PHASE I

AM **70**
PM **90**

303 / 405 303 / 405 303 / 405 70 / 90 **70 / 90**

PHASE II

AM 953
PM 1050

Remaining SB Through 233 / 315

803 / 777 **953 / 1050**

PHASE III

AM 487
PM 655

205 / 235

487 / 655
487 / 655

PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PM
1509	1794

TOTAL OPERATING LEVEL (ILV/HR):

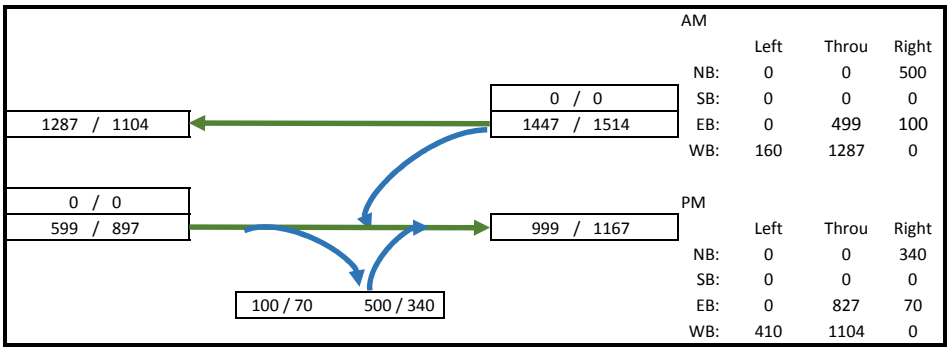
AM:	1509	Over Capacity
PM:	1794	Over Capacity

< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION:	905 / Siempre Viva Road	DIST. CO. RTE	SR-905
ALTERNATIVE:	Near-Term + Project Conditions	PM:	
		DATE:	1/27/2016
		TIME:	

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	0	0	500
SB:	0	0	0
EB:	0	499	100
WB:	160	1287	0

PM

	Left	Throu	Right
NB:	0	0	340
SB:	0	0	0
EB:	0	827	70
WB:	410	1104	0

LANE VOLUMES (ILV/HR)

PHASE I

AM	80	429 / 368
PM	205	429 / 368
		429 / 368
		80 / 205
		80 / 205

PHASE II

AM	349	166 / 276
PM	346	166 / 276
		266 / 346
Remaining EB Through	**349 / 163**	

PHASE III

AM	250		
PM	170		
		250 / 170	250 / 170

PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PHASE II
679	721

TOTAL OPERATING LEVEL (ILV/HR):

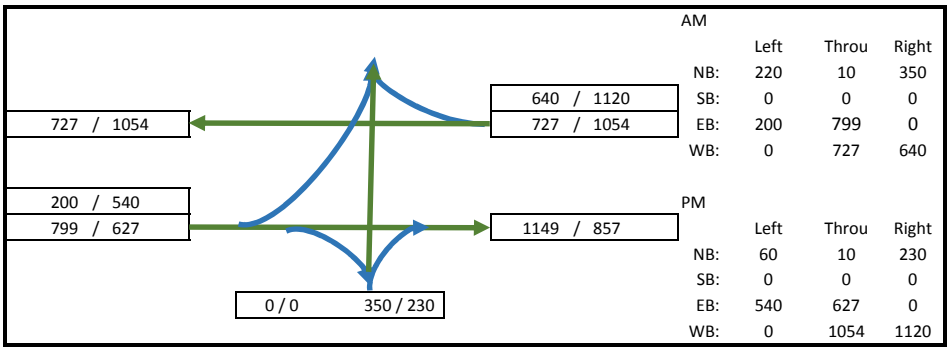
AM:	679	Under Capacity
PM:	721	Under Capacity

< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

SIGNALIZED INTERSECTION
CAPACITY ANALYSIS

INTERSECTION:	905 / Siempre Viva Road	DIST. CO. RTE	SR-905
ALTERNATIVE:	Near-Term + Project Conditions	PM:	
		DATE:	1/27/2016
		TIME:	

DEMAND TRAFFIC FLOWS



AM

	Left	Throu	Right
NB:	220	10	350
SB:	0	0	0
EB:	200	799	0
WB:	0	727	640

PM

	Left	Throu	Right
NB:	60	10	230
SB:	0	0	0
EB:	540	627	0
WB:	0	1054	1120

LANE VOLUMES (ILV/HR)

PHASE I

AM	100	**100 / 270**
PM	270	100 / 270
		266 / 209
		266 / 209
		266 / 209

PHASE II

AM	562	320 / 560
PM	911	**562 / 911**
		242 / 351
Remaining EB		242 / 351
Through	**166 / 0**	

PHASE III

AM	230	**230 / 70**	175 / 115	**175 / 115**
PM	115			

PHASE IV

CRITICAL LANE VOLUMES PER HOUR

AM	PHASE II
892	1296

TOTAL OPERATING LEVEL (ILV/HR):

AM:	892	Under Capacity
PM:	1296	At Capacity

< 1,200 ILV/HR	**Under Capacity**
> 1,200 BUT < 1,500 ILV/HR	**At Capacity**
> 1,500 ILV/HR (CAPACITY)	**Over Capacity**

Appendix K
Improvements Worksheets, Triggers, Fair share calculations, and Signal Warrants
- Year 2025 Cumulative Plus Project Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	10	150	100	10	120	20	126	50	100	278	327
Future Volume (vph)	205	10	150	100	10	120	20	126	50	100	278	327
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.95	0.95		1.00	0.91		1.00	0.91		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.88		1.00	0.86		1.00	0.96		1.00	0.92	
Flt Protected	0.95	0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1633	1496		1641	4023		1719	4488		1641	3062	
Flt Permitted	0.95	0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1633	1496		1641	4023		1719	4488		1641	3062	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	11	163	109	11	130	22	137	54	109	302	355
RTOR Reduction (vph)	0	127	0	0	113	0	0	41	0	0	246	0
Lane Group Flow (vph)	201	69	0	109	28	0	22	150	0	109	411	0
Confl. Peds. (#/hr)	1					1	6		1	1		6
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	10%	5%	10%	5%	10%	10%	10%	10%	5%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.7	12.7		7.4	7.4		1.2	13.3		5.4	17.5	
Effective Green, g (s)	12.7	12.7		7.4	7.4		1.2	13.3		5.4	17.5	
Actuated g/C Ratio	0.22	0.22		0.13	0.13		0.02	0.23		0.10	0.31	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	365	334		213	524		36	1050		156	943	
v/s Ratio Prot	c0.12	0.05		c0.07	0.01		0.01	0.03		c0.07	c0.13	
v/s Ratio Perm												
v/c Ratio	0.55	0.21		0.51	0.05		0.61	0.14		0.70	0.44	
Uniform Delay, d1	19.5	18.0		23.0	21.6		27.6	17.2		24.9	15.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.3		2.1	0.0		27.0	0.1		12.8	0.3	
Delay (s)	21.3	18.3		25.1	21.7		54.5	17.3		37.7	16.0	
Level of Service	C	B		C	C		D	B		D	B	
Approach Delay (s)		19.8			23.2			21.1			19.1	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	56.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	200	100	100	812	1766	60
Future Volume (vph)	200	100	100	812	1766	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	4715	4715	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	4715	4715	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	109	109	883	1920	65
RTOR Reduction (vph)	0	87	0	0	0	31
Lane Group Flow (vph)	217	22	109	883	1920	34
Confl. Peds. (#/hr)			1			
Heavy Vehicles (%)	2%	2%	2%	10%	10%	2%
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	13.0	13.0	5.1	43.9	34.3	34.3
Effective Green, g (s)	13.0	13.0	5.1	43.9	34.3	34.3
Actuated g/C Ratio	0.20	0.20	0.08	0.67	0.52	0.52
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	349	312	136	3140	2454	823
v/s Ratio Prot	c0.12		c0.06	0.19	c0.41	
v/s Ratio Perm		0.01				0.02
v/c Ratio	0.62	0.07	0.80	0.28	0.78	0.04
Uniform Delay, d1	24.2	21.5	29.9	4.5	12.8	7.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.4	0.1	27.7	0.0	1.7	0.0
Delay (s)	27.6	21.6	57.6	4.6	14.5	7.8
Level of Service	C	C	E	A	B	A
Approach Delay (s)	25.6			10.4	14.3	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	65.9	Sum of lost time (s)	13.5
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	30	256	732	850	60	40
Future Volume (vph)	30	256	732	850	60	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.0	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.94	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1641	1468	1641	4715	4407	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1641	1468	1641	4715	4407	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	278	796	924	65	43
RTOR Reduction (vph)	0	278	0	0	39	0
Lane Group Flow (vph)	33	0	796	924	69	0
Confl. Peds. (#/hr)			3			3
Turn Type	Prot	custom	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	2.8	0.0	40.7	51.8	6.6	
Effective Green, g (s)	2.8	0.0	40.7	51.8	6.6	
Actuated g/C Ratio	0.04	0.00	0.64	0.81	0.10	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	72	0	1050	3840	457	
v/s Ratio Prot	c0.02		c0.49	c0.20	0.02	
v/s Ratio Perm						
v/c Ratio	0.46	0.00	0.76	0.24	0.15	
Uniform Delay, d1	29.7	31.8	8.0	1.4	26.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.6	0.0	3.2	0.0	0.2	
Delay (s)	34.2	31.8	11.2	1.4	26.1	
Level of Service	C	C	B	A	C	
Approach Delay (s)	32.1			5.9	26.1	
Approach LOS	C			A	C	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	63.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	1079	150	208	1124	532	200	50	126	505	100	300
Future Volume (vph)	200	1079	150	208	1124	532	200	50	126	505	100	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	0.88	1.00	1.00		0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	4715	1468	3183	4715	2584	1641	1541		3183	4715	1468
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	4715	1468	3183	4715	2584	1641	1541		3183	4715	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	1173	163	226	1222	578	217	54	137	549	109	326
RTOR Reduction (vph)	0	0	109	0	0	372	0	94	0	0	0	88
Lane Group Flow (vph)	217	1173	54	226	1222	206	217	97	0	549	109	238
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	9.0	31.7	31.7	9.0	32.0	32.0	16.5	13.0		20.1	16.6	25.6
Effective Green, g (s)	9.0	31.7	31.7	9.0	32.0	32.0	16.5	13.0		20.1	16.6	25.6
Actuated g/C Ratio	0.09	0.33	0.33	0.09	0.34	0.34	0.17	0.14		0.21	0.17	0.27
Clearance Time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Vehicle Extension (s)	2.0	4.1	4.1	2.0	4.5	4.5	2.0	4.3		2.0	3.7	2.0
Lane Grp Cap (vph)	301	1571	489	301	1586	869	284	210		672	823	395
v/s Ratio Prot	0.07	0.25		c0.07	c0.26		0.13	0.06		c0.17	0.02	c0.06
v/s Ratio Perm			0.04			0.08						0.10
v/c Ratio	0.72	0.75	0.11	0.75	0.77	0.24	0.76	0.46		0.82	0.13	0.60
Uniform Delay, d1	41.8	28.1	21.9	42.0	28.3	22.7	37.4	37.8		35.7	33.2	30.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.0	2.1	0.1	9.0	2.7	0.2	10.5	2.5		7.2	0.1	1.8
Delay (s)	48.9	30.3	22.1	51.0	30.9	23.0	47.9	40.4		43.0	33.3	32.1
Level of Service	D	C	C	D	C	C	D	D		D	C	C
Approach Delay (s)		32.0			30.9			44.4			38.3	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	33.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	95.1	Sum of lost time (s)	21.3
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1620	440	234	1370	310	411
Future Volume (vph)	1620	440	234	1370	310	411
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	3183	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	3183	4715	3183	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1761	478	254	1489	337	447
RTOR Reduction (vph)	0	246	0	0	0	212
Lane Group Flow (vph)	1761	232	254	1489	337	235
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	38.8	38.8	10.3	53.1	16.4	16.4
Effective Green, g (s)	38.8	38.8	10.3	53.1	16.4	16.4
Actuated g/C Ratio	0.48	0.48	0.13	0.66	0.20	0.20
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	2286	711	409	3129	652	300
v/s Ratio Prot	c0.37		c0.08	0.32	0.11	
v/s Ratio Perm		0.16				c0.16
v/c Ratio	0.77	0.33	0.62	0.48	0.52	0.78
Uniform Delay, d1	16.9	12.6	33.0	6.6	28.3	30.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	1.2	2.1	0.5	0.3	11.6
Delay (s)	19.5	13.8	35.1	7.1	28.6	41.7
Level of Service	B	B	D	A	C	D
Approach Delay (s)	18.3			11.2	36.0	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	5	925	0	0	0	0	947	149	140	772	0
Future Volume (vph)	200	5	925	0	0	0	0	947	149	140	772	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1					5.1		4.7	5.1	
Lane Util. Factor		1.00	0.88					0.95		0.97	0.91	
Frpb, ped/bikes		1.00	1.00					1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00		1.00	1.00	
Frt		1.00	0.85					0.98		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1647	2584					3215		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1647	2584					3215		3183	4715	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	5	1005	0	0	0	0	1029	162	152	839	0
RTOR Reduction (vph)	0	0	202	0	0	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	222	803	0	0	0	0	1181	0	152	839	0
Confl. Bikes (#/hr)												2
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		42.2	42.2					51.8		6.4	62.9	
Effective Green, g (s)		42.2	42.2					51.8		6.4	62.9	
Actuated g/C Ratio		0.37	0.37					0.45		0.06	0.55	
Clearance Time (s)		5.1	5.1					5.1		4.7	5.1	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		602	945					1444		176	2572	
v/s Ratio Prot								c0.37		c0.05	0.18	
v/s Ratio Perm		0.13	c0.31									
v/c Ratio		0.37	0.85					0.82		0.86	0.33	
Uniform Delay, d1		26.8	33.6					27.6		54.0	14.5	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.4	7.2					3.7		32.8	0.1	
Delay (s)		27.2	40.9					31.4		86.8	14.6	
Level of Service		C	D					C		F	B	
Approach Delay (s)		38.4			0.0			31.4			25.6	
Approach LOS		D			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	115.3	Sum of lost time (s)	14.9
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1344	273	102	110	358	160	65	230	30	480	625	887
Future Volume (vph)	1344	273	102	110	358	160	65	230	30	480	625	887
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.4	4.4	5.1	4.4	4.4	4.9	4.4	4.4	5.1	4.4
Lane Util. Factor	0.97	0.91	1.00	0.97	0.95	0.88	0.97	0.91	1.00	0.97	0.91	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3183	4715	1468	3183	3282	2559	3183	4715	1455	3183	4715	2584
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3183	4715	1468	3183	3282	2559	3183	4715	1455	3183	4715	2584
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1461	297	111	120	389	174	71	250	33	522	679	964
RTOR Reduction (vph)	0	0	35	0	0	87	0	0	27	0	0	38
Lane Group Flow (vph)	1461	297	76	120	389	87	71	250	6	522	679	926
Confl. Peds. (#/hr)	1					1			2			
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases			2			6			8			4
Actuated Green, G (s)	58.6	67.9	74.7	8.9	18.0	39.6	6.8	12.9	21.8	21.6	27.5	86.1
Effective Green, g (s)	58.6	67.9	74.7	8.9	18.0	39.6	6.8	12.9	21.8	21.6	27.5	86.1
Actuated g/C Ratio	0.45	0.52	0.58	0.07	0.14	0.30	0.05	0.10	0.17	0.17	0.21	0.66
Clearance Time (s)	4.4	4.9	4.4	4.4	5.1	4.4	4.4	4.9	4.4	4.4	5.1	4.4
Vehicle Extension (s)	2.0	3.8	2.0	2.0	3.8	2.0	2.0	3.8	2.0	2.0	3.8	2.0
Lane Grp Cap (vph)	1435	2464	844	218	454	780	166	468	244	529	998	1712
v/s Ratio Prot	c0.46	0.06	0.00	0.04	c0.12	0.02	0.02	0.05	0.00	c0.16	c0.14	0.24
v/s Ratio Perm			0.05			0.02			0.00			0.11
v/c Ratio	1.02	0.12	0.09	0.55	0.86	0.11	0.43	0.53	0.02	0.99	0.68	0.54
Uniform Delay, d1	35.7	15.8	12.4	58.6	54.7	32.5	59.7	55.6	45.2	54.0	47.2	11.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.4	0.0	0.0	1.7	15.1	0.0	0.6	1.4	0.0	35.3	2.1	0.2
Delay (s)	64.0	15.8	12.4	60.3	69.8	32.5	60.3	57.1	45.2	89.3	49.2	11.7
Level of Service	E	B	B	E	E	C	E	E	D	F	D	B
Approach Delay (s)		53.3			58.6			56.6			42.2	
Approach LOS		D			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	49.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	129.9	Sum of lost time (s)	19.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	341	25	70	254	70	10	88	10	40	244	80
Future Volume (vph)	50	341	25	70	254	70	10	88	10	40	244	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4662		1641	4550		1641	1701		3183	3139	
Flt Permitted	0.53	1.00		0.13	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	920	4662		227	4550		1641	1701		3183	3139	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	371	27	76	276	76	11	96	11	43	265	87
RTOR Reduction (vph)	0	7	0	0	38	0	0	4	0	0	34	0
Lane Group Flow (vph)	54	391	0	76	314	0	11	103	0	43	318	0
Confl. Peds. (#/hr)			1	1								2
Confl. Bikes (#/hr)			2			1						1
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		2			1		3	8		7	4	
Permitted Phases	2			1								
Actuated Green, G (s)	13.4	13.4		30.5	30.5		0.7	14.5		2.2	16.0	
Effective Green, g (s)	13.4	13.4		30.5	30.5		0.7	14.5		2.2	16.0	
Actuated g/C Ratio	0.17	0.17		0.38	0.38		0.01	0.18		0.03	0.20	
Clearance Time (s)	4.9	4.9		4.9	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	4.8	4.8		4.8	4.8		2.0	3.3		2.0	4.4	
Lane Grp Cap (vph)	154	783		86	1741		14	309		87	630	
v/s Ratio Prot		c0.08			0.07		0.01	0.06		c0.01	c0.10	
v/s Ratio Perm	0.06			c0.34								
v/c Ratio	0.35	0.50		0.88	0.18		0.79	0.33		0.49	0.51	
Uniform Delay, d1	29.3	30.1		22.9	16.3		39.4	28.4		38.2	28.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.7	1.0		62.8	0.1		123.8	0.7		1.6	1.1	
Delay (s)	32.0	31.1		85.7	16.4		163.3	29.1		39.8	29.4	
Level of Service	C	C		F	B		F	C		D	C	
Approach Delay (s)		31.2			28.7			41.6			30.5	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	79.7	Sum of lost time (s)	19.1
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	339	507	260	400	275	170	100	250	840	100	400	218
Future Volume (vph)	339	507	260	400	275	170	100	250	840	100	400	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.88		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4715	1443	1641	4445		1641	2868		3183	3108	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	4715	1443	1641	4445		1641	2868		3183	3108	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	368	551	283	435	299	185	109	272	913	109	435	237
RTOR Reduction (vph)	0	0	172	0	108	0	0	349	0	0	65	0
Lane Group Flow (vph)	368	551	111	435	376	0	109	836	0	109	607	0
Confl. Peds. (#/hr)			3						3			
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	26.3	20.1	20.1	27.8	21.6		11.0	34.4		7.8	32.1	
Effective Green, g (s)	26.3	20.1	20.1	27.8	21.6		11.0	34.4		7.8	32.1	
Actuated g/C Ratio	0.24	0.18	0.18	0.25	0.20		0.10	0.31		0.07	0.29	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	392	861	263	414	872		164	896		225	906	
v/s Ratio Prot	0.22	c0.12		c0.27	0.08		c0.07	c0.29		0.03	0.20	
v/s Ratio Perm			0.08									
v/c Ratio	0.94	0.64	0.42	1.05	0.43		0.66	1.14dr		0.48	0.67	
Uniform Delay, d1	41.1	41.6	39.8	41.1	38.8		47.7	36.7		49.2	34.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	29.6	3.6	4.9	58.2	1.6		7.6	16.2		0.6	2.6	
Delay (s)	70.7	45.2	44.7	99.3	40.4		55.3	52.9		49.8	36.9	
Level of Service	E	D	D	F	D		E	D		D	D	
Approach Delay (s)		52.9			68.2			53.1			38.7	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	53.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↱
Traffic Volume (vph)	0	999	945	0	0	500
Future Volume (vph)	0	999	945	0	0	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5			4.5
Lane Util. Factor		0.91	0.91			1.00
Frt		1.00	1.00			0.86
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		4715	4715			1494
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		4715	4715			1494
Peak-hour factor, PHF	0.85	0.85	0.89	0.89	0.73	0.73
Adj. Flow (vph)	0	1175	1062	0	0	685
RTOR Reduction (vph)	0	0	0	0	0	7
Lane Group Flow (vph)	0	1175	1062	0	0	678
Turn Type		NA	NA			Perm
Protected Phases		4	8			
Permitted Phases						6
Actuated Green, G (s)		17.7	17.7			26.1
Effective Green, g (s)		17.7	17.7			26.1
Actuated g/C Ratio		0.34	0.34			0.49
Clearance Time (s)		4.5	4.5			4.5
Vehicle Extension (s)		3.0	3.0			3.0
Lane Grp Cap (vph)		1580	1580			738
v/s Ratio Prot		c0.25	0.23			
v/s Ratio Perm						c0.45
v/c Ratio		0.74	0.67			0.92
Uniform Delay, d1		15.5	15.1			12.4
Progression Factor		1.00	1.00			1.00
Incremental Delay, d2		1.9	1.1			16.3
Delay (s)		17.5	16.2			28.7
Level of Service		B	B			C
Approach Delay (s)		17.5	16.2		28.7	
Approach LOS		B	B		C	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	52.8	Sum of lost time (s)	9.0
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	100	1365	483	30	100	19
Future Volume (vph)	100	1365	483	30	100	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00	0.91		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1641	1727	4674		1641	1468
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1641	1727	4674		1641	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	1484	525	33	109	21
RTOR Reduction (vph)	0	0	4	0	0	19
Lane Group Flow (vph)	109	1484	554	0	109	2
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	14.5	122.6	103.6		14.5	14.5
Effective Green, g (s)	14.5	122.6	103.6		14.5	14.5
Actuated g/C Ratio	0.10	0.84	0.71		0.10	0.10
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	162	1449	3314		162	145
v/s Ratio Prot	0.07	c0.86	0.12		c0.07	
v/s Ratio Perm						0.00
v/c Ratio	0.67	1.02	0.17		0.67	0.01
Uniform Delay, d1	63.5	11.8	7.0		63.5	59.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	10.5	30.0	0.0		10.5	0.0
Delay (s)	74.0	41.7	7.0		74.0	59.4
Level of Service	E	D	A		E	E
Approach Delay (s)		43.9	7.0		71.6	
Approach LOS		D	A		E	

Intersection Summary			
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	146.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	299	10	100	100	10	300	40	347	40	100	190	379
Future Volume (vph)	299	10	100	100	10	300	40	347	40	100	190	379
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.95	0.95		1.00	0.91		1.00	0.91		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.85		1.00	0.98		1.00	0.90	
Flt Protected	0.95	0.98		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1633	1555		1641	3985		1641	4829		1641	3018	
Flt Permitted	0.95	0.98		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1633	1555		1641	3985		1641	4829		1641	3018	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	325	11	109	109	11	326	43	377	43	109	207	412
RTOR Reduction (vph)	0	45	0	0	240	0	0	18	0	0	297	0
Lane Group Flow (vph)	227	173	0	109	97	0	43	402	0	109	322	0
Confl. Peds. (#/hr)							2		2	2		2
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	10%	5%	10%	10%	5%	10%	10%	10%	5%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	13.4	13.4		10.2	10.2		2.1	13.5		5.5	16.9	
Effective Green, g (s)	13.4	13.4		10.2	10.2		2.1	13.5		5.5	16.9	
Actuated g/C Ratio	0.22	0.22		0.17	0.17		0.03	0.22		0.09	0.28	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	361	343		276	670		56	1075		148	841	
v/s Ratio Prot	c0.14	0.11		c0.07	0.02		0.03	0.08		c0.07	c0.11	
v/s Ratio Perm												
v/c Ratio	0.63	0.50		0.39	0.15		0.77	0.37		0.74	0.38	
Uniform Delay, d1	21.4	20.7		22.5	21.5		29.0	20.0		26.8	17.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.4	1.2		0.9	0.1		46.0	0.2		17.3	0.3	
Delay (s)	24.8	21.9		23.4	21.6		75.1	20.2		44.1	17.9	
Level of Service	C	C		C	C		E	C		D	B	
Approach Delay (s)		23.3			22.0			25.3			21.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	110	90	320	1308	1332	330
Future Volume (vph)	110	90	320	1308	1332	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	4715	4715	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	4715	4715	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	98	348	1422	1448	359
RTOR Reduction (vph)	0	86	0	0	0	212
Lane Group Flow (vph)	120	12	348	1422	1448	147
Confl. Peds. (#/hr)			2			
Heavy Vehicles (%)	2%	2%	2%	10%	10%	2%
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	8.0	8.0	16.1	46.8	26.2	26.2
Effective Green, g (s)	8.0	8.0	16.1	46.8	26.2	26.2
Actuated g/C Ratio	0.13	0.13	0.25	0.73	0.41	0.41
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	221	198	446	3458	1936	650
v/s Ratio Prot	c0.07		c0.20	0.30	c0.31	
v/s Ratio Perm		0.01				0.09
v/c Ratio	0.54	0.06	0.78	0.41	0.75	0.23
Uniform Delay, d1	26.2	24.6	22.2	3.2	16.0	12.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	0.1	8.6	0.1	1.6	0.2
Delay (s)	28.9	24.7	30.8	3.3	17.6	12.4
Level of Service	C	C	C	A	B	B
Approach Delay (s)	27.0			8.7	16.6	
Approach LOS	C			A	B	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	63.8	Sum of lost time (s)	13.5
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	70	511	840	260	240	80
Future Volume (vph)	70	511	840	260	240	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1641	1468	1641	4715	4495	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1641	1468	1641	4715	4495	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	555	913	283	261	87
RTOR Reduction (vph)	0	491	0	0	58	0
Lane Group Flow (vph)	76	64	913	283	290	0
Confl. Peds. (#/hr)			10			10
Confl. Bikes (#/hr)						6
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	11.1	11.1	59.8	75.9	11.6	
Effective Green, g (s)	11.1	11.1	59.8	75.9	11.6	
Actuated g/C Ratio	0.12	0.12	0.62	0.79	0.12	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	189	169	1022	3727	543	
v/s Ratio Prot	c0.05		c0.56	0.06	c0.06	
v/s Ratio Perm		0.04				
v/c Ratio	0.40	0.38	0.89	0.08	0.53	
Uniform Delay, d1	39.4	39.3	15.4	2.2	39.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.4	1.4	10.1	0.0	1.0	
Delay (s)	40.8	40.7	25.4	2.2	40.7	
Level of Service	D	D	C	A	D	
Approach Delay (s)	40.7			20.0	40.7	
Approach LOS	D			B	D	

Intersection Summary			
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	96.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	1298	150	290	1321	761	200	100	166	564	100	400
Future Volume (vph)	250	1298	150	290	1321	761	200	100	166	564	100	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	0.88	1.00	1.00		0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	4715	1439	3183	4715	2497	1641	1548		3183	4715	1468
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	4715	1439	3183	4715	2497	1641	1548		3183	4715	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	1411	163	315	1436	827	217	109	180	613	109	435
RTOR Reduction (vph)	0	0	109	0	0	408	0	45	0	0	0	71
Lane Group Flow (vph)	272	1411	54	315	1436	419	217	244	0	613	109	364
Confl. Peds. (#/hr)						11			1			
Confl. Bikes (#/hr)			12			13			5			
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	12.0	43.5	43.5	14.1	45.9	45.9	21.2	26.4		25.1	30.3	42.3
Effective Green, g (s)	12.0	43.5	43.5	14.1	45.9	45.9	21.2	26.4		25.1	30.3	42.3
Actuated g/C Ratio	0.09	0.33	0.33	0.11	0.35	0.35	0.16	0.20		0.19	0.23	0.32
Clearance Time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Vehicle Extension (s)	2.0	4.1	4.1	2.0	4.5	4.5	2.0	4.3		2.0	3.7	2.0
Lane Grp Cap (vph)	292	1572	480	344	1659	878	266	313		612	1095	476
v/s Ratio Prot	0.09	0.30		c0.10	c0.30		0.13	0.16		c0.19	0.02	c0.07
v/s Ratio Perm			0.04			0.17						0.18
v/c Ratio	0.93	0.90	0.11	0.92	0.87	0.48	0.82	0.78		1.00	0.10	0.76
Uniform Delay, d1	58.8	41.3	30.1	57.6	39.4	32.9	52.7	49.2		52.7	39.3	39.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	34.5	7.4	0.2	27.6	5.3	0.7	16.5	12.6		36.8	0.1	6.5
Delay (s)	93.3	48.7	30.2	85.1	44.7	33.6	69.2	61.8		89.4	39.4	46.1
Level of Service	F	D	C	F	D	C	E	E		F	D	D
Approach Delay (s)		53.6			46.1			65.0			68.4	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	54.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.4	Sum of lost time (s)	21.3
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1560	490	380	1700	660	445
Future Volume (vph)	1560	490	380	1700	660	445
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	3183	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	3183	4715	3183	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1696	533	413	1848	717	484
RTOR Reduction (vph)	0	250	0	0	0	329
Lane Group Flow (vph)	1696	283	413	1848	717	155
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	52.2	52.2	21.6	77.8	41.7	41.7
Effective Green, g (s)	52.2	52.2	21.6	77.8	41.7	41.7
Actuated g/C Ratio	0.40	0.40	0.17	0.60	0.32	0.32
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	1893	589	528	2821	1021	470
v/s Ratio Prot	c0.36		c0.13	0.39	c0.23	
v/s Ratio Perm		0.19				0.11
v/c Ratio	0.90	0.48	0.78	0.66	0.70	0.33
Uniform Delay, d1	36.4	28.9	51.9	17.2	38.7	33.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.1	2.8	6.9	1.2	1.8	0.2
Delay (s)	43.5	31.7	58.8	18.4	40.5	33.7
Level of Service	D	C	E	B	D	C
Approach Delay (s)	40.6			25.8	37.8	
Approach LOS	D			C	D	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	10	955	0	0	0	0	1110	273	180	790	0
Future Volume (vph)	225	10	955	0	0	0	0	1110	273	180	790	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1					5.1		4.7	5.1	
Lane Util. Factor		1.00	0.88					0.95		0.97	0.91	
Frt		1.00	0.85					0.97		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1648	2584					3185		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1648	2584					3185		3183	4715	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	11	1038	0	0	0	0	1207	297	196	859	0
RTOR Reduction (vph)	0	0	184	0	0	0	0	18	0	0	0	0
Lane Group Flow (vph)	0	256	854	0	0	0	0	1486	0	196	859	0
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		39.9	39.9					56.7		8.5	69.9	
Effective Green, g (s)		39.9	39.9					56.7		8.5	69.9	
Actuated g/C Ratio		0.33	0.33					0.47		0.07	0.58	
Clearance Time (s)		5.1	5.1					5.1		4.7	5.1	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		547	859					1504		225	2746	
v/s Ratio Prot								c0.47		c0.06	0.18	
v/s Ratio Perm		0.16	c0.33									
v/c Ratio		0.47	0.99					0.99		0.87	0.31	
Uniform Delay, d1		31.7	39.9					31.3		55.2	12.8	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.6	29.0					20.2		28.7	0.1	
Delay (s)		32.3	69.0					51.5		83.9	12.9	
Level of Service		C	E					D		F	B	
Approach Delay (s)		61.7			0.0			51.5			26.0	
Approach LOS		E			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	48.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1101	235	114	215	420	370	98	360	50	220	585	1674
Future Volume (vph)	1101	235	114	215	420	370	98	360	50	220	585	1674
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.4	4.4	5.1	4.4	4.4	4.9	4.4	4.4	5.1	4.4
Lane Util. Factor	0.97	0.91	1.00	0.97	0.95	0.88	0.97	0.91	1.00	0.97	0.91	0.88
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3183	4715	1456	3183	3282	2548	3183	4715	1468	3183	4715	2575
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3183	4715	1456	3183	3282	2548	3183	4715	1468	3183	4715	2575
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1197	255	124	234	457	402	107	391	54	239	636	1820
RTOR Reduction (vph)	0	0	68	0	0	65	0	0	19	0	0	38
Lane Group Flow (vph)	1197	255	56	234	457	337	107	391	35	239	636	1782
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						1
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases			2			6			8			4
Actuated Green, G (s)	63.0	13.3	21.8	66.8	16.9	31.4	8.5	17.7	84.5	14.5	23.5	86.5
Effective Green, g (s)	63.0	13.3	21.8	66.8	16.9	31.4	8.5	17.7	84.5	14.5	23.5	86.5
Actuated g/C Ratio	0.48	0.10	0.17	0.51	0.13	0.24	0.06	0.14	0.65	0.11	0.18	0.66
Clearance Time (s)	4.4	4.9	4.4	4.4	5.1	4.4	4.4	4.9	4.4	4.4	5.1	4.4
Vehicle Extension (s)	2.0	3.8	2.0	2.0	3.8	2.0	2.0	3.8	2.0	2.0	3.8	2.0
Lane Grp Cap (vph)	1531	479	242	1624	423	611	206	637	947	352	846	1701
v/s Ratio Prot	0.38	0.05	0.01	c0.07	c0.14	0.06	0.03	0.08	0.02	c0.08	0.13	c0.50
v/s Ratio Perm			0.02			0.07			0.00			0.19
v/c Ratio	0.78	0.53	0.23	0.14	1.08	0.55	0.52	0.61	0.04	0.68	0.75	1.05
Uniform Delay, d1	28.2	55.8	47.3	16.9	57.0	43.6	59.2	53.4	8.4	56.0	50.9	22.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	1.4	0.2	0.0	67.0	0.6	0.9	1.9	0.0	4.1	4.0	35.5
Delay (s)	30.7	57.2	47.5	17.0	124.0	44.2	60.1	55.3	8.4	60.0	54.9	57.7
Level of Service	C	E	D	B	F	D	E	E	A	E	D	E
Approach Delay (s)		36.3			71.7			51.7			57.2	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	53.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	130.9	Sum of lost time (s)	19.0
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	385	35	75	436	80	10	164	10	30	207	40
Future Volume (vph)	140	385	35	75	436	80	10	164	10	30	207	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4657		1641	4595		1641	1712		3183	3187	
Flt Permitted	0.43	1.00		0.13	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	745	4657		227	4595		1641	1712		3183	3187	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	418	38	82	474	87	11	178	11	33	225	43
RTOR Reduction (vph)	0	9	0	0	22	0	0	2	0	0	17	0
Lane Group Flow (vph)	152	447	0	82	539	0	11	187	0	33	251	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						5						5
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		2			1		3	8		7	4	
Permitted Phases	2			1								
Actuated Green, G (s)	23.0	23.0		30.4	30.4		0.7	16.8		2.2	18.3	
Effective Green, g (s)	23.0	23.0		30.4	30.4		0.7	16.8		2.2	18.3	
Actuated g/C Ratio	0.25	0.25		0.33	0.33		0.01	0.18		0.02	0.20	
Clearance Time (s)	4.9	4.9		4.9	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	4.8	4.8		4.8	4.8		2.0	3.3		2.0	4.4	
Lane Grp Cap (vph)	187	1170		75	1526		12	314		76	637	
v/s Ratio Prot		0.10			0.12		0.01	c0.11		c0.01	0.08	
v/s Ratio Perm	c0.20			c0.36								
v/c Ratio	0.81	0.38		1.09	0.35		0.92	0.59		0.43	0.39	
Uniform Delay, d1	32.2	28.4		30.6	23.1		45.4	34.2		44.0	31.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	25.2	0.4		131.7	0.3		209.7	3.1		1.4	0.7	
Delay (s)	57.4	28.8		162.2	23.4		255.1	37.3		45.5	32.5	
Level of Service	E	C		F	C		F	D		D	C	
Approach Delay (s)		35.9			41.1			49.3			33.9	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	39.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	91.5	Sum of lost time (s)	19.1
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	304	200	550	488	150	100	200	600	100	350	194
Future Volume (vph)	127	304	200	550	488	150	100	200	600	100	350	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.89		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4715	1446	1641	4549		1641	2880		3183	3106	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	4715	1446	1641	4549		1641	2880		3183	3106	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	330	217	598	530	163	109	217	652	109	380	211
RTOR Reduction (vph)	0	0	184	0	36	0	0	367	0	0	49	0
Lane Group Flow (vph)	138	330	33	598	657	0	109	502	0	109	542	0
Confl. Peds. (#/hr)									1			
Confl. Bikes (#/hr)			2						2			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	16.6	23.0	23.0	60.5	66.9		14.7	36.4		10.2	32.8	
Effective Green, g (s)	16.6	23.0	23.0	60.5	66.9		14.7	36.4		10.2	32.8	
Actuated g/C Ratio	0.11	0.15	0.15	0.40	0.45		0.10	0.24		0.07	0.22	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	181	722	221	661	2028		160	698		216	679	
v/s Ratio Prot	0.08	c0.07		c0.36	0.14		c0.07	0.17		0.03	c0.17	
v/s Ratio Perm			0.02									
v/c Ratio	0.76	0.46	0.15	0.90	0.32		0.68	0.91dr		0.50	0.80	
Uniform Delay, d1	64.8	57.8	55.0	42.0	26.9		65.4	52.1		67.5	55.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.6	2.1	1.4	15.6	0.4		9.1	3.6		0.7	7.6	
Delay (s)	80.4	59.9	56.5	57.6	27.3		74.5	55.7		68.1	63.0	
Level of Service	F	E	E	E	C		E	E		E	E	
Approach Delay (s)		62.9			41.3			57.8			63.8	
Approach LOS		E			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	54.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1167	1114	0	0	400
Future Volume (vph)	0	1167	1114	0	0	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5			4.5
Lane Util. Factor		0.91	0.91			1.00
Frt		1.00	1.00			0.86
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		4715	4715			1494
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		4715	4715			1494
Peak-hour factor, PHF	0.82	0.82	0.87	0.87	0.91	0.91
Adj. Flow (vph)	0	1423	1280	0	0	440
RTOR Reduction (vph)	0	0	0	0	0	7
Lane Group Flow (vph)	0	1423	1280	0	0	433
Turn Type		NA	NA			Perm
Protected Phases		4	8			
Permitted Phases						6
Actuated Green, G (s)		23.7	23.7			20.4
Effective Green, g (s)		23.7	23.7			20.4
Actuated g/C Ratio		0.45	0.45			0.38
Clearance Time (s)		4.5	4.5			4.5
Vehicle Extension (s)		3.0	3.0			3.0
Lane Grp Cap (vph)		2104	2104			573
v/s Ratio Prot		c0.30	0.27			
v/s Ratio Perm						c0.29
v/c Ratio		0.68	0.61			0.75
Uniform Delay, d1		11.7	11.2			14.2
Progression Factor		1.00	1.00			1.00
Incremental Delay, d2		0.9	0.5			5.6
Delay (s)		12.5	11.7			19.8
Level of Service		B	B			B
Approach Delay (s)		12.5	11.7		19.8	
Approach LOS		B	B		B	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	53.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	100	1062	1916	87	70	15
Future Volume (vph)	100	1062	1916	87	70	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00	0.91		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1641	1727	4685		1641	1468
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1641	1727	4685		1641	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	1154	2083	95	76	16
RTOR Reduction (vph)	0	0	5	0	0	14
Lane Group Flow (vph)	109	1154	2173	0	76	2
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	7.0	59.7	48.2		9.1	9.1
Effective Green, g (s)	7.0	59.7	48.2		9.1	9.1
Actuated g/C Ratio	0.09	0.77	0.62		0.12	0.12
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	147	1325	2902		191	171
v/s Ratio Prot	0.07	c0.67	0.46		c0.05	
v/s Ratio Perm						0.00
v/c Ratio	0.74	0.87	0.75		0.40	0.01
Uniform Delay, d1	34.5	6.3	10.5		31.8	30.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	18.1	6.5	1.1		1.4	0.0
Delay (s)	52.6	12.9	11.6		33.2	30.4
Level of Service	D	B	B		C	C
Approach Delay (s)		16.3	11.6		32.7	
Approach LOS		B	B		C	

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	77.8	Sum of lost time (s)	13.5
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection No.	6	Peak:	PM		Green = Manual Input			Control Type		AWSC	Base Delay	47.2
Project's Total Daily Trip Generation - Table 3.1 **[a]**	40126								SI Type	+2 sec	Max Delay	49.2
External Peak Hour Trip Generation - Table 3.1 **[b]**	In	2201	Out	1345								
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
NT + P Peak Hour Turning Movements Volumes - Figure 8-4 **[c]**	40	347	40	100	190	379	299	10	100	100	10	100
Project Trip Assignment - Figure 3-4 **[d]**	0	66	0	0	40	54	88	0	0	0	0	0
Type of Turning Movement **[e]**		in			out	out	in					
Base Volume (c - d) **[f]**	40	281	40	100	150	325	211	10	100	100	10	100
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[g]**	2599		Delay (from Synchro)	49.2	LOS (from Synchro)	E						
Percent Reduction in Trip Gen. (g / a) **[h]**	93.5%											
Trip Assignment after Trip Gen reduction (d - h * d) **[i]**	0	4	0	0	3	3	6	0	0	0	0	0
Base Volume + Reduced Trip Assignment (f + i)	40	285	40	100	153	328	217	10	100	100	10	100
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[j]**	217	10	100	100	10	100	40	285	40	100	153	328
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Trigger ADT **[k]**	**2600**		Delay (from Synchro)	49.2	LOS (from Synchro)	E						
Percent Reduction in Trip Gen. (k / a) **[L]**	93.5%											
Trip Assignment after Trip Gen reduction (d - L * d) **[m]**	0	4	0	0	3	3	6	0	0	0	0	0
Base Volume + Reduced Trip Assignment (f + m)	40	285	40	100	153	328	217	10	100	100	10	100
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[n]**	217	10	100	100	10	100	40	285	40	100	153	328
Change when compare to previous ADT (n - j) **[o]**	0	0	0	0	0	0	0	0	0	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[p]**	2601		Delay (from Synchro)	49.5	LOS (from Synchro)	E						
Percent Reduction in Trip Gen. (p / a) **[q]**	93.5%											
Trip Assignment after Trip Gen reduction (d - q * d) **[r]**	0	4	0	0	3	4	6	0	0	0	0	0
Base Volume + Reduced Trip Assignment (f + r)	40	285	40	100	153	329	217	10	100	100	10	100
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[s]**	217	10	100	100	10	100	40	285	40	100	153	329
Change when compare to previous ADT (s - n) **[t]**	0	0	0	0	0	0	0	0	0	0	0	1

HCM Unsignalized Intersection Capacity Analysis
6: Caliente Avenue & Airway Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	217	10	100	100	10	300	40	285	40	100	153	328
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	236	11	109	109	11	326	43	310	43	109	166	357

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	157	198	109	337	43	353	109	523
Volume Left (vph)	157	79	109	0	43	0	109	0
Volume Right (vph)	0	109	0	326	0	43	0	357
Hadj (s)	0.58	-0.10	0.67	-0.51	0.67	0.01	0.67	-0.37
Departure Headway (s)	9.2	8.5	9.1	7.9	9.0	8.4	8.8	7.8
Degree Utilization, x	0.40	0.47	0.27	0.74	0.11	0.82	0.27	1.0
Capacity (veh/h)	373	402	387	443	388	421	399	473
Control Delay (s)	17.0	17.6	14.2	29.2	11.9	39.0	13.8	108.4
Approach Delay (s)	17.3		25.6		36.1		92.2	
Approach LOS	C		D		E		F	

Intersection Summary			
Delay	49.2		
Level of Service	E		
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Caliente Avenue & Airway Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	217	10	100	100	10	300	40	285	40	100	153	328
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	236	11	109	109	11	326	43	310	43	109	166	357

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	157	198	109	337	43	353	109	523
Volume Left (vph)	157	79	109	0	43	0	109	0
Volume Right (vph)	0	109	0	326	0	43	0	357
Hadj (s)	0.58	-0.10	0.67	-0.51	0.67	0.01	0.67	-0.37
Departure Headway (s)	9.2	8.5	9.1	7.9	9.0	8.4	8.8	7.8
Degree Utilization, x	0.40	0.47	0.27	0.74	0.11	0.82	0.27	1.0
Capacity (veh/h)	373	402	387	443	388	421	399	473
Control Delay (s)	17.0	17.6	14.2	29.2	11.9	39.0	13.8	108.4
Approach Delay (s)	17.3		25.6		36.1		92.2	
Approach LOS	C		D		E		F	

Intersection Summary			
Delay	49.2		
Level of Service	E		
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Caliente Avenue & Airway Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	217	10	100	100	10	300	40	285	40	100	153	329
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	236	11	109	109	11	326	43	310	43	109	166	358

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	157	198	109	337	43	353	109	524
Volume Left (vph)	157	79	109	0	43	0	109	0
Volume Right (vph)	0	109	0	326	0	43	0	358
Hadj (s)	0.58	-0.10	0.67	-0.51	0.67	0.01	0.67	-0.37
Departure Headway (s)	9.2	8.5	9.1	7.9	9.0	8.4	8.8	7.8
Degree Utilization, x	0.40	0.47	0.27	0.74	0.11	0.82	0.27	1.0
Capacity (veh/h)	373	402	387	443	388	421	399	473
Control Delay (s)	17.0	17.6	14.2	29.2	11.9	39.0	13.8	109.2
Approach Delay (s)	17.3		25.6		36.1		92.8	
Approach LOS	C		D		E		F	

Intersection Summary			
Delay	49.5		
Level of Service	E		
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

Intersection No.	8	Peak:	AM		Green = Manual Input			Control Type		AWSC	Base Delay	725.3
Project's Total Daily Trip Generation - Table 3.1 **[a]**	40126								SI Type	+1 sec	Max Delay	726.3
External Peak Hour Trip Generation - Table 3.1 **[b]**	In	876	Out	1931								
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
NT + P Peak Hour Turning Movements Volumes - Figure 8-4 **[c]**	100	812			1766	60	200		100			
Project Trip Assignment - Figure 3-4 **[d]**		212			96							
Type of Turning Movement **[e]**		out			in							
Base Volume (c - d) **[f]**	100	600	0	0	1670	60	200	0	100	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[g]**	3133		Delay (from Synchro)	725.7	LOS (from Synchro)	F						
Percent Reduction in Trip Gen. (g / a) **[h]**	92.2%											
Trip Assignment after Trip Gen reduction (d - h * d) **[i]**	0	17	0	0	7	0	0	0	0	0	0	0
Base Volume + Reduced Trip Assignment (f + i)	100	617	0	0	1677	60	200	0	100	0	0	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[j]**	200	0	100	0	0	0	100	617	0	0	1677	60
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Trigger ADT **[k]**	**3134**		Delay (from Synchro)	725.7	LOS (from Synchro)	F						
Percent Reduction in Trip Gen. (k / a) **[L]**	92.2%											
Trip Assignment after Trip Gen reduction (d - L * d) **[m]**	0	17	0	0	7	0	0	0	0	0	0	0
Base Volume + Reduced Trip Assignment (f + m)	100	617	0	0	1677	60	200	0	100	0	0	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[n]**	200	0	100	0	0	0	100	617	0	0	1677	60
Change when compare to previous ADT (n - j) **[o]**	0	0	0	0	0	0	0	0	0	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[p]**	3135		Delay (from Synchro)	726.4	LOS (from Synchro)	F						
Percent Reduction in Trip Gen. (p / a) **[q]**	92.2%											
Trip Assignment after Trip Gen reduction (d - q * d) **[r]**	0	17	0	0	8	0	0	0	0	0	0	0
Base Volume + Reduced Trip Assignment (f + r)	100	617	0	0	1678	60	200	0	100	0	0	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[s]**	200	0	100	0	0	0	100	617	0	0	1678	60
Change when compare to previous ADT (s - n) **[t]**	0	0	0	0	0	0	0	0	0	0	1	0

HCM Unsignalized Intersection Capacity Analysis
8: Heritage Road & Avenida De Las Vistas

4/28/2016

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	200	100	100	617	1677	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	217	109	109	671	1823	65

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	217	109	109	671	1823	65
Volume Left (vph)	217	0	109	0	0	0
Volume Right (vph)	0	109	0	0	0	65
Hadj (s)	0.53	-0.67	0.53	0.17	0.17	-0.67
Departure Headway (s)	8.1	7.0	7.1	6.8	6.9	6.0
Degree Utilization, x	0.49	0.21	0.22	1.0	1.0	0.11
Capacity (veh/h)	437	510	494	538	530	582
Control Delay (s)	17.6	10.6	10.9	154.0	1131.4	8.6
Approach Delay (s)	15.2		134.1		1092.6	
Approach LOS	C		F		F	

Intersection Summary			
Delay	725.7		
Level of Service	F		
Intersection Capacity Utilization	106.0%	ICU Level of Service	G
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
8: Heritage Road & Avenida De Las Vistas

4/28/2016

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	200	100	100	617	1677	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	217	109	109	671	1823	65

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	217	109	109	671	1823	65
Volume Left (vph)	217	0	109	0	0	0
Volume Right (vph)	0	109	0	0	0	65
Hadj (s)	0.53	-0.67	0.53	0.17	0.17	-0.67
Departure Headway (s)	8.1	7.0	7.1	6.8	6.9	6.0
Degree Utilization, x	0.49	0.21	0.22	1.0	1.0	0.11
Capacity (veh/h)	437	510	494	538	530	582
Control Delay (s)	17.6	10.6	10.9	154.0	1131.4	8.6
Approach Delay (s)	15.2		134.1		1092.6	
Approach LOS	C		F		F	

Intersection Summary			
Delay	725.7		
Level of Service	F		
Intersection Capacity Utilization	106.0%	ICU Level of Service	G
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
8: Heritage Road & Avenida De Las Vistas

4/28/2016

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	200	100	100	617	1678	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	217	109	109	671	1824	65

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	217	109	109	671	1824	65
Volume Left (vph)	217	0	109	0	0	0
Volume Right (vph)	0	109	0	0	0	65
Hadj (s)	0.53	-0.67	0.53	0.17	0.17	-0.67
Departure Headway (s)	8.1	7.0	7.1	6.8	6.9	6.0
Degree Utilization, x	0.49	0.21	0.22	1.0	1.0	0.11
Capacity (veh/h)	437	510	494	538	530	582
Control Delay (s)	17.6	10.6	10.9	154.0	1132.3	8.6
Approach Delay (s)	15.2		134.1		1093.5	
Approach LOS	C		F		F	

Intersection Summary			
Delay	726.4		
Level of Service	F		
Intersection Capacity Utilization	106.1%	ICU Level of Service	G
Analysis Period (min)	15		

Intersection No.	9	Peak:	AM		Green = Manual Input			Control Type		AWSC	Base Delay	119.6
Project's Total Daily Trip Generation - Table 3.1 **[a]**	40126								SI Type	+1 sec	Max Delay	120.6
External Peak Hour Trip Generation - Table 3.1 **[b]**	In	876	Out	1931								
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
NT + P Peak Hour Turning Movements Volumes - Figure 8-4 **[c]**	732	850			60	40	30		256			
Project Trip Assignment - Figure 3-4 **[d]**	212								96			
Type of Turning Movement **[e]**	out								in			
Base Volume (c - d) **[f]**	520	850	0	0	60	40	30	0	160	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[g]**	1418		Delay (from Synchro)	120.6	LOS (from Synchro)	F						
Percent Reduction in Trip Gen. (g / a) **[h]**	96.5%											
Trip Assignment after Trip Gen reduction (d - h * d) **[i]**	7	0	0	0	0	0	0	0	3	0	0	0
Base Volume + Reduced Trip Assignment (f + i)	527	850	0	0	60	40	30	0	163	0	0	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[j]**	30	0	163	0	0	0	527	850	0	0	60	40
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Trigger ADT **[k]**	**1419**		Delay (from Synchro)	120.6	LOS (from Synchro)	F						
Percent Reduction in Trip Gen. (k / a) **[L]**	96.5%											
Trip Assignment after Trip Gen reduction (d - L * d) **[m]**	7	0	0	0	0	0	0	0	3	0	0	0
Base Volume + Reduced Trip Assignment (f + m)	527	850	0	0	60	40	30	0	163	0	0	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[n]**	30	0	163	0	0	0	527	850	0	0	60	40
Change when compare to previous ADT (n - j) **[o]**	0	0	0	0	0	0	0	0	0	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[p]**	1420		Delay (from Synchro)	120.7	LOS (from Synchro)	F						
Percent Reduction in Trip Gen. (p / a) **[q]**	96.5%											
Trip Assignment after Trip Gen reduction (d - q * d) **[r]**	8	0	0	0	0	0	0	0	3	0	0	0
Base Volume + Reduced Trip Assignment (f + r)	528	850	0	0	60	40	30	0	163	0	0	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[s]**	30	0	163	0	0	0	528	850	0	0	60	40
Change when compare to previous ADT (s - n) **[t]**	0	0	0	0	0	0	1	0	0	0	0	0

HCM Unsignalized Intersection Capacity Analysis
9: Heritage Road & Datsun Street

4/28/2016

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	30	163	527	850	60	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	177	573	924	65	43

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	210	573	924	109
Volume Left (vph)	33	573	0	0
Volume Right (vph)	177	0	0	43
Hadj (s)	-0.31	0.67	0.17	-0.07
Departure Headway (s)	5.6	6.0	5.4	5.5
Degree Utilization, x	0.33	0.95	1.0	0.17
Capacity (veh/h)	619	597	665	634
Control Delay (s)	11.4	47.6	203.8	9.6
Approach Delay (s)	11.4	144.0		9.6
Approach LOS	B	F		A

Intersection Summary			
Delay	120.6		
Level of Service	F		
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
9: Heritage Road & Datsun Street

4/28/2016

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	30	163	527	850	60	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	177	573	924	65	43

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	210	573	924	109
Volume Left (vph)	33	573	0	0
Volume Right (vph)	177	0	0	43
Hadj (s)	-0.31	0.67	0.17	-0.07
Departure Headway (s)	5.6	6.0	5.4	5.5
Degree Utilization, x	0.33	0.95	1.0	0.17
Capacity (veh/h)	619	597	665	634
Control Delay (s)	11.4	47.6	203.8	9.6
Approach Delay (s)	11.4	144.0		9.6
Approach LOS	B	F		A

Intersection Summary			
Delay	120.6		
Level of Service	F		
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
9: Heritage Road & Datsun Street

4/28/2016

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	30	163	528	850	60	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	177	574	924	65	43

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	210	574	924	109
Volume Left (vph)	33	574	0	0
Volume Right (vph)	177	0	0	43
Hadj (s)	-0.31	0.67	0.17	-0.07
Departure Headway (s)	5.6	6.0	5.4	5.5
Degree Utilization, x	0.33	0.95	1.0	0.17
Capacity (veh/h)	619	597	665	634
Control Delay (s)	11.4	47.9	203.8	9.6
Approach Delay (s)	11.4	144.1		9.6
Approach LOS	B	F		A

Intersection Summary			
Delay	120.7		
Level of Service	F		
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

Intersection No.	10	Peak:	PM		Green = Manual Input			Control Type		Signal	Base Delay	44.2
Project's Total Daily Trip Generation - Table 3.1 **[a]**	40126								SI Type	LOS D	Max Delay	55
External Peak Hour Trip Generation - Table 3.1 **[b]**	In	2201	Out	1345								
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
NT + P Peak Hour Turning Movements Volumes - Figure 8-4 **[c]**	200	100	166	564	100	400	250	1298	150	290	1321	761
Project Trip Assignment - Figure 3-4 **[d]**	0	0	66	264	0	0	0	198	0	40	121	161
Type of Turning Movement **[e]**			in	in		out	in	in		out	out	out
Base Volume (c - d) **[f]**	200	100	100	300	100	400	250	1100	150	250	1200	600
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[g]**	11018		Delay (from Synchro)	54.9	LOS (from Synchro)	D						
Percent Reduction in Trip Gen. (g / a) **[h]**	72.5%											
Trip Assignment after Trip Gen reduction (d - h * d) **[i]**	0	0	18	72	0	0	0	54	0	11	33	44
Base Volume + Reduced Trip Assignment (f + i)	200	100	118	372	100	400	250	1154	150	261	1233	644
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[j]**	250	1154	150	261	1233	644	200	100	118	372	100	400
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Trigger ADT **[k]**	**11019**		Delay (from Synchro)	54.9	LOS (from Synchro)	D						
Percent Reduction in Trip Gen. (k / a) **[L]**	72.5%											
Trip Assignment after Trip Gen reduction (d - L * d) **[m]**	0	0	18	72	0	0	0	54	0	11	33	44
Base Volume + Reduced Trip Assignment (f + m)	200	100	118	372	100	400	250	1154	150	261	1233	644
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[n]**	250	1154	150	261	1233	644	200	100	118	372	100	400
Change when compare to previous ADT (n - j) **[o]**	0	0	0	0	0	0	0	0	0	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[p]**	11020		Delay (from Synchro)	55	LOS (from Synchro)	E						
Percent Reduction in Trip Gen. (p / a) **[q]**	72.5%											
Trip Assignment after Trip Gen reduction (d - q * d) **[r]**	0	0	18	73	0	0	0	54	0	11	33	44
Base Volume + Reduced Trip Assignment (f + r)	200	100	118	373	100	400	250	1154	150	261	1233	644
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[s]**	250	1154	150	261	1233	644	200	100	118	373	100	400
Change when compare to previous ADT (s - n) **[t]**	0	0	0	0	0	0	0	0	0	1	0	0

HCM Signalized Intersection Capacity Analysis
10: Heritage Road & Otay Mesa Road

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	1154	150	261	1233	644	200	100	118	372	100	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	1.00		1.00	1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	4715	1438	3183	4715	1418	1641	1571		1641	1727	2584
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	4715	1438	3183	4715	1418	1641	1571		1641	1727	2584
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	1254	163	284	1340	700	217	109	128	404	109	435
RTOR Reduction (vph)	0	0	113	0	0	368	0	34	0	0	0	139
Lane Group Flow (vph)	272	1254	50	284	1340	332	217	203	0	404	109	296
Confl. Peds. (#/hr)						11			1			
Confl. Bikes (#/hr)			12			13			5			
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	11.0	38.8	38.8	12.0	40.1	40.1	20.8	22.4		32.1	33.7	44.7
Effective Green, g (s)	11.0	38.8	38.8	12.0	40.1	40.1	20.8	22.4		32.1	33.7	44.7
Actuated g/C Ratio	0.09	0.31	0.31	0.09	0.32	0.32	0.16	0.18		0.25	0.27	0.35
Clearance Time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Vehicle Extension (s)	2.0	4.1	4.1	2.0	4.5	4.5	2.0	4.3		2.0	3.7	2.0
Lane Grp Cap (vph)	276	1445	440	301	1493	449	269	277		416	459	912
v/s Ratio Prot	0.09	0.27		c0.09	c0.28		0.13	c0.13		c0.25	0.06	0.03
v/s Ratio Perm			0.03			0.23						0.09
v/c Ratio	0.99	0.87	0.11	0.94	0.90	0.74	0.81	0.73		0.97	0.24	0.32
Uniform Delay, d1	57.7	41.5	31.5	57.0	41.3	38.6	51.0	49.3		46.8	36.4	29.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	49.6	6.0	0.2	36.5	7.8	7.3	15.2	10.6		36.3	0.3	0.1
Delay (s)	107.4	47.5	31.7	93.5	49.1	45.9	66.2	59.9		83.1	36.7	30.0
Level of Service	F	D	C	F	D	D	E	E		F	D	C
Approach Delay (s)		55.6			53.6			62.9			53.4	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	126.6	Sum of lost time (s)	21.3
Intersection Capacity Utilization	82.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
10: Heritage Road & Otay Mesa Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	1154	150	261	1233	644	200	100	118	372	100	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	1.00		1.00	1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	4715	1438	3183	4715	1418	1641	1571		1641	1727	2584
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	4715	1438	3183	4715	1418	1641	1571		1641	1727	2584
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	1254	163	284	1340	700	217	109	128	404	109	435
RTOR Reduction (vph)	0	0	113	0	0	368	0	34	0	0	0	139
Lane Group Flow (vph)	272	1254	50	284	1340	332	217	203	0	404	109	296
Confl. Peds. (#/hr)						11			1			
Confl. Bikes (#/hr)			12			13			5			
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	11.0	38.8	38.8	12.0	40.1	40.1	20.8	22.4		32.1	33.7	44.7
Effective Green, g (s)	11.0	38.8	38.8	12.0	40.1	40.1	20.8	22.4		32.1	33.7	44.7
Actuated g/C Ratio	0.09	0.31	0.31	0.09	0.32	0.32	0.16	0.18		0.25	0.27	0.35
Clearance Time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Vehicle Extension (s)	2.0	4.1	4.1	2.0	4.5	4.5	2.0	4.3		2.0	3.7	2.0
Lane Grp Cap (vph)	276	1445	440	301	1493	449	269	277		416	459	912
v/s Ratio Prot	0.09	0.27		c0.09	c0.28		0.13	c0.13		c0.25	0.06	0.03
v/s Ratio Perm			0.03			0.23						0.09
v/c Ratio	0.99	0.87	0.11	0.94	0.90	0.74	0.81	0.73		0.97	0.24	0.32
Uniform Delay, d1	57.7	41.5	31.5	57.0	41.3	38.6	51.0	49.3		46.8	36.4	29.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	49.6	6.0	0.2	36.5	7.8	7.3	15.2	10.6		36.3	0.3	0.1
Delay (s)	107.4	47.5	31.7	93.5	49.1	45.9	66.2	59.9		83.1	36.7	30.0
Level of Service	F	D	C	F	D	D	E	E		F	D	C
Approach Delay (s)		55.6			53.6			62.9			53.4	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	126.6	Sum of lost time (s)	21.3
Intersection Capacity Utilization	82.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
10: Heritage Road & Otay Mesa Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	1154	150	261	1233	644	200	100	118	373	100	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	1.00		1.00	1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	4715	1438	3183	4715	1418	1641	1571		1641	1727	2584
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	4715	1438	3183	4715	1418	1641	1571		1641	1727	2584
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	1254	163	284	1340	700	217	109	128	405	109	435
RTOR Reduction (vph)	0	0	113	0	0	368	0	34	0	0	0	139
Lane Group Flow (vph)	272	1254	50	284	1340	332	217	203	0	405	109	296
Confl. Peds. (#/hr)						11			1			
Confl. Bikes (#/hr)			12			13			5			
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	11.0	38.8	38.8	12.0	40.1	40.1	20.8	22.4		32.1	33.7	44.7
Effective Green, g (s)	11.0	38.8	38.8	12.0	40.1	40.1	20.8	22.4		32.1	33.7	44.7
Actuated g/C Ratio	0.09	0.31	0.31	0.09	0.32	0.32	0.16	0.18		0.25	0.27	0.35
Clearance Time (s)	4.0	7.4	7.4	4.0	7.1	7.1	4.0	5.9		4.0	5.9	4.0
Vehicle Extension (s)	2.0	4.1	4.1	2.0	4.5	4.5	2.0	4.3		2.0	3.7	2.0
Lane Grp Cap (vph)	276	1445	440	301	1493	449	269	277		416	459	912
v/s Ratio Prot	0.09	0.27		c0.09	c0.28		0.13	c0.13		c0.25	0.06	0.03
v/s Ratio Perm			0.03			0.23						0.09
v/c Ratio	0.99	0.87	0.11	0.94	0.90	0.74	0.81	0.73		0.97	0.24	0.32
Uniform Delay, d1	57.7	41.5	31.5	57.0	41.3	38.6	51.0	49.3		46.8	36.4	29.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	49.6	6.0	0.2	36.5	7.8	7.3	15.2	10.6		36.8	0.3	0.1
Delay (s)	107.4	47.5	31.7	93.5	49.1	45.9	66.2	59.9		83.6	36.7	30.0
Level of Service	F	D	C	F	D	D	E	E		F	D	C
Approach Delay (s)		55.6			53.6			62.9			53.7	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	126.6	Sum of lost time (s)	21.3
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection No.	16	Peak:	PM		Green = Manual Input			Control Type		Signal	Base Delay	38.3
Project's Total Daily Trip Generation - Table 3.1 **[a]**	40126								SI Type	LOS D	Max Delay	55
External Peak Hour Trip Generation - Table 3.1 **[b]**	In	2201	Out	1345								
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
NT + P Peak Hour Turning Movements Volumes - Figure 8-4 **[c]**	1104	0	445	0	0	0	0	1560	1216	666	1700	0
Project Trip Assignment - Figure 3-4 **[d]**	444	0	175	0	0	0	0	0	726	286	0	0
Type of Turning Movement **[e]**	out		out						in	in		
Base Volume (c - d) **[f]**	660	0	270	0	0	0	0	1560	490	380	1700	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[g]**	12275		Delay (from Synchro)	54.9	LOS (from Synchro)	D						
Percent Reduction in Trip Gen. (g / a) **[h]**	69.4%											
Trip Assignment after Trip Gen reduction (d - h * d) **[i]**	136	0	54	0	0	0	0	0	222	87	0	0
Base Volume + Reduced Trip Assignment (f + i)	796	0	324	0	0	0	0	1560	712	467	1700	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[j]**	0	1560	712	467	1700	0	796	0	324	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Trigger ADT **[k]**	**12276**		Delay (from Synchro)	54.9	LOS (from Synchro)	D						
Percent Reduction in Trip Gen. (k / a) **[L]**	69.4%											
Trip Assignment after Trip Gen reduction (d - L * d) **[m]**	136	0	54	0	0	0	0	0	222	87	0	0
Base Volume + Reduced Trip Assignment (f + m)	796	0	324	0	0	0	0	1560	712	467	1700	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[n]**	0	1560	712	467	1700	0	796	0	324	0	0	0
Change when compare to previous ADT (n - j) **[o]**	0	0	0	0	0	0	0	0	0	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[p]**	12277		Delay (from Synchro)	55	LOS (from Synchro)	E						
Percent Reduction in Trip Gen. (p / a) **[q]**	69.4%											
Trip Assignment after Trip Gen reduction (d - q * d) **[r]**	136	0	54	0	0	0	0	0	222	88	0	0
Base Volume + Reduced Trip Assignment (f + r)	796	0	324	0	0	0	0	1560	712	468	1700	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[s]**	0	1560	712	468	1700	0	796	0	324	0	0	0
Change when compare to previous ADT (s - n) **[t]**	0	0	0	1	0	0	0	0	0	0	0	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1560	712	467	1700	796	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	1641	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	1641	4715	3183	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1696	774	508	1848	865	352
RTOR Reduction (vph)	0	370	0	0	0	260
Lane Group Flow (vph)	1696	404	508	1848	865	92
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	43.5	43.5	33.0	80.5	29.0	29.0
Effective Green, g (s)	43.5	43.5	33.0	80.5	29.0	29.0
Actuated g/C Ratio	0.36	0.36	0.28	0.67	0.24	0.24
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	1709	532	451	3162	769	354
v/s Ratio Prot	c0.36		c0.31	0.39	c0.27	
v/s Ratio Perm		0.28				0.06
v/c Ratio	0.99	0.76	1.13	0.58	1.12	0.26
Uniform Delay, d1	38.1	33.7	43.5	10.7	45.5	36.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.0	9.8	81.7	0.8	72.5	0.1
Delay (s)	58.1	43.5	125.2	11.5	118.0	37.0
Level of Service	E	D	F	B	F	D
Approach Delay (s)	53.5			36.0	94.6	
Approach LOS	D			D	F	

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1560	712	467	1700	796	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	1641	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	1641	4715	3183	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1696	774	508	1848	865	352
RTOR Reduction (vph)	0	370	0	0	0	260
Lane Group Flow (vph)	1696	404	508	1848	865	92
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	43.5	43.5	33.0	80.5	29.0	29.0
Effective Green, g (s)	43.5	43.5	33.0	80.5	29.0	29.0
Actuated g/C Ratio	0.36	0.36	0.28	0.67	0.24	0.24
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	1709	532	451	3162	769	354
v/s Ratio Prot	c0.36		c0.31	0.39	c0.27	
v/s Ratio Perm		0.28				0.06
v/c Ratio	0.99	0.76	1.13	0.58	1.12	0.26
Uniform Delay, d1	38.1	33.7	43.5	10.7	45.5	36.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.0	9.8	81.7	0.8	72.5	0.1
Delay (s)	58.1	43.5	125.2	11.5	118.0	37.0
Level of Service	E	D	F	B	F	D
Approach Delay (s)	53.5			36.0	94.6	
Approach LOS	D			D	F	

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1560	712	468	1700	796	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4715	1468	1641	4715	3183	1468
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4715	1468	1641	4715	3183	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1696	774	509	1848	865	352
RTOR Reduction (vph)	0	370	0	0	0	260
Lane Group Flow (vph)	1696	404	509	1848	865	92
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	43.5	43.5	33.0	80.5	29.0	29.0
Effective Green, g (s)	43.5	43.5	33.0	80.5	29.0	29.0
Actuated g/C Ratio	0.36	0.36	0.28	0.67	0.24	0.24
Clearance Time (s)	6.5	6.5	4.0	6.5	4.0	4.0
Vehicle Extension (s)	4.8	4.8	2.0	4.8	2.0	2.0
Lane Grp Cap (vph)	1709	532	451	3162	769	354
v/s Ratio Prot	c0.36		c0.31	0.39	c0.27	
v/s Ratio Perm		0.28				0.06
v/c Ratio	0.99	0.76	1.13	0.58	1.12	0.26
Uniform Delay, d1	38.1	33.7	43.5	10.7	45.5	36.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.0	9.8	82.5	0.8	72.5	0.1
Delay (s)	58.1	43.5	126.0	11.5	118.0	37.0
Level of Service	E	D	F	B	F	D
Approach Delay (s)	53.5			36.2	94.6	
Approach LOS	D			D	F	

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection No.	18	Peak:	PM		Green = Manual Input			Control Type		Signal	Base Delay	16.4
Project's Total Daily Trip Generation - Table 3.1 **[a]**	40126								SI Type	LOS D	Max Delay	55
External Peak Hour Trip Generation - Table 3.1 **[b]**	In	2201	Out	1345								
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
NT + P Peak Hour Turning Movements Volumes - Figure 8-4 **[c]**	0	1558	273	180	1524	0	225	10	955	0	0	0
Project Trip Assignment - Figure 3-4 **[d]**	0	888	13	0	1034	0	0	0	440	0	0	0
Type of Turning Movement **[e]**		out	out		in				in			
Base Volume (c - d) **[f]**	0	670	260	180	490	0	225	10	515	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[g]**	27224		Delay (from Synchro)	54.9	LOS (from Synchro)	D						
Percent Reduction in Trip Gen. (g / a) **[h]**	32.2%											
Trip Assignment after Trip Gen reduction (d - h * d) **[i]**	0	602	9	0	702	0	0	0	299	0	0	0
Base Volume + Reduced Trip Assignment (f + i)	0	1272	269	180	1192	0	225	10	814	0	0	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[j]**	225	10	814	0	0	0	0	1272	269	180	1192	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Trigger ADT **[k]**	**27225**		Delay (from Synchro)	54.9	LOS (from Synchro)	D						
Percent Reduction in Trip Gen. (k / a) **[L]**	32.2%											
Trip Assignment after Trip Gen reduction (d - L * d) **[m]**	0	602	9	0	702	0	0	0	299	0	0	0
Base Volume + Reduced Trip Assignment (f + m)	0	1272	269	180	1192	0	225	10	814	0	0	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[n]**	225	10	814	0	0	0	0	1272	269	180	1192	0
Change when compare to previous ADT (n - j) **[o]**	0	0	0	0	0	0	0	0	0	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[p]**	27226		Delay (from Synchro)	55	LOS (from Synchro)	E						
Percent Reduction in Trip Gen. (p / a) **[q]**	32.1%											
Trip Assignment after Trip Gen reduction (d - q * d) **[r]**	0	603	9	0	702	0	0	0	299	0	0	0
Base Volume + Reduced Trip Assignment (f + r)	0	1273	269	180	1192	0	225	10	814	0	0	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[s]**	225	10	814	0	0	0	0	1273	269	180	1192	0
Change when compare to previous ADT (s - n) **[t]**	0	0	0	0	0	0	0	1	0	0	0	0

HCM Signalized Intersection Capacity Analysis
18: Britannia Boulevard & SR-905 EB Ramps

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	10	814	0	0	0	0	1272	273	180	1192	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1					5.1		4.7	5.1	
Lane Util. Factor		1.00	0.88					0.95		0.97	0.91	
Frt		1.00	0.85					0.97		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1648	2584					3195		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1648	2584					3195		3183	4715	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	11	885	0	0	0	0	1383	297	196	1296	0
RTOR Reduction (vph)	0	0	91	0	0	0	0	14	0	0	0	0
Lane Group Flow (vph)	0	256	794	0	0	0	0	1666	0	196	1296	0
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		36.9	36.9					64.3		12.4	81.4	
Effective Green, g (s)		36.9	36.9					64.3		12.4	81.4	
Actuated g/C Ratio		0.29	0.29					0.50		0.10	0.63	
Clearance Time (s)		5.1	5.1					5.1		4.7	5.1	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		473	742					1598		307	2986	
v/s Ratio Prot								c0.52		c0.06	0.27	
v/s Ratio Perm		0.16	c0.31									
v/c Ratio		0.54	1.07					1.04		0.64	0.43	
Uniform Delay, d1		38.7	45.8					32.1		55.9	11.9	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		1.3	53.3					34.5		4.3	0.1	
Delay (s)		39.9	99.1					66.6		60.2	12.0	
Level of Service		D	F					E		E	B	
Approach Delay (s)		85.8			0.0			66.6			18.3	
Approach LOS		F			A			E			B	

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	128.5	Sum of lost time (s)	14.9
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
18: Britannia Boulevard & SR-905 EB Ramps

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	10	814	0	0	0	0	1272	273	180	1192	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1					5.1		4.7	5.1	
Lane Util. Factor		1.00	0.88					0.95		0.97	0.91	
Frt		1.00	0.85					0.97		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1648	2584					3195		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1648	2584					3195		3183	4715	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	11	885	0	0	0	0	1383	297	196	1296	0
RTOR Reduction (vph)	0	0	91	0	0	0	0	14	0	0	0	0
Lane Group Flow (vph)	0	256	794	0	0	0	0	1666	0	196	1296	0
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		36.9	36.9					64.3		12.4	81.4	
Effective Green, g (s)		36.9	36.9					64.3		12.4	81.4	
Actuated g/C Ratio		0.29	0.29					0.50		0.10	0.63	
Clearance Time (s)		5.1	5.1					5.1		4.7	5.1	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		473	742					1598		307	2986	
v/s Ratio Prot								c0.52		c0.06	0.27	
v/s Ratio Perm		0.16	c0.31									
v/c Ratio		0.54	1.07					1.04		0.64	0.43	
Uniform Delay, d1		38.7	45.8					32.1		55.9	11.9	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		1.3	53.3					34.5		4.3	0.1	
Delay (s)		39.9	99.1					66.6		60.2	12.0	
Level of Service		D	F					E		E	B	
Approach Delay (s)		85.8			0.0			66.6			18.3	
Approach LOS		F			A			E			B	

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	128.5	Sum of lost time (s)	14.9
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
18: Britannia Boulevard & SR-905 EB Ramps

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	10	814	0	0	0	0	1273	273	180	1192	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1					5.1		4.7	5.1	
Lane Util. Factor		1.00	0.88					0.95		0.97	0.91	
Frt		1.00	0.85					0.97		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1648	2584					3195		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1648	2584					3195		3183	4715	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	245	11	885	0	0	0	0	1384	297	196	1296	0
RTOR Reduction (vph)	0	0	91	0	0	0	0	14	0	0	0	0
Lane Group Flow (vph)	0	256	794	0	0	0	0	1667	0	196	1296	0
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		36.9	36.9					64.3		12.4	81.4	
Effective Green, g (s)		36.9	36.9					64.3		12.4	81.4	
Actuated g/C Ratio		0.29	0.29					0.50		0.10	0.63	
Clearance Time (s)		5.1	5.1					5.1		4.7	5.1	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		473	742					1598		307	2986	
v/s Ratio Prot								c0.52		c0.06	0.27	
v/s Ratio Perm		0.16	c0.31									
v/c Ratio		0.54	1.07					1.04		0.64	0.43	
Uniform Delay, d1		38.7	45.8					32.1		55.9	11.9	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		1.3	53.3					34.7		4.3	0.1	
Delay (s)		39.9	99.1					66.8		60.2	12.0	
Level of Service		D	F					E		E	B	
Approach Delay (s)		85.8			0.0			66.8			18.3	
Approach LOS		F			A			E			B	

Intersection Summary			
HCM 2000 Control Delay	55.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	128.5	Sum of lost time (s)	14.9
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection No.	19	Peak:	PM		Green = Manual Input			Control Type		Signal	Base Delay	54.5
Project's Total Daily Trip Generation - Table 3.1 **[a]**	40126								SI Type	LOS D	Max Delay	55
External Peak Hour Trip Generation - Table 3.1 **[b]**	In	2201	Out	1345								
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
NT + P Peak Hour Turning Movements Volumes - Figure 8-4 **[c]**	98	360	50	220	585	1674	1101	235	114	215	420	370
Project Trip Assignment - Figure 3-4 **[d]**	88	0	0	0	0	1474	901	135	54	0	220	0
Type of Turning Movement **[e]**	in					in	out	out	out		in	
Base Volume (c - d) **[f]**	10	360	50	220	585	200	200	100	60	215	200	370
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[g]**	110		Delay (from Synchro)	54.9	LOS (from Synchro)	D						
Percent Reduction in Trip Gen. (g / a) **[h]**	99.7%											
Trip Assignment after Trip Gen reduction (d - h * d) **[i]**	0	0	0	0	0	4	2	0	0	0	1	0
Base Volume + Reduced Trip Assignment (f + i)	10	360	50	220	585	204	202	100	60	215	201	370
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[j]**	202	100	60	215	201	370	10	360	50	220	585	204
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Trigger ADT **[k]**	**111**		Delay (from Synchro)	54.9	LOS (from Synchro)	D						
Percent Reduction in Trip Gen. (k / a) **[L]**	99.7%											
Trip Assignment after Trip Gen reduction (d - L * d) **[m]**	0	0	0	0	0	4	2	0	0	0	1	0
Base Volume + Reduced Trip Assignment (f + m)	10	360	50	220	585	204	202	100	60	215	201	370
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[n]**	202	100	60	215	201	370	10	360	50	220	585	204
Change when compare to previous ADT (n - j) **[o]**	0	0	0	0	0	0	0	0	0	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[p]**	112		Delay (from Synchro)	55	LOS (from Synchro)	E						
Percent Reduction in Trip Gen. (p / a) **[q]**	99.7%											
Trip Assignment after Trip Gen reduction (d - q * d) **[r]**	0	0	0	0	0	4	3	0	0	0	1	0
Base Volume + Reduced Trip Assignment (f + r)	10	360	50	220	585	204	203	100	60	215	201	370
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[s]**	203	100	60	215	201	370	10	360	50	220	585	204
Change when compare to previous ADT (s - n) **[t]**	1	0	0	0	0	0	0	0	0	0	0	0

HCM Signalized Intersection Capacity Analysis
19: Britannia Boulevard & Airway Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	202	100	60	215	201	370	10	360	50	220	585	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99			1.00	0.99	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94			1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1617			1684	1447	1641	3222		1641	1727	1437
Flt Permitted	0.95	1.00			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1617			1684	1447	1641	3222		1641	1727	1437
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	220	109	65	234	218	402	11	391	54	239	636	221
RTOR Reduction (vph)	0	19	0	0	0	252	0	9	0	0	0	115
Lane Group Flow (vph)	220	155	0	0	452	150	11	436	0	239	636	106
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						1
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	16.0	16.0			31.9	31.9	0.9	25.3		17.4	41.6	41.6
Effective Green, g (s)	16.0	16.0			31.9	31.9	0.9	25.3		17.4	41.6	41.6
Actuated g/C Ratio	0.14	0.14			0.29	0.29	0.01	0.23		0.16	0.38	0.38
Clearance Time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Vehicle Extension (s)	2.0	2.0			3.7	3.7	2.0	3.8		2.0	3.8	3.8
Lane Grp Cap (vph)	237	234			486	418	13	738		258	650	541
v/s Ratio Prot	c0.13	0.10			c0.27		0.01	0.14		c0.15	c0.37	
v/s Ratio Perm						0.10						0.07
v/c Ratio	0.93	0.66			0.93	0.36	0.85	0.59		0.93	0.98	0.20
Uniform Delay, d1	46.6	44.7			38.2	31.1	54.7	37.9		45.9	34.0	23.2
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	38.4	5.4			24.8	0.7	162.2	1.4		36.0	29.7	0.2
Delay (s)	85.0	50.0			63.0	31.8	216.9	39.4		81.9	63.6	23.4
Level of Service	F	D			E	C	F	D		F	E	C
Approach Delay (s)		69.6			48.3			43.6			59.5	
Approach LOS		E			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	54.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	110.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
19: Britannia Boulevard & Airway Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	202	100	60	215	201	370	10	360	50	220	585	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99			1.00	0.99	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94			1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1617			1684	1447	1641	3222		1641	1727	1437
Flt Permitted	0.95	1.00			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1617			1684	1447	1641	3222		1641	1727	1437
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	220	109	65	234	218	402	11	391	54	239	636	221
RTOR Reduction (vph)	0	19	0	0	0	252	0	9	0	0	0	115
Lane Group Flow (vph)	220	155	0	0	452	150	11	436	0	239	636	106
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						1
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	16.0	16.0			31.9	31.9	0.9	25.3		17.4	41.6	41.6
Effective Green, g (s)	16.0	16.0			31.9	31.9	0.9	25.3		17.4	41.6	41.6
Actuated g/C Ratio	0.14	0.14			0.29	0.29	0.01	0.23		0.16	0.38	0.38
Clearance Time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Vehicle Extension (s)	2.0	2.0			3.7	3.7	2.0	3.8		2.0	3.8	3.8
Lane Grp Cap (vph)	237	234			486	418	13	738		258	650	541
v/s Ratio Prot	c0.13	0.10			c0.27		0.01	0.14		c0.15	c0.37	
v/s Ratio Perm						0.10						0.07
v/c Ratio	0.93	0.66			0.93	0.36	0.85	0.59		0.93	0.98	0.20
Uniform Delay, d1	46.6	44.7			38.2	31.1	54.7	37.9		45.9	34.0	23.2
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	38.4	5.4			24.8	0.7	162.2	1.4		36.0	29.7	0.2
Delay (s)	85.0	50.0			63.0	31.8	216.9	39.4		81.9	63.6	23.4
Level of Service	F	D			E	C	F	D		F	E	C
Approach Delay (s)		69.6			48.3			43.6			59.5	
Approach LOS		E			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	54.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	110.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
19: Britannia Boulevard & Airway Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	203	100	60	215	201	370	10	360	50	220	585	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99			1.00	0.99	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94			1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1617			1684	1447	1641	3222		1641	1727	1437
Flt Permitted	0.95	1.00			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1617			1684	1447	1641	3222		1641	1727	1437
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	221	109	65	234	218	402	11	391	54	239	636	221
RTOR Reduction (vph)	0	19	0	0	0	252	0	9	0	0	0	115
Lane Group Flow (vph)	221	155	0	0	452	150	11	436	0	239	636	106
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						1
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	16.0	16.0			31.9	31.9	0.9	25.3		17.4	41.6	41.6
Effective Green, g (s)	16.0	16.0			31.9	31.9	0.9	25.3		17.4	41.6	41.6
Actuated g/C Ratio	0.14	0.14			0.29	0.29	0.01	0.23		0.16	0.38	0.38
Clearance Time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.1
Vehicle Extension (s)	2.0	2.0			3.7	3.7	2.0	3.8		2.0	3.8	3.8
Lane Grp Cap (vph)	237	234			486	418	13	738		258	650	541
v/s Ratio Prot	c0.13	0.10			c0.27		0.01	0.14		c0.15	c0.37	
v/s Ratio Perm						0.10						0.07
v/c Ratio	0.93	0.66			0.93	0.36	0.85	0.59		0.93	0.98	0.20
Uniform Delay, d1	46.7	44.7			38.2	31.1	54.7	37.9		45.9	34.0	23.2
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	39.7	5.4			24.8	0.7	162.2	1.4		36.0	29.7	0.2
Delay (s)	86.4	50.0			63.0	31.8	216.9	39.4		81.9	63.6	23.4
Level of Service	F	D			E	C	F	D		F	E	C
Approach Delay (s)		70.4			48.3			43.6			59.5	
Approach LOS		E			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	110.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection No.	20	Peak:	PM		Green = Manual Input			Control Type		Signal	Base Delay	203.2
Project's Total Daily Trip Generation - Table 3.1 **[a]**	40126								SI Type	+1 sec	Max Delay	204.2
External Peak Hour Trip Generation - Table 3.1 **[b]**	In	2201	Out	1345								
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
NT + P Peak Hour Turning Movements Volumes - Figure 8-4 **[c]**	10	164	10	30	207	40	140	385	35	75	436	80
Project Trip Assignment - Figure 3-4 **[d]**	0	44	0	0	27	0	0	175	0	0	286	0
Type of Turning Movement **[e]**	in					in	out	out	out		in	
Base Volume (c - d) **[f]**	10	120	10	30	180	40	140	210	35	75	150	80
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[g]**	69		Delay (from Synchro)	203.2	LOS (from Synchro)	F						
Percent Reduction in Trip Gen. (g / a) **[h]**	99.8%											
Trip Assignment after Trip Gen reduction (d - h * d) **[i]**	0	0	0	0	0	0	0	0	0	0	0	0
Base Volume + Reduced Trip Assignment (f + i)	10	120	10	30	180	40	140	210	35	75	150	80
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[j]**	140	210	35	75	150	80	10	120	10	30	180	40
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Trigger ADT **[k]**	**70**		Delay (from Synchro)	203.2	LOS (from Synchro)	F						
Percent Reduction in Trip Gen. (k / a) **[L]**	99.8%											
Trip Assignment after Trip Gen reduction (d - L * d) **[m]**	0	0	0	0	0	0	0	0	0	0	0	0
Base Volume + Reduced Trip Assignment (f + m)	10	120	10	30	180	40	140	210	35	75	150	80
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[n]**	140	210	35	75	150	80	10	120	10	30	180	40
Change when compare to previous ADT (n - j) **[o]**	0	0	0	0	0	0	0	0	0	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[p]**	71		Delay (from Synchro)	204.8	LOS (from Synchro)	F						
Percent Reduction in Trip Gen. (p / a) **[q]**	99.8%											
Trip Assignment after Trip Gen reduction (d - q * d) **[r]**	0	0	0	0	0	0	0	0	0	0	1	0
Base Volume + Reduced Trip Assignment (f + r)	10	120	10	30	180	40	140	210	35	75	151	80
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[s]**	140	210	35	75	151	80	10	120	10	30	180	40
Change when compare to previous ADT (s - n) **[t]**	0	0	0	0	1	0	0	0	0	0	0	0

HCM Signalized Intersection Capacity Analysis
20: Britannia Boulevard & Siempre Viva Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	210	35	75	150	80	10	120	10	30	180	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Lane Util. Factor		0.95			1.00	1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected		0.98			0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3179			1699	1433	1641	1707		3183	3173	
Flt Permitted		0.76			0.11	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2447			197	1433	1641	1707		3183	3173	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	228	38	82	163	87	11	130	11	33	196	43
RTOR Reduction (vph)	0	5	0	0	0	44	0	3	0	0	15	0
Lane Group Flow (vph)	0	413	0	0	245	43	11	138	0	33	224	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						5						5
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		2			1		3	8		7	4	
Permitted Phases	2			1		1						
Actuated Green, G (s)		22.9			60.3	60.3	0.8	17.2		2.3	18.7	
Effective Green, g (s)		22.9			60.3	60.3	0.8	17.2		2.3	18.7	
Actuated g/C Ratio		0.19			0.50	0.50	0.01	0.14		0.02	0.15	
Clearance Time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Vehicle Extension (s)		4.8			4.8	4.8	2.0	3.3		2.0	4.4	
Lane Grp Cap (vph)		460			97	709	10	241		60	487	
v/s Ratio Prot							0.01	c0.08		c0.01	0.07	
v/s Ratio Perm		c0.17			c1.25	0.03						
v/c Ratio		0.90			2.53	0.06	1.10	0.57		0.55	0.46	
Uniform Delay, d1		48.3			30.8	16.0	60.5	48.9		59.2	46.9	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		20.9			716.1	0.1	321.8	3.4		6.1	1.1	
Delay (s)		69.2			746.8	16.1	382.3	52.3		65.3	48.1	
Level of Service		E			F	B	F	D		E	D	
Approach Delay (s)		69.2			555.3			76.2			50.2	
Approach LOS		E			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	203.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.78		
Actuated Cycle Length (s)	121.8	Sum of lost time (s)	19.1
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
20: Britannia Boulevard & Siempre Viva Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	210	35	75	150	80	10	120	10	30	180	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Lane Util. Factor		0.95			1.00	1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected		0.98			0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3179			1699	1433	1641	1707		3183	3173	
Flt Permitted		0.76			0.11	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2447			197	1433	1641	1707		3183	3173	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	228	38	82	163	87	11	130	11	33	196	43
RTOR Reduction (vph)	0	5	0	0	0	44	0	3	0	0	15	0
Lane Group Flow (vph)	0	413	0	0	245	43	11	138	0	33	224	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						5						5
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		2			1		3	8		7	4	
Permitted Phases	2			1		1						
Actuated Green, G (s)		22.9			60.3	60.3	0.8	17.2		2.3	18.7	
Effective Green, g (s)		22.9			60.3	60.3	0.8	17.2		2.3	18.7	
Actuated g/C Ratio		0.19			0.50	0.50	0.01	0.14		0.02	0.15	
Clearance Time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Vehicle Extension (s)		4.8			4.8	4.8	2.0	3.3		2.0	4.4	
Lane Grp Cap (vph)		460			97	709	10	241		60	487	
v/s Ratio Prot							0.01	c0.08		c0.01	0.07	
v/s Ratio Perm		c0.17			c1.25	0.03						
v/c Ratio		0.90			2.53	0.06	1.10	0.57		0.55	0.46	
Uniform Delay, d1		48.3			30.8	16.0	60.5	48.9		59.2	46.9	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		20.9			716.1	0.1	321.8	3.4		6.1	1.1	
Delay (s)		69.2			746.8	16.1	382.3	52.3		65.3	48.1	
Level of Service		E			F	B	F	D		E	D	
Approach Delay (s)		69.2			555.3			76.2			50.2	
Approach LOS		E			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	203.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.78		
Actuated Cycle Length (s)	121.8	Sum of lost time (s)	19.1
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
20: Britannia Boulevard & Siempre Viva Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	210	35	75	151	80	10	120	10	30	180	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Lane Util. Factor		0.95			1.00	1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected		0.98			0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3179			1699	1433	1641	1707		3183	3173	
Flt Permitted		0.76			0.11	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2446			197	1433	1641	1707		3183	3173	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	228	38	82	164	87	11	130	11	33	196	43
RTOR Reduction (vph)	0	5	0	0	0	44	0	3	0	0	15	0
Lane Group Flow (vph)	0	413	0	0	246	43	11	138	0	33	224	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						5						5
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		2			1		3	8		7	4	
Permitted Phases	2			1		1						
Actuated Green, G (s)		22.9			60.3	60.3	0.8	17.2		2.3	18.7	
Effective Green, g (s)		22.9			60.3	60.3	0.8	17.2		2.3	18.7	
Actuated g/C Ratio		0.19			0.50	0.50	0.01	0.14		0.02	0.15	
Clearance Time (s)		4.9			4.9	4.9	4.4	4.9		4.4	4.9	
Vehicle Extension (s)		4.8			4.8	4.8	2.0	3.3		2.0	4.4	
Lane Grp Cap (vph)		459			97	709	10	241		60	487	
v/s Ratio Prot							0.01	c0.08		c0.01	0.07	
v/s Ratio Perm		c0.17			c1.25	0.03						
v/c Ratio		0.90			2.54	0.06	1.10	0.57		0.55	0.46	
Uniform Delay, d1		48.3			30.8	16.0	60.5	48.9		59.2	46.9	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		21.4			720.6	0.1	321.8	3.4		6.1	1.1	
Delay (s)		69.7			751.4	16.1	382.3	52.3		65.3	48.1	
Level of Service		E			F	B	F	D		E	D	
Approach Delay (s)		69.7			559.3			76.2			50.2	
Approach LOS		E			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	204.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.79		
Actuated Cycle Length (s)	121.8	Sum of lost time (s)	19.1
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection No.	22	Peak:	AM		Green = Manual Input			Control Type		Signal	Base Delay	172.2
Project's Total Daily Trip Generation - Table 3.1 **[a]**	40126								SI Type	+1 sec	Max Delay	173.2
External Peak Hour Trip Generation - Table 3.1 **[b]**	In	876	Out	1931								
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
NT + P Peak Hour Turning Movements Volumes - Figure 8-4 **[c]**	100	250	840	100	400	218	339	507	260	400	275	170
Project Trip Assignment - Figure 3-4 **[d]**	0	0	0	0	0	18	39	77	0	0	35	0
Type of Turning Movement **[e]**						in	out	out			in	
Base Volume (c - d) **[f]**	100	250	840	100	400	200	300	430	260	400	240	170
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[g]**	5470		Delay (from Synchro)	172.9	LOS (from Synchro)	F						
Percent Reduction in Trip Gen. (g / a) **[h]**	86.4%											
Trip Assignment after Trip Gen reduction (d - h * d) **[i]**	0	0	0	0	0	2	5	10	0	0	5	0
Base Volume + Reduced Trip Assignment (f + i)	100	250	840	100	400	202	305	440	260	400	245	170
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[j]**	305	440	260	400	245	170	100	250	840	100	400	202
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Trigger ADT **[k]**	**5471**		Delay (from Synchro)	172.9	LOS (from Synchro)	F						
Percent Reduction in Trip Gen. (k / a) **[L]**	86.4%											
Trip Assignment after Trip Gen reduction (d - L * d) **[m]**	0	0	0	0	0	2	5	10	0	0	5	0
Base Volume + Reduced Trip Assignment (f + m)	100	250	840	100	400	202	305	440	260	400	245	170
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[n]**	305	440	260	400	245	170	100	250	840	100	400	202
Change when compare to previous ADT (n - j) **[o]**	0	0	0	0	0	0	0	0	0	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[p]**	5472		Delay (from Synchro)	173.3	LOS (from Synchro)	F						
Percent Reduction in Trip Gen. (p / a) **[q]**	86.4%											
Trip Assignment after Trip Gen reduction (d - q * d) **[r]**	0	0	0	0	0	2	5	11	0	0	5	0
Base Volume + Reduced Trip Assignment (f + r)	100	250	840	100	400	202	305	441	260	400	245	170
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[s]**	305	441	260	400	245	170	100	250	840	100	400	202
Change when compare to previous ADT (s - n) **[t]**	0	1	0	0	0	0	0	0	0	0	0	0

HCM Signalized Intersection Capacity Analysis
5470 ADT

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	305	440	260	400	245	170	100	250	840	100	400	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.88		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4715	1423	1641	4425		1641	1509		3183	1640	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	4715	1423	1641	4425		1641	1509		3183	1640	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	332	478	283	435	266	185	109	272	913	109	435	220
RTOR Reduction (vph)	0	0	240	0	93	0	0	71	0	0	12	0
Lane Group Flow (vph)	332	478	43	435	358	0	109	1114	0	109	643	0
Confl. Peds. (#/hr)			3						3			
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	29.4	21.1	21.1	31.0	22.7		13.2	58.8		9.2	55.7	
Effective Green, g (s)	29.4	21.1	21.1	31.0	22.7		13.2	58.8		9.2	55.7	
Actuated g/C Ratio	0.21	0.15	0.15	0.22	0.16		0.09	0.42		0.07	0.40	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	344	710	214	363	717		154	633		209	652	
v/s Ratio Prot	0.20	c0.10		c0.27	0.08		c0.07	c0.74		0.03	0.39	
v/s Ratio Perm			0.03									
v/c Ratio	0.97	0.67	0.20	1.20	0.50		0.71	1.76		0.52	0.99	
Uniform Delay, d1	54.8	56.2	52.1	54.5	53.5		61.5	40.6		63.3	41.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	38.7	5.0	2.1	112.9	2.5		11.5	348.6		1.1	31.7	
Delay (s)	93.5	61.2	54.1	167.4	55.9		73.0	389.2		64.4	73.5	
Level of Service	F	E	D	F	E		E	F		E	E	
Approach Delay (s)		69.2			110.7			362.5			72.2	
Approach LOS		E			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	172.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	128.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
22: La Media Road & Otay Mesa Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	305	440	260	400	245	170	100	250	840	100	400	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.88		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4715	1423	1641	4425		1641	1509		3183	1640	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	4715	1423	1641	4425		1641	1509		3183	1640	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	332	478	283	435	266	185	109	272	913	109	435	220
RTOR Reduction (vph)	0	0	240	0	93	0	0	71	0	0	12	0
Lane Group Flow (vph)	332	478	43	435	358	0	109	1114	0	109	643	0
Confl. Peds. (#/hr)			3						3			
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	29.4	21.1	21.1	31.0	22.7		13.2	58.8		9.2	55.7	
Effective Green, g (s)	29.4	21.1	21.1	31.0	22.7		13.2	58.8		9.2	55.7	
Actuated g/C Ratio	0.21	0.15	0.15	0.22	0.16		0.09	0.42		0.07	0.40	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	344	710	214	363	717		154	633		209	652	
v/s Ratio Prot	0.20	c0.10		c0.27	0.08		c0.07	c0.74		0.03	0.39	
v/s Ratio Perm			0.03									
v/c Ratio	0.97	0.67	0.20	1.20	0.50		0.71	1.76		0.52	0.99	
Uniform Delay, d1	54.8	56.2	52.1	54.5	53.5		61.5	40.6		63.3	41.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	38.7	5.0	2.1	112.9	2.5		11.5	348.6		1.1	31.7	
Delay (s)	93.5	61.2	54.1	167.4	55.9		73.0	389.2		64.4	73.5	
Level of Service	F	E	D	F	E		E	F		E	E	
Approach Delay (s)		69.2			110.7			362.5			72.2	
Approach LOS		E			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	172.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	128.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
22: La Media Road & Otay Mesa Road

4/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	305	441	260	400	245	170	100	250	840	100	400	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.88		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4715	1423	1641	4425		1641	1509		3183	1640	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	4715	1423	1641	4425		1641	1509		3183	1640	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	332	479	283	435	266	185	109	272	913	109	435	220
RTOR Reduction (vph)	0	0	240	0	93	0	0	71	0	0	12	0
Lane Group Flow (vph)	332	479	43	435	358	0	109	1114	0	109	643	0
Confl. Peds. (#/hr)			3						3			
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	29.4	21.2	21.2	31.0	22.8		13.2	58.7		9.2	55.6	
Effective Green, g (s)	29.4	21.2	21.2	31.0	22.8		13.2	58.7		9.2	55.6	
Actuated g/C Ratio	0.21	0.15	0.15	0.22	0.16		0.09	0.42		0.07	0.40	
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	344	713	215	363	720		154	632		209	651	
v/s Ratio Prot	0.20	c0.10		c0.27	0.08		c0.07	c0.74		0.03	0.39	
v/s Ratio Perm			0.03									
v/c Ratio	0.97	0.67	0.20	1.20	0.50		0.71	1.76		0.52	0.99	
Uniform Delay, d1	54.8	56.1	52.0	54.5	53.4		61.5	40.6		63.3	41.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	38.7	5.0	2.1	112.9	2.4		11.5	349.8		1.1	32.1	
Delay (s)	93.5	61.1	54.0	167.4	55.8		73.0	390.4		64.4	73.9	
Level of Service	F	E	D	F	E		E	F		E	E	
Approach Delay (s)		69.1			110.6			363.7			72.6	
Approach LOS		E			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	173.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	128.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Intersection No.	30	Peak:	AM		Green = Manual Input			Control Type		SSSC	Base Delay	89.8
Project's Total Daily Trip Generation - Table 3.1 **[a]**	40126								SI Type	+1 sec	Max Delay	90.8
External Peak Hour Trip Generation - Table 3.1 **[b]**	In	876	Out	1931								
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
NT + P Peak Hour Turning Movements Volumes - Figure 8-4 **[c]**	0	0	0	0	0	500	0	999	0		945	
Project Trip Assignment - Figure 3-4 **[d]**								39			15	
Type of Turning Movement **[e]**								out			in	
Base Volume (c - d) **[f]**	0	0	0	0	0	500	0	960	0	0	930	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[g]**	12036		Delay (from Synchro)	90.7	LOS (from Synchro)	F						
Percent Reduction in Trip Gen. (g / a) **[h]**	70.0%											
Trip Assignment after Trip Gen reduction (d - h * d) **[i]**	0	0	0	0	0	0	0	12	0	0	4	0
Base Volume + Reduced Trip Assignment (f + i)	0	0	0	0	0	500	0	972	0	0	934	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[j]**	0	972	0	0	934	0	0	0	0	0	0	500
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Trigger ADT **[k]**	**12037**		Delay (from Synchro)	90.7	LOS (from Synchro)	F						
Percent Reduction in Trip Gen. (k / a) **[L]**	70.0%											
Trip Assignment after Trip Gen reduction (d - L * d) **[m]**	0	0	0	0	0	0	0	12	0	0	4	0
Base Volume + Reduced Trip Assignment (f + m)	0	0	0	0	0	500	0	972	0	0	934	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[n]**	0	972	0	0	934	0	0	0	0	0	0	500
Change when compare to previous ADT (n - j) **[o]**	0	0	0	0	0	0	0	0	0	0	0	0
Trigger Calculation Testing Documentation (Multiple iterations)												
Project's Total Daily Trip Generation - Before Impact **[p]**	12038		Delay (from Synchro)	90.9	LOS (from Synchro)	F						
Percent Reduction in Trip Gen. (p / a) **[q]**	70.0%											
Trip Assignment after Trip Gen reduction (d - q * d) **[r]**	0	0	0	0	0	0	0	12	0	0	5	0
Base Volume + Reduced Trip Assignment (f + r)	0	0	0	0	0	500	0	972	0	0	935	0
Arrange to Synchro input order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
(EB - WB - NB - SB) **[s]**	0	972	0	0	935	0	0	0	0	0	0	500
Change when compare to previous ADT (s - n) **[t]**	0	0	0	0	1	0	0	0	0	0	0	0

HCM Unsignalized Intersection Capacity Analysis
30: Siempre Viva Road & SR-905 SB Off-Ramp

4/28/2016

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	972	934	0	0	500
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.89	0.89	0.73	0.73
Hourly flow rate (vph)	0	1144	1049	0	0	685
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1049				1431	350
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1049				1431	350
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	0
cM capacity (veh/h)	613				116	624

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	381	381	381	350	350	350	685
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	685
cSH	1700	1700	1700	1700	1700	1700	624
Volume to Capacity	0.22	0.22	0.22	0.21	0.21	0.21	1.10
Queue Length 95th (ft)	0	0	0	0	0	0	508
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	90.7
Lane LOS							F
Approach Delay (s)	0.0			0.0			90.7
Approach LOS							F

Intersection Summary			
Average Delay	21.6		
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
30: Siempre Viva Road & SR-905 SB Off-Ramp

4/28/2016

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	972	934	0	0	500
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.89	0.89	0.73	0.73
Hourly flow rate (vph)	0	1144	1049	0	0	685
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1049				1431	350
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1049				1431	350
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	0
cM capacity (veh/h)	613				116	624

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	381	381	381	350	350	350	685
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	685
cSH	1700	1700	1700	1700	1700	1700	624
Volume to Capacity	0.22	0.22	0.22	0.21	0.21	0.21	1.10
Queue Length 95th (ft)	0	0	0	0	0	0	508
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	90.7
Lane LOS							F
Approach Delay (s)	0.0			0.0			90.7
Approach LOS							F

Intersection Summary			
Average Delay	21.6		
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
30: Siempre Viva Road & SR-905 SB Off-Ramp

4/28/2016

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↱
Volume (veh/h)	0	972	935	0	0	500
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.89	0.89	0.73	0.73
Hourly flow rate (vph)	0	1144	1051	0	0	685
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1051				1432	350
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1051				1432	350
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	0
cM capacity (veh/h)	613				116	623

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	381	381	381	350	350	350	685
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	685
cSH	1700	1700	1700	1700	1700	1700	623
Volume to Capacity	0.22	0.22	0.22	0.21	0.21	0.21	1.10
Queue Length 95th (ft)	0	0	0	0	0	0	508
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	90.9
Lane LOS							F
Approach Delay (s)	0.0			0.0			90.9
Approach LOS							F

Intersection Summary			
Average Delay	21.6		
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

FAIR SHARE CALCULATION

The volume shown below is the sum of all movements

Intersection No.	EXISTING AM	EXISTING PM	Cumulative Projects AM Trips	Cumulative Projects PM Trips	Project Assignment AM	Project Assignment Pm	Near-Term + Project AM	Near-Term + Project PM	AM Fair Share	PM Fair Share
6	260	444	1040	1223	196	248	1496	1915	16%	**17%**
8	432	667	2298	2433	308	390	3038	3490	12%	**14%**
9	462	860	1198	789	308	371	1968	2020	20%	**32%**
10	973	1437	2927	3313	674	850	4574	5600	19%	**20%**
16	971	1512	3049	3512	1291	1631	5311	6655	30%	**32%**
18	1444	1411	741	939	1880	2375	4065	4725	72%	**72%**
19	941	1265	1449	1305	2274	2872	4664	5442	61%	**69%**
20	370	386	490	694	422	532	1282	1612	**46%**	43%
22	1595	1716	2095	1434	169	213	3859	3363	7%	**13%**
30	1612	1779	778	831	54	71	2444	2681	6%	**8%**

Fair Share = Proposed Project Trips / (Cumulative Projects Trips + Proposed Project Trips)

Year 2025 Cumulative + Project Trigger Calculations

Roadway	From	To	Cross-Section	Threshold LOS E	Cumulative ADT	LOS w/o Project	Available Capacity	% of Project Trips	LOS w/ Project	Project's External Trip Generation at Time of Impact [1]	Projects Total ADT Generation at Time of Impact
Heritage Road	Avenida De Las Vistas	Datsun Street	2-Ln	6,500	31900	F	100	11%	F	909	1,003
	Datsun Street	Otay Mesa Road	2-Ln	6,500	38500	F	150	12%	F	1250	1,380
Cactus Road	Otay Mesa Road	SR-905	2-Ln	6,500	6200	D	300	5%	E	6000	6,623
Britannia Boulevard	SR-905 EB Ramps	Airway Road	5-Ln w/RM (2-NB, 3-SB)	45,840	25,090	B	20750	67%	E	30970	34,183
La Media	Northern Terminus	Otay Mesa Road	2-Ln	6,500	22,500	F	80	2%	F	4000	4,415
	Avenida De La Fuente	Siempre Viva Road	2-Ln	6,500	27,780	F	100	3%	F	3333	3,679
Airway Road	Cactus Road	Continental Road	2-Ln	6,500	8,700	F	333	83%	F	401	444
Airway Road	Continental Road	Britannia Blvd	2-Ln	6,500	8,700	F	80	83%	F	96	106
Airway Road	Brittania Blvd	La Media Road	2-Ln	6,500	14,170	F	80	10%	F	800	883
Airway Road	La Media Road	Avenida Costa Azul	2-Ln	6,500	10,300	F	80	3%	F	2667	2,944
Airway Road	Piper Ranch Road	Harvest Road	2-Ln w/CLTL	13,000	15,500	F	150	2%	F	7500	8,278
Airway Road	Harvest Road	Sanyo Avneue	2-Ln w/CLTL	13,000	14,100	E	300	1%	E	30000	33,113
Siempre Viva Road	Cactus Road	Britannia Blvd	2-Ln	6,500	6,400	D	100	13%	F	769	849
Siempre Viva Road	Britannia Blvd	La Media Road	2-Ln	6,500	9,270	F	80	13%	F	615	679

Notes:

90.6% of Total Trip Generation due to internal capture.

Intersection		CONDITION A - Minimum Vehicular Volume	CONDITION B - Interruption of Continuous Traffc	Combination of CONDITIONS A+B
6	Caliente Avenue / Airway Road	Yes	Yes	Yes
8	Heritage Road / Avenida De Las Vistas	Yes	Yes	Yes
9	Heritage Road / Datsun Street	Yes	Yes	Yes
30	SR-905 SB Off-Ramp / Siempre Viva Road	Yes	Yes	Yes

NEARTERM YEAR 2025 + PROJECT SIGNAL WARRANT

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

		COUNT DATE	NT 2025 + Project
Major St:	Caliente Avenue	# of Lanes:	2 or more
Minor St:	Airway Road	# of Lanes:	2 or more

Speed limit or critical speed on major street traffic > 64 km/h (40 mph) .....

or

In built up area of isolated community of < 10,000 population.....

RURAL (R)

URBAN (U)

Major St ADT (Total):	33500	Roadway Type:	Urban
Minor Street ADT (Highest Direction):	9150		

(Based on Estimated Average Daily Traffic - See Note)

CONDITION A - Minimum Vehicular Volume			Minimum Requirements EADT			
Satisfied	X	Not Satisfied	Vehichles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Number of lanes for moving traffic on each approach						
Major Street		Minor Street	Urban	Rural	Urban	Rural
1		1	8000	5,600	2,400	1,680
2 or more		1	9,600	6,720	2,400	1,680
2 or more		2 or more	9,600	6,720	3,200	2,240
1		2 or more	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffc			Vehichles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Staisfied	X	Not Satisfied				
Number of lanes for moving traffic on each approach						
Major Street		Minor Street	Urban	Rural	Urban	Rural
1		1	12,000	8,400	1,200	850
2 or more		1	14,400	10,080	1,200	850
2 or more		2 or more	14,400	10,080	1,600	1,120
1		2 or more	12,000	8,400	1,600	1,120
Combination of CONDITIONS A+B						
Satisfied	X	Not Satisfied	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% or More		286% A	233% B			

Note: To be used only for NEW INTERSECTIONS or other locations wehre it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

		COUNT DATE	NT 2025 + Project
Major St:	Heritage Road	# of Lanes:	2 or more
Minor St:	Avenida De Las Vistas	# of Lanes:	2 or more

Speed limit or critical speed on major street traffic > 64 km/h (40 mph) .....

or

In built up area of isolated community of < 10,000 population.....

RURAL (R)

URBAN (U)

Major St ADT (Total):	40200	Roadway Type:	Urban
Minor Street ADT (Highest Direction):	7900		

(Based on Estimated Average Daily Traffic - See Note)

CONDITION A - Minimum Vehicular Volume			Minimum Requirements EADT			
Satisfied	X	Not Satisfied	Vehichles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Number of lanes for moving traffic on each approach						
Major Street		Minor Street	Urban	Rural	Urban	Rural
1		1	8000	5,600	2,400	1,680
2 or more		1	9,600	6,720	2,400	1,680
2 or more		2 or more	9,600	6,720	3,200	2,240
1		2 or more	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffc			Vehichles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Staisfied	X	Not Satisfied				
Number of lanes for moving traffic on each approach						
Major Street		Minor Street	Urban	Rural	Urban	Rural
1		1	12,000	8,400	1,200	850
2 or more		1	14,400	10,080	1,200	850
2 or more		2 or more	14,400	10,080	1,600	1,120
1		2 or more	12,000	8,400	1,600	1,120
Combination of CONDITIONS A+B						
Satisfied	X	Not Satisfied	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% or More		247% A	279% B			

Note: To be used only for NEW INTERSECTIONS or other locations wehre it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

		COUNT DATE	NT 2025 + Project
Major St:	Heritage Road	# of Lanes:	2 or more
Minor St:	Datsun Street	# of Lanes:	2 or more

Speed limit or critical speed on major street traffic > 64 km/h (40 mph) .....

or

In built up area of isolated community of < 10,000 population.....

RURAL (R)

URBAN (U)

Major St ADT (Total):	35800	Roadway Type:	Urban
Minor Street ADT (Highest Direction):	5200		

(Based on Estimated Average Daily Traffic - See Note)

CONDITION A - Minimum Vehicular Volume			Minimum Requirements EADT			
Satisfied	X	Not Satisfied	Vehichles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Number of lanes for moving traffic on each approach						
Major Street		Minor Street	Urban	Rural	Urban	Rural
1		1	8000	5,600	2,400	1,680
2 or more		1	9,600	6,720	2,400	1,680
2 or more		2 or more	9,600	6,720	3,200	2,240
1		2 or more	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffc			Vehichles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Staisfied	X	Not Satisfied				
Number of lanes for moving traffic on each approach						
Major Street		Minor Street	Urban	Rural	Urban	Rural
1		1	12,000	8,400	1,200	850
2 or more		1	14,400	10,080	1,200	850
2 or more		2 or more	14,400	10,080	1,600	1,120
1		2 or more	12,000	8,400	1,600	1,120
Combination of CONDITIONS A+B						
Satisfied	X	Not Satisfied	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% or More		163% A	249% B			

Note: To be used only for NEW INTERSECTIONS or other locations wehre it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

		COUNT DATE	NT 2025 + Project
Major St:	SR-905 SB Off-Ramp	# of Lanes:	2 or more
Minor St:	Siempre Viva Road	# of Lanes:	2 or more

Speed limit or critical speed on major street traffic > 64 km/h (40 mph) .....

or

In built up area of isolated community of < 10,000 population.....

RURAL (R)

URBAN (U)

Major St ADT (Total):	41700	Roadway Type:	Urban
Minor Street ADT (Highest Direction):	4950		

(Based on Estimated Average Daily Traffic - See Note)

CONDITION A - Minimum Vehicular Volume			Minimum Requirements EADT			
Satisfied	X	Not Satisfied	Vehichles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Number of lanes for moving traffic on each approach						
Major Street		Minor Street	Urban	Rural	Urban	Rural
1		1	8000	5,600	2,400	1,680
2 or more		1	9,600	6,720	2,400	1,680
2 or more		2 or more	9,600	6,720	3,200	2,240
1		2 or more	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffc			Vehichles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Staisfied	X	Not Satisfied				
Number of lanes for moving traffic on each approach						
Major Street		Minor Street	Urban	Rural	Urban	Rural
1		1	12,000	8,400	1,200	850
2 or more		1	14,400	10,080	1,200	850
2 or more		2 or more	14,400	10,080	1,600	1,120
1		2 or more	12,000	8,400	1,600	1,120
Combination of CONDITIONS A+B						
Satisfied	X	Not Satisfied	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% or More		155% A	290% B			

Note: To be used only for NEW INTERSECTIONS or other locations wehre it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

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OTAY MESA CENTRAL VILLAGE
WATER AND SEWER CONCEPTUAL SEWER SERVICE PLAN
FEBRUARY 12, 2016

The City of San Diego (City), in 2014, adopted a new Otay Mesa Community Plan Update (OMCPU) to meet the housing and industrial needs of the region. In support of the OMCPU, an infrastructure plan (Otay Mesa Community Plan Update, Technical Infrastructure Study, by PBS&J) was prepared outlining onsite and offsite water and sewer facility requirements to serve the community at build-out.

The proposed Otay Mesa Central Village planned development includes over 200 acres of the western area of the OMCPU and is being processed as a Specific Plan. It is anticipated that multiple tentative maps will be prepared for the planning area, where more detailed hydraulic analysis will be included for water and sewer service.

Table 1 summarizes the proposed land uses, which includes a mix of multi-family and commercial uses. Nearly 4,500 residential units are proposed, with commercial, school and park areas also included in the specific plan.

Table 1

Planning Area	General Plan Land Use	Specific Plan Land Use	Gross Acres	Net Acres	Max Commercial Square Footage	Target Density	Unit Yield
1	Neighborhood Village (15-44 du/ac)	MH Mixed Use	3.5	3.5	7,500	44	154
2	Neighborhood Village (15-44 du/ac)	MH Multi-Family	6.7	6.7		44	295
3	Neighborhood Village (15-44 du/ac)	MH Mixed Use	3.3	2.6	14,000	44	114
4	Neighborhood Village (15-44 du/ac)	MH Mixed Use	8	6.7	21,700	44	295
5	Population-Based Park	Park	3.5	3.5		0	0
6	Residential – Medium (15-29 du/ac)	MD Multi-Family	5.5	4.8		29	139
7	Residential – Medium (15-29 du/ac)	MD Multi-Family	9.7	7.7		29	223
8	Open Space	Open Space	1.3	1.3		0	0
9	Residential – Low Medium to Medium (10-29 du/ac)	LD Multi-Family	5.6	5.4		15	81
10	Open Space	Open Space	4.4	4.4		0	0
11	Residential – Low Medium to Medium (10-29 du/ac)	LD Multi-Family	8	7.7		15	116
12	Population-Based Park	Park	6	6		0	0
13	Institutional (3)	School/Recreation	15.5	13.1		0	0

Table 1

Planning Area	General Plan Land Use	Specific Plan Land Use	Gross Acres	Net Acres	Max Commercial Square Footage	Target Density	Unit Yield
14	Neighborhood Village (15-44 du/ac)	MH Mixed Use	11.1	9.5	15,000	35	333
15	Open Space	Open Space	7	7		0	0
16	Neighborhood Village (15-44 du/ac)	MH Mixed Use	12.2	12.2	26,500	35	427
17	Residential – Medium (15-29 du/ac)	MD Multi-Family	3.9	3.5		29	101
18	Population-Based Park	Park	3.1	3.1		0	0
19	Residential – Medium (15-29 du/ac)	MD Multi-Family	10.1	8.8		29	255
20	Residential – Low Medium to Medium (10-29 du/ac)	LD Multi-Family	9.4	9		15	135
21	Residential – Medium (15-29 du/ac)	MD Multi-Family	9.9	8.5		29	246
22	Neighborhood Village (15-44 du/ac)	MH Mixed Use	11.7	11.3	27,500	44	497
23	Residential – Low Medium to Medium (10-29 du/ac)	LD Multi-Family	6.7	6.2		15	93
24	Neighborhood Village (15-44 du/ac)	MH Mixed Use	6	5.2	27,500	44	228
25	Residential – Medium (15-29 du/ac)	MD Multi-Family	10	9.7		29	281
26	Residential – Medium (15-29 du/ac)	MD Multi-Family	9.8	9.4		29	272
27	Neighborhood Village (15-44 du/ac)	MH Multi-Family	6.5	5.7		35	200
28	Population-Based Park	Park	3.5	3.5		0	0
29	Open Space	Open Space	3.2	3.2		0	0
--	Circulation	Circulation	24.1	40		0	0
Total			**229**	**229**	**139,700**		**4,485**

Purpose

The preparation and processing of the Otay Mesa Central Village Specific Plan will require environmental review in conformance with CEQA. As part of this effort, supplemental technical studies may be required to identify the required water and sewer facilities needed to serve the specific plan project.

Water Service Plan (Figure 1)

General

The majority of the Project is located within the Otay Water District (District) and will receive potable water service from the District's Otay Mesa Service Area. Supply to the Project will be provided through connections to the existing and planned 870 Pressure Zone water distribution mains located in Cactus, Airway, Heritage, and Siempre Viva Roads. A small portion of the Project

located west of Heritage Road, mainly Lots 1, 2 and 3, is located within the City of San Diego's (City) water service area, however, there are no existing City water facilities in close proximity to these parcels. Water supply to these parcels from the City will be challenging and would have to be provided either through extension of the City's existing South San Diego water system in Heritage and Airway Roads. Because these road extensions are not planned to be constructed in early phases of development alternative water service plans should be explored including a supply connection to District facilities, with a service agreement between the City and District, or by annexation of the parcels into the District service area and de-annexation of this island area from the City.

One notable change in alternative water supply from the OMCPU is that the District has implemented a moratorium on the use of recycled water in the Otay Mesa area due to the high capital cost to extend recycled water service to the area, in a Board action dated July 2, 2014. As a result, the District will not require the construction of any recycled water facilities as part of the Otay Mesa Central Village and all future irrigation will be via the potable water system.

Regional Supply

Potable water is supplied to the District's Otay Mesa Service Area through a connection to the San Diego County Water Authority (SDCWA) Second Aqueduct located near Lower Otay Reservoir. Water is delivered to the existing 36.7 million gallon (MG) 571-1 Reservoir and then pumped into the 871 Pressure Zone water distribution system by the 11 million gallon per day (mgd) capacity 871-1 Pump Station to the 11 MG 871-1 Reservoir. As part of the District's Capital Improvement Program, construction of a new 11 mgd capacity pump station to replace the 871-1 Pump Station underwent preliminary design in 2014. An additional 10 MG operational storage reservoir after year 2020 is also planned. The District is in the process of preparing an update to its Water Master Plan and it is anticipated that several planned capital improvement projects may be revised or deferred due to a lower water demand forecast being projected. In addition, the District is pursuing a new local water supply project with the Rosarito Desalinated Water Conveyance Project to provide a new reliable water supply from the south. The proposed conveyance project would be located in the eastern portion of Otay Mesa and is currently undergoing the preparation of a NEPA/CEQA document with the State Department as the lead agency.

The District also has an agreement with the City for a 10 mgd water supply from the City's Otay Filtration Plant. The City's obligation to supply water under this agreement is contingent upon there being a surplus of water at the Plant, until such time when the Plant is expanded. As a result, this supply is viewed as an emergency water supply in the event of a facility outage affecting SDCWA supplies and is currently supplies by a temporary pump station.

The western portion of the Project, if served by the City, would be supplied by the City's South San Diego Service Area, which receives potable water s from the City owned Otay Filtration Plant located at Lower Otay Reservoir. Water is delivered from the plant to the 15 MG South San Diego Reservoir with a high water elevation of 490 feet. The Project could be served from an extension of the existing 680 Pressure Zone distribution system which receives supply from the South San Diego Reservoir via the South San Diego Pipelines and the Otay Mesa and Ocean View Hills Pump Stations, however, there are no immediate facilities in the vicinity of Parcels 1, 2, and 3. Extension of water transmission mains would be problematic until future roadway extensions are completed in Heritage Road and Airway Road.

It is recommended that implementation of the Specific Plan consider alternative water service plans for Parcel 1, 2, and 3 from the District to provide a cost effective and environmental preferred alternative to service this area.

Per the provisions of Senate Bills (SB) 610 and 221, the Project will require preparation of water supply assessment and verification reports by the District as part of environmental review in conformance with CEQA. A Water Supply and Verification (WSA&V) Report was prepared and approved by the District for the OMCPU in July 2013 which includes the Specific Plan area. *It is recommended as part of the Specific Plan process a supplement or addendum to the WSA&V Report is prepared for only the Specific Plan portion and submitted to the District for Board approval.*

Water System Improvements

The Project can receive water service by three direct connections to an existing 10-inch District water main in Cactus Road and parallel 14-inch and 16-inch mains in Airway Road. Parcels 1, 2, and 3 could be easily served by extensions from the District water system. However, if these parcels situated west of Heritage Road do not receive potable water service from the District, an existing 24-inch City main in Otay Mesa Road would have to be extended south in Heritage Road to the project to provide City water service, which may not be feasible due to the uncertainty of the Heritage Road extension.

Based on water demand projections, the project is anticipated to require an average annual demand of 1.45 million gallons per day (mgd) as shown in Table 2. Based on this level of demand, the initial connections to the existing mains in Airway and Cactus Road should provide adequate capacity and redundancy to serve the Project. Based on proposed pad elevations ranging from 480 feet to 510 feet, static pressure in the District system will range from 155 to 170 psi. The likely critical hydraulic condition for the distribution system will be fire flow requirements. The District will require preparation of a Sub Area Water Master Plan (SAMP) for proposed tentative maps processed within the Specific Plan area.

Sewer Service Plan (Figure 2)

General

The City of San Diego will provide sanitary sewer service for the entire Project via development of a new onsite sewer collection system and connections to the Otay Mesa Trunk Sewer system. Wastewater flows generated within the Project will flow by gravity to Cactus Road, which flows to Pump Station 23T located near Cactus and Siempre Viva Roads. Pump Station 23T conveys flow to an 18-inch gravity sewer in Otay Mesa Road that currently connects to the City's Otay Valley Trunk Sewer. The City's sewer master plan includes diversion of Pump Station 23T flows to the west in Otay Mesa Road and conveyed through new trunk sewer improvements to the San Ysidro Interceptor, near Interstate 5 and 805, when capacity is reached in the Otay Valley Trunk Sewer.

Based on sewer demand projections, the project is anticipated to require sewer flows of 1.26 mgd as shown in Table 2. Based on these projected flows, the connection to the gravity main in Cactus Road with some minor upgrades, and conveying through Pump Station 23T should provide the necessary sewage capacity for the project until planned upgrades are completed on the City's Otay Mesa Trunk Sewer system as noted in the following section.

Regional Sewer System

The on-site sewer collection system will convey flows southeasterly toward an existing 10-inch gravity main located in Cactus Road, which should be upgraded to 18-inch as part of the Project. This new gravity main flows into Pump Station 23T, which is located at Cactus and Siempre Viva Roads. This station has a current capacity of approximately 3 mgd. Recorded peak existing inflows (from 2008) to the station are approximately 1 mgd. Pump Station 23T pumps flows through a 16-inch diameter force main in Cactus and Otay Mesa Roads to an 18-inch diameter gravity main in Heritage Road which flows to the Otay Valley Trunk Sewer.

The City has designed the extension of the Otay Mesa Trunk Sewer gravity system from Otay Mesa Road to a future connection with the San Ysidro Interceptor located west of Interstate 5. Initial phases of the extension include construction of a large-diameter gravity sewer in Otay Mesa Road, expansion of the temporary pump station at Cactus and Otay Mesa Roads, and construction of larger diameter force mains in Cactus and Otay Mesa Roads. The upgrades to Pump Station 23T and the new Cactus Road force main have not been designed. Once these improvements are complete, Project flows will be redirected from the Otay Valley Trunk Sewer to the Otay Mesa Trunk Sewer in Otay Mesa Road. In the interim flows will continue to Otay Valley from the Project until hydraulic constraints are reached as noted below.

Hydraulic analysis of the existing regional sewerage system, including temporary pumping operations to the Otay Valley Trunk Sewer, have indicated that future capacity constraints may arise due to continued development of areas to the east of Heritage Road. Specifically, reaches of the Otay Valley Trunk sewer may exceed capacity based on current development and flow projections. Current construction phasing of the Otay Mesa Trunk Sewer, will allow flow to be redirected from the Otay Valley Trunk Sewer. Continued monitoring of the Otay Mesa Trunk Sewer construction progress as well as flow conditions within the Otay Valley Trunk Sewer under interim temporary pumping operations is recommended to assess potential regional sewer constraints.

The specific requirements and timing of the Otay Mesa Trunk Sewer and Pump Station 23T improvements have been identified in the City's report untitled: Otay Mesa Trunk Sewer Refinement and Phasing Report (Addendum No. 1 May 2009). *It is recommended that as part of the tentative map preparation that this report be reviewed with the City to determine the current flow and capacity conditions on Otay Mesa and in Otay Valley.* The City has seen a significant reduction in sewer flows and development forecasts were likely conservative, which may result in deferral of sewer improvement upgrades in the future.

The City plans to develop a sewer assessment financial district for the Otay Mesa sewer service area, including portions of the County of San Diego, to assist in the funding of long term sewer improvements. In 2010, some progress was made in its formation by several property owners but subsequently stalled due to a slowdown in development. *As part of tentative map activities this sewer assessment would need to be evaluated as part of the participation in sewer system upgrades.*

Wastewater Treatment Plant Capacity

The City continues to evaluate and updates its regional wastewater treatment and disposal needs incorporating current SANDAG population projections and sewer generation trends in the region. As such, the City has included the proposed OMCPU in its regional treatment plant capacity planning at the South Bay Water Reclamation Plant, which is one of three major sewer plants

operated by the City. The City is also required to upgrade its Point Loma Wastewater Treatment Plant to secondary standards and has developed a new treatment and reuse program known as the "Pure Water" program. The City plans to upgrade its existing wastewater plants and construct a new wastewater plant at Harbor Drive to meet the ultimate sewer treatment needs for the region and produce a new source of water supply through advanced water purification. *In summary, the City has sufficient wastewater capacity to serve the OMCPU and in the future through its planned Pure Water program.*

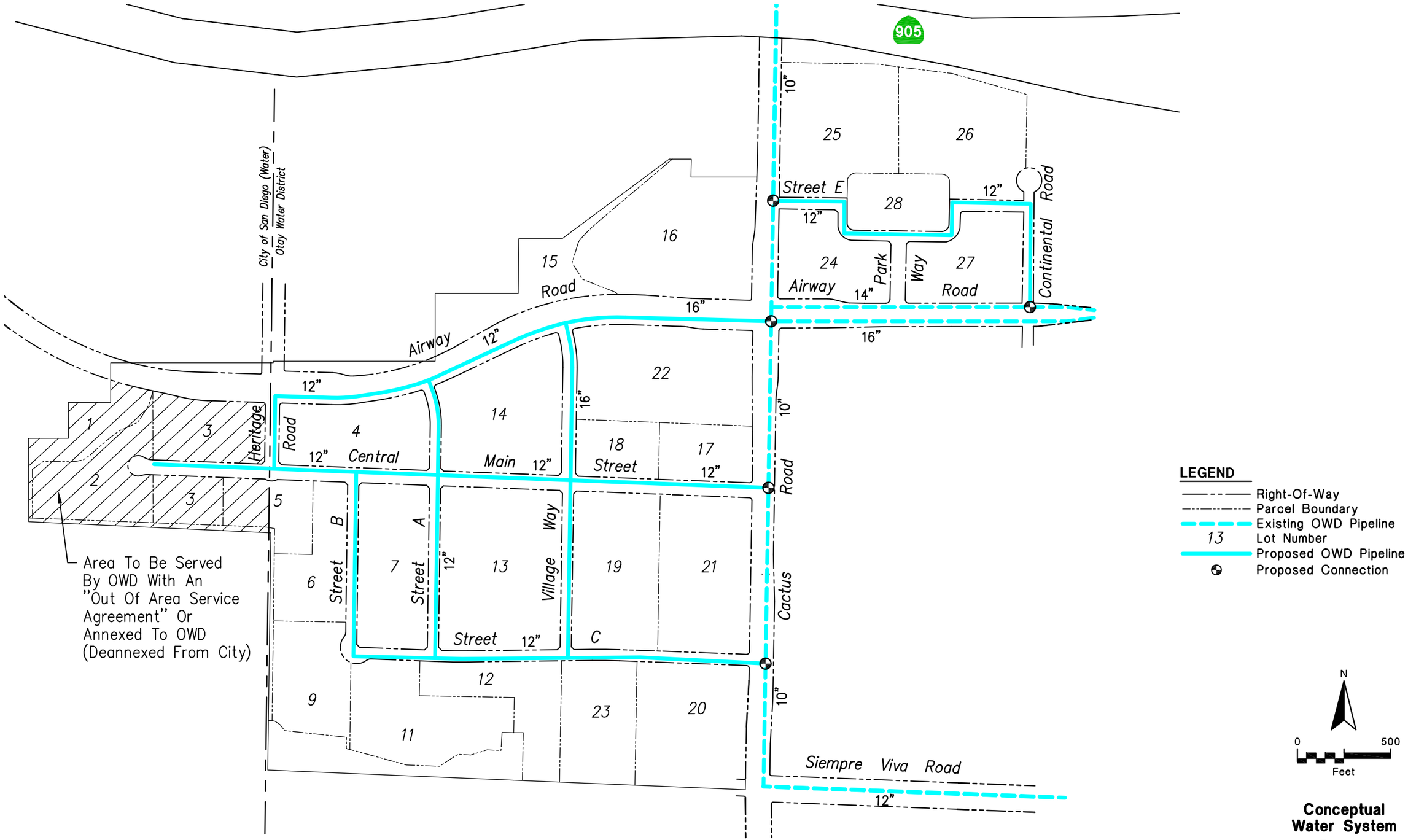
Table 2: Pacel Water Demand and Sewer Flow Projections

Planning Area	General Plan Land Use	Specific Plan Land Use	Gross Acres	Net Acres	Max Commercial Square Footage	Target Density	Unit Yield	Water Demand (mgd) [1]	Sewer Flow (mgd) [2]
1	Neighborhood Village (15-44 du/ac)	MH Mixed Use	3.5	3.5	7,500	44	154	0.048	0.043
2	Neighborhood Village (15-44 du/ac)	MH Multi-Family	6.7	6.7		44	295	0.092	0.081
3	Neighborhood Village (15-44 du/ac)	MH Mixed Use	3.3	2.6	14,000	44	114	0.036	0.032
4	Neighborhood Village (15-44 du/ac)	MH Mixed Use	8	6.7	21,700	44	295	0.092	0.082
5	Population-Based Park	Park	3.5	3.5		0	0	0.008	0.000
6	Residential – Medium (15-29 du/ac)	MD Multi-Family	5.5	4.8		29	139	0.043	0.038
7	Residential – Medium (15-29 du/ac)	MD Multi-Family	9.7	7.7		29	223	0.069	0.062
8	Open Space	Open Space	1.3	1.3		0	0	0.000	0.000
9	Residential – Low Medium to Medium (10-29 du/ac)	LD Multi-Family	5.6	5.4		15	81	0.025	0.022
10	Open Space	Open Space	4.4	4.4		0	0	0.000	0.000
11	Residential – Low Medium to Medium (10-29 du/ac)	LD Multi-Family	8	7.7		15	116	0.036	0.032
12	Population-Based Park	Park	6	6		0	0	0.013	0.000
13	Institutional (3)	School/Recreation	15.5	13.1		0	0	0.023	0.018
14	Neighborhood Village (15-44 du/ac)	MH Mixed Use	11.1	9.5	15,000	35	333	0.104	0.092
15	Open Space	Open Space	7	7		0	0	0.000	0.000
16	Neighborhood Village (15-44 du/ac)	MH Mixed Use	12.2	12.2	26,500	35	427	0.133	0.118
17	Residential – Medium (15-29 du/ac)	MD Multi-Family	3.9	3.5		29	101	0.031	0.028
18	Population-Based Park	Park	3.1	3.1		0	0	0.007	0.000
19	Residential – Medium (15-29 du/ac)	MD Multi-Family	10.1	8.8		29	255	0.079	0.070
20	Residential – Low Medium to Medium (10-29 du/ac)	LD Multi-Family	9.4	9		15	135	0.042	0.037
21	Residential – Medium (15-29 du/ac)	MD Multi-Family	9.9	8.5		29	246	0.076	0.068
22	Neighborhood Village (15-44 du/ac)	MH Mixed Use	11.7	11.3	27,500	44	497	0.155	0.138
23	Residential – Low Medium to Medium (10-29 du/ac)	LD Multi-Family	6.7	6.2		15	93	0.029	0.026
24	Neighborhood Village (15-44 du/ac)	MH Mixed Use	6	5.2	27,500	44	228	0.071	0.063
25	Residential – Medium (15-29 du/ac)	MD Multi-Family	10	9.7		29	281	0.087	0.078
26	Residential – Medium (15-29 du/ac)	MD Multi-Family	9.8	9.4		29	272	0.084	0.075
27	Neighborhood Village (15-44 du/ac)	MH Multi-Family	6.5	5.7		35	200	0.062	0.055
28	Population-Based Park	Park	3.5	3.5		0	0	0.008	0.000
29	Open Space	Open Space	3.2	3.2		0	0	0.000	0.000
--	Circulation	Circulation	24.1	40		0	0	0.000	0.000
Total			**229**	**229**	**139,700**		**4,485**	**1.45**	**1.26**

[1] Water Demand Method uses the OMCP per Capita approach (pg 26) with average occupancy (pg 27) for Residential and Commercial plus the per Ac approach for non -Residential/Commercial

[2] Sewer Demand Method uses the OMCP per Capita approach with average occupancy (pg 29) for Residential and the per Ac approach with a 75% return to sewer ratio for non -Residential

[3] 197 dwelling units within Planning Area 13 only would be constructed in the event that this planning area is not needed as a school site. In the event Planning Area 13 is developed with residential units, the total number of dwelling units allowed within the CENTRAL VILLAGE would increase to 4,682 dwelling units.



Conceptual Water System

Figure 1

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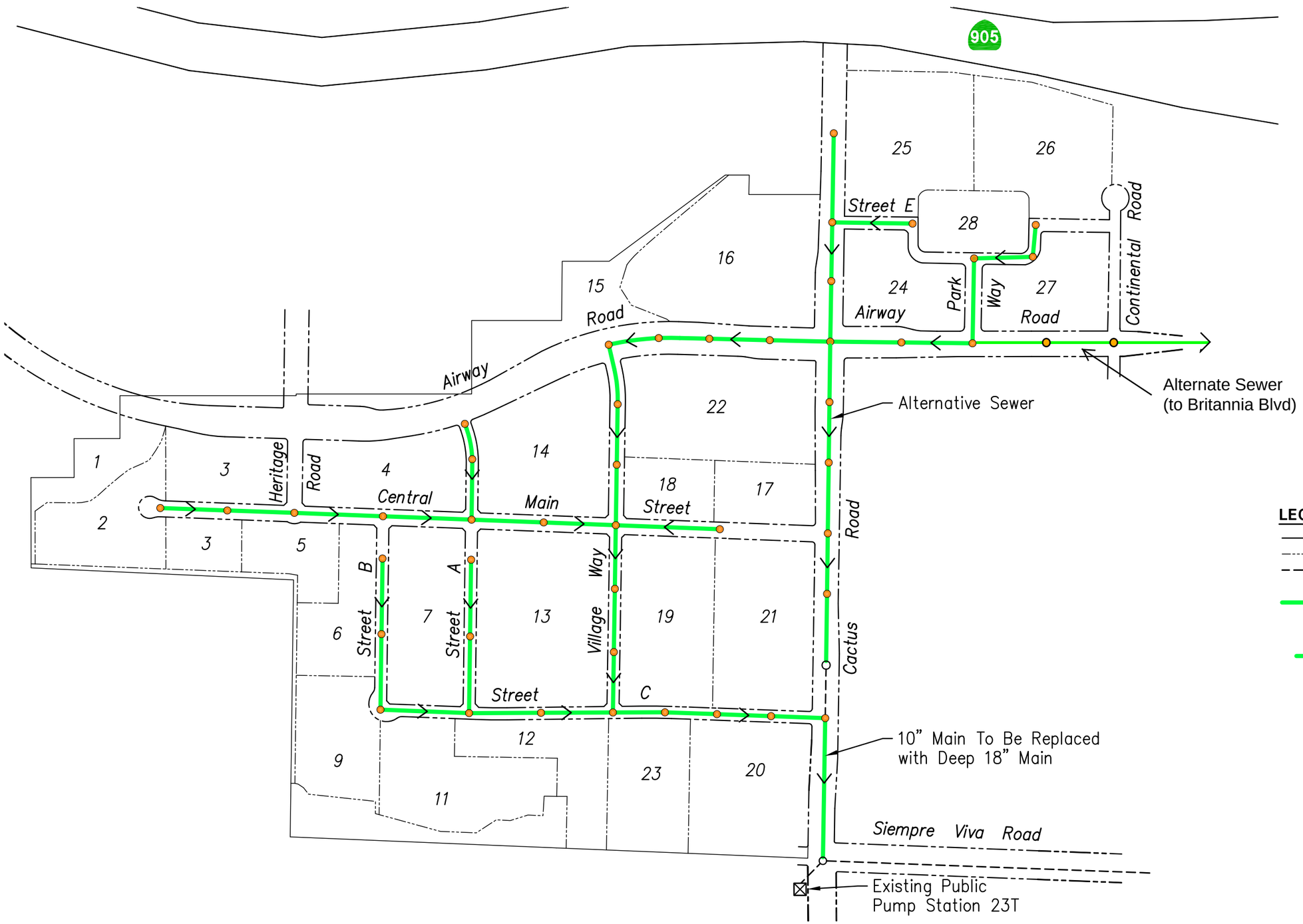
Otay Mesa Central Village
October 2015



LEGEND

- Right-Of-Way
- Parcel Boundary
- Existing Sewer
- 13 Lot Number
- Proposed Sewer
- Existing Manhole
- Proposed Manhole
- Sewer Flow Direction

N

0 500
Feet

Conceptual Sewer System

Figure 2

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John S. Fisher, RLA No. 2995
Development Project Manager
Development Services Department
City of San Diego
1222 First Avenue, MS 301

July 27, 2016

Subject: Central Village Specific Plan - Water Supply Assessment Update for Specific Plan Portion Served Water by the City of San Diego and Otay Water District

Dear Mr. Fisher,

This is an update to the Water Supply Assessment letter dated July 7, 2016, to provide a more inclusive evaluation of the Central Village Specific Plan water supply. The purpose of this letter report is to document that the proposed Central Village Specific Plan located within the City of San Diego (City) and Otay Water District (District) Water Service Areas has been included in an approved Water Supply Assessment as required by Senate Bill (SB) 610 and no further water supply documentation is required as part of the Specific Plan entitlement process. The District has confirmed this inclusive approach based on a review of the draft Central Village water demands within their water service area and an understanding of the proposed two-part entitlement process: A Specific Plan and followed by Tentative Maps.

Background

The proposed Specific Plan (Project) includes approximately 230 acres located on Otay Mesa, generally west of Cactus Road and north of Siempre Viva Road, extending north to Airway Road (see Figure 1). The Project is planned to include 4,485 multi-family (MF) residential units and 139,700 square feet of commercial development. In addition, the Project will include approximately 16.1 acres of park sites and a 15.5 acre school/recreation site. The Project is being planned in accordance with the City of San Diego's Otay Mesa Community Plan Update (OMCPU) (March 2014).

The Project will primarily be supplied water by the District, which serves the City generally east of Heritage Road on Otay Mesa. However, a small portion of the Project is located west of Heritage Road, which is within the City water service area. Table 1 lists the proposed land uses by water service area for the Project.

Table 1. Central Village Proposed Land Uses

Land Use Description	Area, ac	Dwelling Units
Otay WD Service Area		
Multi-Family Residential	86.4	3,922
Elementary School	13.1	---
Commercial	44.9	---
Parks	12.6	---
Open Space	15.9	---
Circulation	40.0	---
City of San Diego Service Area		
Multi-Family Residential	6.7	563
Commercial	6.1	---
Parks	3.5	---
TOTAL	**229.2**	**4,485**

As part of the OMCPU environmental review and approval, the City obtained Water Supply Assessments (WSAs), in accordance with SB 610 requirements, from the District and the City documenting water supply availability within their respective service areas for the OMCPU. These reports were approved by their respective Board and Council, as referenced below:

- "Water Supply Assessment and Verification Report, City of San Diego Otay Mesa Community Plan Update (D0899-090154)", prepared May 2013 by the District and approved by its Board of Directors on June 19, 2013.
- "Water Supply Assessment Report, Otay Mesa Community Plan Update (Project #30330)" (OMCPU WSA), prepared September 2011 by the City Public Water Utilities Department and approved by its City Director on October 5, 2011.

City Water Supply Update

The specific plan entitlement process for the Project requires an addendum to the OMCPU Environmental Impact Report (EIR) and therefore subsequent review of water supply documentation. Based on the approved City OMCPU WSA and water duty factors, this City water service area of the Project will generate an average annual water demand of approximately 173 afy (0.15 mgd).

Table 2. Projected City Potable Water Annual Average Demands

Location (Land Use)	Quantity	Unit Rate	Average Demand, GPD
OMCPU EIR Assumptions			
MF Residential	563 units	267 GPD/unit [1]	150,321
Mixed Use Commercial	6.1 ac	435 GPD/ac [2]	2,653
Parks	3.5 ac	435 GPD/ac [2]	1,522
Total			**154,496**

1. 80 gallons per person per day is the City's standard for MFR water consumption. The City assumes a residential occupancy of 3.42 persons per household and a vacancy rate of 2.3%.
2. The City assumes 60 gallons per person per day for employment water use and an average of 7.25 employees per non-residential acre.

Upon review of the City's approved OMCPU WSA, the proposed Project land use and water demand for the approximate 15 acres is consistent and has therefore been included as part of the water supply documentation for the City.

District Water Supply Update

The expected potable water demand for the Project area served by Otay WD is 1,307,283 gallons per day (GPD) or about 1,465 acre feet per year (AFY), as shown in Table 3. The current development plan is expected to only slightly increase the potable water demand for this project by 20 AFY from the May 2013 Water Supply Assessment and Verification Report that was prepared for the Project and approved by the District Board. This is primarily due to proposed recycled water demands now planned to be served by the potable water system. The previously estimated 1,445 AFY demand (May 2013 WSA&V Report) was accounted for in the District's 2015 Urban Water Management Plan (UWMP) and the Water Authority's 2015 UWMP. Therefore, based on the findings from the District's 2015 UWMP and the Water Authority's 2015 UWMP, this project will result in minor unanticipated demands that could be supplied by the Water Authority's Accelerated Forecasted Growth supply.

Table 3. Projected District Potable Water Annual Average Demands

Location (Land Use)	Quantity	Unit Rate	Average Demand, GPD
OMCPU EIR Assumptions			
MF Residential (>10 DU/AC)	4,683 units	255 GPD/unit [1]	1,194,165
Elementary School	13.1 ac	1,785 GPD/ac [1]	23,384
Mixed Use Commercial	51.0 ac	1,607 GPD/ac [1]	72,154
Parks	16.1 ac	0 GPD/ac [1]	0
Circulation	40.0 ac	0	0
Open Space	15.9 ac	0	0
Subtotal			**1,289,703**
Proposed Central Village Specific Plan			
MF Residential (>10 DU/AC)	3,922 units	300 GPD/unit	1,176,600
Elementary School	13.1 ac	1,785 GPD/ac	23,384
Mixed Use Commercial	44.9 ac [2]	1,785 GPD/ac	80,147
Parks	12.6 ac	2,155 GPD/ac	27,153
Circulation	40.0 ac	0	0
Open Space	15.9 ac	0	0
Subtotal	**3,922 units**		**1,307,283**

[1] OMCPU EIR potable water unit demands assumed a potable water factor to account for proposed recycled water supply

[2] 139,700 SF of commercial is proposed on approximately 2.0 acres of these sites.

In summary, the only notable change in water supply from the OMCPU is that the District has implemented a moratorium on the use of recycled water in the Otay Mesa area due to the high capital cost to extend recycled water service to the area, in a District Board action dated July 2, 2014. As a result, the District will not require the construction of any recycled water facilities as part of the Otay Mesa Central Village Specific Plan and all future irrigation will be via the potable water system.

Conclusion

The Project portions within the City and District water service areas have sufficient water supply based on the proposed land uses and approved OMCPU WSAs and these findings would serve as sufficient water supply documentation for the Project Specific Plan addendum EIR.

The District will review individual proposed Tentative Maps within the Central Village Specific Plan area to determine if any additional water supply documentation is required at that time, or if the OMCPU WSA remains adequate. If required, assuming due to changes in water demand or service area boundaries, the District will prepare a revised WSA at the City's request, for approval by their Board.

We appreciate the opportunity to assist the City and should have any additional questions please call me at 619.272.7283 or Leanne Hammond at 619.272.7226.

Regards,
CH2M

Mark B. Elliott,

Project Manager

MBE:lmh

cc: Rita Mahoney, ColRich
Jason Shepard, ColRich
Jer Harding, Turrini & Brink
Bob Kennedy, Otay Water District
Lisa Coburn-Boyd, Otay Water District
Leanne Hammond, CH2M