Otay Mesa Lumina

Transportation Impact Study

Final Report | February 20, 2019

Prepared For:

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EXECUTIVE SUMMARY

ES.1 Study Purpose and Project Description

The purpose of this Transportation Impact Study (TIS) is to identify and document potential transportation related impacts associated with the development of the proposed Otay Mesa Lumina project (the "Project"), as well as to recommend mitigation measures for any identified traffic impact on study area intersections, roadway and freeway segments.

The proposed project site is located just west of Cactus Road, both north and south of Airway Road within the City of San Diego Otay Mesa Community Planning Area (CPA). It is a part of the approved Otay Mesa Central Village Specific Plan.

The proposed project will be developed in two phases (see Figure ES-1) and it assumes the following land uses for each development phase:

Phase 1 (2023)

- 1,129 medium high-density multi-family units; and
- 62.53 ksf of commercial uses.

Phase 2 (2027)

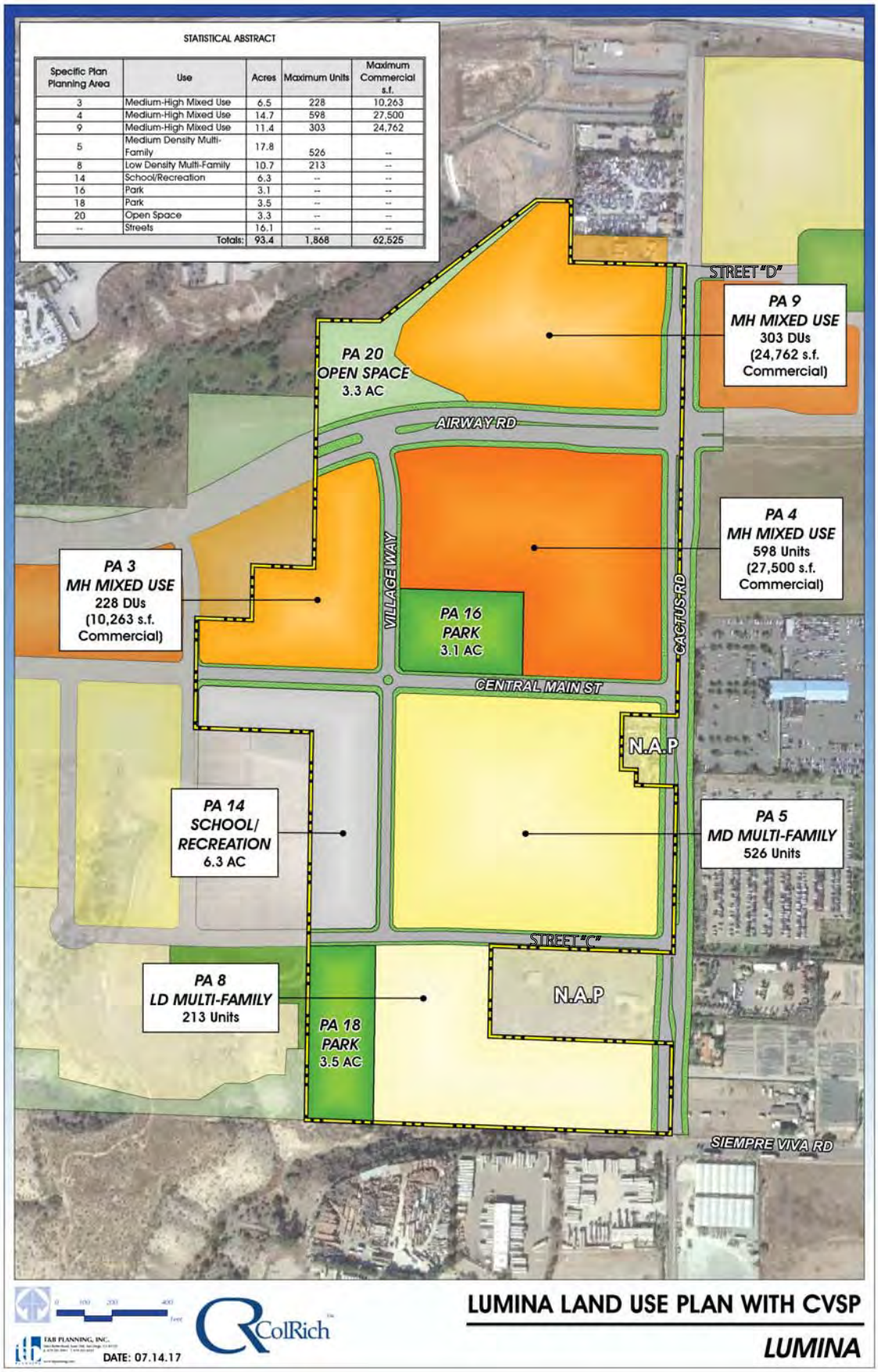
- 526 medium density multi-family units;
- 213 low density multi-family units;
- 6.3 acres of school uses; and
- 6.6 acres of parks.

Project access is proposed via Cactus Road and Airway Road. The following facilities are assumed to be constructed by the project as a part of project frontage and access improvements by the 1st EDU by each of the development phases.

Phase 1 - to be constructed by the proposed project

Roadway Segments

- Airway Road, between Western Lumina project boundary and Cactus Road – This segment serves as the project frontage and will be constructed to a 4-Lane Prime Arterial, which is within the ultimate classification (6-Lane Prime Arterial) 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 Street "D" and Airway Road - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median), which is within the ultimate classification (4-Lane Major Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).



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Figures ES-1
Project Site Plan

- Cactus Road, between Airway Road and Central Main Street - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median), which is within the ultimate classification (4-Lane Major Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).

Intersections

7. 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 with Phase 1. See **Appendix J** for traffic signal warrant.

16. Village Way / Airway Road – Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross-section mentioned above. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

17. Cactus Road / Street "D" – Construction of an all-way stop control (AWSC) T-intersection, but the fourth leg (east of Cactus Road) will be constructed by the developer(s) of PA 14, 15, 16, 17, and 21 of the Otay Mesa Central Village Specific Plan. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

18. Cactus Road / Central Main Street – Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross section mentioned above. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

Phase 2 – to be constructed by the proposed project

Roadway Segments

- Cactus Road, between Central Main Street and Street "C" - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median), which is within the ultimate classification (4-Lane Major Arterial) 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 Street "C" and Siempre Viva Road - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median), which is within the ultimate classification (4-Lane Major Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).

Intersection

19. Cactus Road / Street "C" – Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross section mentioned above. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

Table ES.1 summarizes the proposed project frontage improvements by phase.

TABLE ES.1
OTAY MESA LUMINA – FRONTAGE IMPROVEMENTS PHASING PLAN

Facility	Existing Conditions			Phase 1 (2023)			Phase 2 (2027)		
	Current Configuration	LOS	Ultimate Configuration	Trigger	Frontage Improvement	LOS	Trigger	Frontage Improvement	LOS
Roadway Segment									
Airway Road, between Village Way (project access) and Cactus Road	Does Not Exist	-	6-Lane Prime Arterial	1 ADT	4-Lane Prime Arterial	A	-	-	A
Cactus Road, between Street "D" and Airway Road	2-Lane Collector w/ commercial fronting	A	4-Lane Major Arterial	1 ADT	3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median)	A	-	-	A
Cactus Road, between Airway Road and Central Main Street	2-Lane Collector w/ commercial fronting	A	4-Lane Major Arterial	1 ADT	3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median)	A	-	-	A
Cactus Road, between Central Main Street and Street "C"	2-Lane Collector w/ commercial fronting	A	4-Lane Major Arterial	-	See Phase 2	-	11,152 ADT	3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median)	A
Cactus Road, between Street "C" and Siempre Viva Road	2-Lane Collector w/ commercial fronting	A	4-Lane Major Arterial	-	See Phase 2	-	11,152 ADT	3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median)	A

TABLE ES.1
OTAY MESA LUMINA – FRONTAGE IMPROVEMENTS PHASING PLAN

Facility	Existing Conditions			Phase 1 (2023)			Phase 2 (2027)		
	Current Configuration	LOS	Ultimate Configuration	Trigger	Frontage Improvement	LOS	Trigger	Frontage Improvement	LOS
Intersection									
7. Cactus Road / Airway Road	See Figure 4-2	A / A	-	1 ADT	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 mentioned above. This intersection is proposed to be signalized.	B / C	-	-	C / D
16. Village Way / Airway Road	Does Not Exist	-	-	1 ADT	Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross-section mentioned above.	A / B	-	-	B / C
17. Cactus Road / Street "D"	Does Not Exist			1 ADT	Construction of an all-way stop control (AWSC) T-intersection.	A / A	-	-	A / A

TABLE ES.1
OTAY MESA LUMINA – FRONTAGE IMPROVEMENTS PHASING PLAN

Facility	Existing Conditions			Phase 1 (2023)			Phase 2 (2027)		
	Current Configuration	LOS	Ultimate Configuration	Trigger	Frontage Improvement	LOS	Trigger	Frontage Improvement	LOS
18. Cactus Road / Central Main Street	Does Not Exist	-	-	1 ADT	Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross section mentioned above.	A / A	-	-	B / B
19. Cactus Road / Street "C"	Does Not Exist	-	-	-	See Phase 2	-	1 ADT	Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross section mentioned above.	A / A

Source: Chen Ryan Associates, February 2019.

ES.2 Street Vacation

The Lumina project site contains a public right-of-way for an unnamed road in the western portion of the site, dedicated by Map 1267 shown on **Figure ES-2**. The unnamed road was dedicated to provide circulation, access, and public services; however, the unnamed road was never constructed and is undriveable under existing conditions. The Lumina project will implement the Central Village Specific Plan planned roadway circulation system on-site, which will provide the circulation necessary to the public within and through the community. The Lumina project proposes vacation of the unnamed road because it is not needed to provide public circulation.

ES.3 Project Trip Generation and Distribution

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*.

Phase 1

Under Phase 1, the proposed project is anticipated to generate a total of 11,151 average daily trips, including 673 (187-in / 486-out) AM peak hour trips and 1,048 (646-in / 402-out) PM peak hour trips.

Full Development (Phases 1 and 2)

The project full development includes both Phases 1 and 2 and would generate a total of 17,198 average daily trips, including 1,340 (431-in / 909-out) AM peak hour trips and 1,691 (1,042-in / 649-out) PM peak hour trips. The same SANDAG Select Zone Assignment that was conducted for the approved Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) is utilized for the analysis of the proposed Otay Mesa Lumina project (Full Development). This exercise estimates the percent of trips that will be internally captured. The Select Zone Assignment for the Otay Mesa Central Village Specific Plan 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., offsite) roadways. Therefore, applying the calculated internal capture from the SANDAG Select Zone Assignment, the proposed project is anticipated to generate a total of 15,581 external daily trips, including 1,214 (390-in / 824-out) AM peak hour trips and 1,532 (944-in / 588-out) PM peak hour trips.

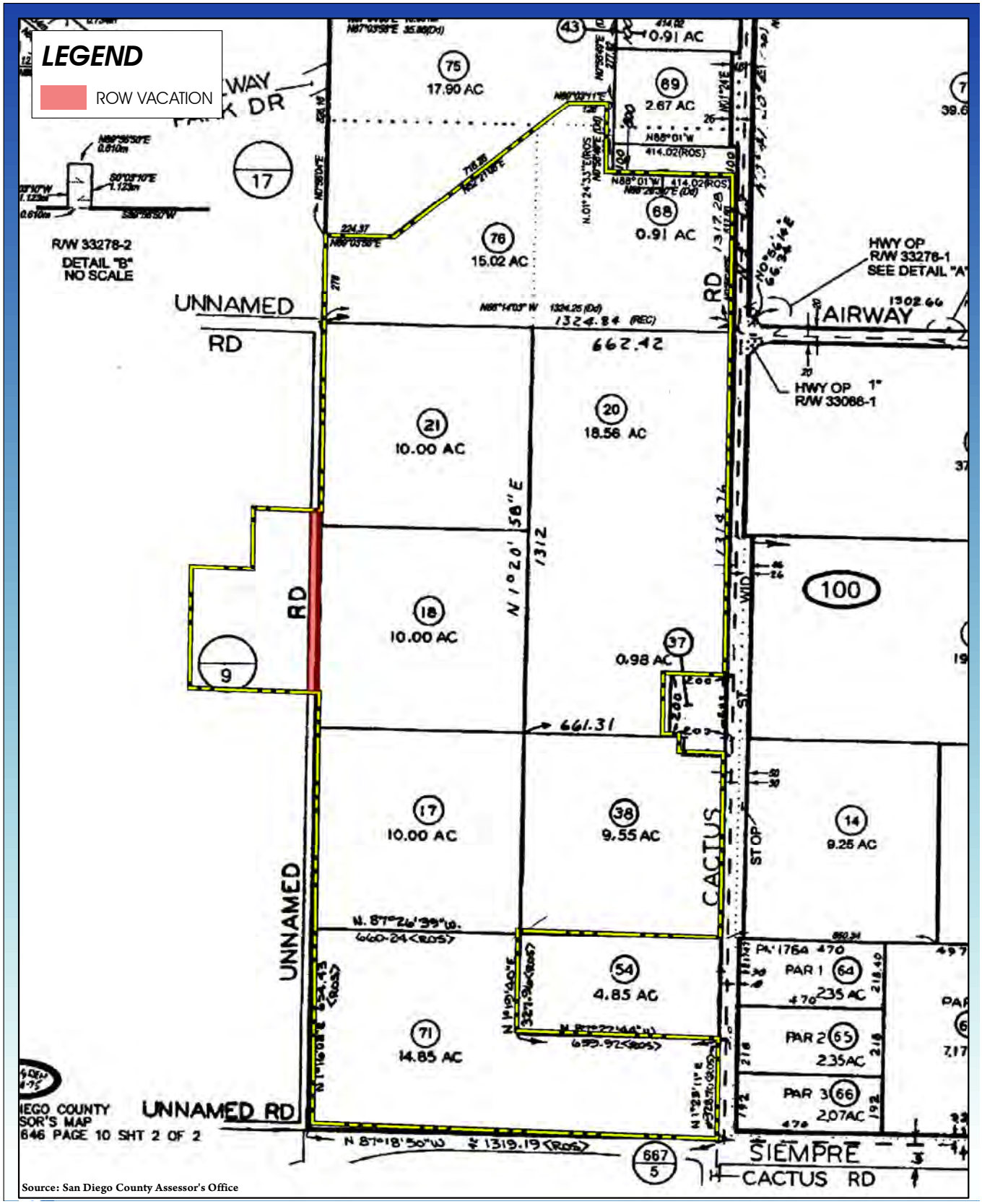

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Figure ES-2
Street Vacation

Project Trip Distribution

Project trip distribution was based on the trip distribution utilized for the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis as well as taking into consideration of adjacent land uses and the existing transportation network. Trip distribution is identical under the following scenarios:

- Existing plus Project – Full Development (Phases 1 & 2);
- Near-Term Year 2023 plus Project - Phase 1; and
- Near-Term Year 2027 plus Project - Full Development (Phases 1 & 2)

However, under Buildout of Community Plan Conditions, the same project trip distribution utilized for the Otay Mesa Central Village Specific Plan TFTA was employed.

ES.4 Timing of Required Mitigation Measures

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 mitigation measures associated with the development of the Otay Mesa Lumina project was analyzed under the following three (3) scenarios:

- Near-Term Year 2023 Cumulative (Existing Plus Cumulative Projects) Plus Project (Phase 1) Conditions
- Near-Term Year 2027 Cumulative (Existing Plus Cumulative Projects) Plus Project (Full Development) Conditions
- Buildout Community Plan Plus Project (Full Development) Conditions

Near-Term Year 2023 and 2027 analyses include reasonably foreseeable projects in the vicinity of the proposed project (cumulative projects information). Traffic related to the proposed project was added to the respective near-term volumes by development phases in order to analyze a Near-Term Year 2023 Plus Project (Phase 1) and Near-Term Year 2027 Plus Project (Full Development) scenarios. The following projects were considered as near-term reasonably foreseeable projects with full discussion found in Chapters 6.0 and 8.0 of this report:

Near-Term Year 2023

1. 7-Eleven Expansion at Ocean View Hills Parkway / Otay Mesa Road
2. Azul Playa Del Sol/Luna
3. Cesar Solis Park
4. Candlelight
5. Southview
6. Southview East
7. Southwind
8. Handler Retail Center
9. Arco #5770 at 1625 Heritage Road
10. Marijuana Production Facility at Innovative Drive
11. California Terraces PA 61 at Otay Mesa Road / Caliente Avenue

12. Cross Border Facility Project – Phase 2 (2017)
13. Plaza La Media – Full buildout (2019)
14. Metro Airpark – Phase 1 (2022)
15. Sunroad Otay Mesa – Phase 1 and Phase 2 (2018 and 2020, respectively)

Near-Term Year 2027

1. 7-Eleven Expansion at Ocean View Hills Parkway / Otay Mesa Road
2. Azul Playa Del Sol/Luna
3. Cesar Solis Park
4. Candlelight
5. Southview
6. Southview East
7. Southwind
8. Handler Retail Center
9. Arco #5770 at 1625 Heritage Road
10. Marijuana Production Facility at Innovative Drive
11. California Terraces PA 61 at Otay Mesa Road / Caliente Avenue
12. Cross Border Facility Project – Full buildout (2026)
13. Plaza La Media – Full buildout (2019)
14. Metro Airpark – Phase 1 and Phase 2 (2027)
15. Sunroad Otay Mesa – Phase 1 and Phase 2 (2018 and 2020, respectively)

Existing Plus Project Conditions

In addition to the three scenarios identified above, Existing Plus Project conditions was also analyzed. Under the Existing Plus Project Conditions, 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 as hypothetical when used in connection with a long-range development project such as the proposed project, which is not anticipated to reach full buildout until approximately 2027.

The scenario is hypothetical because it assumes that the proposed project would be fully built out immediately and the corresponding full development traffic volumes added to existing roadway volumes and infrastructure.

As a result of this presumption, future increases in traffic volumes attributable to other development projects (i.e., cumulative traffic volumes) are not accounted for in the analysis. This results in the analysis potentially understating project impacts because capacity that otherwise would be utilized by future development that precedes the proposed project buildout is now available to the project. On the other hand, because the scenario does not account for future planned roadway network mitigation measures that would increase roadway capacities, the analysis potentially results in overstating project impacts. Furthermore, because the analysis does not take into account future reasonably foreseeable development and related changing land uses, the analysis does not account for the corresponding change in trip distribution patterns

that accompany changing land uses, which could result in either understating or overstating impacts.

Near-Term Year 2023 Plus Project (Phase 1) Conditions

Roadway Segments

Mitigation measures associated with Phase 1 of the Otay Mesa Lumina project would be required at the following roadway segments:

- *Britannia Boulevard, between SR-905 EB Ramps and Airway Road* - The Project shall widen this roadway from a 5-Lane Prime Arterial (2 NB & 3 SB) to a 6-Lane Prime Arterial prior to the project's **total trip generation** of 1,493 ADT. This cross-section is consistent with the ultimate classification (6-Lane Prime Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and this mitigation measure is consistent with the OMCPU EIR at buildout of the OMCPU. As shown in Table 7.5, this segment would operate at LOS D with the recommended mitigation measure under Near-Term Year 2023 Plus Project (Phase 1) conditions.
- *Airway Road, between Cactus Road and Britannia Boulevard* – The Project shall widen this roadway segment from a 2-Lane Collector to a 4-Lane Collector prior to the project's **total trip generation** of 4,310 ADT. This cross-section is within the ultimate classification (6-Lane Major Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and this mitigation measure is consistent with the OMCPU EIR at buildout of the OMCPU. As shown in Table 7.5, this segment would operate at LOS D with the recommended mitigation measure under Near-Term Year 2023 Plus Project (Phase 1) conditions.
- *Airway Road, between Britannia Boulevard and 1,600 feet west of La Media Road* – The Project shall widen this roadway segment from a 2-Lane Collector to a 2-Lane Collector with a continuous left-turn lane prior to the project's **total trip generation** of 682 ADT. This cross-section is within the ultimate classification (4-Lane Major Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and this mitigation measure is consistent with the OMCPU EIR at buildout of the OMCPU. As shown in Table 7.5, this segment would operate at LOS B with the recommended mitigation measure under Near-Term Year 2023 Plus Project (Phase 1) conditions.

Intersections

Mitigation measures associated with Phase 1 of the Otay Mesa Lumina project would be required at the following intersection:

11. *Britannia Blvd / Airway Road* – The Project shall widen the eastbound approach (Airway Road) of this intersection to accommodate dual left-turn lanes and a through lane with a shared right-turn lane, and add a right-turn overlap phase at the southbound approach (Britannia Blvd), prior to the project's **total trip generation** of 4,912 ADT.

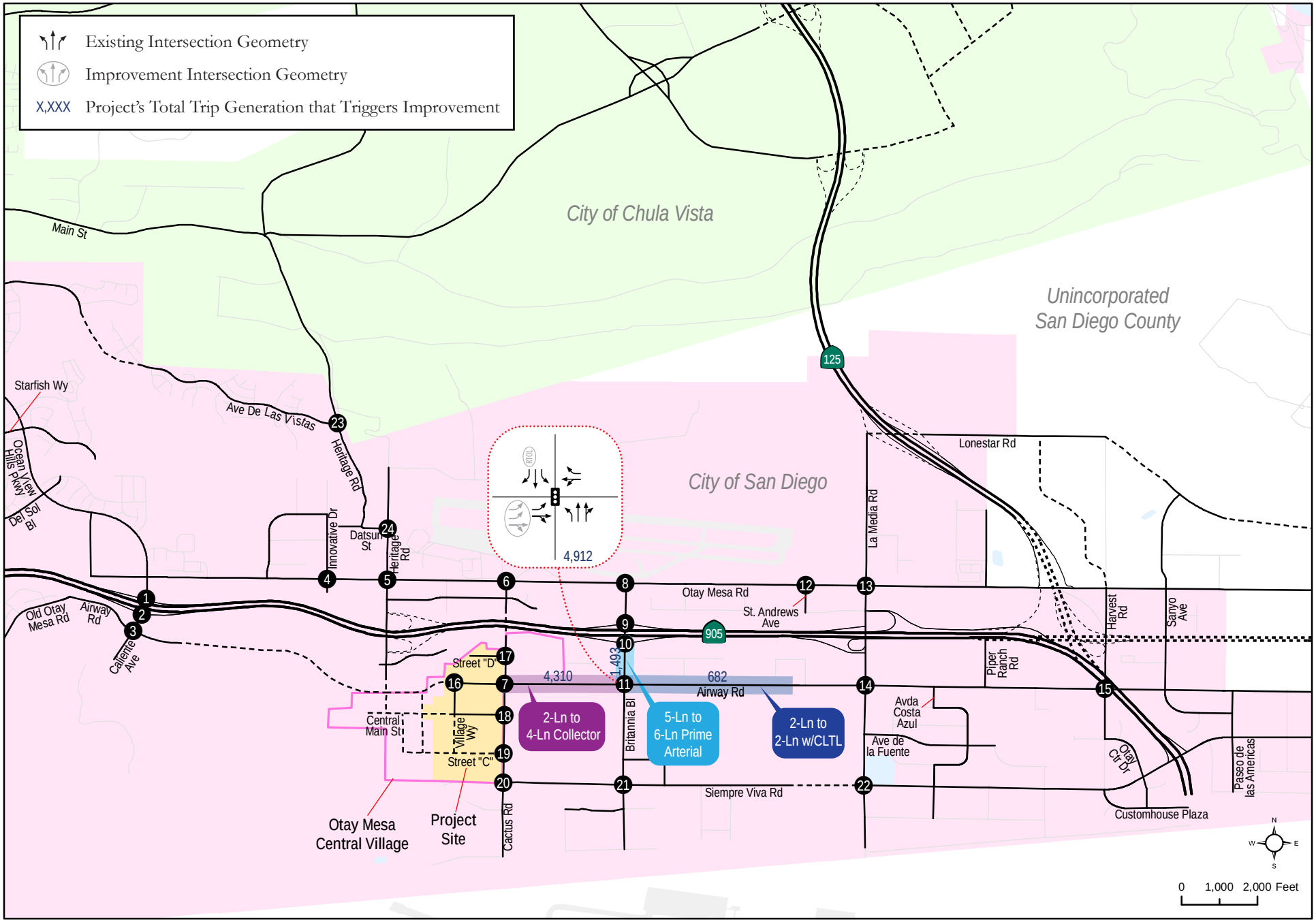
Ramp Meters

Ramp meters are currently installed but not in operations within the project study area. Therefore, ramp metering analysis is not included in this scenario.

Freeway Segments

No significant impacts were identified at any of the analyzed freeway segments.

Figure ES-3 displays significantly impacted facilities and their respective mitigation measures and triggers while **Figure ES-4** displays conceptual design of the proposed mitigation measures.



Otay Mesa Lumina
Transportation Impact Study

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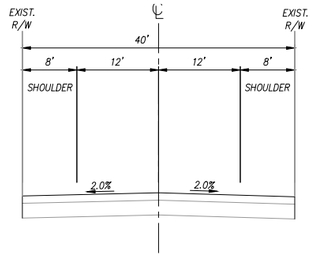
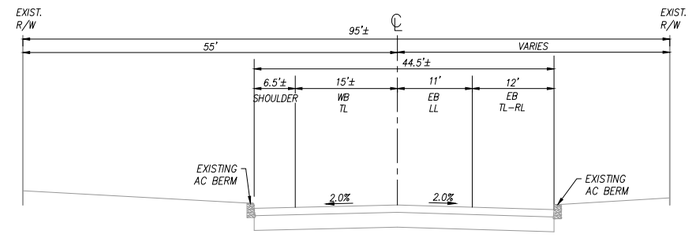
Figure ES-3

Geometrics with Recommended Mitigation Measures - Near-Term Year 2023 Plus Project (Phase 1) Conditions



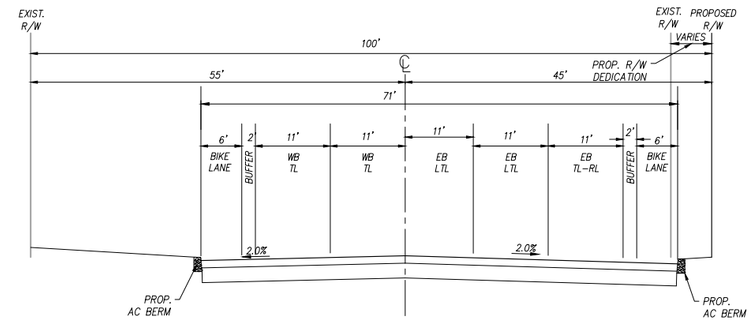
L-L AIRWAY ROAD SECTION - EXISTING (CACTUS RD TO BRITANNIA BL)

TWO-LANE
NOT TO SCALE



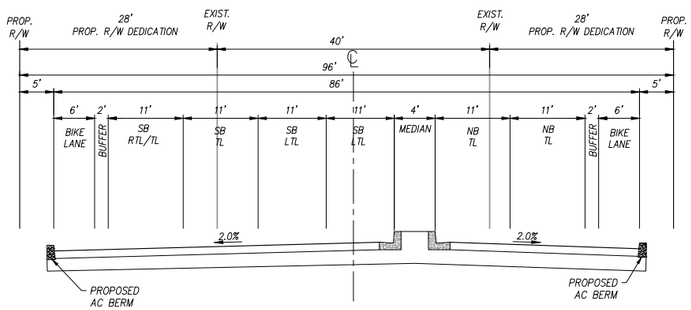
H-H AIRWAY ROAD SECTION - EXISTING (CACTUS RD TO BRITANNIA BLVD INTERSECTION)

NOT TO SCALE



H-H AIRWAY ROAD SECTION - PROPOSED (CACTUS RD TO BRITANNIA BL)

NOT TO SCALE

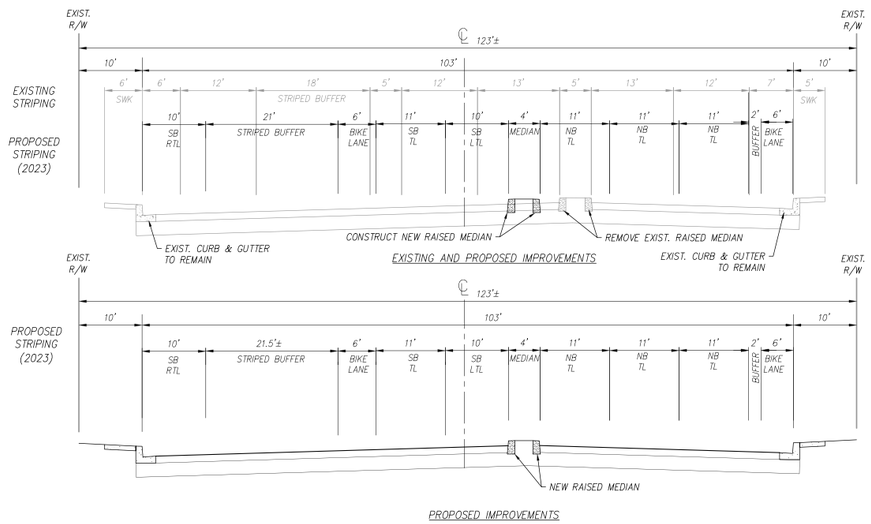


L-L AIRWAY ROAD SECTION - PROPOSED (CACTUS ROAD INTERSECTION)

NOT TO SCALE

CACTUS ROAD TO BRITANNIA BLVD. SECTIONS

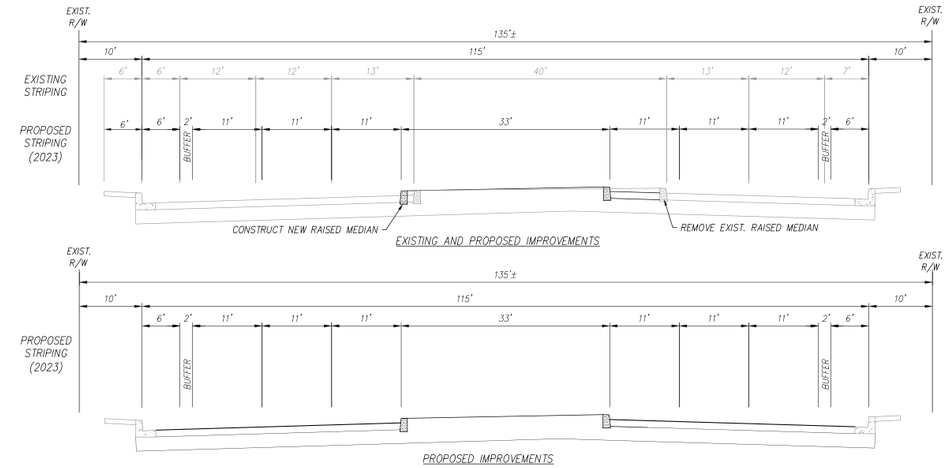
AIRWAY ROAD FROM CACTUS ROAD TO BRITANNIA BLVD. CONCEPTUAL STRIPING PLAN (2023)



F-F BRITANNIA BLVD. SECTION

NOT TO SCALE

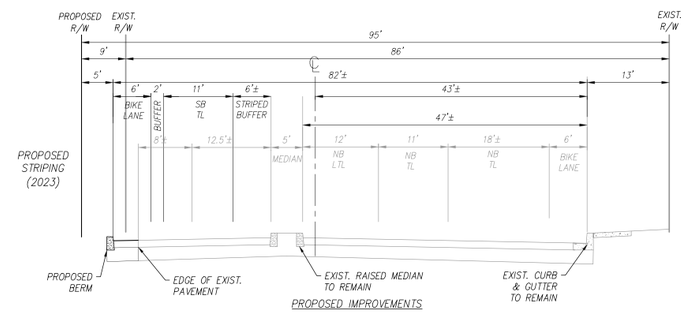
PROPOSED: SIX-LANE PRIME ARTERIAL



G-G BRITANNIA BLVD. SECTION

NOT TO SCALE

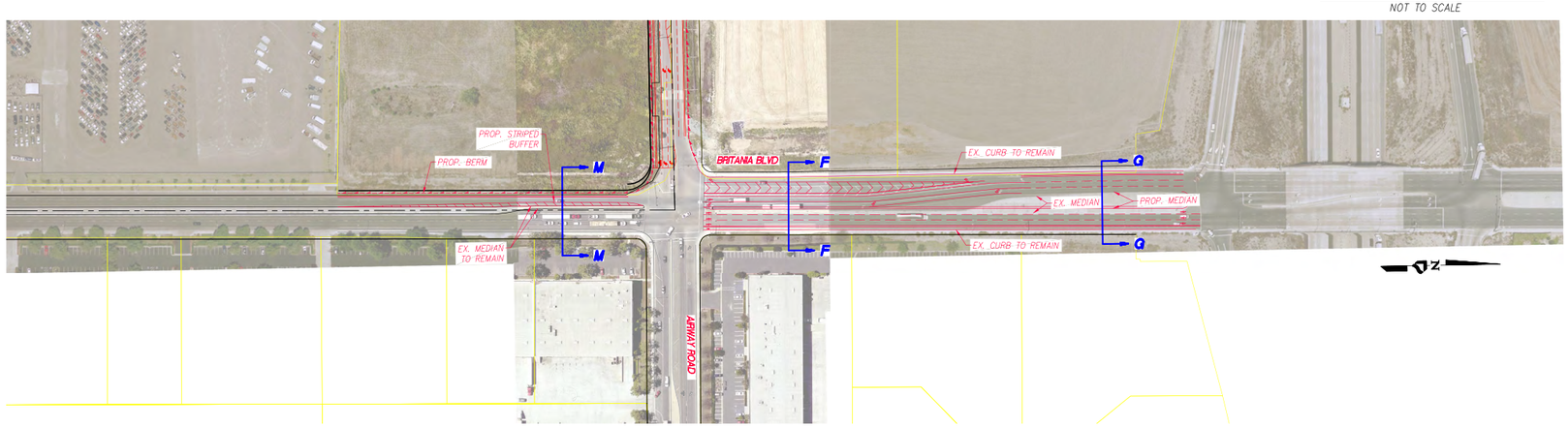
PROPOSED: SIX-LANE PRIME ARTERIAL



M-M BRITANNIA BLVD. SECTION (SOUTH OF AIRWAY)

NOT TO SCALE

BRITANNIA BLVD. SECTION



BRITANNIA BLVD. PLAN (2023)

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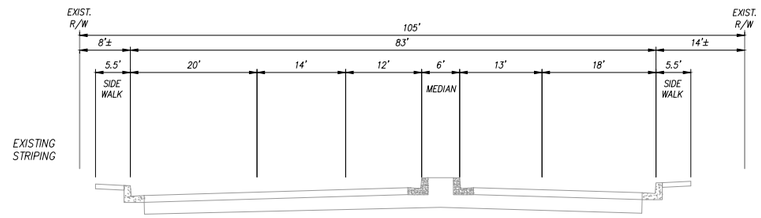
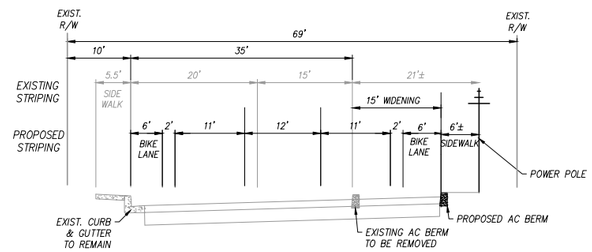
Figure ES-4
Conceptual Design of Recommended Mitigation Measures - Near-Term Year 2023 Plus Project (Phase 1) Conditions
(Sheet 2 of 4)

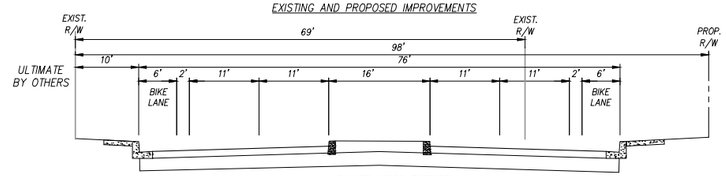


A-A AIRWAY ROAD SECTION - EXISTING (EAST OF BRITANNIA BLVD INTERSECTION)

NOT TO SCALE



EXISTING AND PROPOSED IMPROVEMENTS

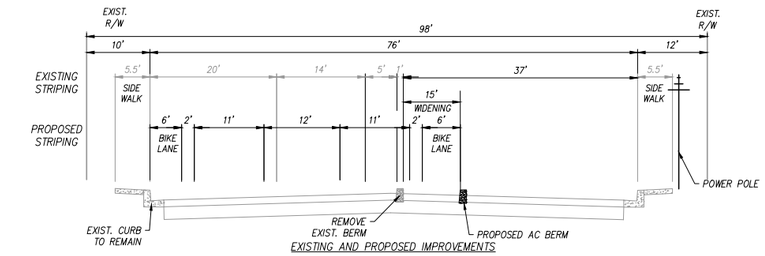


ULTIMATE IMPROVEMENTS

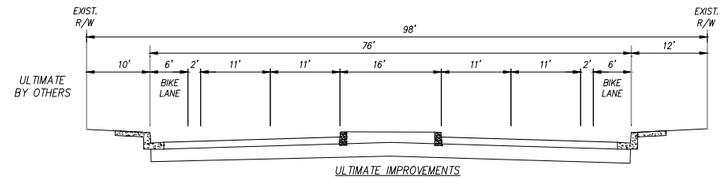
B-B AIRWAY ROAD SECTION (DUBLIN STREET INTERSECTION APPROX.)

NOT TO SCALE

PROPOSED: MODIFIED TWO-LANE COLLECTOR WITH CENTER TURN LANE



EXISTING AND PROPOSED IMPROVEMENTS



ULTIMATE IMPROVEMENTS

C-C AIRWAY ROAD SECTION (DUBLIN DR TO EXCELLANTE ST)

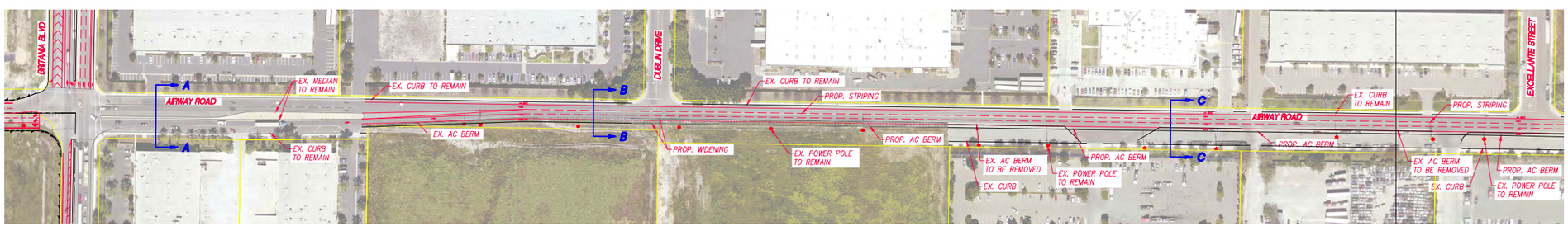
NOT TO SCALE

PROPOSED: MODIFIED TWO-LANE COLLECTOR WITH CENTER TURN LANE

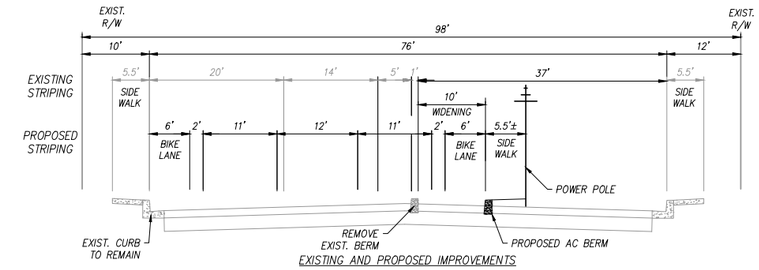
ULTIMATE: 4-LANE MAJOR (BY OTHERS)

N

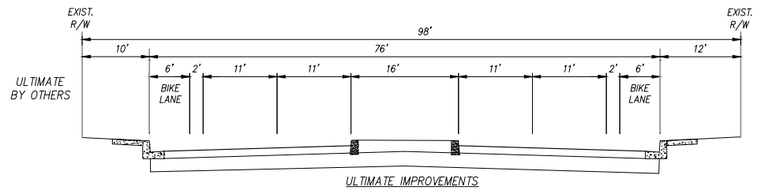
AIRWAY ROAD FROM BRITANNIA BLVD. TO EXCELLANTE STREET SECTIONS



AIRWAY ROAD FROM BRITANNIA BLVD. TO EXCELLANTE STREET CONCEPTUAL STRIPING PLAN (2023)



EXISTING AND PROPOSED IMPROVEMENTS



ULTIMATE IMPROVEMENTS

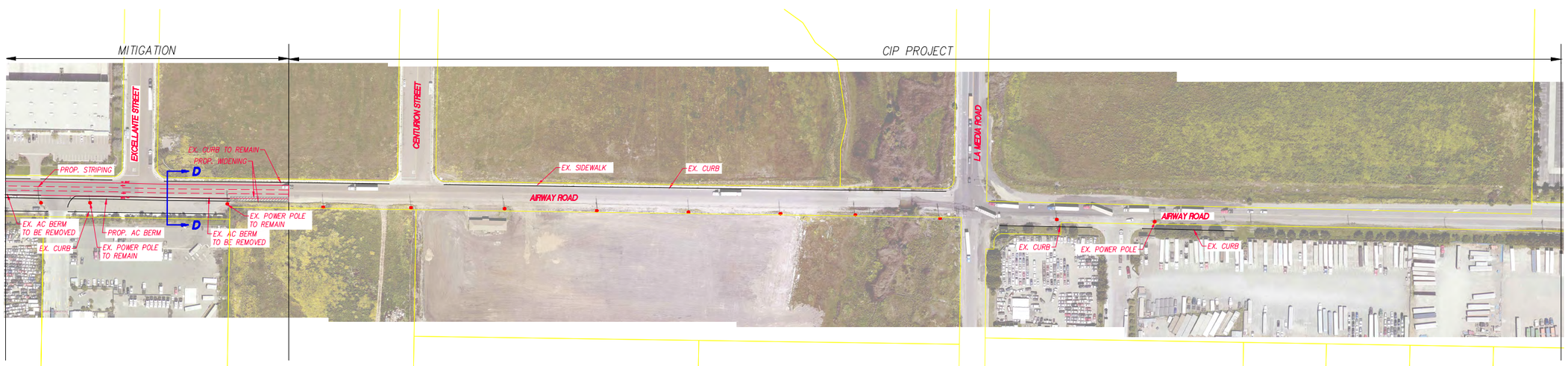
D-D AIRWAY ROAD SECTION (EXCELLANTE ST TO CENTURION ST)

NOT TO SCALE

PROPOSED: MODIFIED TWO-LANE COLLECTOR WITH CENTER TURN LANE

ULTIMATE: 4-LANE MAJOR (BY OTHERS)

EXCELLANTE STREET TO LA MEDIA ROAD SECTIONS



AIRWAY ROAD FROM EXCELLANTE STREET TO LA MEDIA ROAD CONCEPTUAL STRIPING PLAN (2023)

Near-Term Year 2027 Plus Project (Full Development) Conditions

It is assumed that mitigation measures identified under the Near-Term Year 2023 Plus Project (Phase 1) scenario are carried forward to the Near-Term Year 2027 Plus Project (Full Development) analysis.

Roadway Segments

Facility mitigation measures associated with Full Development of the Otay Mesa Lumina project would be required at the following roadway segments:

- *Airway Road, between Cactus Road and Britannia Boulevard* – The Project shall widen this roadway segment from a 4-Lane Collector to a 4-Lane Collector with a continuous left-turn lane prior to the project's **total trip generation** of 11,258 ADT. This cross-section is within the ultimate classification (6-Lane Major Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and this mitigation measure is consistent with the OMCPU EIR at buildout of the OMCPU. As shown in Table 9.5, this segment would operate at LOS C with the recommended mitigation measure under Near-Term Year 2027 Plus Project (Full Development) conditions.

Intersections

Mitigation measures associated with Full Development of the Otay Mesa Lumina project would be required at the following intersections:

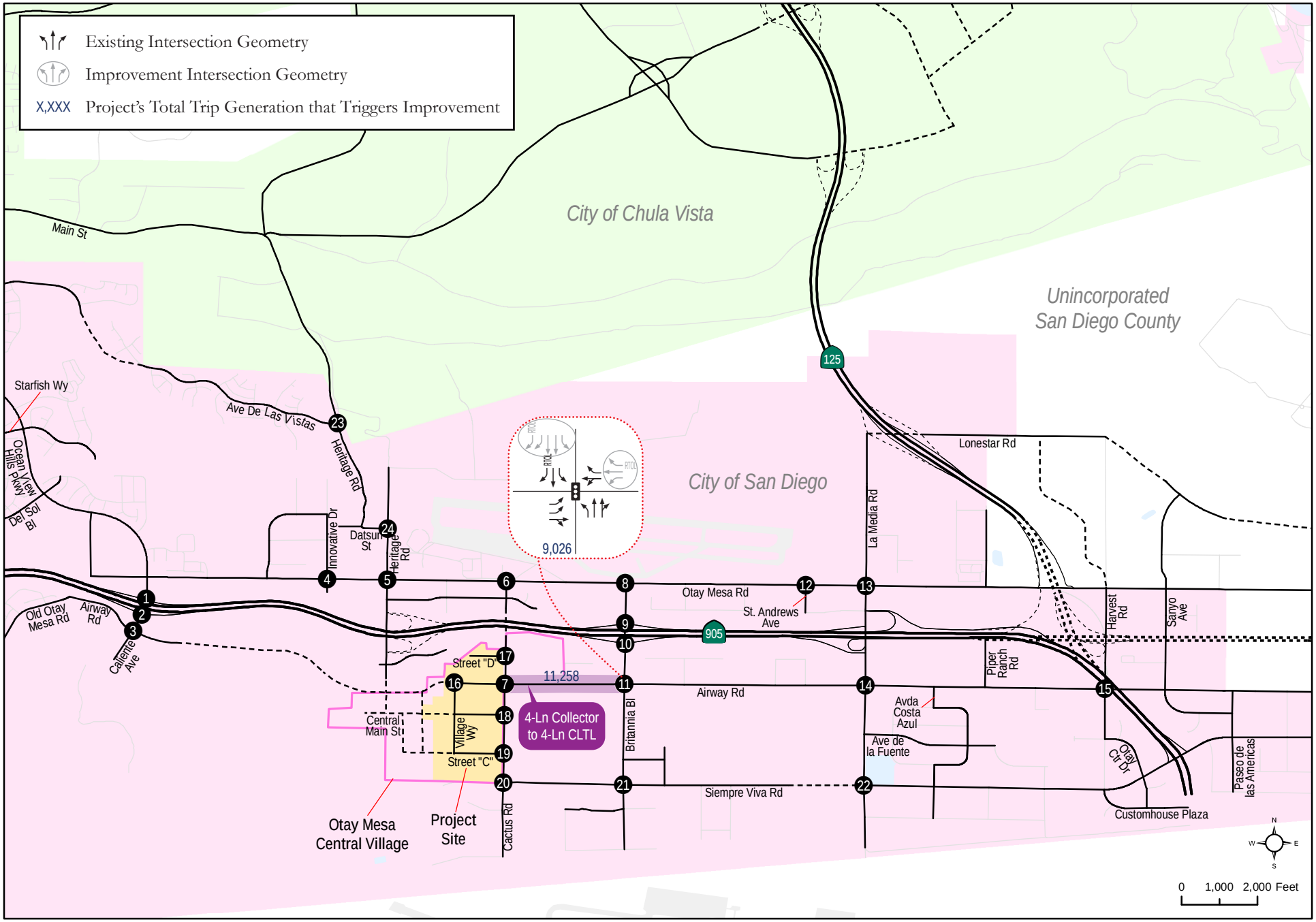
11. *Britannia Boulevard / Airway Road* - The Project shall widen the eastbound approach (Airway Road) of this intersection to accommodate dual left-turn lanes and a through lane with a shared right-turn lane, widen the southbound approach (Britannia Boulevard) to accommodate an exclusive left-turn lane, two through lanes, two exclusive right-turn lanes with right-turn overlap phasing, and stripe an exclusive left-turn lane at the westbound approach (Airway Road) and add right-turn overlap phasing, prior to the project's **total trip generation** of 9,026 ADT. These recommended mitigation measures are consistent with the intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 9.5, this intersection would operate at LOS D during both peak hours with the recommended mitigation measures under Near-Term Year 2027 Plus Project (Full Development) conditions.

Ramp Meters

Ramp meters are currently installed but not in operations within the project study area. Therefore, ramp metering analysis is not included in this scenario.

Freeway Segments

No significant impacts were identified at any of the analyzed freeway segments. **Figure ES-5** displays significantly impacted facilities and their respective mitigation measures and triggers while **Figure ES-6** displays conceptual design of the proposed mitigation measures.



Otay Mesa Lumina
Transportation Impact Study

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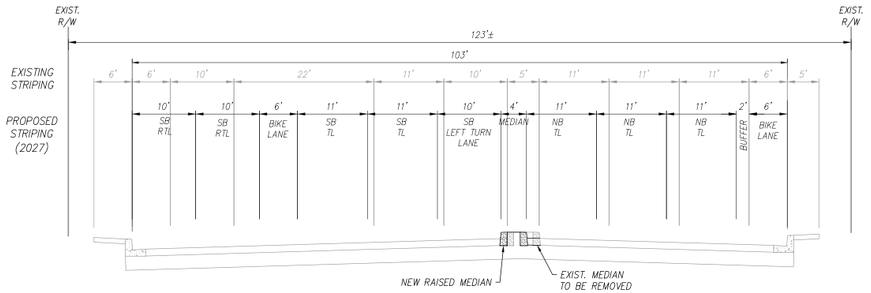
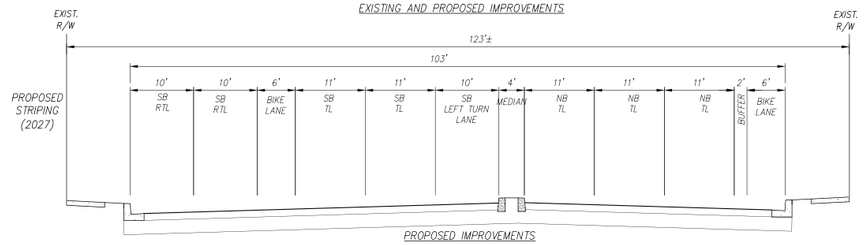
Figure ES-5

Geometrics with Recommended Mitigation Measures - Near-Term Year 2027 Plus Project (Full Development) Conditions



EXISTING AND PROPOSED IMPROVEMENTS

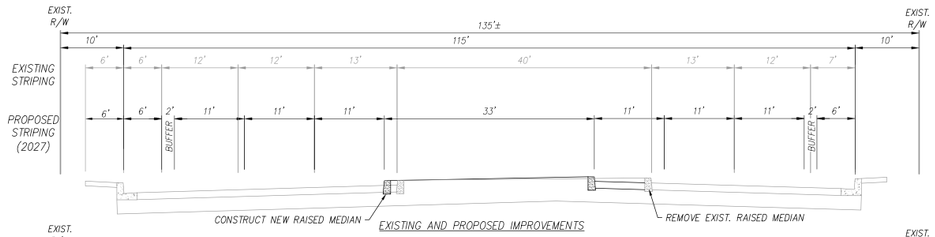


PROPOSED IMPROVEMENTS

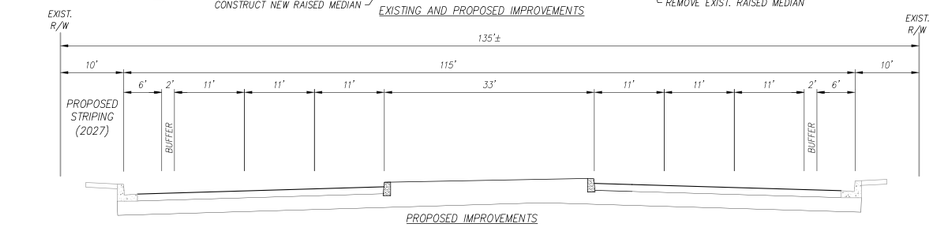
F-F BRITANNIA BLVD. SECTION

NOT TO SCALE

PROPOSED: SIX-LANE PRIME ARTERIAL



EXISTING AND PROPOSED IMPROVEMENTS

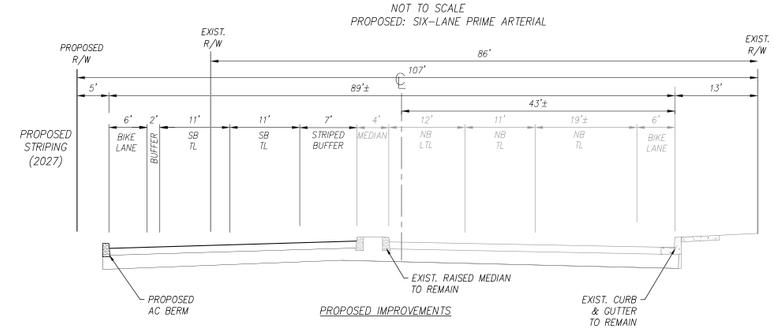


PROPOSED IMPROVEMENTS

G-G BRITANNIA BLVD. SECTION

NOT TO SCALE

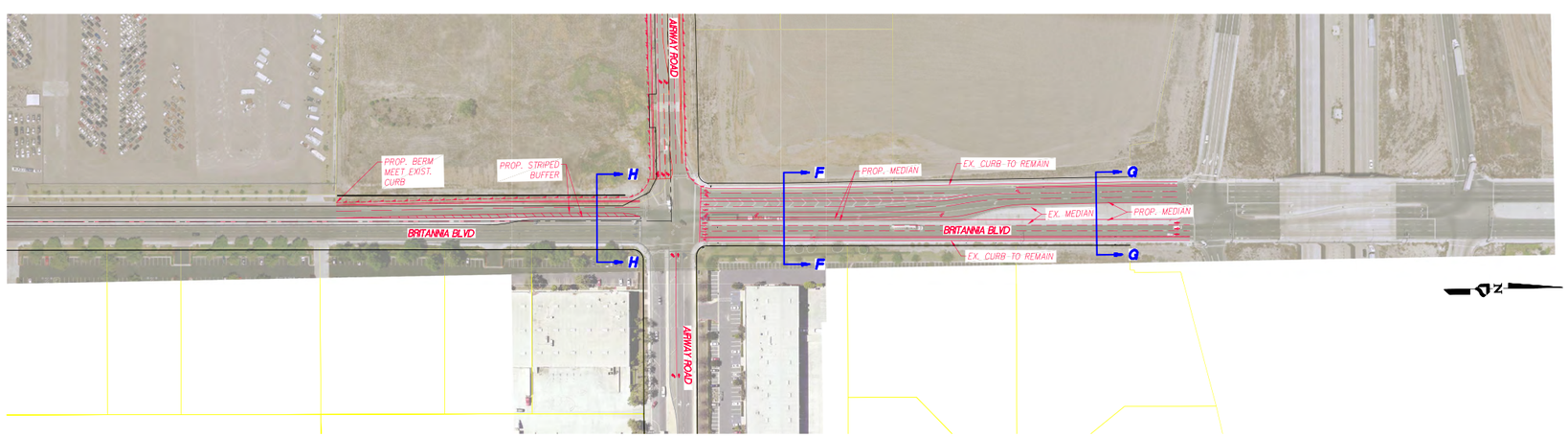
PROPOSED: SIX-LANE PRIME ARTERIAL



PROPOSED IMPROVEMENTS

H-H BRITANNIA BLVD. SECTION (SOUTH OF AIRWAY)

NOT TO SCALE

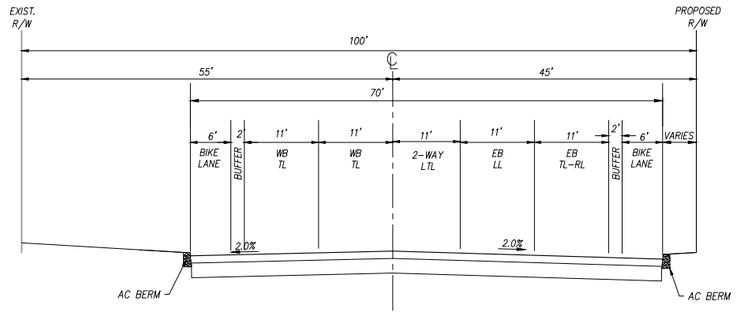


BRITANNIA BLVD. PLAN (2027)

BRITANNIA BLVD. SECTIONS

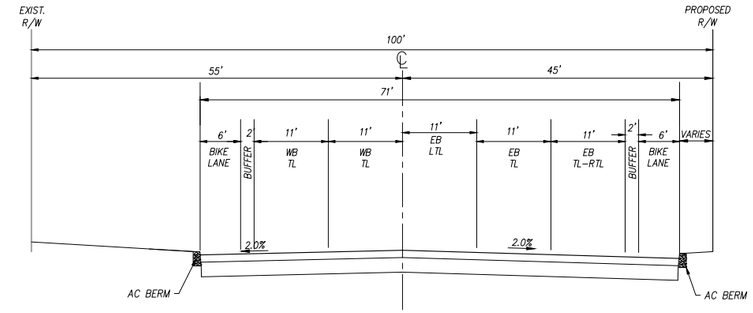
Otay Mesa Lumina
Transportation Impact Study
CHEN RYAN

Figure ES-6
Conceptual Design of Recommended Mitigation Measures - Near-Term Year 2027 Plus Project (Full Development) Conditions (Sheet 1 of 2)



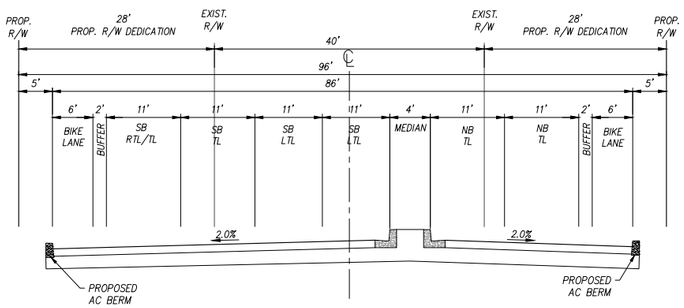
J-J AIRWAY ROAD SECTION - PROPOSED PHASE 2 (CACTUS RD TO BRITANNIA BL)

NOT TO SCALE



K-K AIRWAY ROAD SECTION - PROPOSED PHASE 2 (CACTUS RD TO BRITANNIA BL)

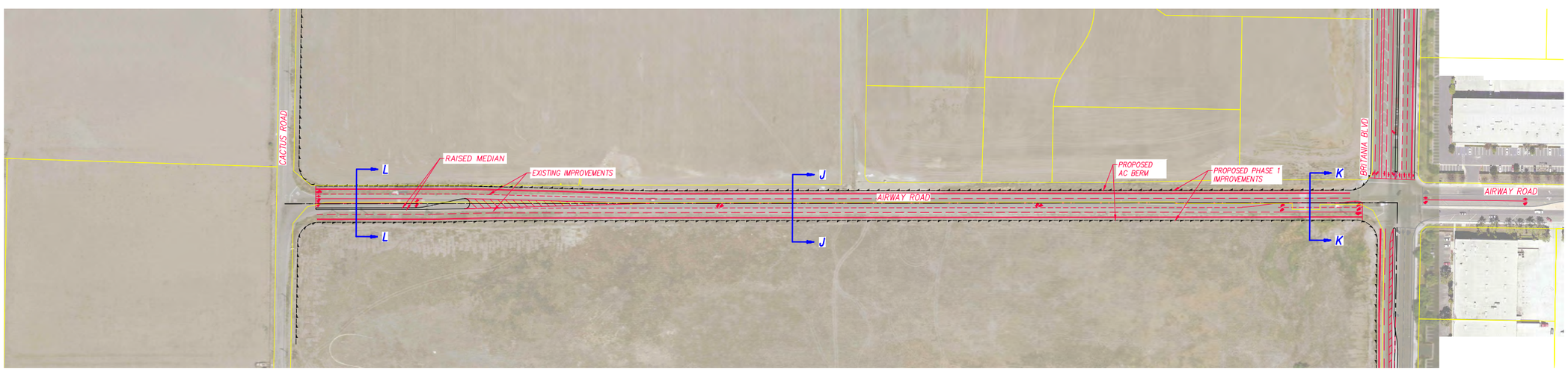
NOT TO SCALE



L-L AIRWAY ROAD SECTION - PROPOSED (CACTUS ROAD INTERSECTION)

NOT TO SCALE

CACTUS ROAD TO BRITANNIA BLVD. SECTIONS



AIRWAY ROAD CONCEPTUAL STRIPING PLAN (2027)

Otay Mesa Lumina
Transportation Impact Study
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Figure ES-6
Conceptual Design of Recommended Mitigation Measures - Near-Term Year 2027 Plus Project (Full Development) Conditions (Sheet 2 of 2)

Buildout of Community Plan Plus Project (Full Development) Conditions

Buildout of the Community Plan Plus Project analysis assumes full buildout of the planned land uses and transportation network as identified in the Otay Mesa Community Plan assumed to occur in Year 2062. Note that the Central Village Specific Plan, adopted on 4/4/2017, land uses were used to replace those in the Community Plan Update. See Chapter 11.0 for details on the methodology.

Roadway Segments

Full Development of the Otay Mesa Lumina project would have significant impacts at the following roadway segments:

- *Heritage Road, between Avenida De Las Vistas and Datsun Street* – This roadway segment would operate at LOS F and this finding is consistent with the OMCPU EIR. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unavoidable, consistent with the OM CPU EIR.

- *Cactus Road, between Street "D" and Airway Road* – This roadway segment would operate at LOS E and the OMCPU EIR disclosed its operations as LOS F, both exceed the LOS D threshold. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unmitigated, consistent with the OM CPU EIR.

- *Cactus Road, between Airway Road and Central Main Street* – This roadway segment would operate at LOS E and the OMCPU EIR disclosed its operations as LOS F, both exceed the LOS D threshold. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unmitigated, consistent with the OM CPU EIR.

- *Cactus Road, between Central Main Street and Street "C"* – This roadway segment would operate at LOS E and the OMCPU EIR disclosed its operations as LOS F, both exceed the LOS D threshold. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as

adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unmitigated, consistent with the OM CPU EIR.

- *Cactus Road, between* Street "C" *and Siempre Viva Road* – This roadway segment would operate at LOS E and the OMCPU EIR disclosed its operations as LOS F, both exceed the LOS D threshold. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unmitigated, consistent with the OM CPU EIR.

- *Britannia Boulevard, between SR-905 WB Ramps and SR-905 EB Ramps* – This roadway segment would operate at LOS E and the OMCPU EIR disclosed its operations as LOS F, both exceed the LOS D threshold. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unavoidable, consistent with the OM CPU EIR.

- *Britannia Boulevard, between SR-905 EB Ramps* and Airway Road – This roadway segment would operate at LOS E and the OMCPU EIR disclosed its operations as LOS F, both exceed the LOS D threshold. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unavoidable, consistent with the OM CPU EIR.

- *Otay Mesa Road, between Ocean View Hills Parkway and Corporate Center Drive* – This roadway segment would operate at LOS F and this finding is consistent with the OMCPU EIR. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unavoidable, consistent with the OM CPU EIR.

- *Otay Mesa Road, between Heritage Road and Cactus Road* – This roadway segment would operate at LOS F and this finding is consistent with the OMCPU EIR. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally

sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unavoidable, consistent with the OM CPU EIR.

- *Airway Road, between Heritage Road and Village Way* (project access) – This roadway segment would operate at LOS E and the OMCPU EIR disclosed its operations as LOS F, both exceed the LOS D threshold. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unmitigated, consistent with the OM CPU EIR.

- *Airway Road, between Village Way (project access) and Cactus Road* – This roadway segment would operate at LOS E and the OMCPU EIR disclosed its operations as LOS F, both exceed the LOS D threshold. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unmitigated, consistent with the OM CPU EIR.

Intersections

Mitigation measures associated with Full Development of the Otay Mesa Lumina project would be required at the following intersections:

2. *Caliente Avenue / SR-905 EB Ramps – The project shall pay a 2.23%* fair share contribution (See **Appendix R**) towards the widening of the eastbound approach (SR-905 off EB Ramps) to accommodate an exclusive left-turn lane, a through lane with a shared right-turn lane, and an exclusive right-turn lane, restripe the southbound approach (Caliente Avenue) to accommodate dual left-turn lanes and three through lanes, and widen the northbound approach to accommodate three through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics shown in the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would operate at LOS E during the AM peak hour and LOS D during the PM peak hour with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

3. *Caliente Avenue / Airway Road – The project shall pay a 1.40%* fair share contribution (See Appendix R) towards the widening of the eastbound approach (Airway Road) to accommodate dual left-turn lanes, two through lanes, and an exclusive right-turn lane, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics shown in the OMCPU EIR's analysis

of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

4. *Innovative Drive / Otay Mesa Road – The project shall pay a 2.67%* fair share contribution (See Appendix R) towards the widening of the southbound approach to accommodate dual left-turn lanes, a through lane with a shared right-turn lane, and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics shown in the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would operate at LOS C during the AM peak hour and LOS E during the PM peak hour with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

5. *Heritage Road / Otay Mesa Road – The project shall pay a 3.27%* fair share contribution (See Appendix R) towards the widening of the southbound approach (Heritage Road) to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane, widen the westbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics shown in the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

6. *Cactus Road / Otay Mesa Road – The project shall pay a 5.62%* fair share contribution (See Appendix R) towards the widening of the eastbound approach (Otay Mesa Road) to accommodate an exclusive left-turn lane, three through lanes and dual right-turn lanes, and widen the westbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics shown in the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

7. *Cactus Road / Airway Road – The project shall pay a 15.61%* fair share contribution (See Appendix R) towards the widening of the eastbound approach (Airway Road) to accommodate a dual left-turn lanes, three through lanes with a shared right-turn lane, and an exclusive right-turn lane, widen the southbound approach (Cactus Road) to accommodate dual left-turn lanes, two through lanes with a shared right-turn lane and an exclusive right-turn lane, widen the westbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics shown in the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

8. *Britannia Boulevard / Otay Mesa Road – The project shall pay a 14.21%* fair share contribution (See Appendix R) towards the widening of the eastbound approach (Otay Mesa Road) to accommodate an exclusive left-turn lane, three through lanes and an exclusive right-turn lane and widen the westbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics shown in the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would operate at LOS D during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions.

9. *Britannia Boulevard / SR-905 WB Ramps – The project shall pay an 18.61%* fair share contribution (See Appendix R) towards the restriping of the westbound approach to accommodate an exclusive left-turn lane, a shared left-through-right lane, and an exclusive right-turn lane, and widening of the southbound approach to accommodate three through lanes with a shared right-turn lane and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics shown in the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would operate at LOS E during the AM peak hour and continue to operate at LOS F during the PM peak hour with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

10. *Britannia Boulevard / SR-905 EB Ramps – The project shall pay a 13.45%* fair share contribution (See Appendix R) towards the widening of the northbound approach to accommodate three through lanes and dual right-turn lanes. These recommended mitigation measures are consistent with the ultimate intersection geometrics shown in the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

11. *Britannia Blvd / Airway Road – The project shall pay a 9.43%* fair share contribution (See Appendix R) towards the widening of the eastbound approach (Airway Road) to accommodate dual left-turn lanes, three through lanes, and an exclusive right-turn lane, widen the southbound approach (Britannia Blvd) to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, widen the westbound approach to accommodate dual left-turn lanes, two through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics shown in the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

13. *La Media Road / Otay Mesa Road – The project shall pay a 0.87%* fair share contribution (See Appendix R) towards the widening of the eastbound approach (Otay Mesa Road) to accommodate dual left-turn lanes, three through lanes, and dual right-turn lanes, widen the southbound approach (La Media Road) to accommodate dual left-turn lanes, two through lanes and dual right-turn lanes, widen the westbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes. These recommended mitigation measures are consistent with the ultimate intersection geometrics shown in the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

14. *La Media Road / Airway Road – The project shall pay a 0.42%* fair share contribution (See Appendix R) towards the widening of the eastbound approach (Airway Road) to accommodate dual left-turn lanes, two through lanes, and an exclusive right-turn lane, widen the southbound approach (La Media Road) to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, widen the westbound approach to accommodate dual left-turn lanes, two through lanes and dual right-turn lanes, and widen

the northbound approach to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics shown in the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

16. *Village Way / Airway Road – The project's fair-share contribution is calculated at 9.05%*. However, the intersection is fully within the Lumina project boundaries (TM No. 1972222), therefore, the project shall signalize this intersection when warranted. As shown in Table 11.6, this intersection would operate as a signalized intersection at LOS D during the AM peak hour and LOS B during the PM peak hour with implementation of the OM CPU recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions. Therefore, the significant impact would be considered mitigated.

17. *Cactus Road / Street "D" – The project's fair-share contribution is calculated at 5.03%*. However, because the project fronts one of four corners of the intersection, the applicant shall contribute 25% towards the future signalization of this intersection. As shown in Table 11.6, this intersection would operate as a signalized intersection at LOS A during the AM peak hour and LOS B during the PM peak hour with implementation of the OM CPU recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

18. *Cactus Road / Central Main Street – The project's fair-share contribution is calculated at 13.72%.* However, because the project fronts one of four corners of the intersection, the applicant shall contribute 25% towards the future signalization of this intersection. As shown in Table 11.6, this intersection would operate as a signalized intersection at LOS D during the AM peak hour and LOS B during the PM peak hour with implementation of the OM CPU recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions.

19. *Cactus Road / Street "C" – The project's fair-share contribution is calculated at 7.62%.* However, because the project fronts one of four corners of the intersection, the applicant shall contribute 25% towards the future signalization of this intersection. As shown in Table 11.6, this intersection would operate as a signalized intersection at LOS B during both the AM and PM peak hours with implementation of the OM CPU recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions.

20. *Cactus Road / Siempre Viva Road – The project shall pay a 4.68%* fair share contribution (See Appendix R) towards the widening of the northbound approach to accommodate an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics shown in the OMCPU EIR's analysis of traffic at

OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS D during the AM peak hour and LOS F during the PM peak hour with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

21. *Britannia Blvd / Siempre Viva Road – The project shall pay a 2.50%* fair share contribution (See Appendix R) towards the widening of the eastbound approach (Siempre Viva Road) to accommodate dual left-turn lanes, three through lanes, and an exclusive right-turn lane, widen the southbound approach (Britannia Boulevard) to accommodate dual left-turn lanes, two through lanes and dual right-turn lanes, widen the westbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics shown in the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

22. *La Media Road / Siempre Viva Road – The project shall pay a 2.36%* fair share contribution (See Appendix R) towards the widening of the southbound approach (La Media Road) to accommodate dual left-turn lanes, one through lane and dual right-turn lanes, and widen the westbound approach to accommodate three through lanes and dual right-turn lanes. These recommended mitigation measures are consistent with the ultimate intersection geometrics shown in the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would operate at LOS E during the AM peak hour and LOS C during the PM peak hour with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

23. *Heritage Road / Avenida De Las Vistas* – This intersection would operate at LOS F during both the AM and PM peak hours and this is consistent with findings of the OMCPU EIR. Since this intersection is assumed to be built up to its ultimate intersection geometrics assumption as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, existing development conflicts, and/or multi-modal and urban design context. The impact is considered significant and unavoidable.

24. *Heritage Road / Datsun Street – The project shall pay a 2.07%* fair share contribution (See Appendix R) towards the widening of the eastbound approach (Datsun Street) to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane, widen the southbound approach (Heritage Road) to accommodate dual left-turn lanes, three through lanes dual right-turn lanes, widen the westbound approach to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics shown in the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

Ramp Meters

No significant impacts were identified at the analyzed ramp meters.

Freeway Segments

The following freeway segments would be impacted by the proposed project under Buildout of Community Plan Plus Project conditions:

- SR-905, between I-805 and Caliente Avenue – LOS F in the EB direction; and
- 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 mitigation measures. Therefore, mitigation measures 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.

Figure ES-7 displays significantly impacted facilities and their respective mitigation measures and triggers.

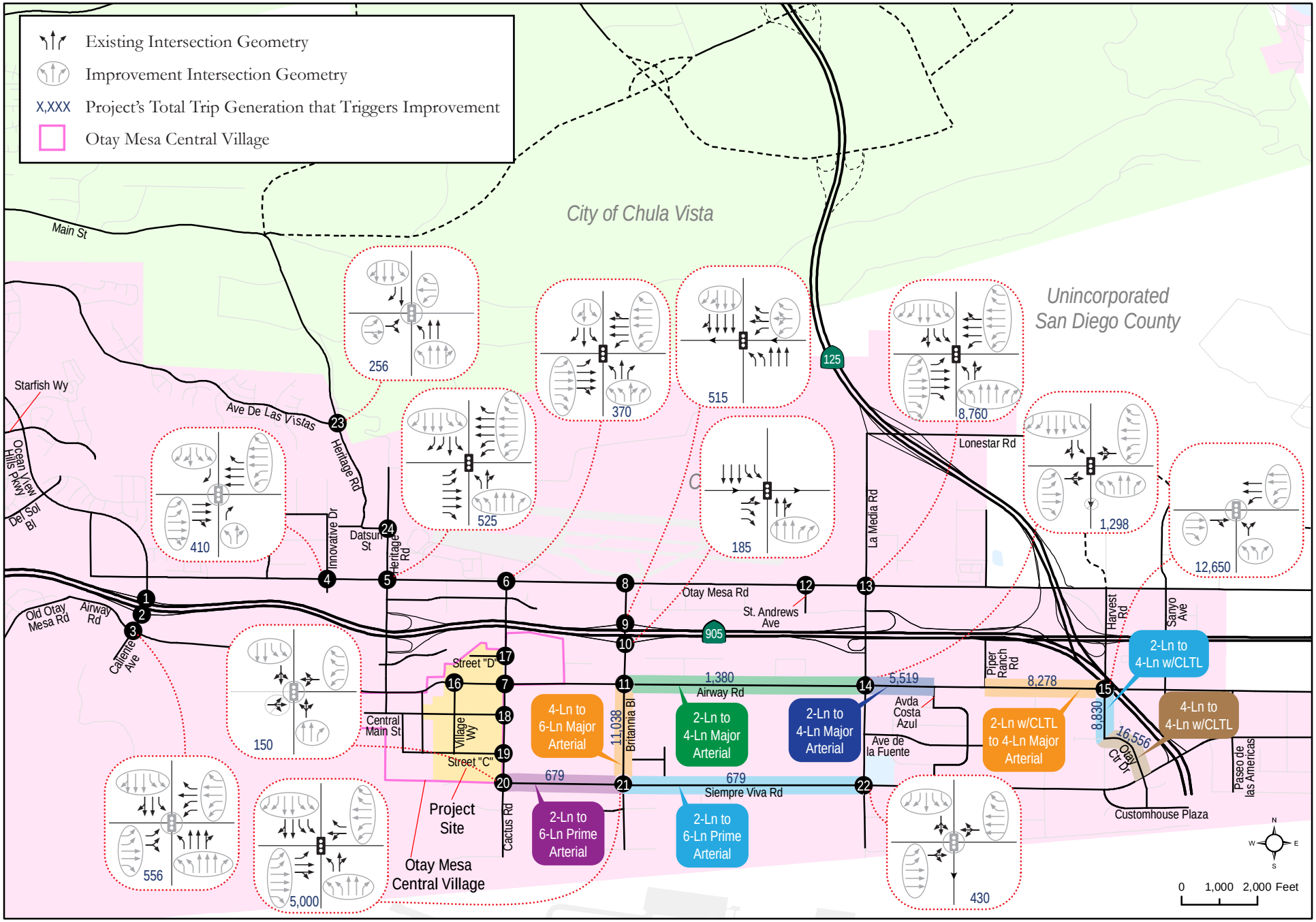

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Figure ES-7

Geometrics with Recommended Mitigation Measures - Buildout of Community Plans Plus Project (Full Development) Conditions

1.0 Introduction

1.1 Purpose of the Report

The purpose of this Transportation Impact Study (TIS) is to identify and document potential transportation related impacts associated with the development of the proposed Otay Mesa Lumina project (the "Project"), as well as to recommend mitigation measures for any identified traffic impact on study area intersections, roadway and freeway segments. The Project proposes approval of a Tentative Map and a public right-of-way vacation. The Project will be required to process a subsequent Neighborhood Development Permit prior to construction of any structures on-site.

1.2 Study Area and Project Background

The proposed project site is located just west of Cactus Road, both north and south of Airway Road within the City of San Diego Otay Mesa Community Planning Area (CPA), as shown in **Figure 1-1**. This project is a part of the approved Otay Mesa Central Village Specific Plan. **Figure 1-2** displays the Project study area.

The proposed project will be developed in two phases and it assumes the following land uses each development phase:

Phase 1 (2023)

- 1,129 medium high-density multi-family units; and
- 62.53 ksf of commercial uses.

Phase 2 (2027)

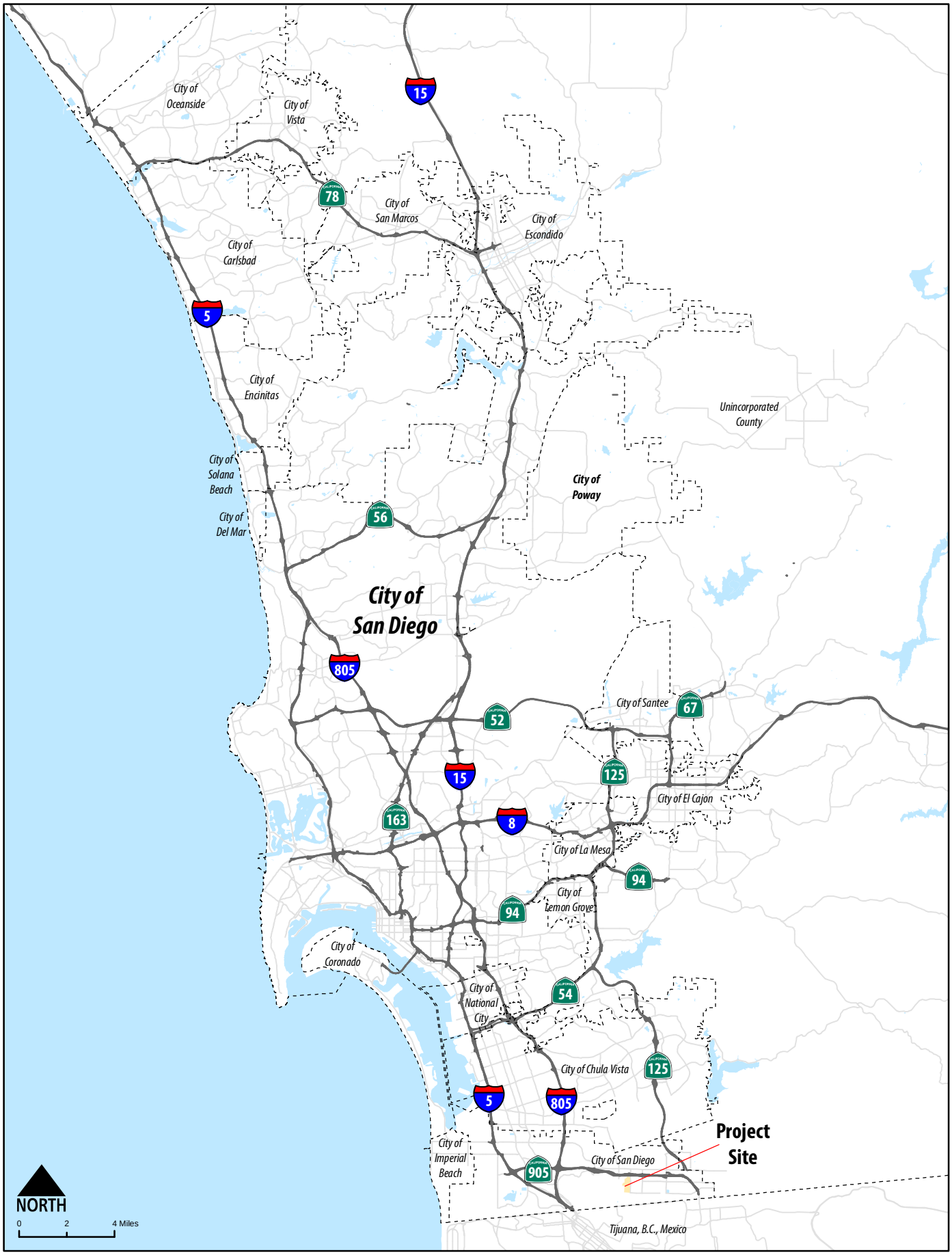
- 526 medium density multi-family units;
- 213 low density multi-family units;
- 6.3 acres of school uses; and
- 6.6 acres of parks.

Project access is proposed via Cactus Road and Airway Road. The following facilities are assumed to be constructed by the project as a part of project frontage and access by the 1st Equivalent Dwelling Unit (EDU) by each of the development phases.

Phase 1 – to be constructed by the proposed project

Roadway Segments

- Airway Road, between Western Lumina project boundary and Cactus Road – This segment serves as the project frontage and will be constructed to a 4-Lane Prime Arterial, which is within the ultimate classification (6-Lane Prime Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).



Otay Mesa Lumina
Transportation Impact Study

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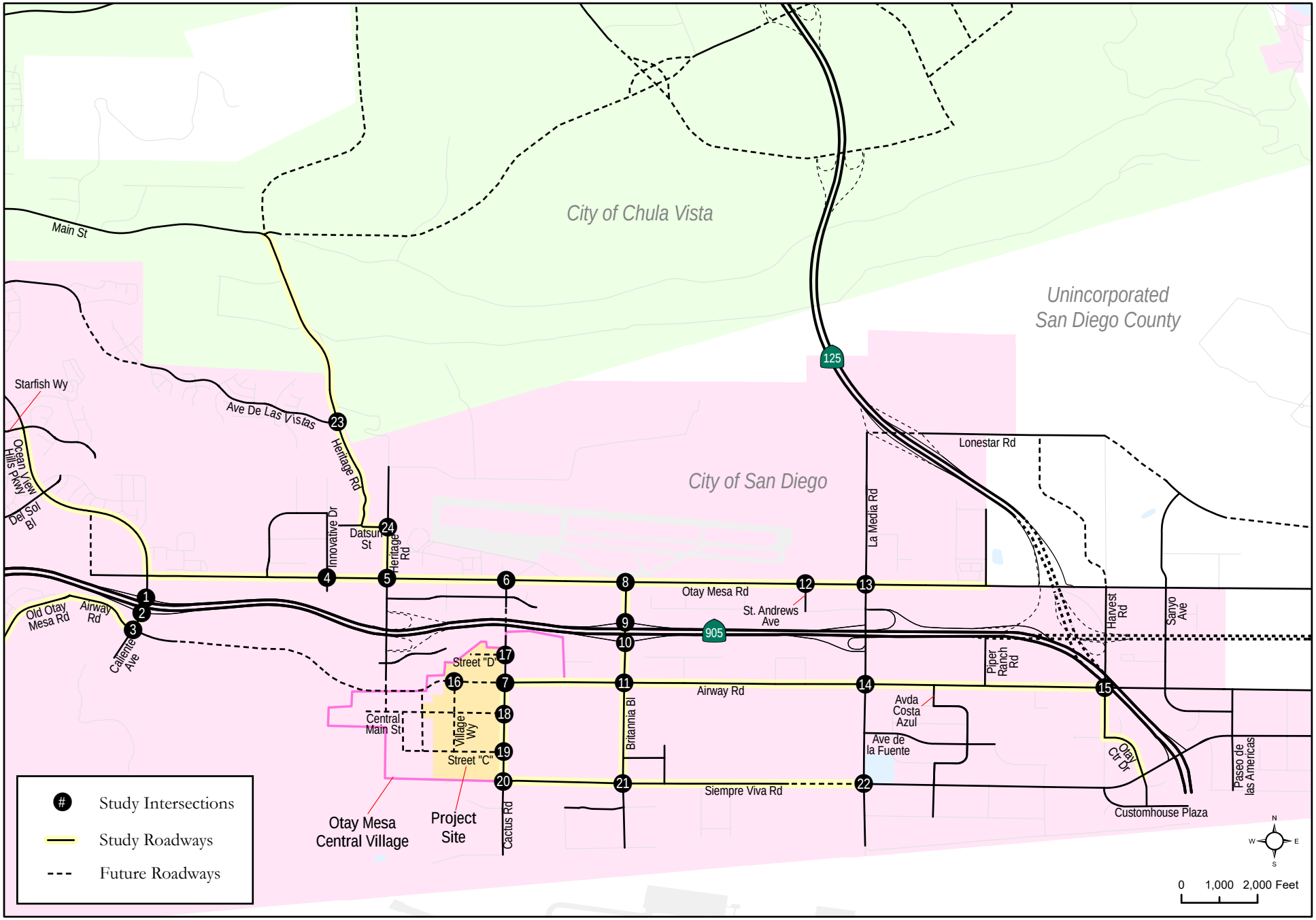
Figure 1-1
Project Regional Location



Otay Mesa Lumina
Transportation Impact Study

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Figure 1-2
Project Study Area

- Cactus Road, between Street "D" and Airway Road - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median). 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 Airway Road and Central Main Street - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median). 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>

7. 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 with Phase 1. See Appendix J for traffic signal warrant.

16. Village Way / Airway Road – Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross-section mentioned above. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

17. Cactus Road / Street "D" – Construction of an all-way stop control (AWSC) T-intersection, but the fourth leg (east of Cactus Road) will be constructed by the developer(s) of PA 14, 15, 16, 17, and 21 of the Otay Mesa Central Village Specific Plan. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

18. Cactus Road / Central Main Street – Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross section mentioned above. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

Phase 2 – to be constructed by the proposed project

Roadway Segments

- Cactus Road, between Central Main Street and Street "C" - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median), which is within the ultimate classification (4-Lane Major Arterial) 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 Street "C" and Siempre Viva Road - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median), which is within the ultimate classification (4-Lane Major Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).

Intersection

19. Cactus Road / Street "C" – Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross section mentioned above. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

Eight (8) scenarios were analyzed in this study, including:

- Existing Conditions – utilized to establish the existing baseline traffic operations within the study area.
- Existing Plus Project (Full Development) Conditions – represents existing traffic conditions with the addition of "Full Development" traffic from the proposed Otay Mesa Lumina project.
- Near-Term Year 2023 (Existing Plus Cumulative Projects) Conditions – represents cumulative traffic conditions including traffic from anticipated land development projects.
- Near-Term Year 2023 Plus Project (Phase 1) Conditions – represents 2023 cumulative traffic conditions with the addition of Phase 1 traffic from the proposed Otay Mesa Lumina project.
- Near-Term Year 2027 (Existing Plus Cumulative Projects) Conditions – represents cumulative traffic conditions including traffic from anticipated land development projects.
- Near-Term Year 2027 Plus Project (Full Development) Conditions – represents 2027 cumulative traffic conditions with the addition of "full development" traffic from the proposed Otay Mesa Lumina project.
- Buildout of Community Plan Conditions – represents traffic conditions under the buildout of the Otay Mesa Community Plan without the proposed Lumina project. Note that the Central Village Specific Plan land uses were used to replace those in the Community Plan Update.
- Buildout of Community Plan Plus Project (Full Development) Conditions – represents traffic conditions under the buildout of the Otay Mesa Community Plan including traffic from full development of the proposed Lumina project. Note that the Central Village Specific Plan land uses were used to replace those in the Community Plan Update.

This traffic analysis was performed in accordance with *City of San Diego (City) Traffic Impact Study Manual, July 1998* (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.

The traffic operational 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 Lumina project including trip generation, trip distribution patterns, and project trip assignments for the various traffic analysis phases as well as study scenarios.

4.0 Existing Conditions – This chapter describes the existing transportation network within the study area and provides analysis results for the existing traffic conditions.

5.0 Existing Plus Project (Full Development) Conditions – This chapter describes the existing transportation network with the addition of the proposed project. Mitigation measures, if necessary, related to the proposed project are also identified.

6.0 Near-Term Year 2023 Traffic Conditions – This chapter describes near-term developments anticipated to generate additional traffic to the project study area. Analysis results are provided for Near-Term Year 2023 conditions without the proposed project.

7.0 Near-Term Year 2023 Plus Project (Phase 1) 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 Near-Term Year 2023 Plus Project (Phase 1) conditions, along with recommended mitigation measures (as necessary).

8.0 Near-Term Year 2027 Traffic Conditions – This chapter describes near-term developments anticipated to generate additional traffic to the project study area. Analysis results are provided for Near-Term Year 2027 conditions without the proposed project.

9.0 Near-Term Year 2027 Plus Project (Full Development) 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 Near-Term Year 2027 Plus Project (Full Development) conditions, along with recommended mitigation measures (as necessary).

10.0 Buildout of Community Plan Conditions – This chapter describes the Horizon Year 2062 future traffic conditions under the buildout of the Otay Mesa Community Plan without the proposed Lumina Project. Note that the Central Village Specific Plan land uses were used to replace those in the Community Plan Update.

11.0 Buildout of Community Plan Plus Project (Full Development) Conditions – This chapter describes the Horizon Year 2062 future traffic conditions including the addition of the proposed project. Note that the Central Village Specific Plan land uses were used to replace those in the Community Plan Update.

12.0 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.

13.0 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.

14.0 Findings and Recommendations – Outlines overall study findings, identifies recommended project-related mitigation measures.

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
Prime Arterial (5-lane)	< 20,800	< 29,200	< 41,700	< 45,800	<50,000
Prime Arterial (4-lane)	< 16,700	< 23,400	< 33,400	< 36,700	< 40,000
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
Major Arterial (3-lane, divided)	< 11,250	< 15,750	< 22,500	< 26,250	< 30,000
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. Heritage Road, between Main Street and Avenida De Las Vistas was analyzed using City of Chula Vista standards.

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:

- *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, which range between 2% and 12%.
- *Signal Timing:* Based on existing signal timing plans (as of December 2017), provided in **Appendix A.**
- *Peak Hour Factor*: Based on existing peak hour count data for existing conditions, 0.92 for near-term year 2023 and 2027, and 0.95 for Buildout of Community Plan scenarios. All PHF utilized in the analysis is per approach.

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*. The proposed Lumina project is part of the Otay Mesa Central Village Specific Plan EIR (SCH No. 2004651076), which utilized the HCM 2000 analysis methodology. Therefore, HCM 2000 was used for the analysis in this report to be consistent with the Otay Mesa Central Village Transportation Facilities Trigger Analysis. 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 9.0* 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 side-street and all-way stop controlled intersections, were analyzed using the 2000 Highway Capacity Manual (Section 10) unsignalized intersection analysis methodology. HCM 2000 was used for the analysis to be consistent with the Otay Mesa Central Village Transportation Facilities Trigger Analysis. The SYNCHRO 9.0 Traffic Analysis software supports this methodology and was utilized to produce LOS results. The LOS for a side-street stop controlled (SSSC) intersection is determined by the computed control delay and is defined for each minor movement and the worst-case minor movement is reported. The LOS for an all-way stop controlled (AWSC) intersection is determined by the computed control delay or measured average control delay of all movements. **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 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, ramp meters are currently installed but not in operations within the project study area. Therefore, ramp metering analysis is only included in the Buildout of Community Plan Scenario.

Meter rates used in the analysis (only under Buildout of Community Plan scenario) were obtained from the OM CPU. Ramp metering analyses to calculate delays at the study area freeway on-ramps were conducted based upon procedures outlined in the *City of San Diego Traffic Impact Study Manual (1998).*

2.5 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 2.6**. 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 2.6
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

2.6 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 2.7** summarizes the impact significant thresholds as identified by the City of San Diego beyond which mitigation measures are required.

TABLE 2.7
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.

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.

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 proposed project site is located just west of Cactus Road, both north and south of Airway Road within the City of San Diego Otay Mesa Community Planning Area (CPA). It is a part of the approved Otay Mesa Central Village Specific Plan. **Figure 3-1** displays the site plan for the proposed project while **Figure 3-2** displays the site plan by phases.

The proposed project will be developed in two phases and it assumes the following land uses for each development phase:

Phase 1 (2023)

- 1,129 medium high-density multi-family units;
- 62.53 ksf of commercial uses.

Phase 2 (2027)

- 526 medium density multi-family units;
- 213 low density multi-family units;
- 6.3 acres of school uses; and
- 6.6 acres of parks.

Project access is proposed via Cactus Road and Airway Road. The following facilities are assumed to be constructed by the Project as a part of project frontage and access improvements by the 1st EDU by each of the development phases.

Phase 1 - to be constructed by the proposed project

Roadway Segments

- Airway Road, between Western Lumina project boundary and Cactus Road – This segment serves as the project frontage and will be constructed to a 4-Lane Prime Arterial, which is consistent with the ultimate classification (6-Lane Prime Arterial) 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 Street "D" and Airway Road - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median), which is consistent with the ultimate classification (4-Lane Major Arterial) 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 Central Main Street - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median), which is consistent with the ultimate classification (4-Lane Major Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).

Intersections

7. 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 with Phase 1. See Appendix J for traffic signal warrant.

16. Village Way / Airway Road – Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross-section mentioned above. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

17. Cactus Road / Street "D" – Construction of an all-way stop control (AWSC) T-intersection, but the fourth leg (east of Cactus Road) will be constructed by the developer(s) of PA 14, 15, 16, 17, and 21 of the Otay Mesa Central Village Specific Plan. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

18. Cactus Road / Central Main Street – Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross section mentioned above. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

Phase 2 – to be constructed by the proposed project

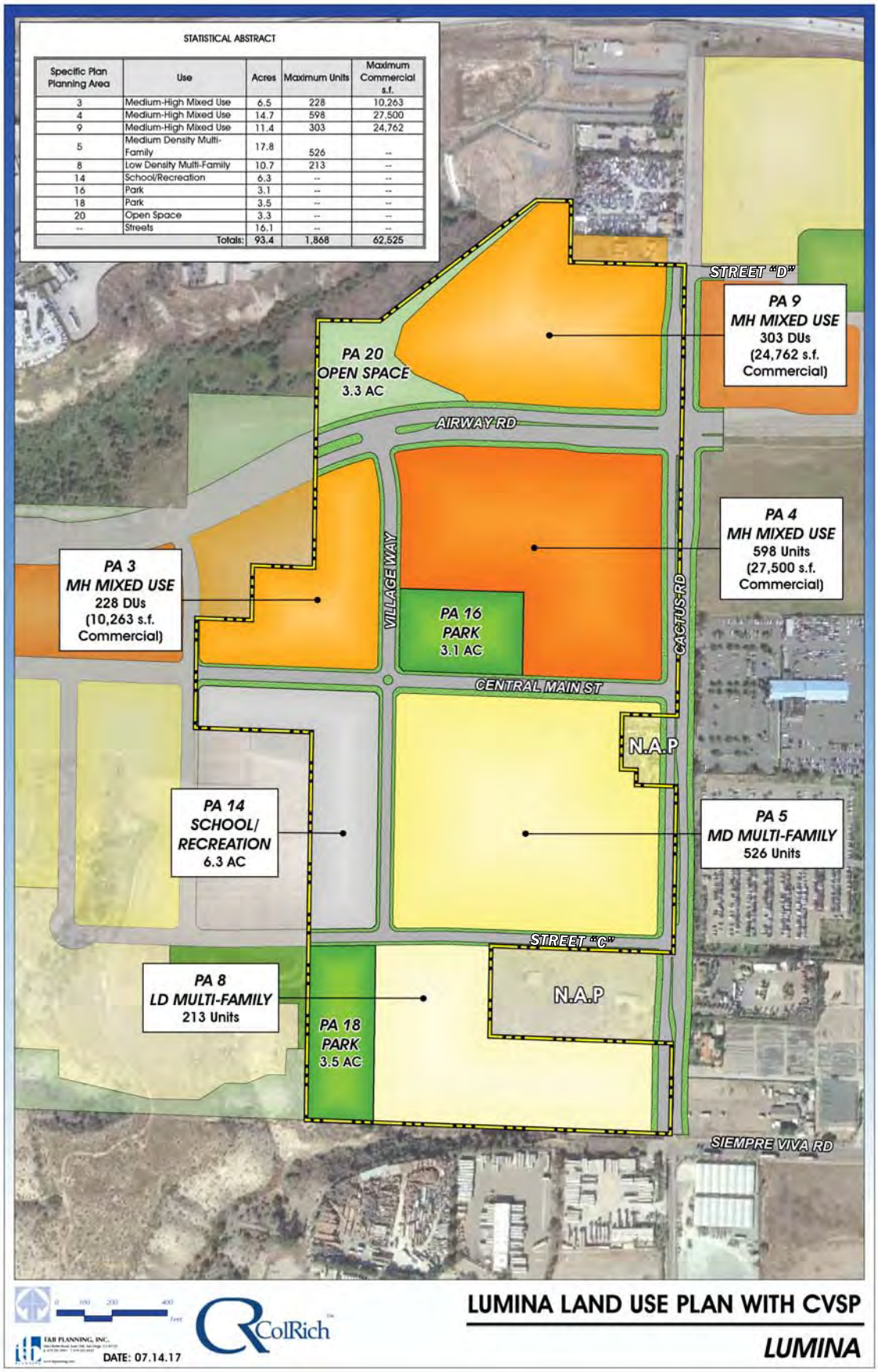
Roadway Segments

- Cactus Road, between Central Main Street and Street "C" - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median), which is within the ultimate classification (4-Lane Major Arterial) 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 Street "C" and Siempre Viva Road - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median), which is within the ultimate classification (4-Lane Major Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).

Intersection

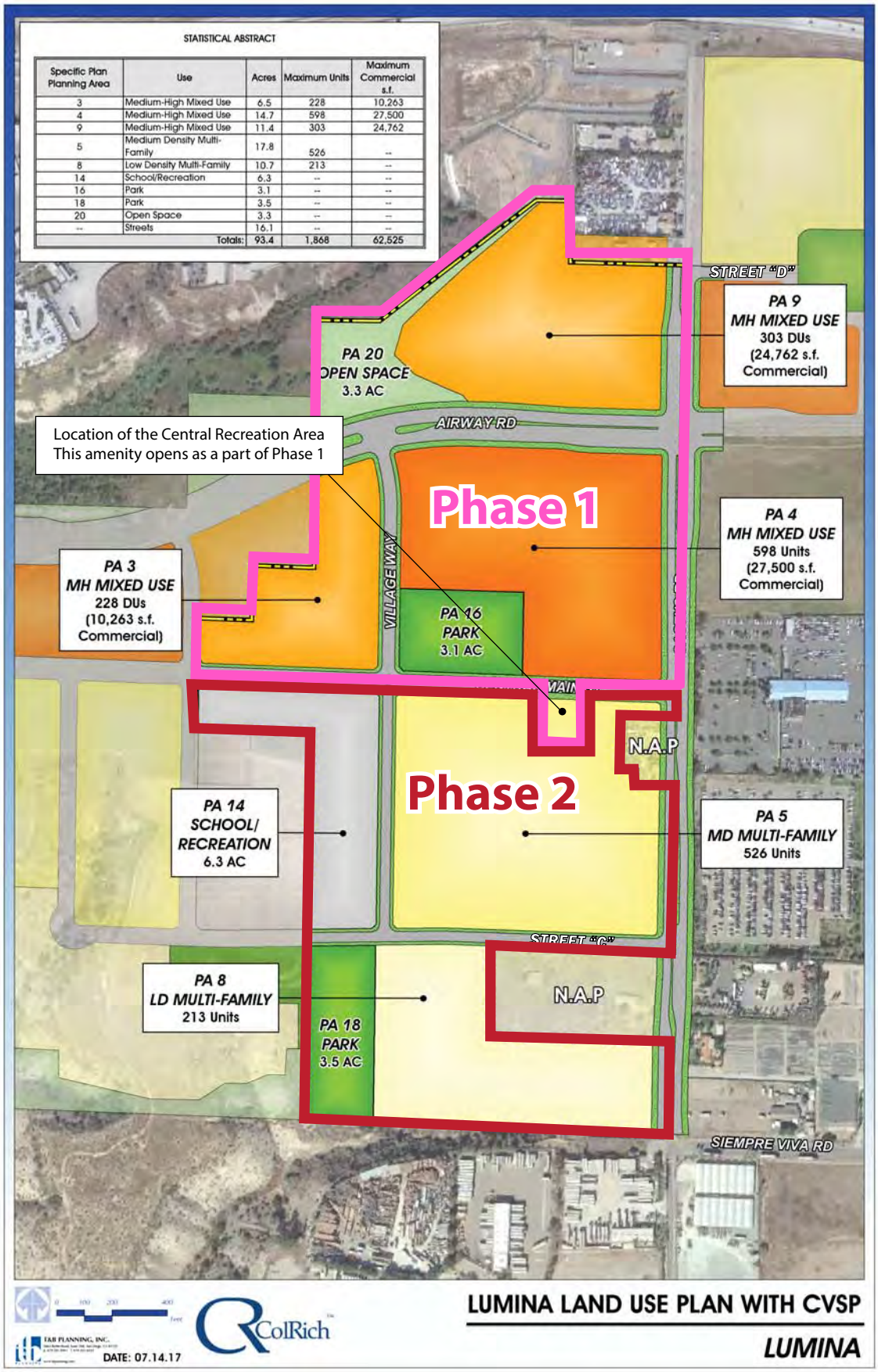
19. Cactus Road / Street "C" – Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross section mentioned above. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.



Otay Mesa Lumina
Transportation Impact Study

Figure 3-1
Project Site Plan

CHEN RYAN



Otay Mesa Lumina
Transportation Impact Study
CHEN RYAN

Figure 3-2
Project Site Plan by Phases

3.2 Street Vacation

The Lumina project site contains a public right-of-way for an unnamed road in the western portion of the site, dedicated by Map 1267 shown on **Figure 3-3**. The unnamed road was dedicated to provide circulation, access, and public services; however, the unnamed road was never constructed and is undriveable under existing conditions. The Lumina project will implement the Central Village Specific Plan planned roadway circulation system on-site, which will provide the circulation necessary to the public within and through the community. The Lumina project proposes vacation of the unnamed road because it is not needed to provide public circulation.

3.3 Project Trip Generation, Distribution, and Assignment

Project Trip Generation

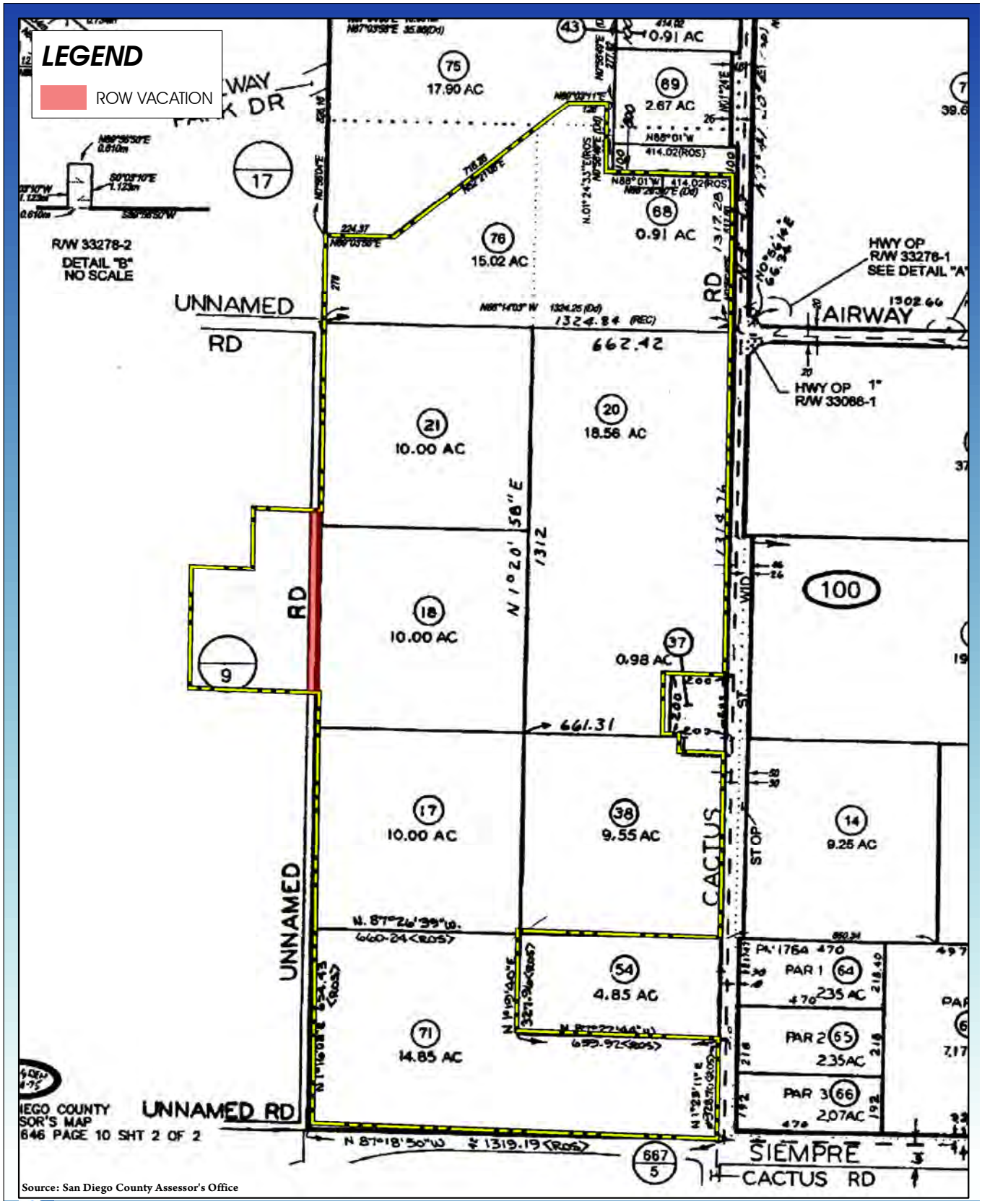
Project trip generation estimates were derived utilizing the trip generation rates outlined in *Table 1* of the *City of San Diego Land Development Code – Trip Generation Manual, May 2003*. **Table 3.1** displays the proposed project's trip generation during both Phase 1 and full development.

TABLE 3.1
OTAY MESA LUMINA - TRIP GENERATION

Land Use	Units	Trip Rate	ADT	AM Peak Hour					PM Peak Hour				
				%	Trips	Split	In	Out	%	Trips	Split	In	Out
Phase 1 (Year 2023)													
Multi-Family (Over 20 DU/acre)	1,129 DU	6	6,774	8%	542	2:8	108	434	9%	610	7:3	427	183
Community Commercial [a]	62.53 KSF	70[a]	4,377	3%	131	6:4	79	52	10%	438	5:5	219	219
Phase 1 Total			**11,151**	**-**	**673**	**-**	**187**	**486**	**-**	**1,048**	**-**	**646**	**402**
Phase 2 (Year 2027)													
Multi-Family (Over 20 DU/acre)	526 DU	6	3,156	8%	252	2:8	51	201	9%	284	7:3	199	85
Multi-Family (Under 20 DU/acre)	213 DU	8	1,704	8%	136	2:8	27	109	10%	170	7:3	119	51
Park (Developed)	6.6 Acres	50	330	4%	13	5:5	7	6	8%	26	5:5	13	13
Elementary School	6.3 Acres*	136	857	31%	266	6:4	159	107	19%	163	4:6	65	98
Phase 2 Total			**6,047**	**-**	**667**	**-**	**244**	**423**	**-**	**643**	**-**	**396**	**247**
Full Development Total			**17,198**		**1,340**		**431**	**909**		**1,691**		**1,042**	**649**
Internal Trips Capture (9.4%)[b]			**1,617**		**126**		**41**	**85**		**159**		**98**	**61**
External Trips			**15,581**		**1,214**		**390**	**824**		**1,532**		**944**	**588**

Source: Colrich, December 2017; City of San Diego Land Development Code – Trip Generation Manual, May 2003

Notes:
* 6.3 acres represents the ColRich portion of the elementary school and the entire school site is estimated to be 13.1 acres.
[a] – Trip generation rate used is consistent with the Otay Mesa CPU & OMCVSP.
[b] – Internal capture consistent with Otay Mesa Central Village Specific Plan.



Source: San Diego County Assessor's Office

Otay Mesa Lumina
Transportation Impact Study

CHEN RYAN

Figure 3-3
Street Vacation

Phase 1 (2023)

Under Phase 1, the proposed project is anticipated to generate a total of 11,151 average daily trips, including 673 (187-in / 486-out) AM peak hour trips and 1,048 (646-in / 402-out) PM peak hour trips.

Phase 2 (Full Development)

The project full development includes both Phases 1 and 2 and would generate a total of 17,198 average daily trips, including 1,340 (431-in / 909-out) AM peak hour trips and 1,691 (1,042-in / 649-out) PM peak hour trips. The same SANDAG Select Zone Assignment that was conducted for the approved Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) is utilized for the analysis of the proposed Otay Mesa Lumina project (Full Development). This exercise estimates the percent of trips that will be internally captured. The Select Zone Assignment for the Otay Mesa Central Village Specific Plan 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., offsite) roadways.

Therefore, applying the calculated internal capture from the SANDAG Select Zone Assignment to Phase 2 (Full Development) trip generation, the proposed project is anticipated to generate a total of 15,581 external daily trips, including 1,214 (390-in / 824-out) AM peak hour trips and 1,532 (944-in / 588-out) PM peak hour trips.

Project Trip Distribution

Project trip distribution was determined based on adjacent land uses and the existing transportation network. Trip distribution is identical during the following scenarios:

- Existing plus Project – Full Development (Phases 1 & 2);
- Near-Term Year 2023 plus Project - Phase 1; and
- Near-Term Year 2027 plus Project – Full Development (Phases 1 & 2).

However, under Buildout of Community Plan conditions, the same project trip distribution utilized for the Otay Mesa Central Village Specific Plan TFTA was employed. **Figure 3-4** displays the external project trip distribution patterns associated with the proposed project under Existing plus Project – Full Development (Phases 1 & 2), Near-Term Year 2023 plus Project – Phase 1, and Near-Term Year 2027 plus Project – Full Development (Phases 1 & 2). **Figure 3-5** displays the external project trip distribution patterns associated with the proposed project under Buildout of Community Plan plus Project (Full Development).

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 3-6** and **3-7** display the assignment of project trips to the roadway network and key study area intersections, respectively under Phase 1, while **Figures 3-8** and **3-9** display the assignment of project trips to the roadway network and key study area intersections, respectively under full development of the proposed project. **Figures 3-10 and 3-11** display the assignment of project trips to the roadway network and key study area intersections, respectively under Buildout of the Community Plan.

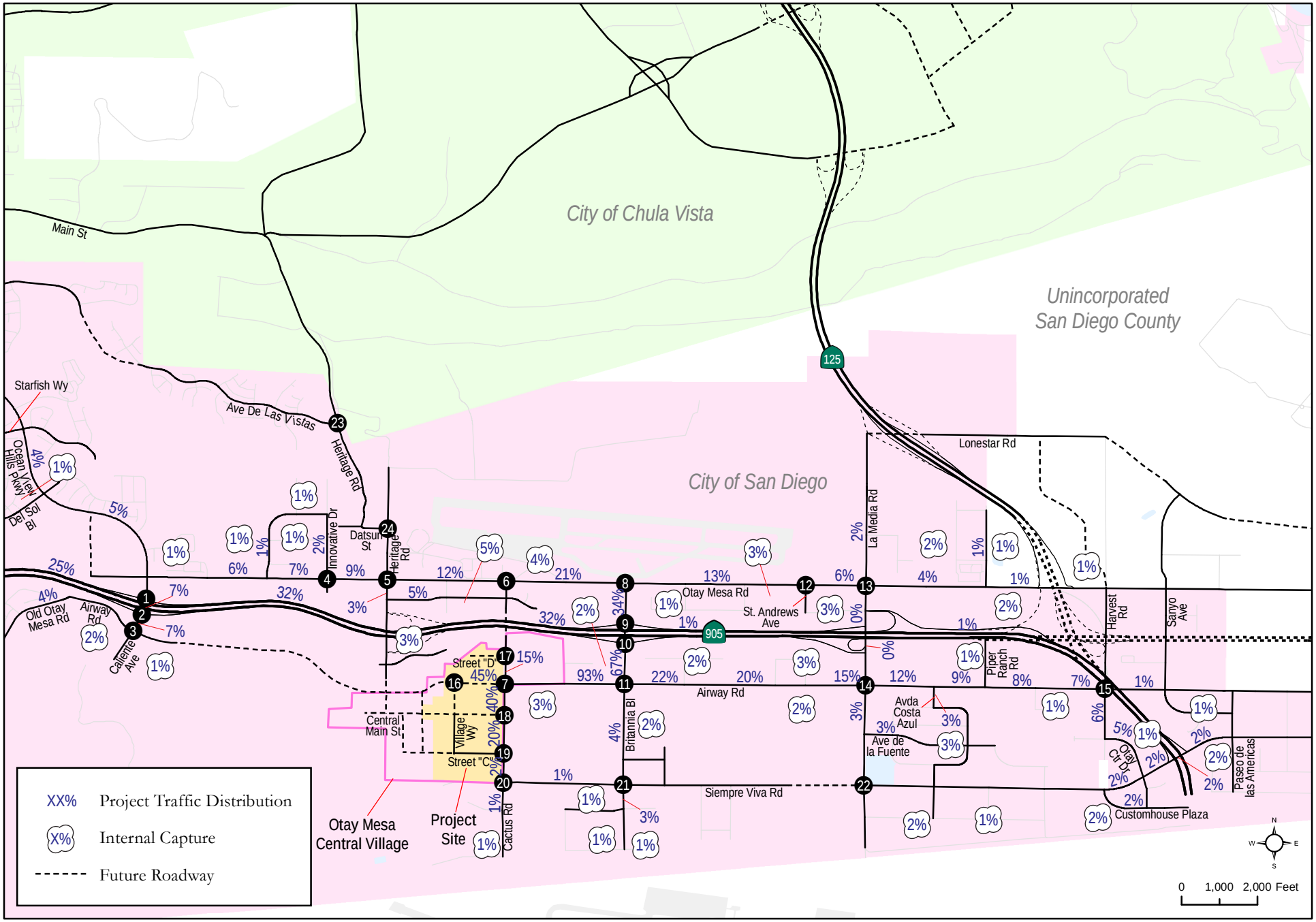


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Figure 3-4
Project Trip Distribution - Existing and Near-Term (2023 and 2027)

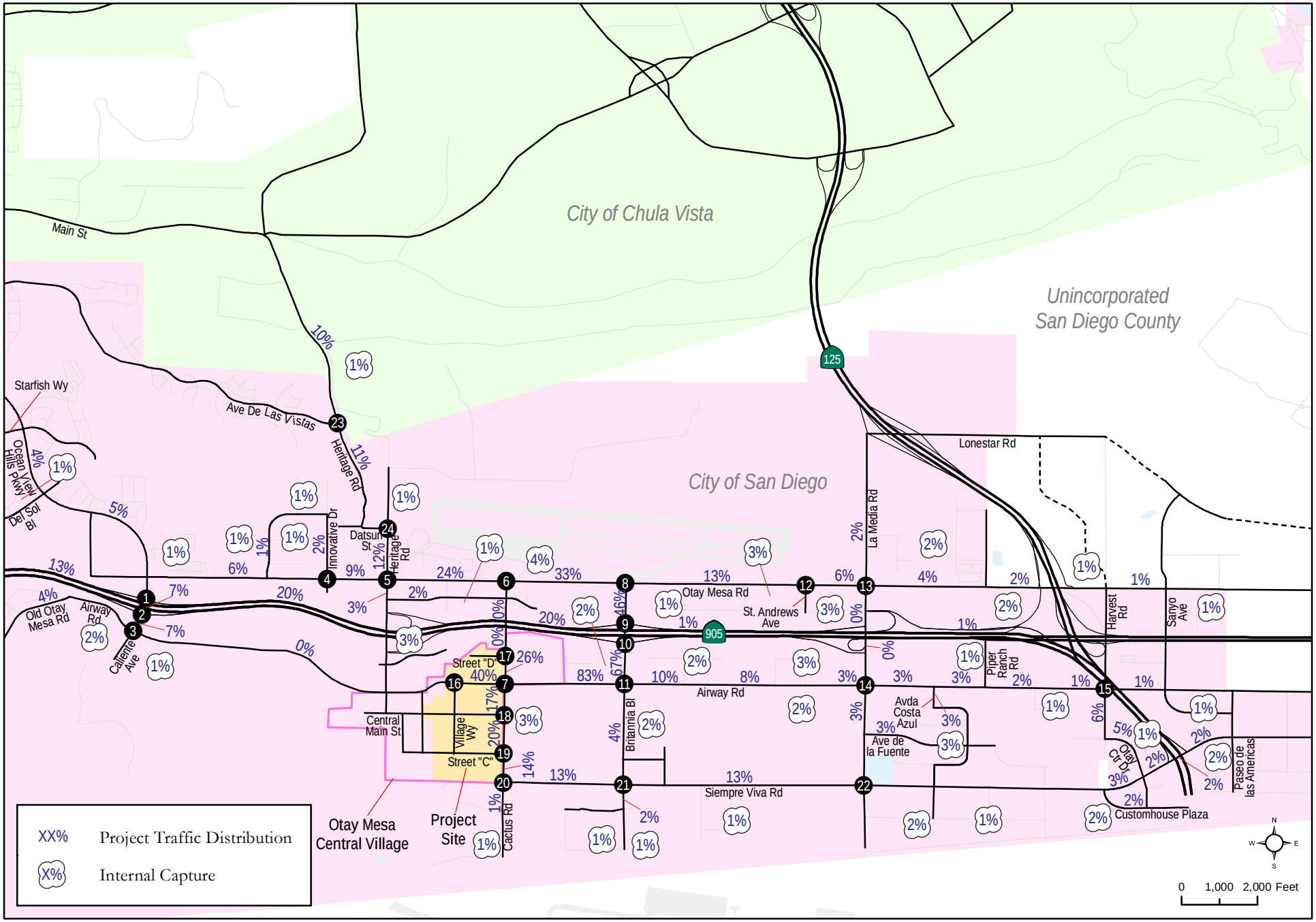

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Figure 3-5
Project Trip Distribution - Buildout of Community Plan Conditions

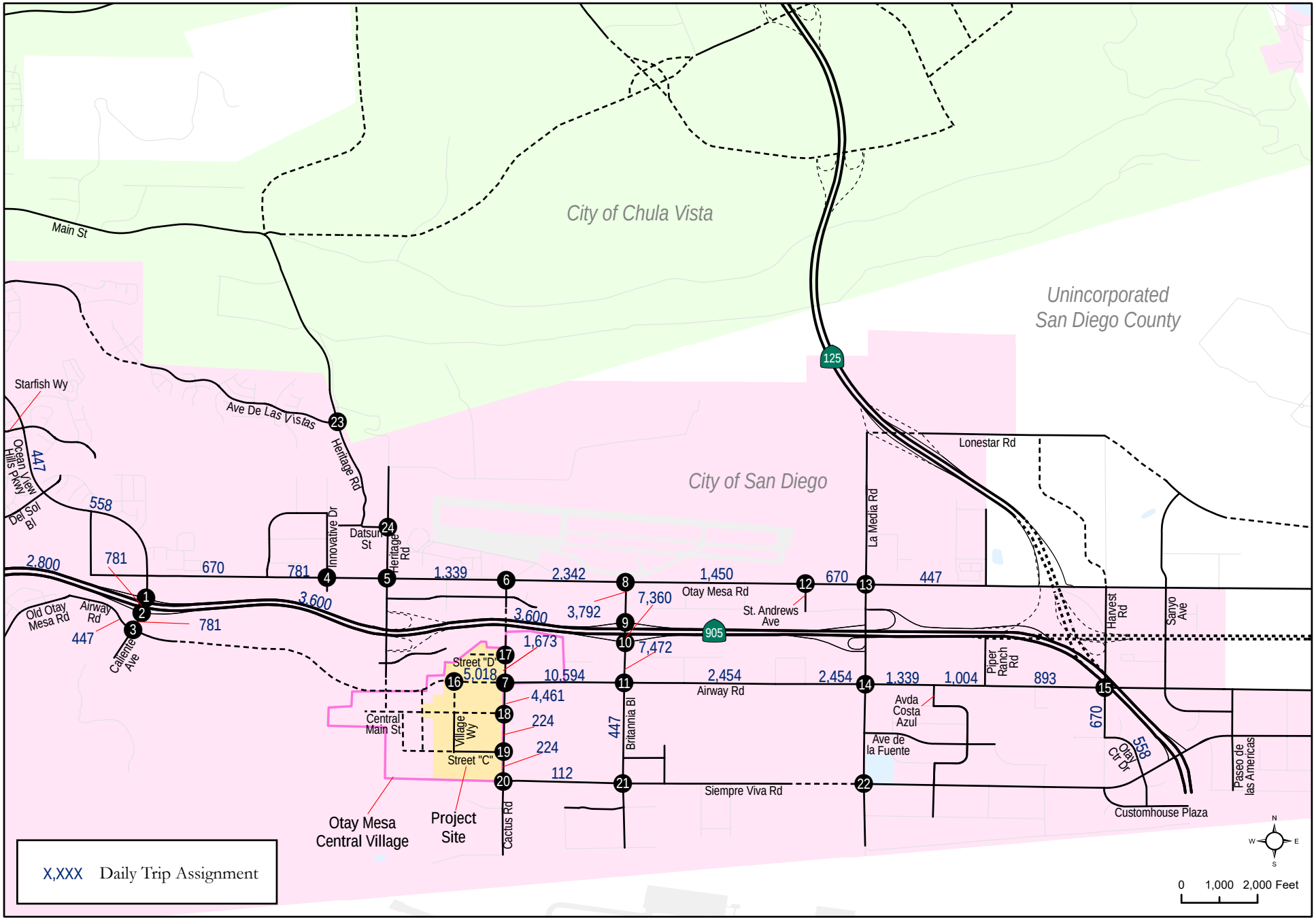

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Figure 3-6
Project Trip Assignment (Phase 1) - Near-Term 2023 Roadway Network

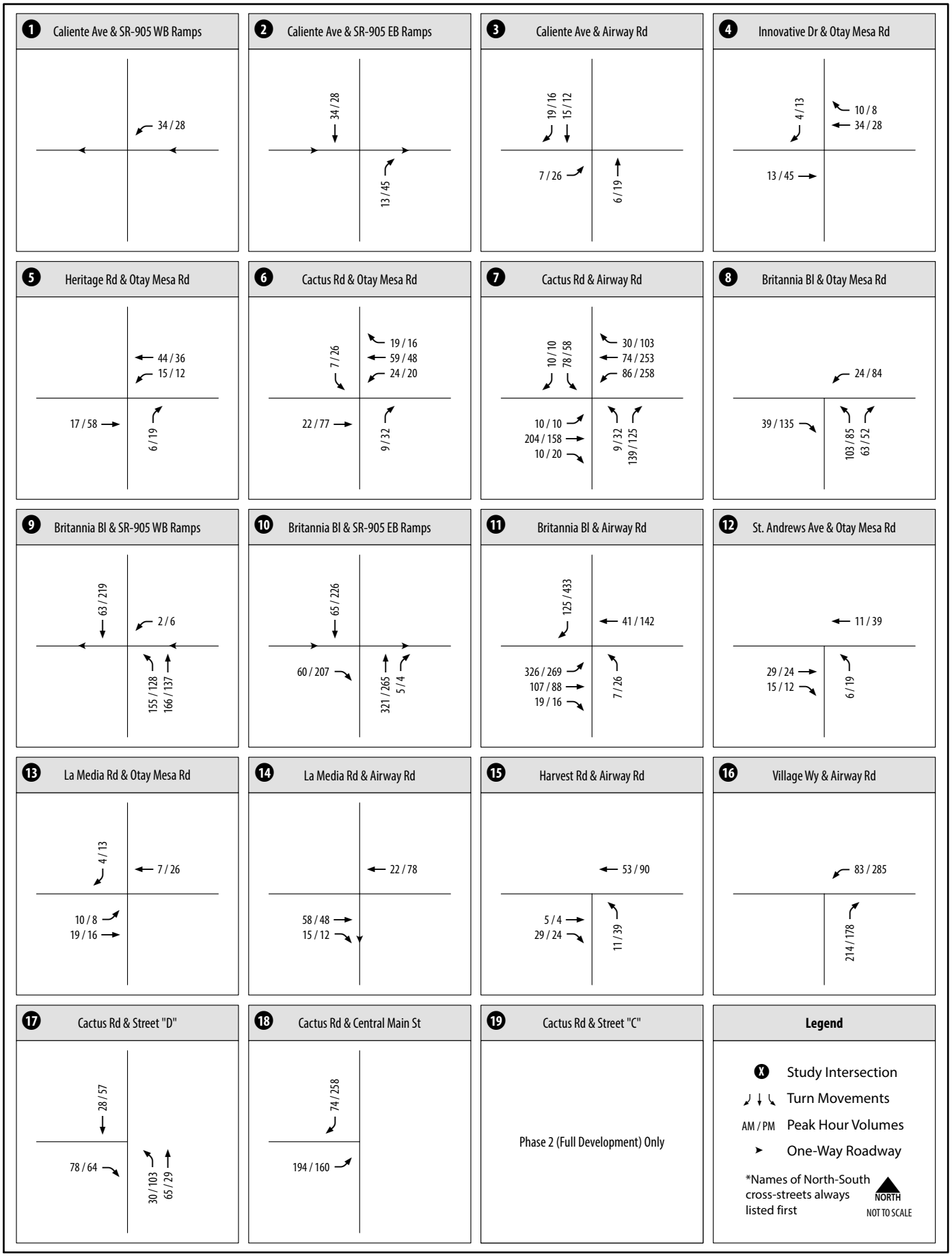

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Figure 3-7
Project Trip Assignment (Phase 1) - Near-Term 2023
(Intersections 1-19)

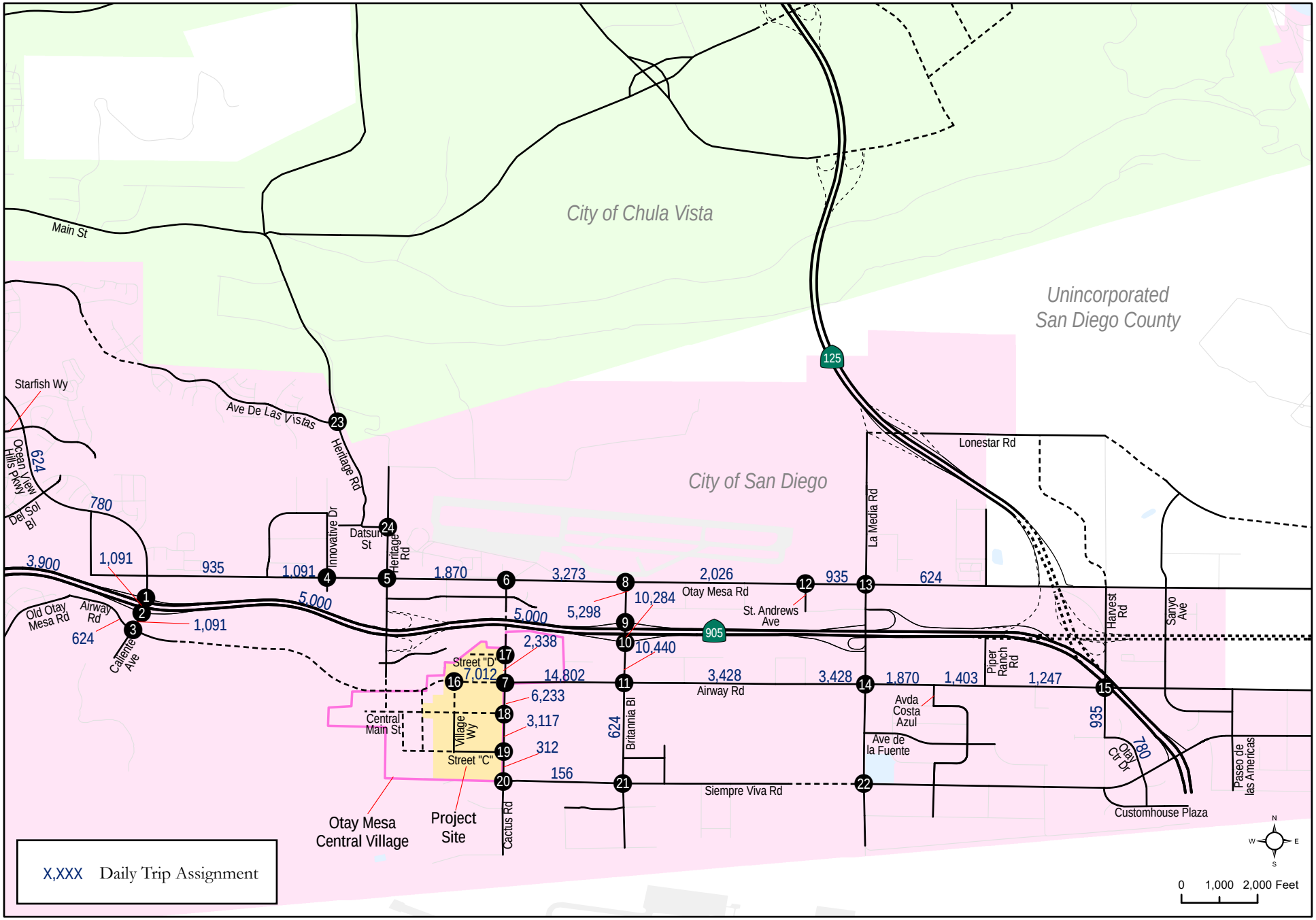

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Figure 3-8
Project Trip Assignment (Full Development) - Existing and Near-Term 2027 Roadway Network

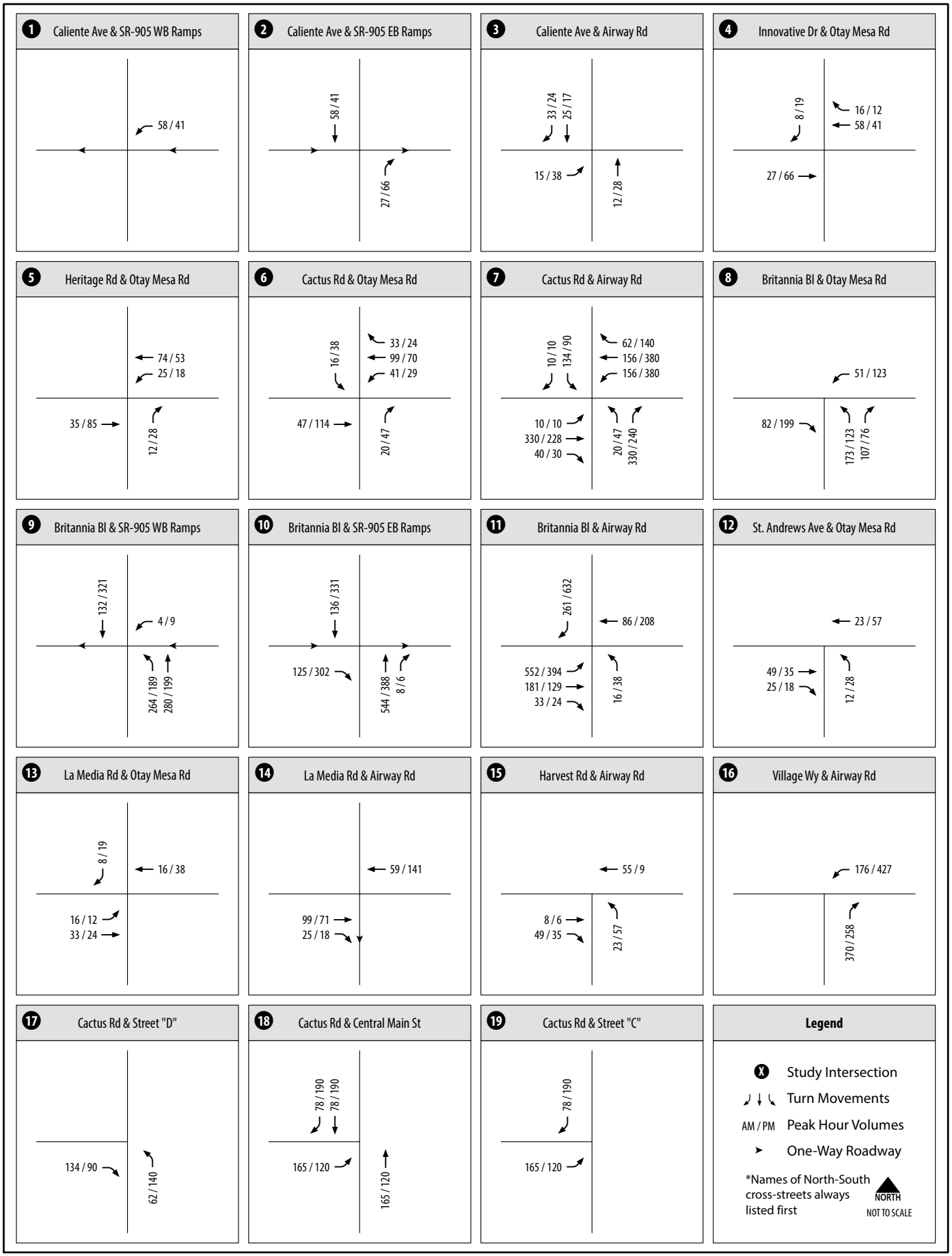

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Figure 3-9
Project Trip Assignment (Full Development) - Existing and Near-Term 2027 (Intersections 1-19)

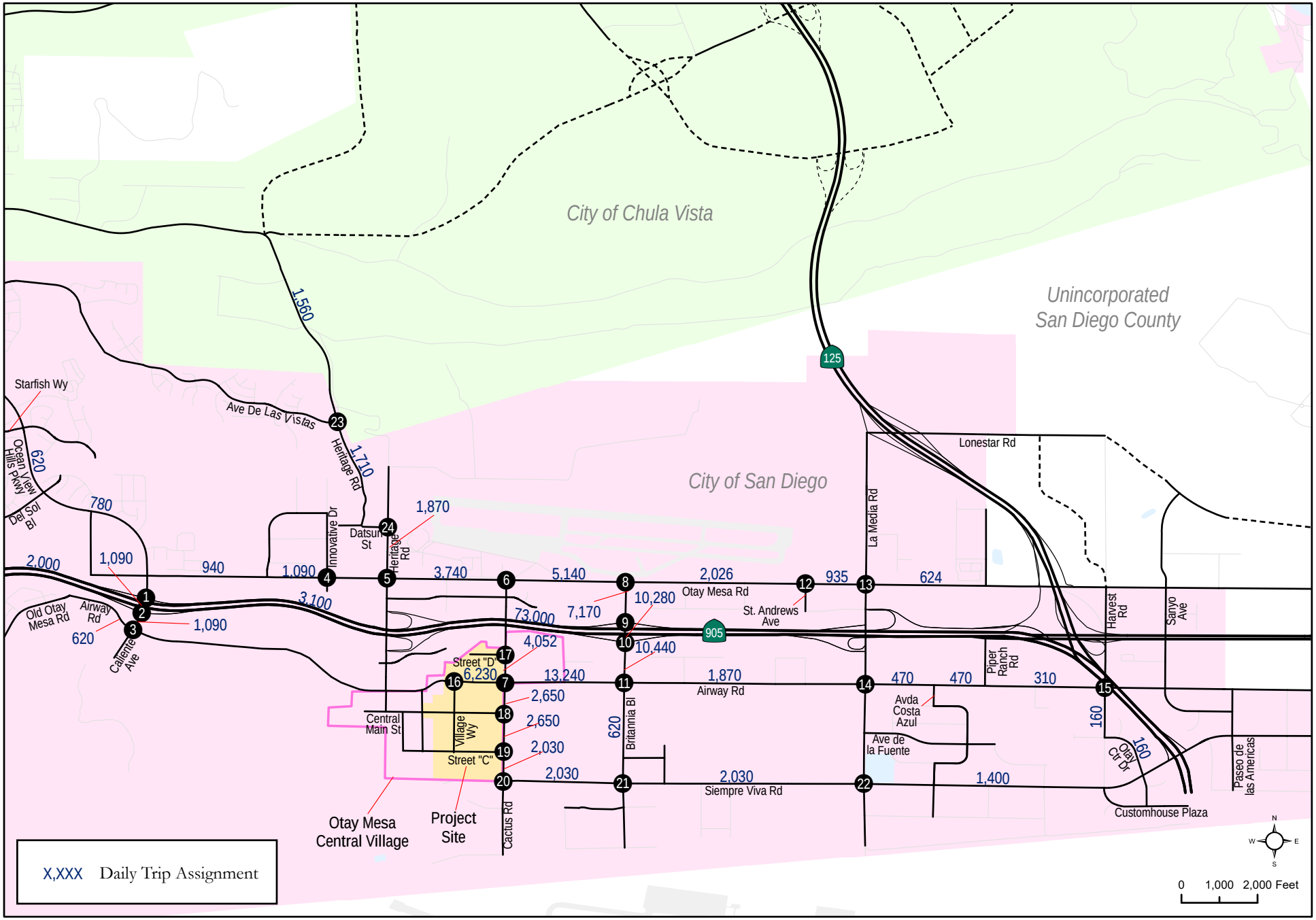

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Figure 3-10
Project Trip Assignment (Full Development) - Buildout of Community Plan Roadway Network

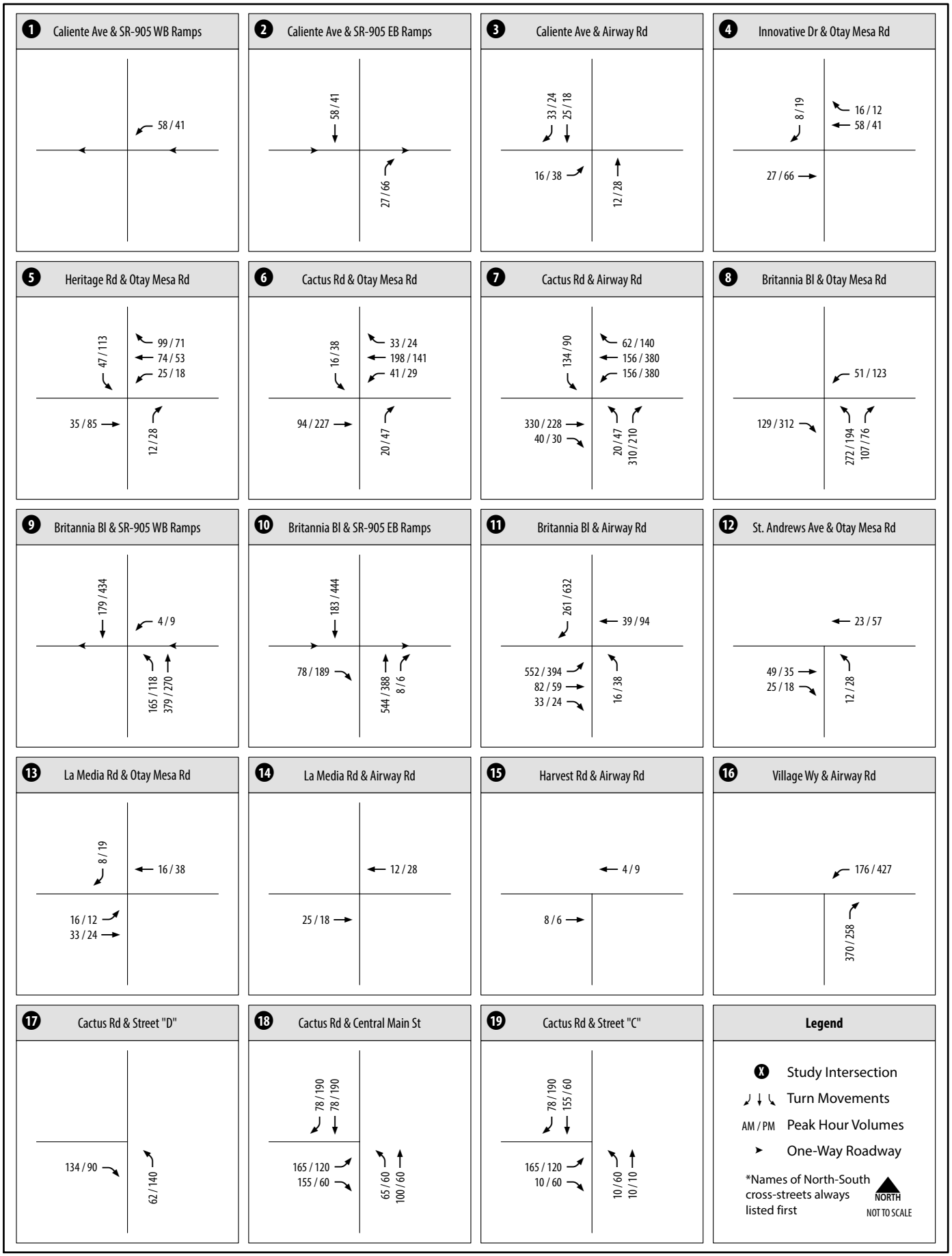

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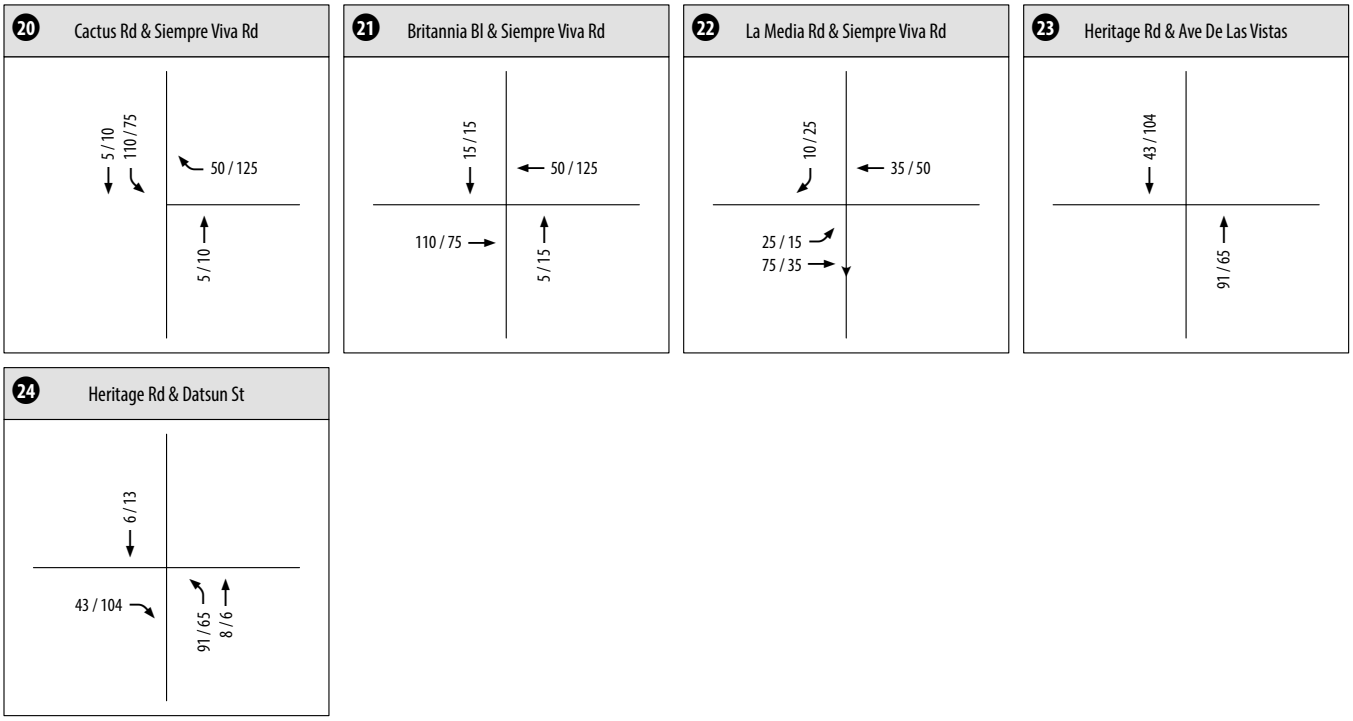
Figure 3-11
Project Trip Assignment (Full Development) - Buildout of Community Plan (Intersections 1-19)



Legend

- X Study Intersection
- Turn Movements
- AM / PM Peak Hour Volumes
- One-Way Roadway

*Names of North-South cross-streets always listed first

NORTH
NOT TO SCALE

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Figure 3-11
Project Trip Assignment (Full Development) - Buildout of Community Plan (Intersections 20-24)

4.0 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.

4.1 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

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 Arterial 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 a 5-lane roadway (2 lanes NB, 3 lanes SB) with a striped median between Otay Mesa Road and the SR-905 EB Ramps. Between the SR-905 EB Ramps and Airway Road, Caliente Avenue is a 5-lane roadway (3 lanes NB, 2 lanes SB) with a striped median. South of Airway Road, Caliente Avenue is a 5-lane roadway (3 lanes NB, 2 lanes SB) with a raised median. Sidewalks and Class II bicycle facilities are present along both sides of the roadway. On-street parking is not permitted on either 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. Caliente Avenue is planned to have a Class I bicycle facility on the east side between Airway Road and Beyer Boulevard 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 (2 lanes SB, 1 lane NB) 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 east 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, and is planned to connect with an overpass over SR-905. Funding for design and construction is anticipated in FY 2039-2042 according to the latest Otay Mesa Public Facilities Financing Plan.

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.

Harvest Road is a 2-lane undivided roadway with no posted speed limit. Sidewalks are present only on the east side of the roadway. Bicycle facilities are not present on either side of the roadway. Parallel on-street parking is only allowed on the east side of the roadway.

Otay Center Drive is a 4-lane undivided roadway with no posted speed limit. Sidewalks are present on both sides of the roadway. Bicycle facilities are not present on either side of the roadway. Parallel on-street parking is allowed on both sides of the roadway.

East-West Facilities

Datsun Street is a 2-lane undivided roadway with no posted speed limit. Sidewalks are not present on either side of the roadway. Bicycle facilities are not present on either side of the roadway. Parallel and perpendicular parking is allowed on both sides of the roadway.

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 except for a small segment between Caliente Avenue/Ocean View Hills Parkway and Emerald Crest Court. Otay Mesa Road is classified as a 6-lane Prime Arterial in the Otay Mesa Community Plan Update.

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. Airway Road is planned to have a Class I bicycle facility on the south side for its entire length per 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.

Study Intersections

The following twenty-four (24) key study area intersections were analyzed in the study:

1. Caliente Avenue / SR-905 WB Ramps / (Signalized)
2. Caliente Avenue / SR-905 EB Ramps (Signalized)
3. Caliente Avenue / Airway Road (All-way stop control)
4. Innovative Drive / Otay Mesa Road (Side-street stop control)
5. Heritage Road / Otay Mesa Road (Signalized)
6. Cactus Road / Otay Mesa Road (Signalized)
7. Cactus Road / Airway Road (Side-street stop control)
8. Britannia Boulevard / Otay Mesa Road (Signalized)
9. Britannia Boulevard / SR-905 WB Ramps (Signalized)
10. Britannia Boulevard / SR-905 EB Ramps (Signalized)
11. Britannia Boulevard / Airway Road (Signalized)
12. St. Andrews Avenue / Otay Mesa Road (Signalized)
13. La Media Road / Otay Mesa Road (Signalized)
14. La Media Road / Airway Road (Signalized, although it currently operates as AWSC)
15. Harvest Road / Airway Road (All-way stop control)
16. Village Way / Airway Road (All-way stop control) *
17. Cactus Road / Street “D” (All-way stop control) *
18. Cactus Road / Central Main Street (All-way stop control) *
19. Cactus Road / Street “C” (All-way stop control) *
20. Cactus Road / Siempre Viva Road (Buildout Conditions Only)
21. Britannia Boulevard / Siempre Viva Road (Buildout Conditions Only)
22. La Media Road / Siempre Viva Road (Buildout Conditions Only)
23. Heritage Road / Avenida De Las Vistas (Buildout Conditions Only)
24. Heritage Road / Datsun Street (Buildout Conditions Only)

**Intersection provides project access and does not exist; therefore, it is not analyzed under Existing, Near-Term Year 2023 Base, Near-Term Year 2027 Base, and Buildout of Community Plan Base conditions.*

Figure 4-1 displays the existing roadway geometrics while **Figure 4-2** displays the existing intersection lane configurations.

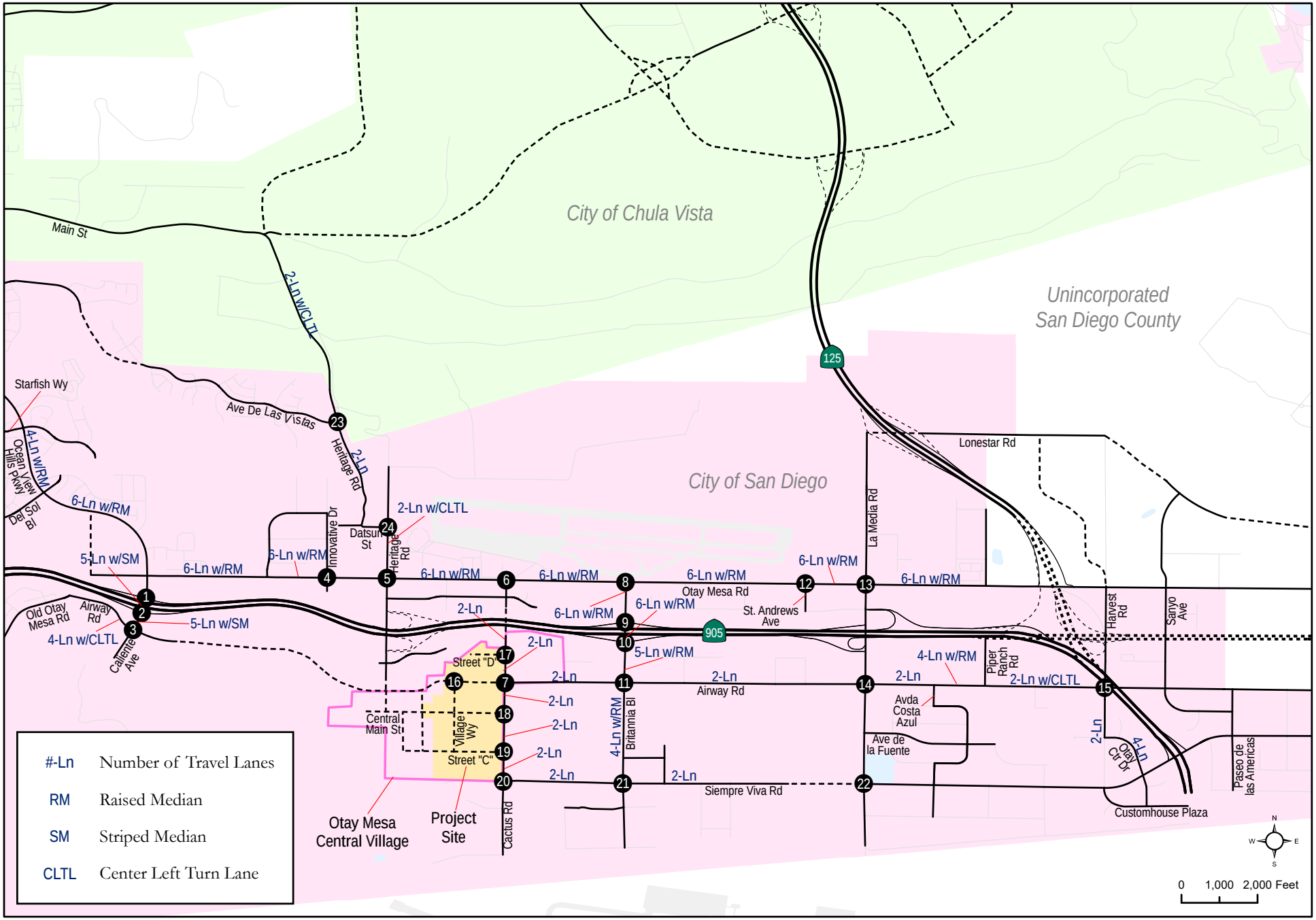

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Figure 4-1
Roadway Geometrics - Existing Conditions

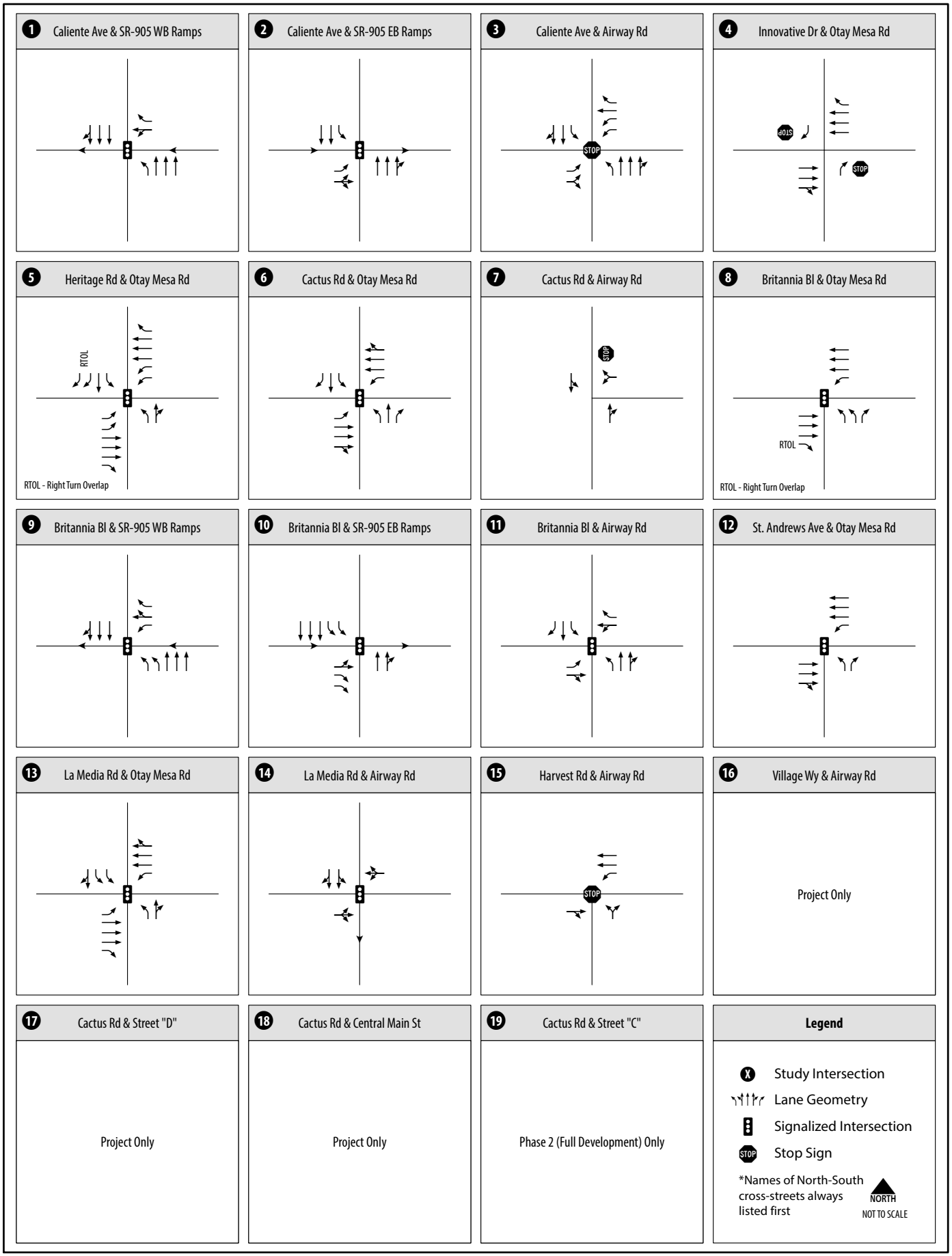

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Figure 4-2
Intersection Geometrics - Existing Conditions
(Intersections 1-19)

4.2 Existing Intersection and Roadway Volumes

Figure 4-3 displays Average Daily Traffic (ADT) volumes for roadway and freeway segments, while **Figure 4-4** shows existing AM/PM peak hour traffic volumes for the key study area intersections. The same roadway segment and study area intersection traffic counts conducted on October 2015 for the analysis of the Otay Mesa Central Village Specific Plan TFTA were utilized for the analysis of the proposed project and are provided in **Appendix C**. The latest freeway segment counts were obtained from the Caltrans 2017 Traffic Volumes on California State Highway document.

4.3 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 analysis results are discussed separately below.

Roadway Segment Analysis

Table 4.1 displays the LOS analysis results for key study area roadway segments located in the City of San Diego under Existing conditions.

As shown in Table 4.1, all of the key study area roadway segments are currently operating at acceptable LOS D or better, with the exception of the following roadway segment:

- Airway Road, between La Media Road and Avenida Costa Azul – LOS E.

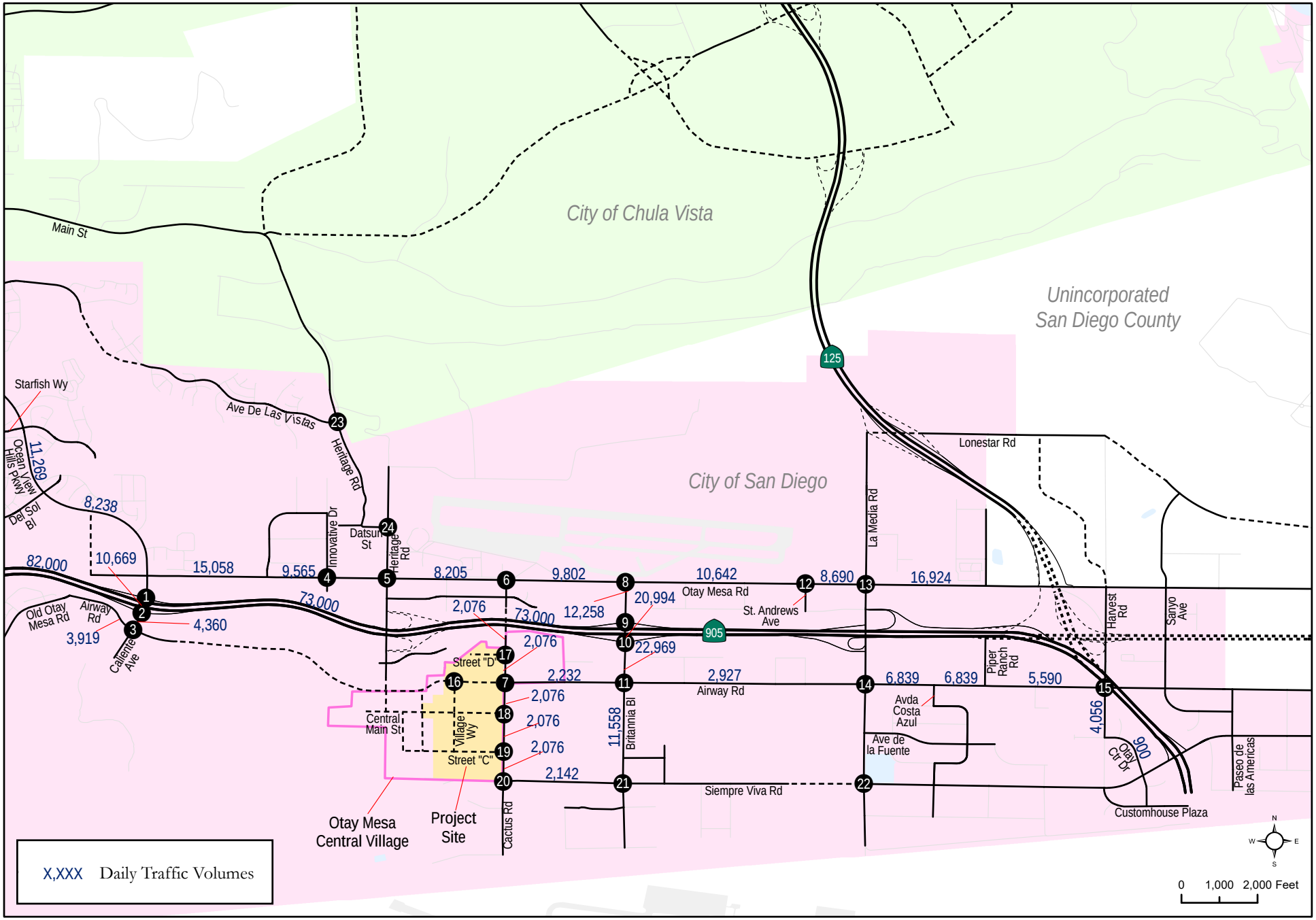

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Figure 4-3
Roadway ADT - Existing Conditions

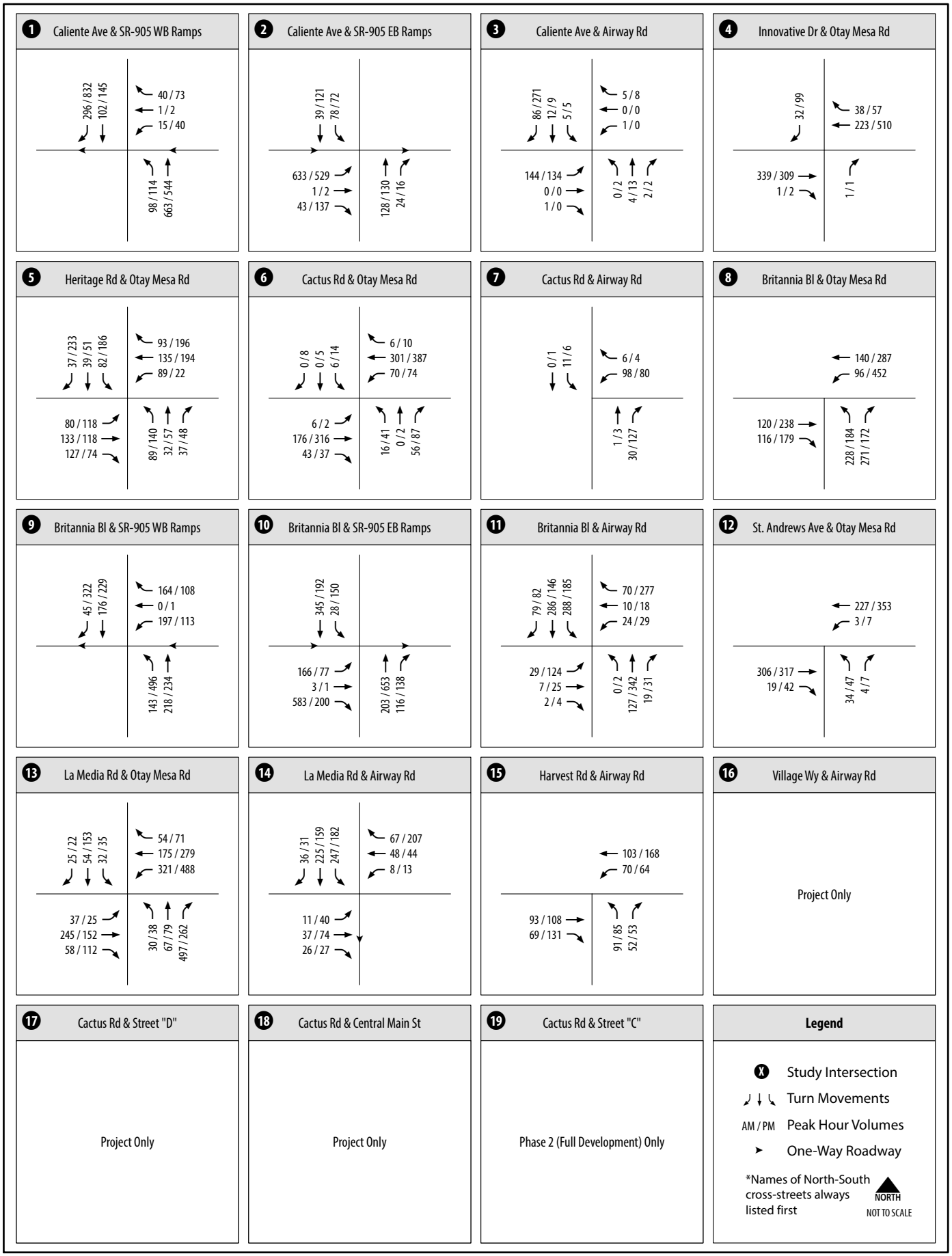

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Figure 4-4
AM/PM Peak Hour Intersection Volumes - Existing Conditions (Intersections 1-19)

TABLE 4.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING CONDITIONS

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
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
Cactus Road	SR-905	Street "D"	2-Ln Collector w/ Commercial Fronting	2-Ln	2,076	8,000	0.260	A
	Street "D"	Airway Road	2-Ln Collector w/ Commercial Fronting	2-Ln	2,076	8,000	0.260	A
	Airway Road	Central Main Street	2-Ln Collector w/ Commercial Fronting	2-Ln	2,076	8,000	0.260	A
	Central Main Street	Street "C"	2-Ln Collector w/ Commercial Fronting	2-Ln	2,076	8,000	0.260	A
	Street "C"	Siempre Viva Road	2-Ln Collector w/ Commercial Fronting	2-Ln	2,076	8,000	0.260	A
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
Harvest Road	Airway Road	Otay Center Drive	2-Ln w/ Commercial Fronting	2-Ln	4,056	8,000	0.507	C
Otay Center Drive	Harvest Road	Siempre Viva Road	4-Ln Collector	4-Ln	900	15,000	0.060	A

TABLE 4.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING CONDITIONS

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
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
	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
Airway Road	Old Otay Mesa Road	Caliente Avenue	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w / CLTL	3,919	30,000	0.131	A
	Cactus Road	Britannia Boulevard	2-Ln Collector w/ Commercial Fronting	2-Ln	2,232	8,000	0.279	A
	Britannia Boulevard	1,600 feet west of La Media Road	2-Ln Collector w/ Commercial Fronting	2-Ln	2,927	8,000	0.366	B
	1,600 feet west of La Media Road	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

TABLE 4.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING CONDITIONS

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
Siempre Viva Road	Cactus Road	Britannia Blvd	2-Ln Collector w/ Commercial Fronting	2-Ln	2,142	8,000	0.268	A

Source: AVC, Chen Ryan Associates; February 2019

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).

Intersection Analysis

Table 4.2 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 4.2
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
1	Caliente Avenue / SR-905 WB Ramps	Signalized	5.8	A	8.7	A
2	Caliente Avenue / SR-905 EB Ramps	Signalized	16.2	B	14.3	B
3	Caliente Avenue / Airway Road	AWSC	7.8	A	8.7	A
4	Innovative Drive / Otay Mesa Road	SSSC	9.1	A	10.6	B
5	Heritage Road / Otay Mesa Road	Signalized	17.9	B	21.5	C
6	Cactus Road / Otay Mesa Road	Signalized	11.4	B	15.5	B
7	Cactus Road / Airway Road	SSSC	9.4	A	9.6	A
8	Britannia Boulevard / Otay Mesa Road	Signalized	11.4	B	20.4	C
9	Britannia Boulevard / SR-905 WB Ramps	Signalized	11.6	B	14.0	B
10	Britannia Boulevard / SR-905 EB Ramps	Signalized	9.9	A	13.2	B
11	Britannia Boulevard / Airway Road	Signalized	16.0	B	41.2	D
12	Saint Andrews Avenue / Otay Mesa Road	Signalized	6.3	A	6.9	A
13	La Media Road / Otay Mesa Road	Signalized	52.8	D	52.0	D
14	La Media Road / Airway Road	AWSC[1]	16.2	C	12.6	B
15	Harvest Road / Airway Road	AWSC	8.9	A	9.9	A
16	Village Way / Airway Road	Does Not Exist				

TABLE 4.2
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
17	Cactus Road / Street "D"	Does Not Exist				
18	Cactus Road / Central Main Street	Does Not Exist				
19	Cactus Road / Street "C"	Does Not Exist				
20	Cactus Road / Siempre Viva Road	Buildout Conditions Only				
21	Britannia Boulevard / Siempre Viva Road	Buildout Conditions Only				
22	La Media Road / Siempre Viva Road	Buildout Conditions Only				
23	Heritage Road / Avenida De Las Vistas	Buildout Conditions Only				
24	Heritage Road / Datsun Street	Buildout Conditions Only				

Source: Chen Ryan Associates; February 2019

Notes:
Bold letter indicates 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] A traffic signal is in place at this intersection, however, it is not in operations. Therefore, it is analyzed as an all-way stop controlled intersection.

As shown in Table 4.2, all of the key study area intersections are currently operating at acceptable LOS D or better during both the AM and PM peak hours.

Freeway Segment Analysis

Table 4.3 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 2.5.

As shown in Table 4.3, all of the freeway segments within the study area operate at acceptable LOS D or better.

TABLE 4.3
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
SR-905	I-805 and Caliente Avenue	82,000	EB	4M	9,400	66.2%	7.6%	11.9%	4,400	0.470	B	AM
			WB	3M+1A	8,460	58.8%	9.0%	11.9%	4,600	0.540	B	PM
	Caliente Avenue and Heritage Road	73,000	EB	3M	7,050	66.2%	7.6%	11.9%	1,900	0.270	A	AM
			WB	3M	7,050	58.8%	9.0%	11.9%	1,300	0.180	A	PM
	Heritage Road and Britannia Boulevard	73,000	EB	3M	7,050	66.2%	7.6%	11.9%	900	0.130	A	AM
			WB	3M	7,050	58.8%	9.0%	11.9%	800	0.110	A	PM

Source: Chen Ryan Associates; February 2019

Notes:
Bold letter indicated substandard LOS.
M = Mainline. A = Auxiliary Lane.
[a] Traffic volumes provided by Caltrans (2017).
[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.

5.0 Existing Plus Project (Full Development) Conditions

This section provides an analysis of existing traffic conditions with the addition of project trips from full development 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 as hypothetical when used in connection with a long-range development project such as the proposed project, which is not anticipated to reach full buildout until approximately 2027.

The scenario is hypothetical because it assumes that the proposed project would be fully built out immediately and the corresponding full buildout traffic volumes added to existing roadway volumes and infrastructure. Thus, the existing plus project analysis presumes that the existing environment (existing traffic volumes, existing roadway infrastructure, and existing land uses) will not change over the long-term buildout of the project.

As a result of this presumption, future increases in traffic volumes attributable to other development projects (i.e., cumulative traffic volumes) are not accounted for in the analysis. This results in the analysis potentially understating project impacts because capacity that otherwise would be utilized by future development that precedes the proposed project buildout is now available to the project. On the other hand, because the scenario does not account for future planned roadway network mitigation measures that would increase roadway capacities, the analysis potentially results in overstating project impacts. Furthermore, because the analysis does not take into account future development and related changing land uses, the analysis does not account for the corresponding change in trip distribution patterns that accompany changing land uses, which could result in either understating or overstating impacts.

For these reasons, the analysis of the project's potential impacts as measured against the existing conditions baseline that follows is presented for information purposes only. The identification of the project's significant impacts, with recommended mitigation, will be based on the future year analyses that take into account cumulative traffic growth, as well as the changing roadway network and land uses that accompany a long-range development project such as this.

5.1 Existing Plus Project (Full Development) Roadway Network and Traffic Volumes

Roadway and intersection geometrics under Existing Plus Project (Full Development) 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:

<u>Roadway Segments</u>

- Airway Road, between Village Way (Project Access) and Cactus Road – This segment serves as the project frontage and will be constructed to a 4-Lane Prime Arterial, which is within the ultimate classification (6-Lane Prime Arterial) 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 Street "D" and Airway Road - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median), which is within the ultimate classification (4-Lane Major Arterial) 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 Central Main Street - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median), which is within the ultimate classification (4-Lane Major Arterial) 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 Central Main Street and Street "C" - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median), which is within the ultimate classification (4-Lane Major Arterial) 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 Street "C" and Siempre Viva Road - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median), which is within the ultimate classification (4-Lane Major Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).

<u>Intersections</u>

7. 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 with Phase 1. See Appendix J for traffic signal warrant.
16. Village Way / Airway Road – Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross-section mentioned above. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.
17. Cactus Road / Street "D" – Construction of an all-way stop control (AWSC) T-intersection, but the fourth leg (east of Cactus Road) will be constructed by the developer(s) of PA 14, 15, 16, 17, and 21 of the Otay Mesa Central Village Specific Plan. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of

the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

18. Cactus Road / Central Main Street – Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross section mentioned above. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.
19. Cactus Road / Street "C" – Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross section mentioned above. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

Figures 5-1 and **5-2** display roadway geometrics and intersection lane configurations under Existing Plus Project (Full Development) conditions.

Existing Plus Project (Full Development) traffic volumes were derived by combining the existing traffic volumes (displayed in Figures 4-3 and 4-4) and the project trip assignment volumes (displayed in Figures 3-7 and 3-8). Existing Plus Project (Full Development) daily roadway and freeway traffic volumes are displayed in **Figure 5-3,** while **Figure 5-4** displays intersection peak hour traffic volumes.

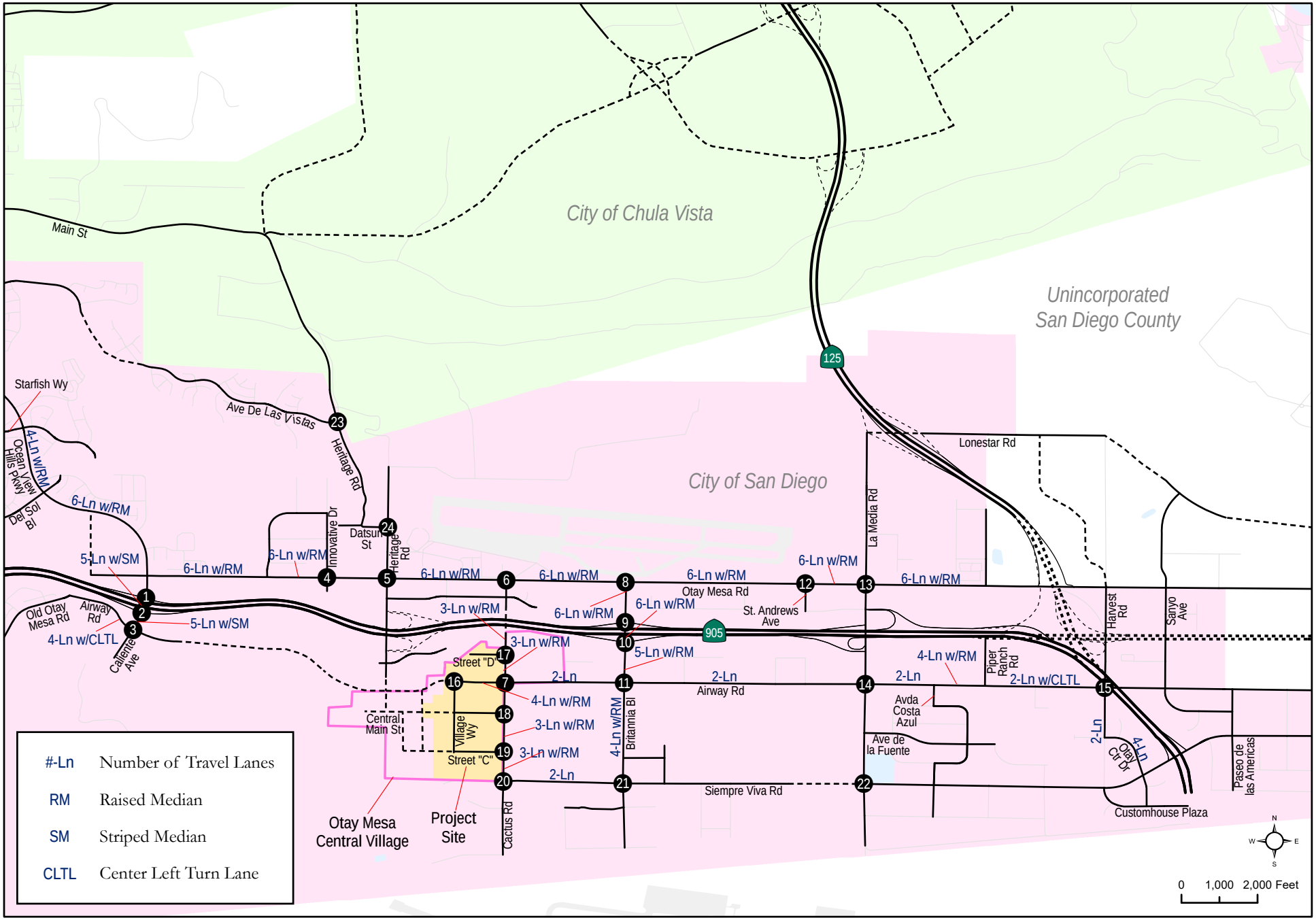

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Figure 5-1
Roadway Geometrics - Existing Plus Project (Full Development) Conditions

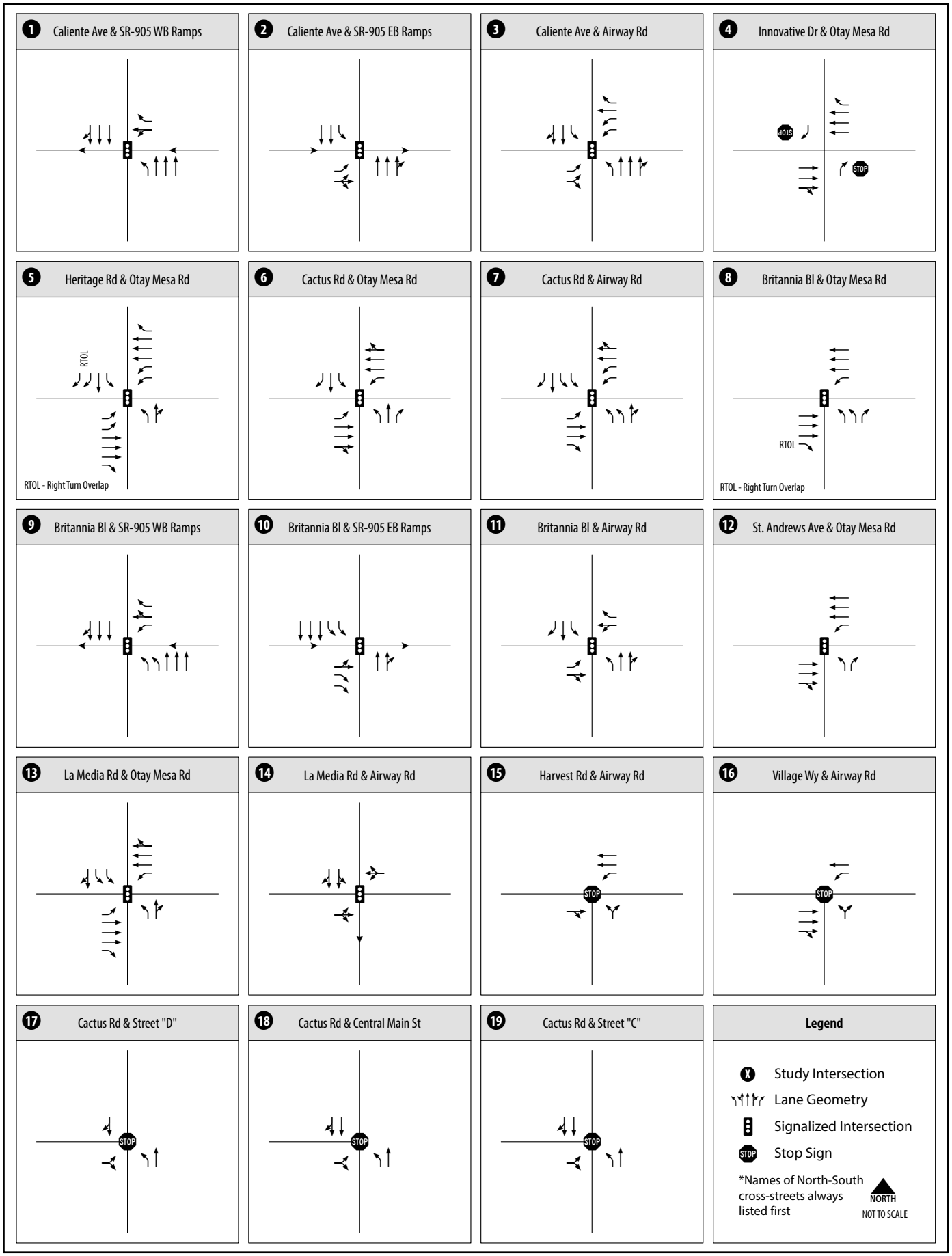

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Figure 5-2
Intersection Geometrics - Existing Plus Project (Full Development) Conditions (Intersections 1-19)

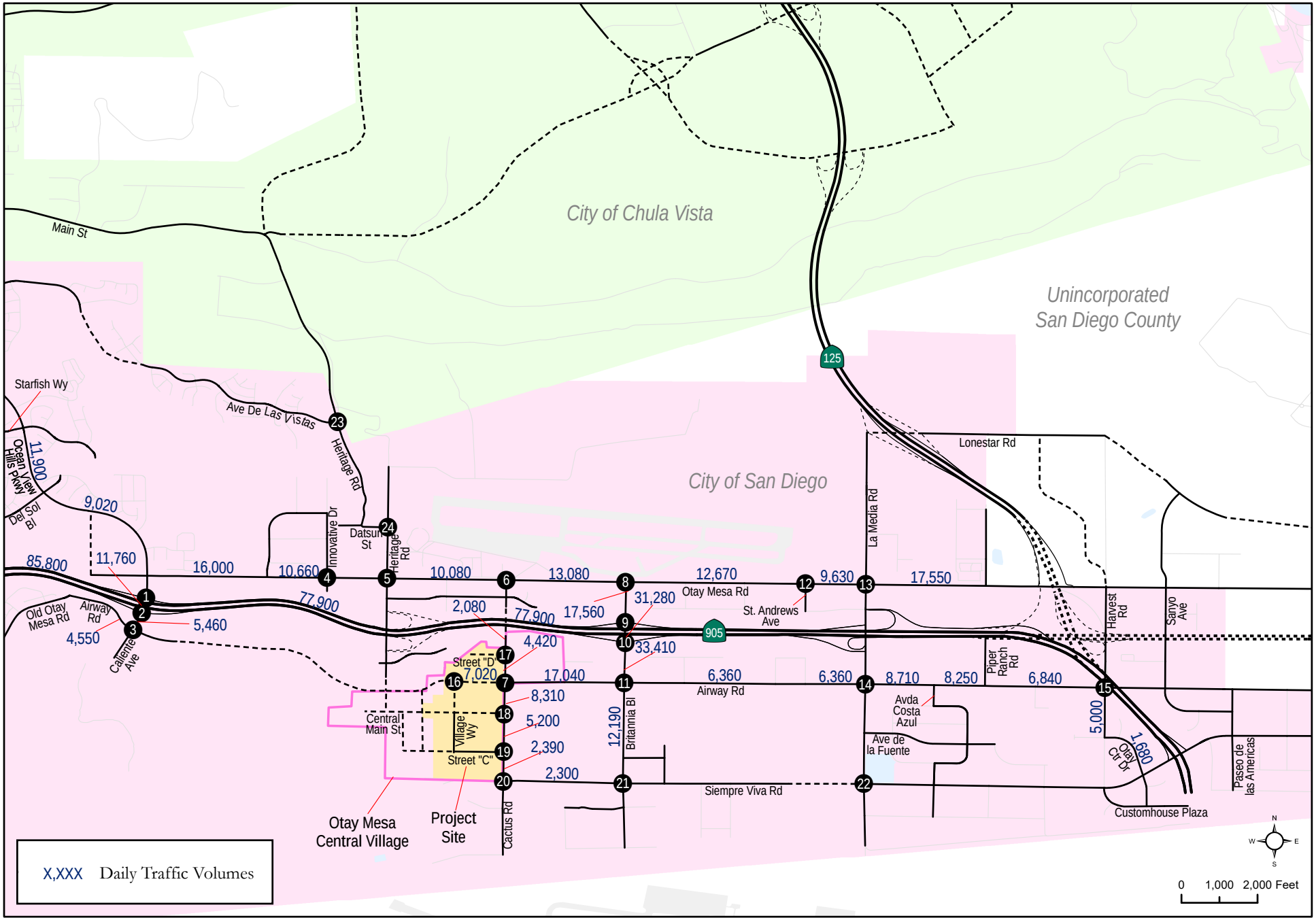

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Figure 5-3
Roadway ADT - Existing Plus Project (Full Development) Conditions

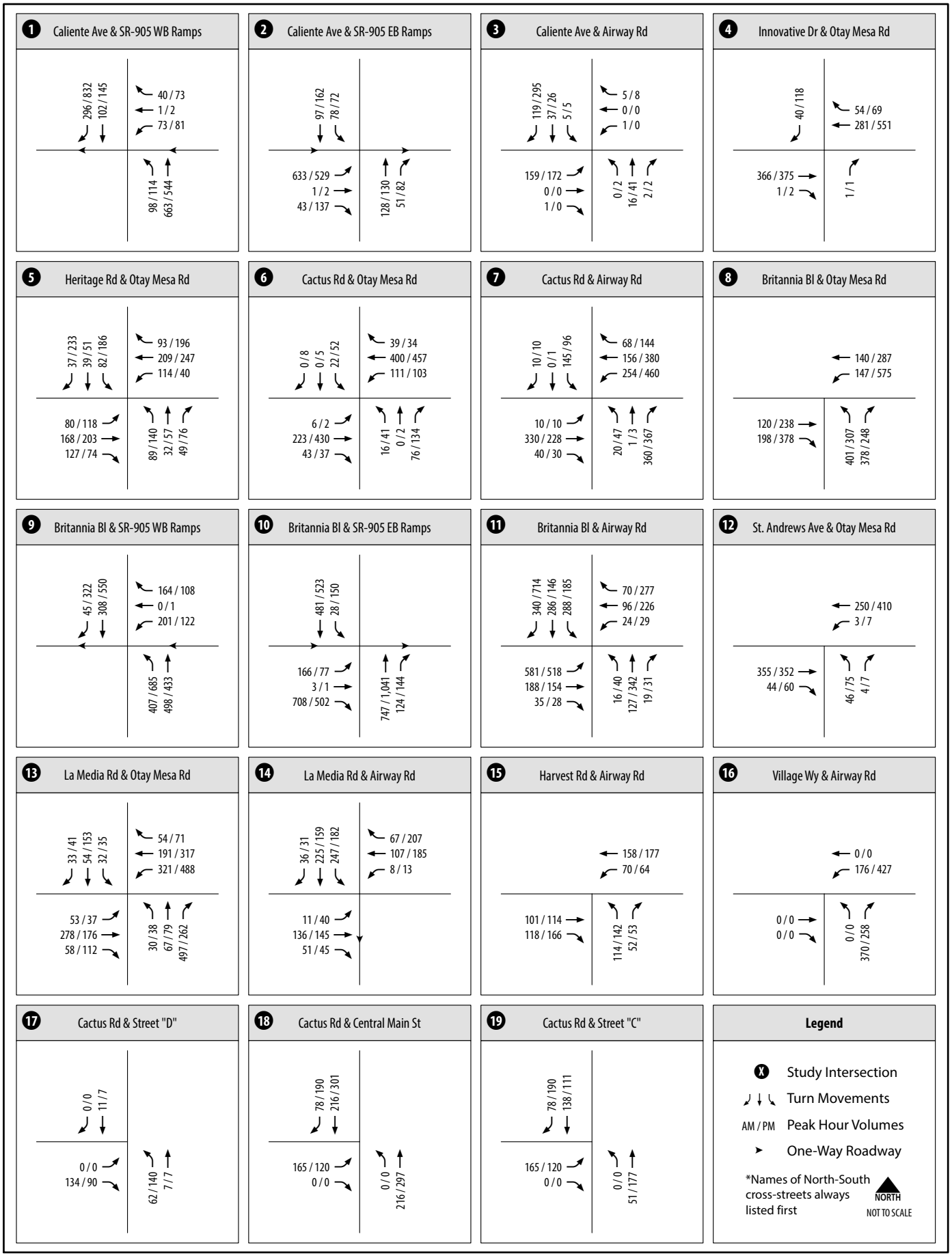

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Figure 5-4
AM/PM Peak Hour Intersection Volumes - Existing Plus Project (Full Development) Conditions (Intersections 1-19)

5.2 Existing Plus Project (Full Development) Traffic Conditions

Analyses were conducted using methodology described in Chapter 2.0. Roadway segment, intersection, and freeway segment level of service are discussed separately below.

Roadway Segment Analysis

Table 5.1 displays the level of service analysis results for key roadway segments located in the City of San Diego under Existing Plus Project (Full Development) conditions.

TABLE 5.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT (FULL DEVELOPMENT) CONDITIONS

Roadway	Segment	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	With Project		Without Project		Δ V/C	SI?
						V/C	LOS	V/C	LOS		
Ocean View Hills Parkway	Starfish Way to Del Sol Boulevard	4-Ln Major Arterial	4-Ln w / RM	11,900	40,000	0.298	A	0.282	A	0.016	No
	Del Sol Boulevard to Otay Mesa Road	6-Ln Major Arterial	6-Ln w / RM	9,020	50,000	0.180	A	0.165	A	0.016	No
Caliente Avenue	SR-905 WB Ramps SR-905 EB Ramps	5-Ln Prime Arterial	5-Ln w / SM (3-NB, 2-SB)	11,760	50,000[1]	0.235	A	0.213	A	0.022	No
	SR-905 EB Ramps to Airway Road	5-Ln Prime Arterial	5-Ln w / SM (3-NB, 2-SB)	5,460	50,000[1]	0.109	A	0.087	A	0.022	No
Cactus Road	SR-905 to Street "D"	2-Ln w/ Commercial Fronting	2-Ln	2,080	8,000	0.260	A	0.260	A	0.000	No
	Street "D" to Airway Road	3-Ln Major Arterial	3-Ln w / RM	4,420	30,000[2]	0.147	A	0.260	A	-0.112	No
	Airway Road to Central Main Street	3-Ln Major Arterial	3-Ln w / RM (1NB, 2SB)	8,310	30,000[2]	0.277	A	0.260	A	0.018	No
	Central Main Street to Street "C"	3-Ln Major Arterial	3-Ln w / RM (1NB, 2SB)	5,200	30,000[2]	0.173	A	0.260	A	-0.086	No

TABLE 5.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT (FULL DEVELOPMENT) CONDITIONS

Roadway	Segment	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	With Project		Without Project		Δ V/C	SI?
						V/C	LOS	V/C	LOS		
Cactus Road	Street "C" and Siempre Viva Road	3-Ln Major Arterial	3-Ln w / RM (1NB, 2SB)	2,390	30,000[2]	0.079	A	0.260	A	-0.180	No
Britannia Boulevard	Otay Mesa Road to SR-905 WB Ramps	6-Ln Prime Arterial	6-Ln w / RM	17,560	60,000	0.293	A	0.204	A	0.088	No
	SR-905 WB Ramps to SR-905 EB Ramps	6-Ln Prime Arterial	6-Ln w / RM	31,280	60,000	0.521	B	0.350	A	0.171	No
	SR-905 EB Ramps to Airway Road	5-Ln Prime Arterial	5-Ln w / RM (2-NB, 3-SB)	33,410	50,000[1]	0.668	C	0.459	B	0.209	No
	Airway Road to Siempre Viva Road	4-Ln Major Arterial	4-Ln w / RM	12,190	40,000	0.305	A	0.289	A	0.016	No
Harvest Road	Airway Road to Otay Center Drive	2-Ln w/ Commercial Fronting	2-Ln	5,000	8,000	0.625	C	0.507	C	0.118	No
Otay Center Drive	Harvest Road to Siempre Viva Road	4-Ln Collector	4-Ln	1,680	15,000	0.112	A	0.060	A	0.052	No
Otay Mesa Road	Ocean View Hills Parkway to Corporate Center Drive	6-Ln Prime Arterial	6-Ln w / RM	16,000	60,000	0.267	A	0.251	A	0.016	No
	Corporate Center Drive to Heritage Road	6-Ln Prime Arterial	6-Ln w / RM	10,660	60,000	0.178	A	0.159	A	0.018	No
	Heritage Road to Cactus Road	6-Ln Prime Arterial	6-Ln w / RM	10,080	60,000	0.168	A	0.137	A	0.031	No

TABLE 5.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT (FULL DEVELOPMENT) CONDITIONS

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	Cactus Road to Britannia Boulevard	6-Ln Prime Arterial	6-Ln w / RM	13,080	60,000	0.218	A	0.163	A	0.055	No
	Britannia Boulevard to Saint Andrews Avenue	6-Ln Prime Arterial	6-Ln w / RM	12,670	60,000	0.211	A	0.177	A	0.034	No
	Saint Andrews Avenue to La Media Road	6-Ln Prime Arterial	6-Ln w / RM	9,630	60,000	0.161	A	0.145	A	0.016	No
	La Media Road to Piper Ranch Road	6-Ln Prime Arterial	6-Ln w / RM	17,550	60,000	0.293	A	0.282	A	0.010	No
Airway Road	Old Otay Mesa Road to Caliente Avenue	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w / CLTL	4,550	30,000	0.152	A	0.131	A	0.021	No
	Village Way to Cactus Road	4-Ln Prime Arterial	4-Ln w/ RM	7,020	40,000	0.176	A	Does Not Exist			No
	Cactus Road to Britannia Boulevard	2-Ln Collector w/ Commercial Fronting	2-Ln	17,040	8,000	2.130	**F**	0.279	A	1.851	**Yes**
	Britannia Boulevard to 1,600 feet west of La Media Road	2-Ln Collector w/ Commercial Fronting	2-Ln	6,360	8,000	0.795	D	0.366	B	0.429	No
	1,600 feet west of La Media Road and La Media Road	2-Ln Collector w/ Commercial Fronting	2-Ln	6,360	8,000	0.795	D	0.366	B	0.429	No
	La Media Road to Avenida Costa Azul	2-Ln Collector w/ Commercial Fronting	2-Ln	8,710	8,000	1.089	**F**	0.855	**E**	0.234	**Yes**

TABLE 5.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT (FULL DEVELOPMENT) CONDITIONS

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	8,250	40,000	0.206	A	0.171	A	0.035	No
	Piper Ranch Road to Harvest Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	6,840	15,000	0.456	B	0.373	B	0.083	No
Siempre Viva Road	Cactus Road	Britannia Blvd	2-Ln	2,300	8,000	0.288	A	0.268	A	0.020	No

Source: Chen Ryan Associates; February 2019

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-Lane Major Arterial, reduced to exclude a lane. (3/4*40,000 = 30,000).
Δ = Change in V/C Ratio.
SI? = Significant Impact.

As shown in Table 5.1, all of the roadway segments are projected to operate at acceptable LOS D or better with the addition of project traffic with the following two (2) exceptions:

- Airway 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 0.279 under Existing conditions to 2.130 under Existing Plus Project (Full Development) conditions, resulting in a net increase of 1.851. 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 2.6, this roadway segment would be significantly impacted under the Existing Plus Project (Full Development) conditions and mitigation measures would be required.

- 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 0.855 under Existing conditions to 1.089 under Existing Plus Project (Full Development) conditions, resulting in a net increase of 0.234. This increase in volume to capacity ratio is above the allowable 0.02 threshold.

Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under the Existing Plus Project (Full Development) conditions and mitigation measures would be required.

Intersection Analysis

Table 5.2 displays LOS and average vehicle delay results for the intersections under Existing Plus Project (Full Development) conditions. LOS calculation worksheets for the Existing Plus Project (Full Development) conditions are provided in **Appendix E**.

TABLE 5.2
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT (FULL DEVELOPMENT) 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	Caliente Avenue / SR-905 WB Ramps	Signalized	7.7	A	9.5	A	5.8 / 8.7	A / A	1.9 / 0.8	No
2	Caliente Avenue / SR-905 EB Ramps	Signalized	16.2	C	14.3	B	16.2 / 14.3	B / B	0.0 / 0.0	No
3	Caliente Avenue / Airway Road	AWSC	8.4	A	9.7	A	7.8 / 8.7	A / A	0.6 / 1.0	No
4	Innovative Drive / Otay Mesa Road	SSSC	9.3	A	11.1	B	9.1 / 10.6	A / B	0.2 / 0.5	No
5	Heritage Road / Otay Mesa Road	Signalized	18.1	B	24.2	C	17.9 / 21.5	B / C	0.2 / 2.7	No
6	Cactus Road / Otay Mesa Road	Signalized	19.7	B	18.7	B	11.4 / 15.5	B / B	8.3 / 3.2	No
7	Cactus Road / Airway Road	Signalized	24.9	C	22.1	C	9.4 / 9.6	A / A	15.5 / 12.5	No
8	Britannia Boulevard / Otay Mesa Road	Signalized	16.4	B	33.6	C	11.4 / 20.4	B / C	5.0 / 13.2	No
9	Britannia Boulevard / SR-905 WB Ramps	Signalized	13.9	B	19.1	B	11.6 / 14.0	B / B	2.3 / 5.1	No
10	Britannia Boulevard / SR-905 EB Ramps	Signalized	15.8	B	16.9	B	9.9 / 13.2	A / B	5.9 / 3.7	No
11	Britannia Boulevard / Airway Road	Signalized	68.0	**E**	67.1	**E**	16.0 / 41.2	B / D	52.0 / 25.9	**Yes**
12	Saint Andrews Avenue / Otay Mesa Road	Signalized	7.2	A	8.2	A	6.3 / 6.9	A / A	0.9 / 1.3	No
13	La Media Road / Otay Mesa Road	Signalized	53.4	D	52.3	D	52.8 / 52.0	D / D	0.6 / 0.3	No
14	La Media Road / Airway Road	AWSC[1]	21.3	C	19.0	C	16.2 / 12.6	C / B	5.1 / 6.4	No

TABLE 5.2
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT (FULL DEVELOPMENT) 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				
15	Harvest Road / Airway Road	AWSC	10.1	B	11.5	B	8.9 / 9.9	A / A	1.2 / 1.6	No
16	Village Way / Airway Road	Signalized	10.1	B	17.9	C	N/A			No
17	Cactus Road / Street "D"	AWSC	7.3	A	7.9	A	N/A			No
18	Cactus Road / Central Main Street	AWSC	9.5	A	10.9	B	N/A			No
19	Cactus Road / Street "C"	AWSC	8.2	A	8.7	A	N/A			No
20	Cactus Road / Siempre Viva Road	AWSC	Buildout Conditions Only							
21	Britannia Boulevard / Siempre Viva Road	Signalized	Buildout Conditions Only							
22	La Media Road / Siempre Viva Road	SSSC	Buildout Conditions Only							
23	Heritage Road / Avenida De Las Vistas	AWSC	Buildout Conditions Only							
24	Heritage Road / Datsun Street	AWSC	Buildout Conditions Only							

Source: Chen Ryan Associates; February 2019

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?
[1] A traffic signal is in place at this intersection, however, it is not in operations. Therefore, it is analyzed as an all-way stop control intersection.

As shown in Table 5.2, 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 exception:

11. Britannia Boulevard / Airway Road (LOS E during the AM/PM peak hour) - the intersection of Britannia Boulevard and Airway Road is projected to operate at LOS E during the AM and PM peak hour under Existing Plus Project (Full Development) conditions. The overall intersection delay during the AM peak hour is projected to increase from 16.0 seconds of delay under Existing conditions to 68.0 seconds of delay under Existing Plus Project conditions, resulting in a net increase of 52.0 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 67.1 seconds of delay under Existing Plus Project conditions, resulting in a net increase of 25.9 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 E.

Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under the Existing Plus Project (Full Development) conditions and mitigation measures would be required.

Freeway Segment Analysis

Table 5.3 displays freeway segment level of service results for the study area freeway mainline facilities under Existing Plus Project (Full Development) conditions. The freeway segment level of service analysis was performed utilizing the methodology presented in Section 2.5.

As shown in Table 5.3, all of the freeway segments are projected to operate at acceptable LOS D or better under Existing Plus Project (Full Development) conditions.

TABLE 5.3
FREEWAY SEGMENT ANALYSIS
EXISTING PLUS PROJECT (FULL DEVELOPMENT) 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		
SR-905	I-805 and Caliente Avenue	85,800	EB	4M	9,400	7.6%	66.2%	11.9%	4,560	0.485	B	AM	0.470	B	0.015	No
			WB	3M+1A	8,460	9.0%	58.8%	11.9%	4,790	0.566	B	PM	0.540	B	0.026	No
	Caliente Avenue and Heritage Road	77,900	EB	3M	7,050	7.6%	66.2%	11.9%	2,020	0.287	A	AM	0.270	A	0.017	No
			WB	3M	7,050	9.0%	58.8%	11.9%	1,400	0.199	A	PM	0.180	A	0.019	No
	Heritage Road and Britannia Boulevard	77,900	EB	3M	7,050	7.6%	66.2%	11.9%	1,000	0.142	A	AM	0.130	A	0.012	No
			WB	3M	7,050	9.0%	58.8%	11.9%	840	0.119	A	PM	0.110	A	0.009	No

Source: Chen Ryan Associates; February 2019

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.

5.3 Recommended Mitigation Measures

As mentioned previously in this report, this scenario is regarded as hypothetical when used in connection with a long-range development project such as the proposed project, which is not anticipated to reach full buildout until approximately 2027. Therefore, the mitigation measures described below are presented for information purposes only. The identification of the project's significant impacts, with recommended mitigation, will be based on the future year analyses that take into account cumulative traffic growth, as well as the changing roadway network and land uses that accompany a long-range development project such as this project.

This section identifies required mitigation measures for roadway, intersection, and freeway facilities that are associated with the full development of the Otay Mesa Lumina Project under Existing Plus Project (Full Development) conditions. Procedure for determining the ADT threshold, facility mitigation measures trigger identification, as well as associated worksheets are provided in **Appendix F**.

Table 5.4 displays level of service analysis results both before and after implementation of the recommended mitigation measures at the impacted roadway segments under Existing Plus Project (Full Development) conditions.

Roadway Segments

Facility mitigation measures associated with the Full Development of the Otay Mesa Lumina project would be required at the following roadway segments:

- *Airway Road, between Cactus Road and Britannia Boulevard* – The Project shall be responsible for the widening of this roadway segment from a 2-Lane Collector to a 4-Lane Collector with a continuous left-turn lane prior to the project's **total trip generation** of 4,959 ADT. This cross-section is within the ultimate classification (6-Lane Major Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and this mitigation measure is consistent with the OMCPU EIR at buildout of the OMCPU. As shown in Table 5.4, this segment would operate at LOS C with the recommended mitigation measure under Existing Plus Project (Full Development) conditions.
- *Airway Road, between La Media Road and Avenida Costa Azul* - The Project shall pay towards the widening of this roadway segment from a 2-Lane Collector to a 2-Lane Collector with a continuous left-turn lane prior to the project's **total trip generation** of 1,471 ADT. This cross-section is within the ultimate classification (4-Lane Major Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and this mitigation measure is consistent with the OMCPU EIR at buildout of the OMCPU. As shown in Table 5.4, this segment would operate at LOS C with the recommended mitigation measure under Existing Plus Project (Full Development) conditions.

TABLE 5.4
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT (FULL DEVELOPMENT) CONDITIONS – WITH MITIGATION MEASURES

Roadway	Segment	Before Mitigation measures			After Mitigation measures		
		ADT	Cross Section	LOS	ADT	Functional Classification	LOS
Airway Road	Cactus Road to Britannia Boulevard	17,040	2-Ln	**F**	17,040	4-Ln w/ CLTL	C
	La Media Road to Avenida Costa Azul	8,710	2-Ln	**F**	8,710	2-Ln w/ CLTL	C

Source: Chen Ryan Associates; February 2019

As shown in Table 5.4, all of the roadway segments would operate at an acceptable LOS C with implementation of the recommended mitigation measures.

Intersection

Table 5.5 displays level of service analysis results both the before and after implementation of the recommended mitigation measures at the deficient intersections under Existing Plus Project (Full Development) conditions.

Facility mitigation measures associated with Full Development of the Otay Mesa Lumina project would be required at the following intersections:

11. *Britannia Boulevard / Airway Road* - The Project shall be responsible for the widening of the eastbound approach (Airway Road) of this intersection to accommodate dual left-turn lanes and a through lane with a shared right-turn lane, prior to the project's **total trip generation** of 3,145 ADT. These recommended mitigation measures 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 5.5, this intersection would operate at LOS D during both the AM and PM peak hours with the recommended mitigation measures under Existing Plus Project (Full Development) conditions.

TABLE 5.5
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
EXISTING PLUS PROJECT (FULL DEVELOPMENT) CONDITIONS – WITH MITIGATION MEASURES

			Before Mitigation measures				After Mitigation measures			
			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
11	Britannia Boulevard / Airway Road	Signalized	68.0	**E**	67.1	**E**	35.4	D	46.3	D

Source: Chen Ryan Associates; February 2019

Notes:
Bold letter indicates substandard LOS.

As shown in Table 5.5, all of the intersections would operate at an acceptable LOS D or better with implementation of the recommended mitigation measures.

6.0 Near-Term Year 2023 (Existing Plus Cumulative Projects) Traffic Conditions

The proposed Otay Mesa Lumina project is anticipated to be built in two different phases: Phase 1 by the year 2023 and Full Development by the year 2027. This section provides an analysis of the expected year 2023 (Phase 1) cumulative traffic conditions without the Otay Mesa Lumina project. The scenario analyzed in this section is:

- Near-Term Year 2023 Conditions (Existing Plus Cumulative Projects).

6.1 Description of Cumulative Projects

Near-Term Year 2023 analysis includes reasonably foreseeable projects in the vicinity of the proposed project (cumulative projects information). The following projects, provided by the City of San Diego, were considered as near-term reasonably foreseeable projects:

Near-Term Year 2023

1. 7-Eleven – A 2,940 square-foot convenience store located on the northwest corner of Ocean View Hills Parkway/Caliente Avenue and Otay Mesa Road.

2. Azul Playa Del Sol/Luna (California Terraces PA 6) – A residential project with up to 740 multi-family units located on the south corner of Ocean View Hills Parkway and Del Sol Blvd.

3. Cesar Solis Park – A 15-acre city park generally located on the south side of Del Sol Blvd west of Ocean View Hills School.

4. Candlelight – A multi-family project with 475 units located on Caliente Avenue south of Airway Road.

5. Southview – A multi-family project with 277 units located on Airway Road east of Caliente Avenue.

6. Southview East – A multi-family project with 136 units located on Airway Road east of Caliente Avenue.

7. Southwind – A multi-family project with 100 units located west of Caliente Avenue and south of Airway Road.

8. Handler Retail Center – A retail center with 24,000 square feet of restaurant, 6,000 square feet of fast food, and a 189-room motel located on the south side of Otay Mesa Road between Emerald Crest Court and Corporate Center Drive.

9. Arco #5770 – A project that will add 2 additional fuel dispensers to an existing gas station located at 1625 Heritage Road.

10. Marijuana Production Facility – An 86,400 square-foot marijuana production facility project located at Innovative Drive.

11. California Terraces PA 61 – A mixed-use project with up to 270 multi-family units, 45,000 square feet of commercial/retail space, and a 0.19-acre private park.

12. Cross Border Facility Project Phase 2 (2017) – A 45,000 square feet cross border facility, a 170-room hotel, a gas station with 12 fuel dispensers, a convenience store and a car wash, and 20,000 square feet of specialty retail land use.

13. Metro Airpark Phase 1 (2022) – A project that consists of general aviation facilities that will allow for 163 additional flights per day, 18,880 square feet of commercial office uses, and 1,500 square feet of high turnover restaurant uses.

14. Plaza La Media Full buildout (2019) – A project that includes 106,700 square feet of community retail land use, 13,500 square feet of drugstore land use, 6,000 square feet of fast food with drive-through, and a gas station with 12 fueling spaces, a convenience store, and a carwash.

15. Sunroad Otay Mesa Phase 1 and Phase 2 (2018 and 2020, respectively) – A project that proposes 845,100 square feet of warehousing land use.

Table 6.1 displays trip generation for the cumulative projects described above. Trip distribution and trip assignment for the cumulative projects was obtained from their respective traffic impact study or assumptions based on existing traffic patterns.

TABLE 6.1
CUMULATIVE PROJECTS TRIP GENERATION

Cumulative Project	Land Use	Daily Trips	AM Peak Hour (In / Out)	PM Peak Hour (In / Out)
1. 7-Eleven [1]	Convenience Store	1,800	144 (72-in / 72-out)	144 (72-in / 72-out)
2. Azul Playa Del Sol/Luna (California Terraces PA 6) [2]	Residential	4,440	356 (71-in / 285-out)	400 (280-in / 120-out)
3. Cesar Solis Park [3]	Park	750	30 (0-in / 30-out)	60 (0-in / 60-out)
4. Candlelight [4]	Residential	2,850	228 (46-in / 182-out)	257 (180-in / 77-out)
5. Southview [5]	Residential	1,662	133 (27-in / 106-out)	299 (105-in / 194-out)
6. Southview East [6]	Residential	816	65 (13-in / 52-out)	220 (51-in / 169-out)
7. Southwind [7]	Residential	800	64 (13-in / 51-out)	80 (56-in / 24-out)
8. Handler Retail Center [6]	Motel	1,701	136 (54-in / 82-out)	153 (61-in / 92-out)
	Restaurant (sit down high turnover)	3,120	250 (125-in / 125-out)	250 (150-in / 100-out)
	Fast food (with drive-through)	4,200	168 (101-in / 67-out)	336 (168-in / 168-out)
9. Arco #5770 [9]	Gas Station	60	4 (2-in / 2-out)	4 (2-in / 2-out)
10. Marijuana Production Facility [10]	Marijuana Facility	346	69 (62-in / 7-out)	69 (14-in / 55-out)

TABLE 6.1
CUMULATIVE PROJECTS TRIP GENERATION

Cumulative Project	Land Use	Daily Trips	AM Peak Hour (In / Out)	PM Peak Hour (In / Out)
11. California Terraces PA 61 [11]	Mixed-use Residential/Commercial	4,716	252 (101-in / 151-out)	486 (271-in / 215-out)
12. Cross Border Facility (Phase 2) [12]	Cross Border Facility	24,700	1,056 (606-in / 450-out)	1,167 (587-in / 580-out)
13. Metro Airpark (Phase 1) [13]	Airport / Retail	1,000	99 (77-in / 22-out)	106 (34-in / 72-out)
14. Plaza La Media (Full Buildout) [14]	Commercial/Retail	8,660	310 (183-in / 127-out)	812 (407-in / 405-out)
15. Sunroad Otay Mesa (Phase 1 and Phase 2) [15]	Warehouse	4,225	633 (444-in / 189-out)	676 (270-in / 406-out)
Cumulative Total		**65,846**	**3,997 (1,997-in / 2,000-out)**	**5,519 (2,708-in / 2,811-out)**

Source: Chen Ryan Associates, February 2019.

Notes:
[1] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[2] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[3] Trip Generation obtained from *City of San Diego Land Development Code – Trip Generation Manual, May 2003*
[4] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[5] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[6] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[7] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[8] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[9] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[10] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[11] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[12] Trip Generation obtained from *Cross Border Facility TIS* prepared by LSA Associates. June 2011.
[13] Trip Generation obtained from *Metro Airpark TIS* prepared by Rick Engineering. April 2012.
[14] Trip Generation obtained from draft *Plaza La Media TIS* prepared by STC. August 2017.
[15] Trip Generation obtained from *Sunroad Otay Mesa TIS* prepared by Kimley-Horn. February 2017.

Figure 6-1 displays cumulative projects location while **Figure 6-2** and **Figure 6-3** display cumulative projects trip assignment for roadways and intersections, respectively. Detailed information regarding the cumulative projects is provided in **Appendix G.**

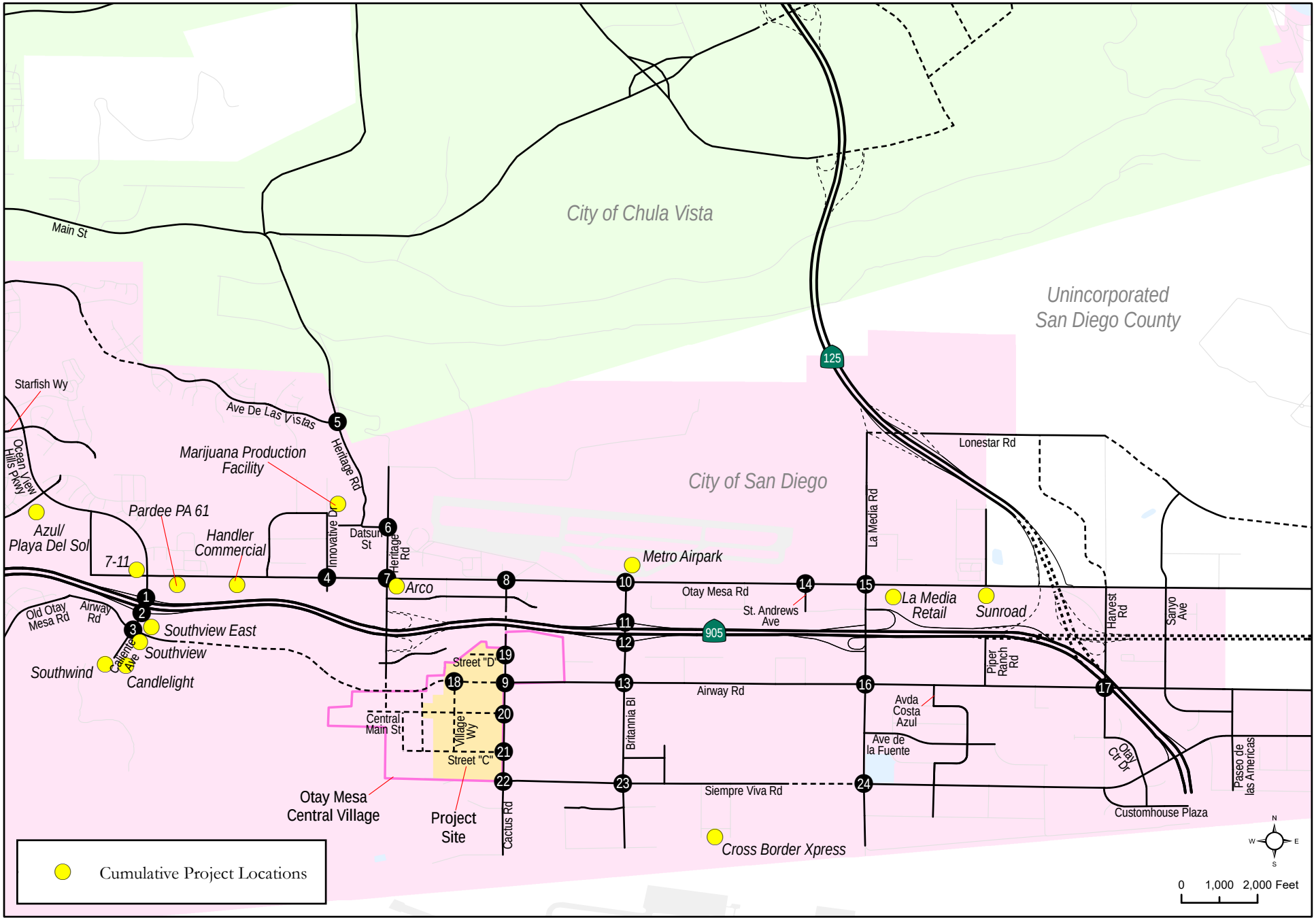

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Figure 6-1
Cumulative Project Locations

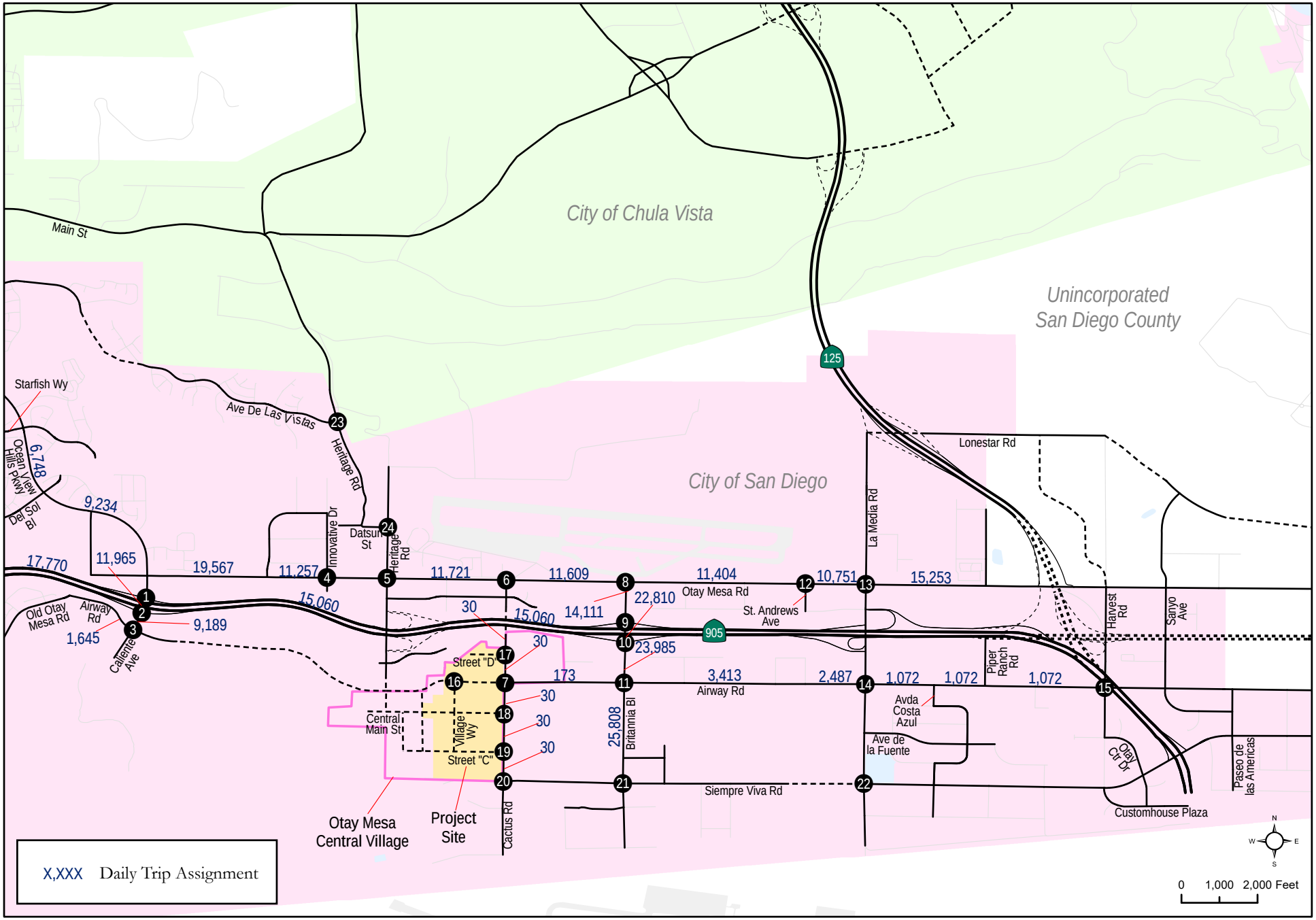

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Figure 6-2
Near-Term Year 2023 Cumulative Projects - Trip Assignment

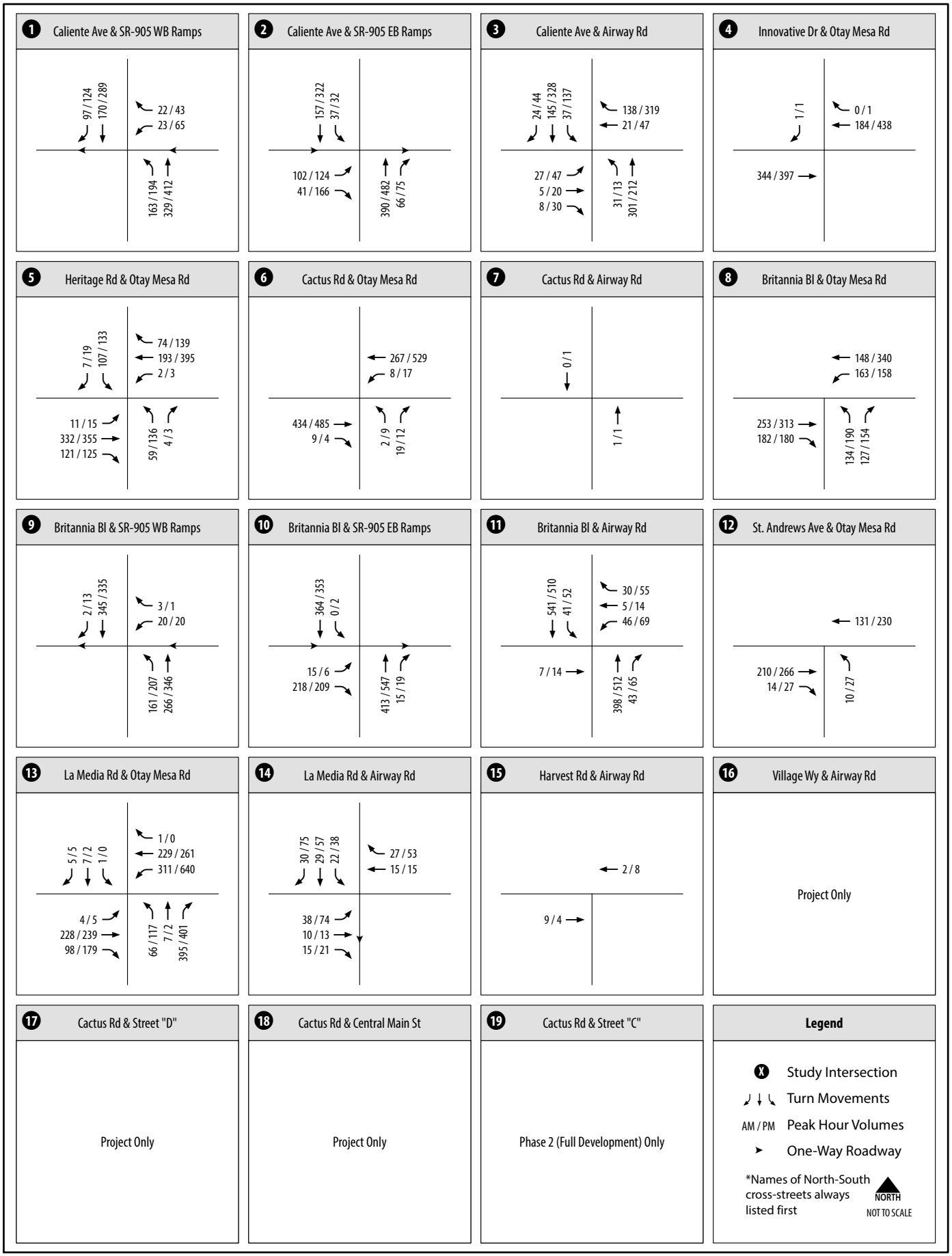

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Figure 6-3
Near-Term Year 2023 Cumulative Projects - Trip Assignment (Intersections 1-19)

6.2 Near-Term Year 2023 Roadway Network and Traffic Volumes

The Near-Term Year 2023 conditions 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 mitigation measures:

To be constructed by others

- Airway Road, between 1,600 feet west of La Media Road and Avenida Costa Azul – This roadway segment will be improved as part of the La Media Road CIP. The entire La Media Road CIP is anticipated to be completed by the winter of 2022. However, as a conservative approach, the analysis performed for the Near-Term Year 2023 scenario assumed only the first phase of this CIP project which consists of widening, amongst other drainage related improvements, the roadway segment of Airway Road between 1,600 feet west of La Media Road and Avenida Costa Azul from a 2-lane collector to a 4-lane major roadway. Intersection improvements at the intersection of La Media Road and Airway Road were assumed as well to match the roadway geometry.

- Caliente Avenue / Airway Road – This intersection is assumed to be signalized under Near-Term Year 2023. As part of the Candlelight project, which was assumed as a cumulative project in this report, a new traffic signal would be installed at the intersection of Caliente Avenue and Airway Road. Additionally, both the Southwind and California Terraces PA 61 projects are conditioned to install a traffic signal at this intersection.

Roadway geometrics under the Near-Term Year 2023 (Existing Plus Cumulative Projects) traffic conditions are displayed in **Figure 6-4**. Intersection geometrics under Near-Term Year 2023 conditions are identical to existing conditions, as seen in Figure 4-2. Detailed information and documentation regarding the roadway network assumptions is provided in **Appendix H**.

Near-Term Year 2023 traffic volumes were derived by combining the existing traffic volumes (displayed in Figures 4-3 and 4-4) and the cumulative trip assignment volumes (displayed in Figures 6-2 and 6-3). Near-Term Year 2023 daily roadway and freeway traffic volumes are displayed in **Figure 6-5**, while **Figure 6-6** displays intersection peak hour traffic volumes.

6.3 Near-Term Year 2023 Traffic Conditions

LOS analyses for the Near-Term Year 2023 traffic conditions were conducted using the methodologies described in Chapter 2.0. Roadway segment, intersection, and freeway segment level of service analysis results for Near-Term Year 2023 traffic conditions are discussed separately below.

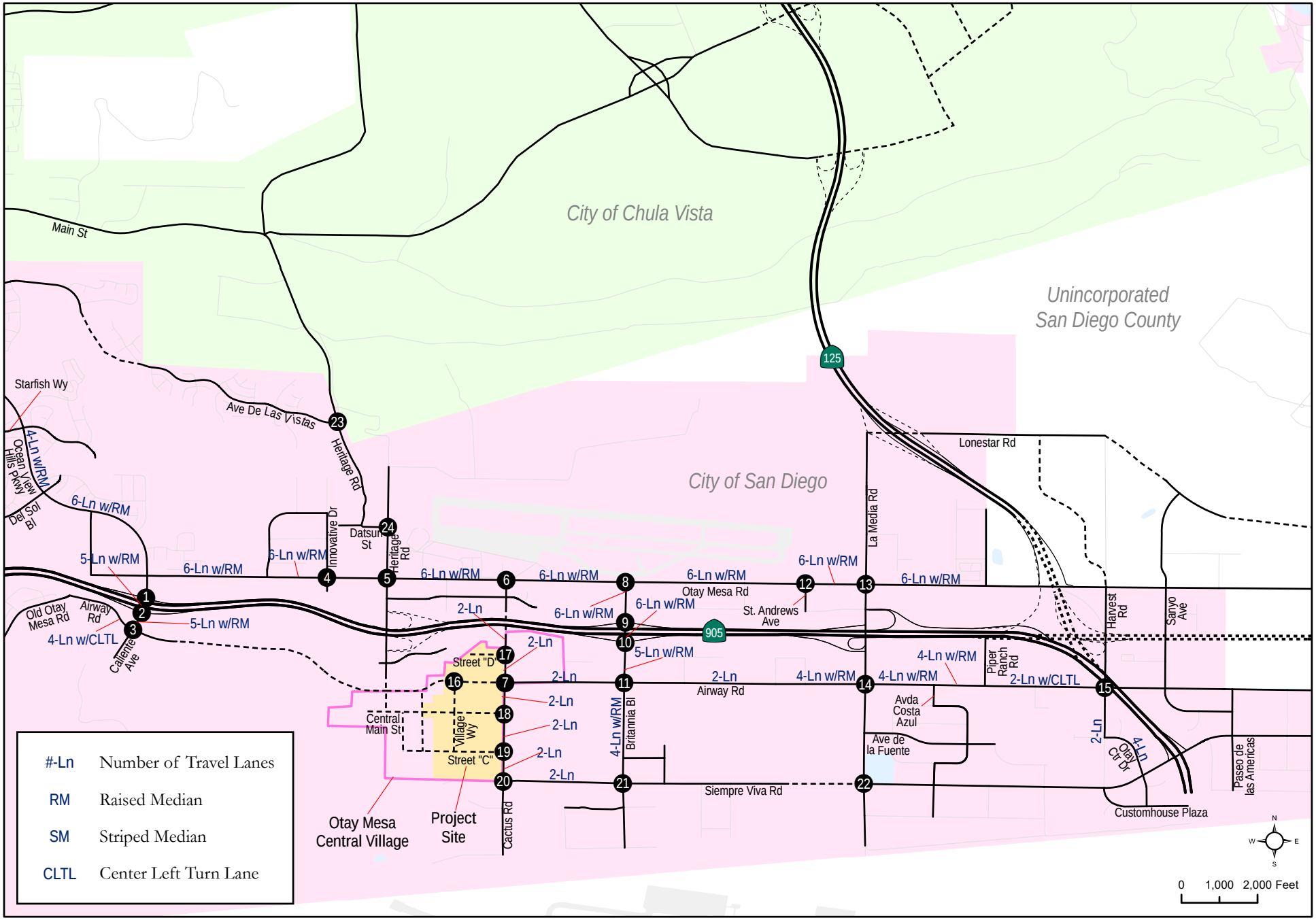

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Figure 6-4
Roadway Geometrics - Near-Term Year 2023 Traffic Conditions

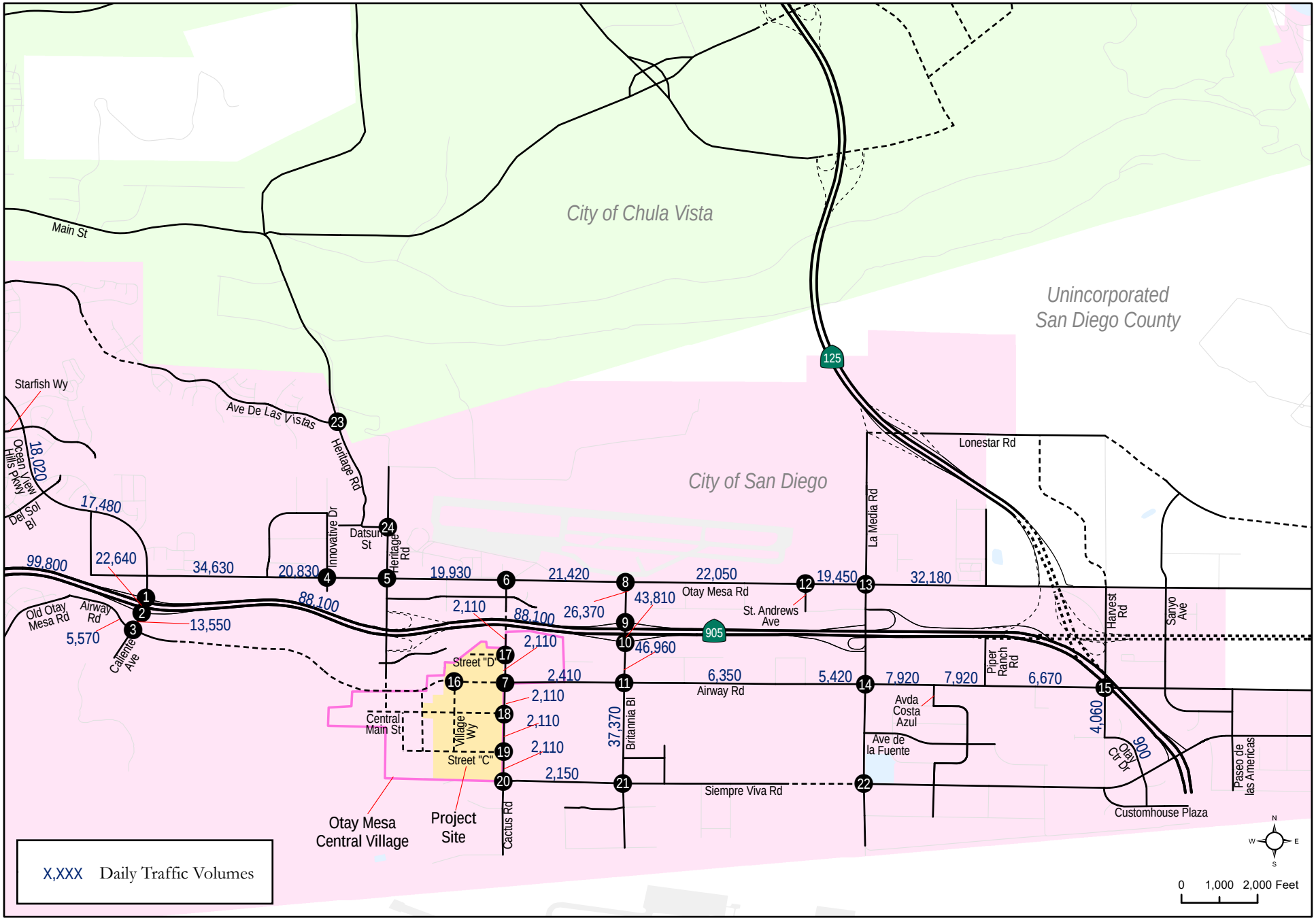

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Figure 6-5
Roadway ADT - Near-Term Year 2023 Traffic Conditions

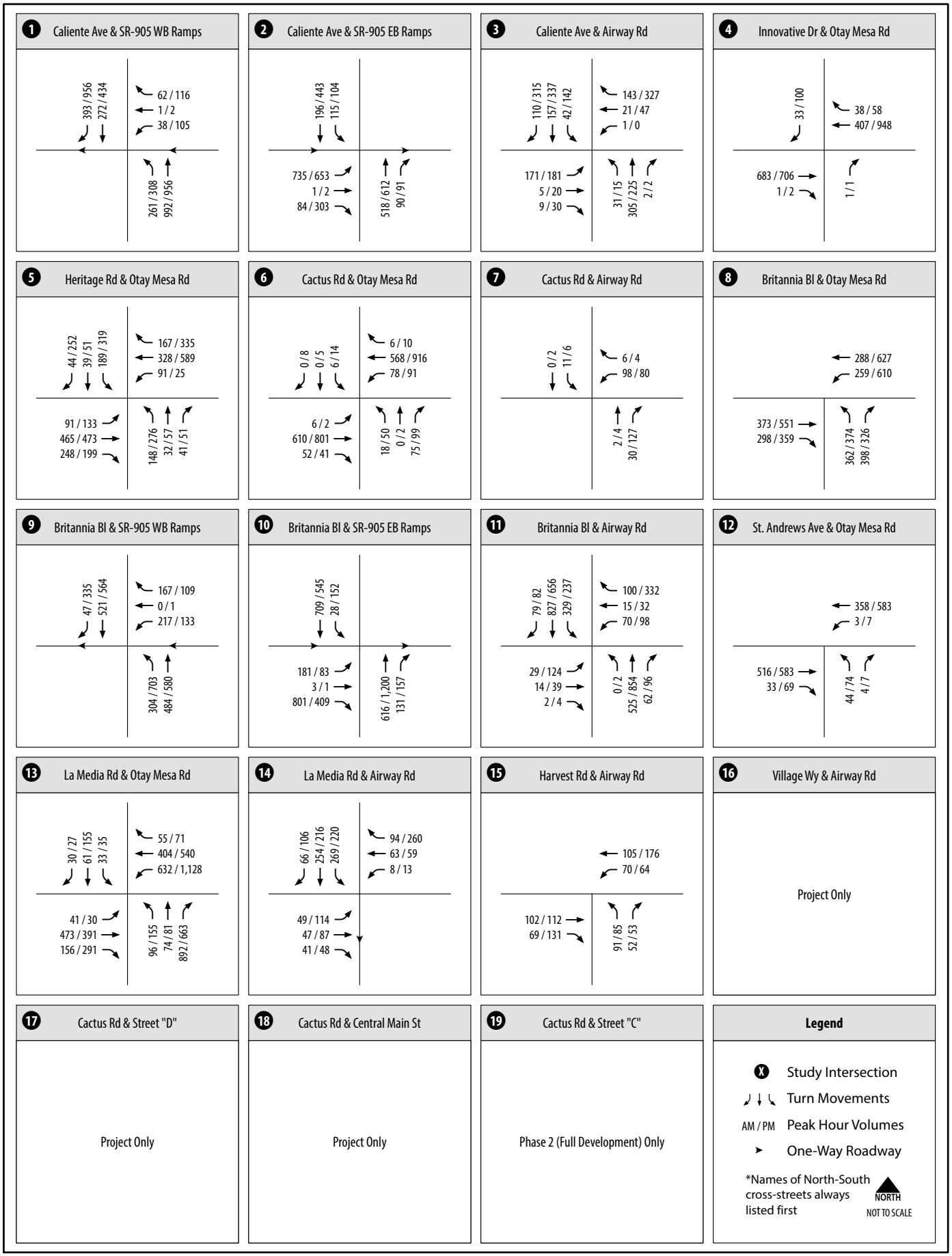

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Figure 6-6
AM/PM Peak Hour Intersection Volumes - Near-Term Year 2023 Traffic Conditions (Intersections 1-19)

Roadway Segment Analysis

Table 6.2 displays the Level of Service analysis results for key roadway segments located in the City of San Diego under Near-Term Year 2023 traffic conditions.

TABLE 6.2
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2023 CONDITIONS – CITY OF SAN DIEGO

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
Ocean View Hills Parkway	Starfish Way	Del Sol Boulevard	4-Ln Major Arterial	4-Ln w / RM	18,020	40,000	0.451	B
	Del Sol Boulevard	Otay Mesa Road	6-Ln Major Arterial	6-Ln w / RM	17,480	50,000	0.350	A
Caliente Avenue	SR-905 WB Ramps	SR-905 EB Ramps	5-Ln Prime Arterial	5-Ln w / SM (3-NB, 2-SB)	22,640	50,000[1]	0.453	A
	SR-905 EB Ramps	Airway Road	5-Ln Prime Arterial	5-Ln w / RM (3-NB, 2-SB)	13,550	50,000[1]	0.271	A
Cactus Road	SR-905	Street "D"	2-Ln Collector w/ Commercial Fronting	2-Ln	2,110	8,000	0.264	A
	Street "D"	Airway Road	2-Ln Collector w/ Commercial Fronting	2-Ln	2,110	8,000	0.264	A
	Airway Road	Central Main Street	2-Ln Collector w/ Commercial Fronting	2-Ln	2,110	8,000	0.264	A
	Central Main Street	Street "C"	2-Ln Collector w/ Commercial Fronting	2-Ln	2,110	8,000	0.264	A
	Street "C"	Siempre Viva Road	2-Ln Collector w/ Commercial Fronting	2-Ln	2,110	8,000	0.264	A
Britannia Boulevard	Otay Mesa Road	SR-905 WB Ramps	6-Ln Prime Arterial	6-Ln w/ RM	26,370	60,000	0.440	B
	SR-905 WB Ramps	SR-905 EB Ramps	6-Ln Prime Arterial	6-Ln w/ RM	43,810	60,000	0.730	C

TABLE 6.2
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2023 CONDITIONS – CITY OF SAN DIEGO

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
Britannia Boulevard	SR-905 EB Ramps	Airway Road	5-Ln Prime Arterial	5-Ln w/ RM (2-NB, 3-SB)	46,960	50,000[1]	0.939	**E**
	Airway Road	Siempre Viva Road	4-Ln Major Arterial	4-Ln w/ RM	37,370	40,000	0.934	**E**
Harvest Road	Airway Road	Otay Center Drive	2-Ln Collector w/ Commercial Fronting	2-Ln	4,060	8,000	0.508	C
Otay Center Drive	Harvest Road	Siempre Viva Road	4-Ln Collector	4-Ln	900	15,000	0.060	A
Otay Mesa Road	Ocean View Hills Parkway	Corporate Center Drive	6-Ln Prime Arterial	6-Ln w / RM	34,630	60,000	0.577	B
	Corporate Center Drive	Heritage Road	6-Ln Prime Arterial	6-Ln w / RM	20,830	60,000	0.347	A
	Heritage Road	Cactus Road	6-Ln Prime Arterial	6-Ln w / RM	19,930	60,000	0.332	A
	Cactus Road	Britannia Boulevard	6-Ln Prime Arterial	6-Ln w / RM	21,420	60,000	0.357	A
	Britannia Boulevard	Saint Andrews Avenue	6-Ln Prime Arterial	6-Ln w / RM	22,050	60,000	0.368	A
	Saint Andrews Avenue	La Media Road	6-Ln Prime Arterial	6-Ln w / RM	19,450	60,000	0.324	A
	La Media Road	Piper Ranch Road	6-Ln Prime Arterial	6-Ln w / RM	32,180	60,000	0.536	B
Airway Road	Old Otay Mesa Road	Caliente Avenue	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w / CLTL	5,570	30,000	0.186	A
	Cactus Road	Britannia Boulevard	2-Ln Collector w/ Commercial Fronting	2-Ln	2,410	8,000	0.301	A
	Britannia Boulevard	1,600 feet west of La Media Road	2-Ln Collector w/ Commercial Fronting	2-Ln	6,350	8,000	0.794	D

TABLE 6.2
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2023 CONDITIONS – CITY OF SAN DIEGO

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
Airway Road	1,600 feet west of La Media Road	La Media Road	4-Ln Major Arterial	4-Ln w / RM	5,420	40,000	0.136	A
	La Media Road	Avenida Costa Azul	4-Ln Major Arterial	4-Ln w / RM	7,920	40,000	0.198	A
	Avenida Costa Azul	Piper Ranch Road	4-Ln Major Arterial	4-Ln w / RM	7,920	40,000	0.198	A
	Piper Ranch Road	Harvest Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	6,670	15,000	0.445	B
Siempre Viva Road	Cactus Road	Britannia Blvd	2-Ln Collector w/ Commercial Fronting	2-Ln	2,150	8,000	0.269	A

Source: Chen Ryan Associates; February 2019

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).

As shown in Table 6.2, all of the roadway segments are projected to operate at acceptable LOS D or better under the Near-Term Year 2023 traffic conditions, with the following two (2) exceptions:

- Britannia Boulevard, between SR-905 EB Ramps and Airway Road – LOS E;
- Britannia Boulevard, between Airway Road and Siempre Viva Road – LOS E.

Intersection Analysis

Table 6.3 displays LOS and average vehicle delay results for intersections under Near-Term Year 2023 conditions. LOS calculation worksheets for the Near-Term Year 2023 conditions are provided in **Appendix I**.

TABLE 6.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2023 CONDITIONS

			AM Peak Hour		PM Peak Hour	
ID	Intersection	Control Type	Avg. Delay (sec.)	LOS	Avg. Delay (sec.)	LOS
1	Caliente Avenue / SR-905 WB Ramps	Signalized	7.6	A	14.5	B
2	Caliente Avenue / SR-905 EB Ramps	Signalized	17.8	B	21.9	C
3	Caliente Avenue / Airway Road	Signalized	15.3	B	19.1	B
4	Innovative Drive / Otay Mesa Road	SSSC	9.9	A	12.0	B
5	Heritage Road / Otay Mesa Road	Signalized	19.0	B	28.1	C
6	Cactus Road / Otay Mesa Road	Signalized	9.4	A	13.5	B
7	Cactus Road / Airway Road	SSSC	9.3	A	9.5	A
8	Britannia Boulevard / Otay Mesa Road	Signalized	14.6	B	30.9	C
9	Britannia Boulevard / SR-905 WB Ramps	Signalized	13.1	B	17.6	B
10	Britannia Boulevard / SR-905 EB Ramps	Signalized	13.6	B	16.4	B
11	Britannia Boulevard / Airway Road	Signalized	24.4	C	37.4	D
12	St Andrews Avenue / Otay Mesa Road	Signalized	5.0	A	7.9	A
13	La Media Road / Otay Mesa Road	Signalized	179.1	**F**	383.6	**F**
14	La Media Road / Airway Road	Signalized	9.4	A	10.7	B
15	Harvest Road / Airway Road	AWSC	8.8	A	9.5	A
16	Village Way / Airway Road	With Project (Phase 1 & Full Development) Only				
17	Cactus Road / Street "D"	With Project (Phase 1 & Full Development) Only				
18	Cactus Road / Central Main Street	With Project (Phase 1 & Full Development) Only				
19	Cactus Road / Street "C"	With Project (Full Development) Only				
20	Cactus Road / Siempre Viva Road	Buildout Conditions Only				

TABLE 6.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2023 CONDITIONS

ID	Intersection	Control Type	AM Peak Hour		PM Peak Hour	
			Avg. Delay (sec.)	LOS	Avg. Delay (sec.)	LOS
21	Britannia Boulevard / Siempre Viva Road	Buildout Conditions Only				
22	La Media Road / Siempre Viva Road	Buildout Conditions Only				
23	Heritage Road / Avenida De Las Vistas	Buildout Conditions Only				
24	Heritage Road / Datsun Street	Buildout Conditions Only				

Source: Chen Ryan Associates; February 2019

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] A traffic signal is in place at this intersection, however, it is not in operations. Therefore, it is analyzed as an all-way stop controlled intersection.

As shown in Table 6.3, 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 Near-Term Year 2023 traffic conditions, with the following exception:

13. La Media Road / Otay Mesa Road – LOS F during both the AM peak hour and PM peak hours.

Freeway Segment Analysis

Table 6.4 displays freeway segment level of service results for the study area freeway mainline facilities under Near-Term Year 2023 traffic conditions. The freeway segment level of service analysis was performed utilizing the methodology presented in Section 2.5.

As shown in Table 6.4, all of the freeway segments would operate at acceptable LOS C or better under Near-Term Year 2023 traffic conditions:

TABLE 6.4
FREEWAY SEGMENT ANALYSIS
NEAR-TERM YEAR 2023 CONDITIONS

Freeway	Segment	ADT	Direction	# of Lanes	Capacity[a]	D[b]	K[c]	HVF[d]	Peak Hour Volume	V/C	LOS[f]	Peak Hour
SR-905	I-805 and Caliente Avenue	99,800	EB	4M	9,400	66.2%	7.6%	11.9%	5,310	0.560	B	AM
			WB	3M+1A	8,460	58.8%	9.0%	11.9%	5,580	0.660	C	PM
	Caliente Avenue and Heritage Road	88,100	EB	3M	7,050	66.2%	7.6%	11.9%	2,290	0.320	A	AM
			WB	3M	7,050	58.8%	9.0%	11.9%	1,590	0.230	A	PM
	Heritage Road and Britannia Boulevard	88,100	EB	3M	7,050	66.2%	7.6%	11.9%	1,130	0.160	A	AM
			WB	3M	7,050	58.8%	9.0%	11.9%	950	0.130	A	PM

Source: Chen Ryan Associates; February 2019

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.

7.0 Near-Term Year 2023 Plus Project (Phase 1)

Year 2023 is assumed to be opening day of Phase 1. This section provides an analysis of the expected year 2023 (Phase 1) cumulative traffic conditions without the Otay Mesa Lumina project. The scenario analyzed in this section is:

- Near-Term Year 2023 Conditions Plus Project (Phase 1).

Near-Term Year 2023 Plus Project (Phase 1) Roadway Network and Traffic Volumes Roadway and intersection geometrics under Near-Term Year 2023 Plus Project (Phase 1) conditions were assumed to be largely identical to the Near-Term Year 2023 traffic conditions geometrics, as shown in Figure 6-3, with the following facilities assumed to be constructed by the Project as a part of frontage and access improvements:

Phase 1 - to be constructed by the proposed project

Roadway Segments

- Airway Road, between Western Lumina project boundary and Cactus Road – This segment serves as the project frontage and will be constructed to a 4-Lane Prime Arterial, which is consistent with the ultimate classification (6-Lane Prime Arterial) 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 Street "D" and Airway Road - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median), which is consistent with the ultimate classification (4-Lane Major Arterial) 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 Central Main Street - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median), which is consistent with the ultimate classification (4-Lane Major Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).

Intersections

7. 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 with Phase 1. See Appendix J for traffic signal warrant.

16. Village Way / Airway Road – Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross-section mentioned above. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

17. Cactus Road / Street "D" – Construction of an all-way stop control (AWSC) T-intersection, but the fourth leg (east of Cactus Road) will be constructed by the developer(s) of PA 14, 15, 16, 17, and 21 of the Otay Mesa Central Village Specific Plan. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

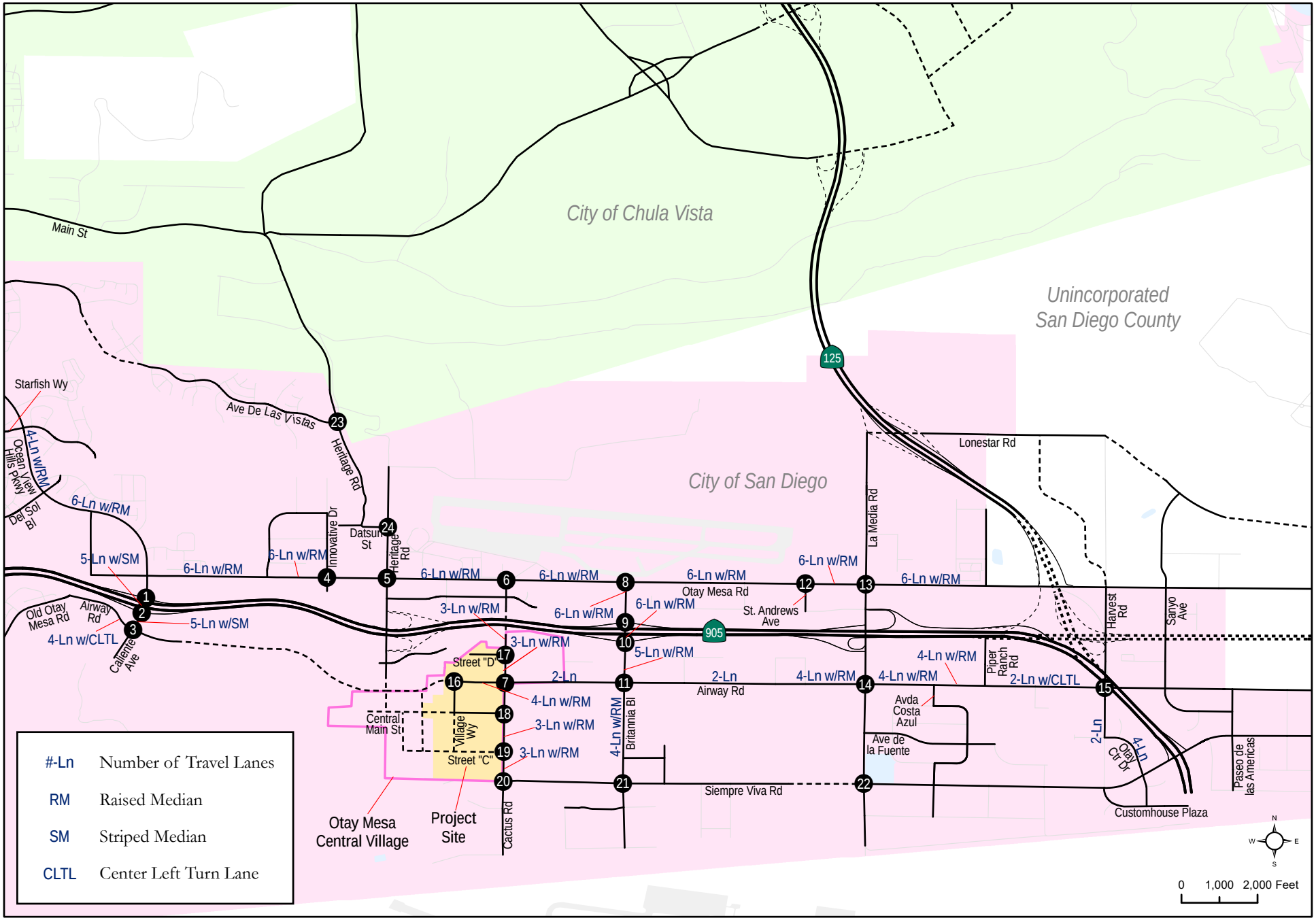
18. Cactus Road / Central Main Street – Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross section mentioned above. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

Note that the identified improvements will be in place by the 1st EDU of Phase 1 of the project.

Roadway and intersection geometrics under Near-Term Year 2023 Plus Project (Phase 1) conditions are displayed in **Figures 7-1** and **7-2**, respectively. Near-Term Year 2023 Plus Project (Phase 1) traffic volumes were derived by combining the Near-Term Year 2023 traffic volumes (displayed in Figures 6-5 and 6-6) and the project trip assignment volumes (displayed in Figures 3-5 and 3-6). Daily roadway volumes for this scenario are displayed in **Figure 7-3** while **Figure 7-4** displays intersection peak hour traffic volumes.

7.1 Near-Term Year 2023 Plus Project (Phase 1) Traffic Conditions

Analyses were conducted using the methodologies described in Chapter 2.0. Roadway segment, intersection, and freeway segment level of service analyses results are discussed in the following sections.



Otay Mesa Lumina
Transportation Impact Study

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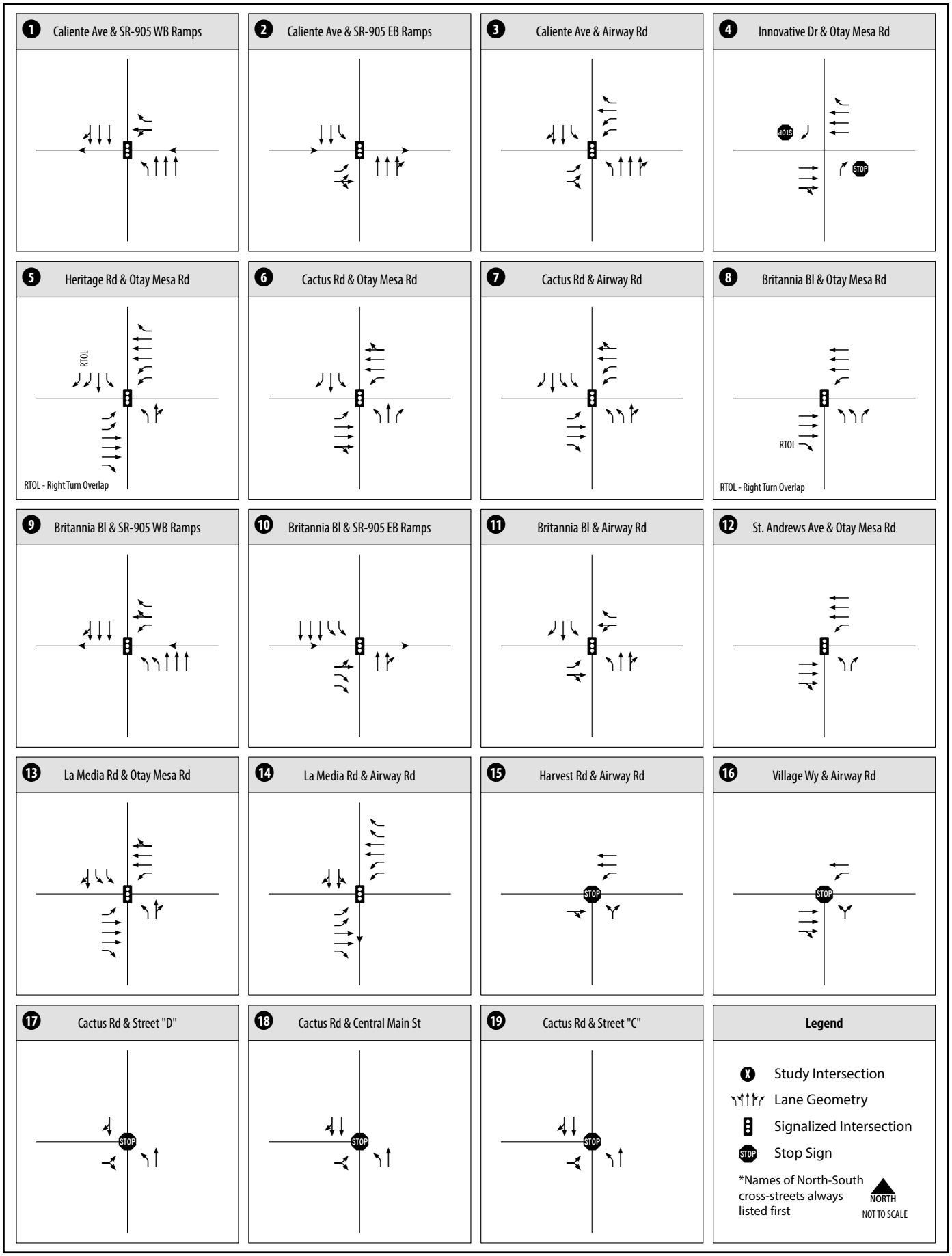
Figure 7-1
Roadway Geometrics - Near-Term Year 2023 Plus Project (Phase 1) Conditions



Otay Mesa Lumina
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Figure 7-2
Intersection Geometrics - Near-Term Year 2023 Plus Project (Phase 1) Conditions (Intersections 1-19)

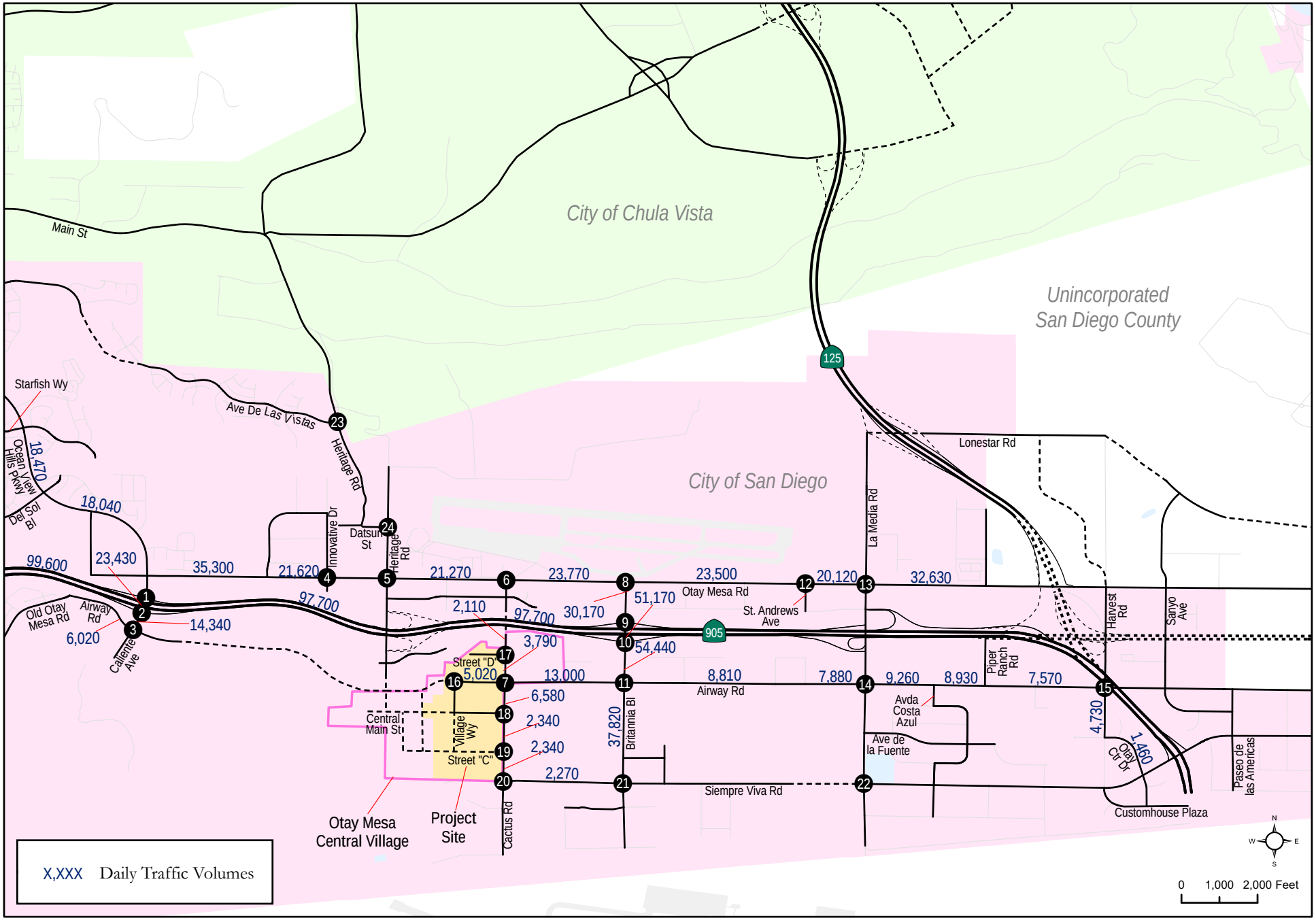

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Figure 7-3
Roadway ADT - Near-Term Year 2023 Plus Project (Phase 1) Conditions

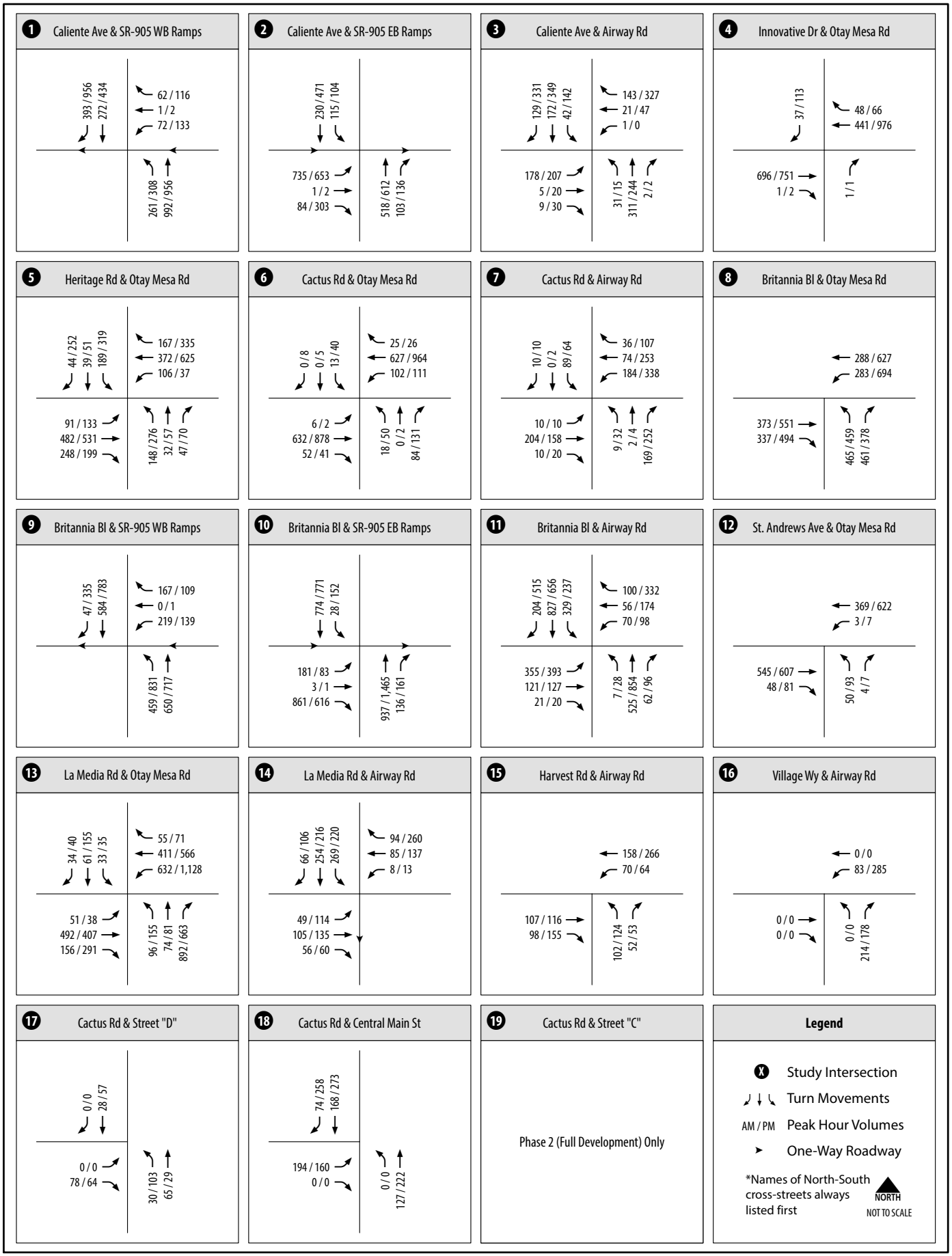

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Figure 7-4
AM/PM Peak Hour Intersection Volumes - Near-Term Year 2023 Plus Project (Phase 1) Conditions (Intersections 1-19)

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 Near-Term Year 2023 Plus Project (Phase 1) conditions.

TABLE 7.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2023 PLUS PROJECT (PHASE 1) 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		
Ocean View Hills Parkway	Starfish Way to Del Sol Boulevard	4-Ln Major Arterial	4-Ln w / RM	18,470	40,000	0.462	B	0.451	B	0.011	No
	Del Sol Boulevard to Otay Mesa Road	6-Ln Major Arterial	6-Ln w / RM	18,040	50,000	0.361	A	0.350	A	0.011	No
Caliente Avenue	SR-905 WB Ramps to SR-905 EB Ramps	5-Ln Prime Arterial	5-Ln w / SM (3-NB, 2-SB)	23,430	50,000[1]	0.469	B	0.453	B	0.016	No
	SR-905 EB Ramps to Airway Road	5-Ln Prime Arterial	5-Ln w / SM (3-NB, 2-SB)	14,340	50,000[1]	0.287	A	0.271	A	0.016	No
Cactus Road	SR-905 to Street "D"	2-Ln Collector w/ Commercial Fronting	2-Ln	2,110	8,000	0.264	A	0.264	A	0.000	No
	Street "D" to Airway Road	3-Ln Major Arterial	3-Ln w / RM (1 NB-2SB)	3,790	30,000[2]	0.126	A	0.264	A	-0.137	No
	Airway Road to Central Main Street	3-Ln Major Arterial	3-Ln w / RM (1 NB-2SB)	6,580	30,000[2]	0.219	A	0.264	A	-0.044	No
	Central Main Street to Street "C"	2-Ln Collector w/ Commercial Fronting	2-Ln	2,340	8,000	0.293	A	0.264	A	0.029	No

TABLE 7.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2023 PLUS PROJECT (PHASE 1) 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		
Cactus Road	Street "C" to Siempre Viva Road	2-Ln Collector w/ Commercial Fronting	2-Ln	2,340	8,000	0.293	A	0.264	A	0.029	No
Britannia Boulevard	Otay Mesa Road to SR-905 WB Ramps	6-Ln Prime Arterial	6-Ln w / RM	30,170	60,000	0.503	B	0.440	B	0.063	No
	SR-905 WB Ramps to SR-905 EB Ramps	6-Ln Prime Arterial	6-Ln w / RM	51,170	60,000	0.853	D	0.730	C	0.123	No
	SR-905 EB Ramps to Airway Road	5-Ln Prime Arterial	5-Ln w / RM (2-NB, 3-SB)	54,440	50,000[1]	1.089	**F**	0.939	**E**	0.150	**Yes**
	Airway Road to Siempre Viva Road	4-Ln Major Arterial	4-Ln w / RM	37,820	40,000	0.946	**E**	0.934	**E**	0.011	No
Harvest Road	Airway Road to Otay Center Drive	2-Ln Collector w/ Commercial Fronting	2-Ln	4,730	8,000	0.591	C	0.508	C	0.084	No
Otay Center Drive	Harvest Road to Siempre Viva Road	4-Ln Collector	4-Ln	1,460	15,000	0.097	A	0.060	A	0.037	No
Otay Mesa Road	Ocean View Hills Parkway to Corporate Center Drive	6-Ln Prime Arterial	6-Ln w / RM	35,300	60,000	0.588	C	0.577	B	0.011	No
	Corporate Center Drive to Heritage Road	6-Ln Prime Arterial	6-Ln w / RM	21,620	60,000	0.360	A	0.347	A	0.013	No
	Heritage Road to Cactus Road	6-Ln Prime Arterial	6-Ln w / RM	21,270	60,000	0.355	A	0.332	A	0.022	No

TABLE 7.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2023 PLUS PROJECT (PHASE 1) 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	Cactus Road to Britannia Boulevard	6-Ln Prime Arterial	6-Ln w / RM	23,770	60,000	0.396	A	0.357	A	0.039	No
	Britannia Boulevard to Saint Andrews Avenue	6-Ln Prime Arterial	6-Ln w / RM	23,500	60,000	0.392	A	0.368	A	0.024	No
	Saint Andrews Avenue to La Media Road	6-Ln Prime Arterial	6-Ln w / RM	20,120	60,000	0.335	A	0.324	A	0.011	No
	La Media Road to Piper Ranch Road	6-Ln Prime Arterial	6-Ln w / RM	32,630	60,000	0.544	B	0.536	B	0.007	No
Airway Road	Old Otay Mesa Road to Caliente Avenue	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w / CLTL	6,020	30,000	0.201	A	0.186	A	0.015	No
	Village Way to Cactus Road	4-Ln Prime Arterial	4-Ln w / RM	5,020	40,000	0.126	A	Does not exist		0.126	No
	Cactus Road to Britannia Boulevard	2-Ln Collector w/ Commercial Fronting	2-Ln	13,000	8,000	1.625	**F**	0.301	A	1.324	**Yes**
	Britannia Boulevard to 1,600 feet west of La Media Road	2-Ln Collector w/ Commercial Fronting	2-Ln	8,810	8,000	1.101	**F**	0.794	D	0.308	**Yes**
	1,600 feet west of La Media Road and La Media Road	4-Ln Major Arterial	4-Ln w/ RM	7,880	40,000	0.197	A	0.136	A	0.062	No
	La Media Road to Avenida Costa Azul	4-Ln Major Arterial	4-Ln w/ RM	9,260	40,000	0.232	A	0.198	A	0.034	No

TABLE 7.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2023 PLUS PROJECT (PHASE 1) 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	8,930	40,000	0.223	A	0.198	A	0.025	No
	Piper Ranch Road to Harvest Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	7,570	15,000	0.505	C	0.445	B	0.060	No
Siempre Viva Road	Cactus Road to Britannia Blvd	2-Ln Collector w/ Commercial Fronting	2-Ln	2,270	8,000	0.284	A	0.269	A	0.015	No

Source: Chen Ryan Associates; February 2019

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-Lane Major Arterial, reduced to exclude a lane. (3/4*40,000 = 30,000).

As shown in Table 7.1, 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 Near-Term Year 2023 Plus Project (Phase 1) conditions, with the following four (4) exceptions:

- 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 0.939 under Near-Term Year 2023 conditions to 1.089 under Near-Term Year 2023 Plus Project (Phase 1) conditions, resulting in a net increase of 0.150. This increase in volume to capacity ratio is above the allowable 0.02 threshold.

  Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under Near-Term Year 2023 Plus Project (Phase 1) conditions and mitigation measures would be required.

- Britannia Boulevard, between Airway Road to Siempre Viva 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 0.934 under Near-Term Year 2023 conditions to 0.946 under Near-Term Year 2023 Plus Project (Phase 1) conditions, resulting in a net increase of 0.011. This increase in volume to capacity ratio is below the allowable 0.02 threshold.

Based upon the significance criteria presented in Section 2.6, this roadway segment would not be significantly impacted under Near-Term Year 2023 Plus Project (Phase 1) conditions and mitigation measures would not be required.

- Airway 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 0.301 under Near-Term Year 2023 conditions to 1.625 under Near-Term Year 2023 Plus Project conditions, resulting in a net increase of 1.324. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

  Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under Near-Term Year 2023 Plus Project (Phase 1) conditions and mitigation measures would be required.

- Airway Road, between Britannia Boulevard and 1,600 feet west of 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 0.794 under Near-Term Year conditions to 1.101 under Near-Term Year 2023 Plus Project conditions, the increase in traffic volume causes the roadway segment to transition from an acceptable LOS D to a substandard LOS F.

  Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under Near-Term Year 2023 Plus Project (Phase 1) conditions and mitigation measures would be required.

As described above, three (3) out of the four deficient roadway segments would be significantly impacted by Phase 1 of the proposed project.

Intersection Analysis

Table 7.2 displays Level of Service and average vehicle delay results for study area intersections under Near-Term Year 2023 Plus Project (Phase 1) conditions. Level of Service calculation worksheets for the Near-Term Year 2023 Plus Project (Phase 1) conditions are provided in **Appendix K**.

TABLE 7.2
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2023 PLUS PROJECT (PHASE 1) 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	Caliente Avenue / SR-905 WB Ramps	Signalized	9.5	A	16.8	B	7.6 / 14.5	A / B	1.9 / 2.3	No

TABLE 7.2
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2023 PLUS PROJECT (PHASE 1) 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				
2	Caliente Avenue / SR-905 EB Ramps	Signalized	19.8	B	21.9	C	17.8 / 21.9	B / C	2.0 / 0.0	No
3	Caliente Avenue / Airway Road	Signalized	15.3	B	20.4	C	15.3 / 19.1	B / B	0.0 / 1.3	No
4	Innovative Drive / Otay Mesa Road	SSSC	10.0	A	12.3	B	9.9 / 12.0	A / B	0.1 / 0.3	No
5	Heritage Road / Otay Mesa Road	Signalized	21.2	C	28.9	C	19.0 / 28.1	B / C	2.2 / 0.8	No
6	Cactus Road / Otay Mesa Road	Signalized	12.6	B	15.3	B	9.4 / 13.5	A / B	3.2 / 1.8	No
7	Cactus Road / Airway Road	Signalized	17.6	B	26.6	C	9.3 / 9.5	A / A	8.3 / 17.1	No
8	Britannia Boulevard / Otay Mesa Road	Signalized	17.2	B	51.7	D	14.6 / 30.9	B / C	2.6 / 20.8	No
9	Britannia Boulevard / SR-905 WB Ramps	Signalized	15.8	B	23.0	C	13.1 / 17.6	B / B	2.7 / 5.4	No
10	Britannia Boulevard / SR-905 EB Ramps	Signalized	22.6	C	24.7	C	13.6 / 16.4	B / B	9.0 / 8.3	No
11	Britannia Boulevard / Airway Road	Signalized	69.1	**E**	86.7	**F**	24.4 / 37.4	C / D	44.7 / 49.3	**Yes**
12	St Andrews Avenue / Otay Mesa Road	Signalized	6.7	A	8.0	A	5.0 / 7.9	A / A	1.7 / 0.1	No
13	La Media Road / Otay Mesa Road	Signalized	177.4	**F**	383.8	**F**	179.1 / 383.6	**F / F**	-1.7 / 0.2	No
14	La Media Road / Airway Road	Signalized	9.6	A	10.9	B	9.4 / 10.7	A / B	0.2 / 0.2	No
15	Harvest Road / Airway Road	AWSC	9.3	A	11.1	B	8.8 / 9.5	A / A	0.5 / 1.6	No
16	Village Way / Airway Road	AWSC	7.8	A	10.7	B	Does Not Exist			No
17	Cactus Road / Street "D"	AWSC	7.1	A	7.6	A	Does Not Exist			No
18	Cactus Road / Central Main Street	AWSC	8.9	A	10.9	B	Does Not Exist			No
19	Cactus Road / Street "C"	Near-Term Year 2027 Plus Project (Full Development) Conditions Only								

TABLE 7.2
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2023 PLUS PROJECT (PHASE 1) 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				
20	Cactus Road / Siempre Viva Road	Buildout Conditions Only								
21	Britannia Boulevard / Siempre Viva Road	Buildout Conditions Only								
22	La Media Road / Siempre Viva Road	Buildout Conditions Only								
23	Heritage Road / Avenida De Las Vistas	Buildout Conditions Only								
24	Heritage Road / Datsun Street	Buildout Conditions Only								

Source: Chen Ryan Associates; February 2019

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.

As shown in Table 7.2, 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 Near-Term Year 2023 Plus Project (Phase 1) conditions, with the following two (2) exceptions:

11. The intersection of Britannia Blvd / Airway Road is projected to operate at LOS E and LOS F under Near-Term Year 2023 Plus Project (Phase 1) conditions, during the AM and PM peak hours, respectively. During the AM peak hour, the overall intersection delay is projected to increase from 24.4 seconds of delay under Near-Term Year 2023 conditions to 69.1 seconds of delay under Near-Term Year 2023 Plus Project (Phase 1) conditions, resulting in a net increase of 44.7 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to decrease from 37.4 seconds of delay under Near-Term Year 2023 conditions to 86.7 seconds of delay under Near-Term Year 2023 Plus Project (Phase 1) conditions, resulting in a net decrease of 49.3 seconds of overall delay. The delay increases during both the AM and PM peak hour causes the intersection LOS to transition from an acceptable LOS C during the AM peak hour and LOS D during the PM peak hour, to a substandard LOS E during the AM peak hour and LOS F during the PM peak hour.

    Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Near-Term Year 2023 Plus Project (Phase 1) conditions and mitigation measures would be required.

13. The intersection of La Media Road / Otay Mesa Road is projected to operate at LOS F under Near-Term Year 2023 Plus Project (Phase 1) conditions, during both the AM and PM peak hours. During the AM peak hour, the overall intersection delay is projected to decrease from 179.1 seconds of delay under Near-Term Year 2023 conditions to 177.4 seconds of delay under Near-Term Year 2023 Plus Project (Phase 1) conditions, resulting in a net decrease of 1.7 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 383.6 seconds of delay under Near-Term Year 2023 conditions to 383.8 seconds of delay under Near-Term Year 2023 Plus Project (Phase 1) conditions, resulting in a net increase of 0.2 seconds of overall delay. The delay increases during the AM peak hour does not exceed the allowable thresholds.

    Based upon the significance criteria presented in Section 2.6, this intersection would not be significantly impacted under Near-Term Year 2023 Plus Project (Phase 1) conditions and mitigation measures would not be required.

As described above, one (1) of the two deficient intersections would be significantly impacted by Phase 1 of the proposed project.

Freeway Segment Analysis

Table 7.3 displays freeway segment level of service results for the study area freeway mainline facilities under Near-Term Year 2023 Plus Project (Phase 1) conditions. The freeway segment level of service analysis was performed utilizing the methodology presented in Section 2.5.

As shown in Table 7.3, all of the freeway segments operate at acceptable LOS C or better.

TABLE 7.3
FREEWAY SEGMENT ANALYSIS
NEAR-TERM YEAR 2023 PLUS PROJECT (PHASE 1) 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		
SR-905	I-805 and Caliente Avenue	99,600	EB	4M	9,400	66.2%	7.6%	11.9%	5,460	0.580	B	AM	0.560	B	0.020	No
			WB	3M+1A	8,460	58.8%	9.0%	11.9%	5,740	0.680	C	PM	0.660	C	0.020	No
	Caliente Avenue and Heritage Road	97,700	EB	3M	7,050	66.2%	7.6%	11.9%	2,380	0.340	A	AM	0.320	A	0.020	No
			WB	3M	7,050	58.8%	9.0%	11.9%	1,650	0.230	A	PM	0.230	A	0.000	No
	Heritage Road and Britannia Boulevard	97,700	EB	3M	7,050	66.2%	7.6%	11.9%	1,180	0.170	A	AM	0.160	A	0.010	No
			WB	3M	7,050	58.8%	9.0%	11.9%	990	0.140	A	PM	0.130	A	0.010	No

Source: Chen Ryan Associates; February 2019

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.

7.2 Recommended Mitigation Measures

This section identifies required mitigation measures for roadway, intersection, and freeway facilities that are associated with Phase 1 of the Otay Mesa Lumina Project under Near-Term Year 2023 Plus Project (Phase 1) conditions. ADT threshold, facility mitigation measures trigger identification, as well as associated worksheets are provided in **Appendix L**.

Table 7.4 displays level of service analysis results both before and after implementation of the recommended mitigation measures at the impacted roadway segments under Near-Term Year 2023 Plus Project (Phase 1) conditions.

Roadway Segments

- *Britannia Boulevard, between SR-905 EB Ramps and Airway Road* - The Project shall widen this roadway from a 5-Lane Prime Arterial (2 NB & 3 SB) to a 6-lane Prime Arterial prior to the project's **total trip generation** of 1,493 ADT. This cross-section is the ultimate classification (6-Lane Prime Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and this mitigation measure is consistent with the OMCPU EIR at buildout of the OMCPU. As shown in Table 7.4, this segment would operate at LOS D with the recommended mitigation measures under Near-Term Year 2023 Plus Project (Phase 1) conditions.

- *Airway Road, between Cactus Road and Britannia Boulevard* – The Project shall pay an widen this roadway segment from a 2-Lane Collector to a 4-Lane Collector prior to the project's **total trip generation** of 4,310 ADT. This cross-section is within the ultimate classification (6-Lane Major Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and this mitigation measure is consistent with the OMCPU EIR at buildout of the OMCPU. As shown in Table 7.4, this segment would operate at LOS D with the recommended mitigation measure under Near-Term Year 2023 Plus Project (Phase 1) conditions.

- *Airway Road, between Britannia Boulevard and 1,600 feet west of La Media Road* – The Project shall widen this roadway segment from a 2-Lane Collector to a 2-Lane Collector with a continuous left-turn lane prior to the project's **total trip generation** of 682 ADT. This cross-section is within the ultimate classification (4-Lane Major Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP), and this mitigation measure is consistent with the OMCPU EIR at buildout of the OMCPU. As shown in Table 7.4, this segment would operate at LOS C with the recommended mitigation measure under Near-Term Year 2023 Plus Project (Phase 1) conditions.

TABLE 7.4
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2023 PLUS PROJECT (PHASE 1) CONDITIONS – WITH MITIGATION MEASURES

Roadway	Segment	Before Mitigation measures			After Mitigation measures		
		ADT	Cross Section	LOS	ADT	Functional Classification	LOS
Britannia Boulevard	SR-905 EB Ramps to Airway Road	54,440	5-Ln w / RM (2-NB, 3-SB)	**F**	54,440	6-Ln Prime Arterial	D
Airway Road	Cactus Road to Britannia Boulevard	13,000	2-Ln	**F**	13,000	4-Ln Collector	D
	Britannia Boulevard to 1,600 feet west of La Media Road	8,810	2-Ln	**F**	8,810	2-Ln w/ CLTL	C

Source: Chen Ryan Associates; February 2019

Notes:
Bold letter indicates substandard LOS.
RM = Raised Median.

As shown in Table 7.4, all of the roadway segments would operate at an acceptable LOS D or better with implementation of the recommended mitigation measures.

Intersections

Facility mitigation measures associated with Phase 1 of the Otay Mesa Lumina project would be required at the following intersections:

11. *Britannia Blvd / Airway Road* – The Project shall widen the eastbound approach (Airway Road) of this intersection to accommodate dual left-turn lanes, a through lane with a shared right-turn lane, and add a right-turn overlap phase at the southbound approach (Britannia Blvd), prior to the project's **total trip generation** of 4,912 ADT.

Table 7.5 displays level of service analysis results both before and after implementation of the recommended mitigation measures at the deficient intersections under Near-Term Year 2023 Plus Project (Phase 1) conditions.

TABLE 7.5
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2023 PLUS PROJECT (PHASE 1) CONDITIONS – WITH MITIGATION MEASURES

			Before Mitigation measures				After Mitigation measures			
			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
11	Britannia Blvd / Airway Road	Signal	69.1	**E**	86.7	**F**	45.8	D	54.5	D

Source: Chen Ryan Associates; February 2019

Notes:
Bold letter indicates substandard LOS.

As shown Table 7.5, the intersection would operate at an acceptable LOS D during both AM and PM peak hour with the implementation of the recommended mitigation measures.

Freeway Segments

No significant impacts were identified at any of the analyzed freeway segments.

8.0 Near-Term Year 2027 (Existing Plus Cumulative Projects) Traffic Conditions

This section provides an analysis of the expected year 2027 cumulative traffic conditions without the Project. The scenario analyzed in this section is:

- Near-Term Year 2027 Conditions (Existing Plus Cumulative Projects).

8.1 Description of Cumulative Projects

Near-Term Year 2027 conditions includes the same reasonably foreseeable projects in the vicinity of the proposed project (cumulative projects information) as identified under Near-Term Year 2023, with the following two (2) projects having additional phases included in the analysis:

Near-Term Year 2027

12. Cross Border Facility Project - Full buildout (2026) – A 95,000 square feet cross border facility, a 340-room hotel, 6,000 square feet of sit-down restaurant, a gas station with 12 fuel dispensers, a convenience store and a car wash, 34,000 square feet of specialty retail land use, and 402,000 square feet of Industrial/Business Park uses.

13. Metro Airpark Phase 2 (2027) – A project that consists of general aviation facilities that will allow for 64 additional flights per day over Phase 1, 110,482 square feet of commercial office uses, 2,500 square feet of high turnover restaurant uses, 0.74 acres of Transit Transfer Station, a 150-room hotel, 647,600 square feet of Large Industrial Park uses, 707,400 square feet of Industrial/Business Park uses, 3,225 square feet of gas station w/ mini mart uses, and 66.50 acres of solar field uses.

Table 8.1 displays trip generation for the cumulative projects described above. Trip distribution and trip assignment for the cumulative projects was obtained from their respective traffic impact study or assumptions based on existing traffic patterns.

TABLE 8.1
CUMULATIVE PROJECTS TRIP GENERATION

Cumulative Project	Land Use	Daily Trips	AM Peak Hour (In / Out)	PM Peak Hour (In / Out)
1. 7-Eleven [1]	Convenience Store	1,800	144 (72-in / 72-out)	144 (72-in / 72-out)
2. Azul Playa Del Sol/Luna (California Terraces PA 6) [2]	Residential	4,440	356 (71-in / 285-out)	400 (280-in / 120-out)

TABLE 8.1
CUMULATIVE PROJECTS TRIP GENERATION

Cumulative Project	Land Use	Daily Trips	AM Peak Hour (In / Out)	PM Peak Hour (In / Out)
3. Cesar Solis Park [3]	Park	750	30 (0-in / 30-out)	60 (0-in / 60-out)
4. Candlelight [4]	Residential	2,850	228 (46-in / 182-out)	257 (180-in / 77-out)
5. Southview [5]	Residential	1,662	133 (27-in / 106-out)	299 (105-in / 194-out)
6. Southview East [6]	Residential	816	65 (13-in / 52-out)	220 (51-in / 169-out)
7. Southwind [7]	Residential	800	64 (13-in / 51-out)	80 (56-in / 24-out)
8. Handler Retail Center [6]	Motel	1,701	136 (54-in / 82-out)	153 (61-in / 92-out)
	Restaurant (sit down high turnover)	3,120	250 (125-in / 125-out)	250 (150-in / 100-out)
	Fast food (with drive-through)	4,200	168 (101-in / 67-out)	336 (168-in / 168-out)
9. Arco #5770 [9]	Gas Station	60	4 (2-in / 2-out)	4 (2-in / 2-out)
10. Marijuana Production Facility [10]	Marijuana Facility	346	69 (62-in / 7-out)	69 (14-in / 55-out)
11. California Terraces PA 61 [11]	Mixed-use Residential/Commercial	4,716	252 (101-in / 151-out)	486 (271-in / 215-out)
12. Cross Border Facility (Full Buildout) [12]	Cross Border Facility	46,700	2,313 (1,505-in / 808-out)	2,547 (1,115-in / 1,431-out)

TABLE 8.1
CUMULATIVE PROJECTS TRIP GENERATION

Cumulative Project	Land Use	Daily Trips	AM Peak Hour (In / Out)	PM Peak Hour (In / Out)
13. Metro Airpark (Phase 2) [13]	Airport / Retail	24,760	2,695 (2,116-in / 579-out)	2,780 (710-in / 2,070-out)
14. Plaza La Media (Full Buildout) [14]	Commercial/Retail	8,660	310 (183-in / 127-out)	812 (407-in / 405-out)
15. Sunroad Otay Mesa (Phase 1 and Phase 2) [15]	Warehouse	4,225	633 (444-in / 189-out)	676 (270-in / 406-out)
Cumulative Total		**111,606**	**7,850 (4,935-in / 2,915-out)**	**9,573 (3,912-in / 5,660-out)**

Source: Chen Ryan Associates, February 2019.

Notes:
[1] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[2] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[3] Trip Generation obtained from *City of San Diego Land Development Code – Trip Generation Manual, May 2003*
[4] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[5] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[6] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[7] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[8] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[9] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[10] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[11] Trip Generation obtained from *California Terraces PA 61 TIS* prepared by LOS Engineering, Inc. January 14, 2019.
[12] Trip Generation obtained from *Cross Border Facility TIS* prepared by LSA Associates. June 2011.
[13] Trip Generation obtained from *Metro Airpark TIS* prepared by Rick Engineering. April 2012.
[14] Trip Generation obtained from draft *Plaza La Media TIS* prepared by STC. August 2017.
[15] Trip Generation obtained from *Sunroad Otay Mesa TIS* prepared by Kimley-Horn. February 2017.

Detailed information regarding the cumulative projects is provided in Appendix G.

8.2 Near-Term Year 2027 Roadway Network and Traffic Volumes

Near-Term Year 2027 conditions roadway network was assumed to be identical to the Near-Term Year 2023 conditions roadway network, as shown in Figures 6-4 and 4-2.

Figure 8-1 displays cumulative projects roadway trip assignment while **Figure 8-2** displays cumulative projects intersection trip assignment under Near-Term Year 2027 conditions.

Near-Term Year 2027 traffic volumes were derived by combining the existing traffic volumes (displayed in Figures 4-3 and 4-4) and the full development project trip assignment volumes (displayed in Figures 3-7 and 3-8). **Figure 8-3** displays daily roadway and freeway traffic volumes, while **Figure 8-4** displays intersection peak hour traffic volumes.

8.3 Near-Term Year 2027 Traffic Conditions

LOS analyses for the Near-Term Year 2027 traffic conditions were conducted using the methodologies described in Chapter 2.0. Roadway segment, intersection, and freeway segment level of service analysis results for Near-Term Year 2027 traffic conditions are discussed separately below.

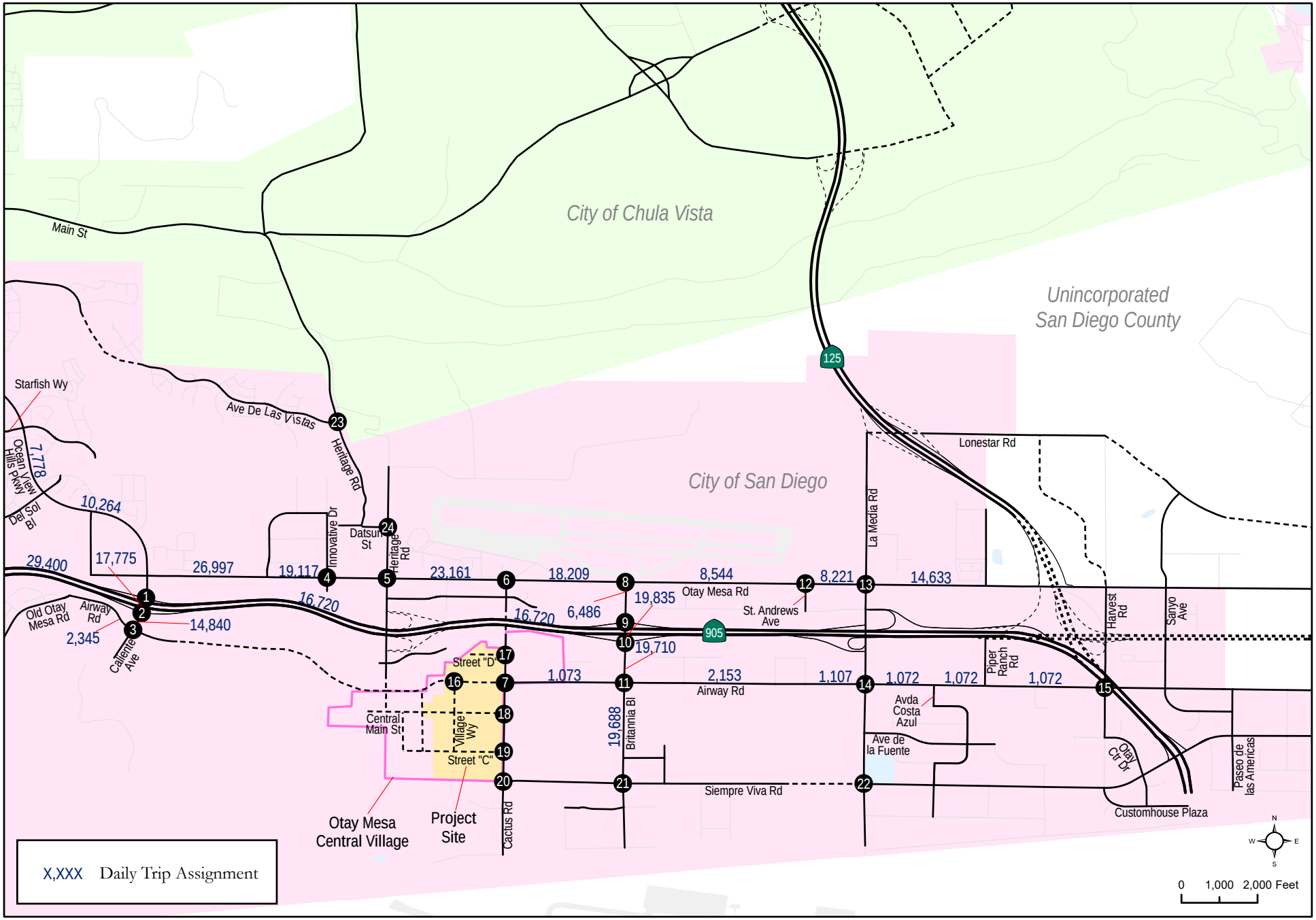

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Figure 8-1
Near-Term Year 2027 Cumulative Projects - Trip Assignment

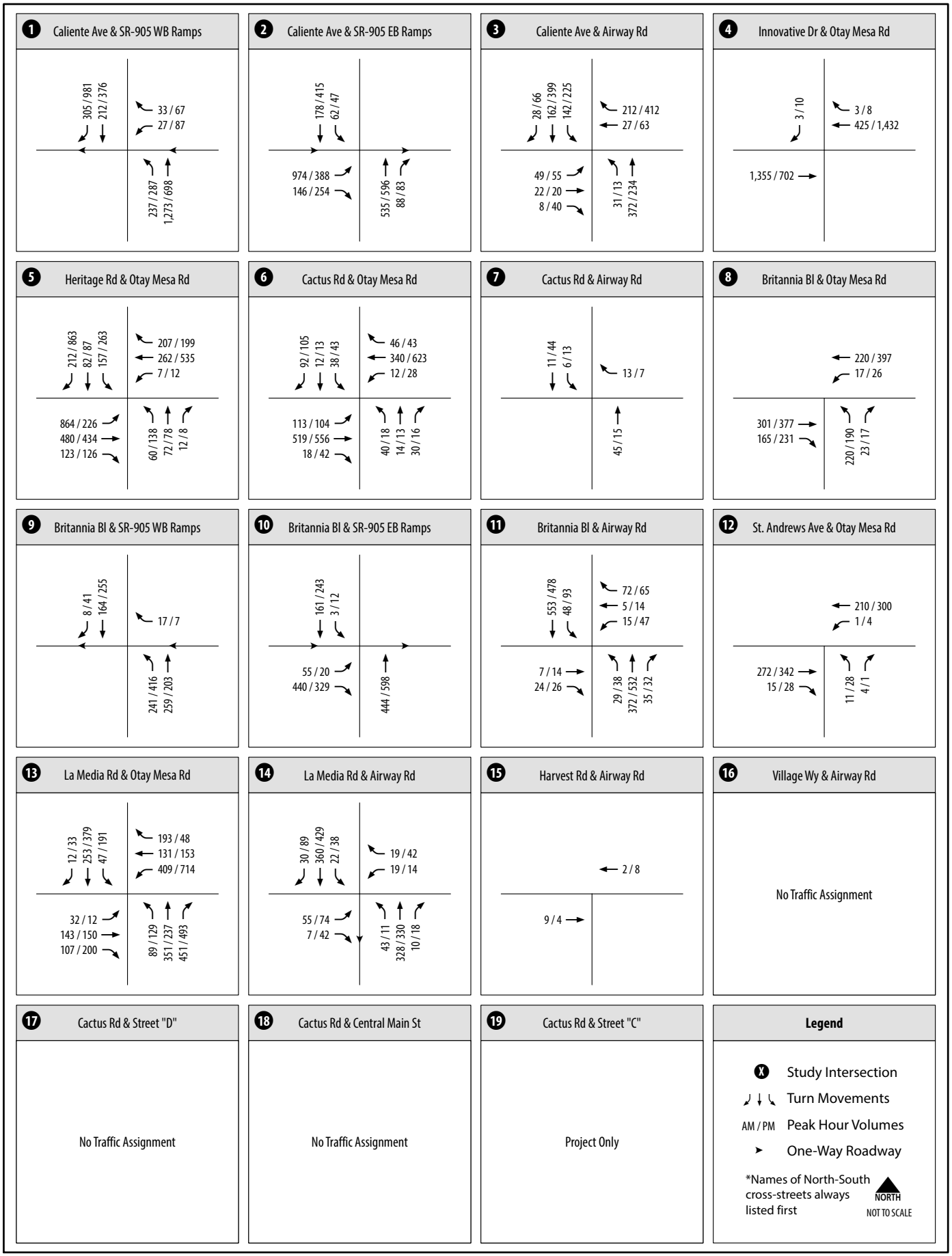

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Figure 8-2
Near-Term Year 2027 Cumulative Projects - Trip Assignment (Intersections 1-19)

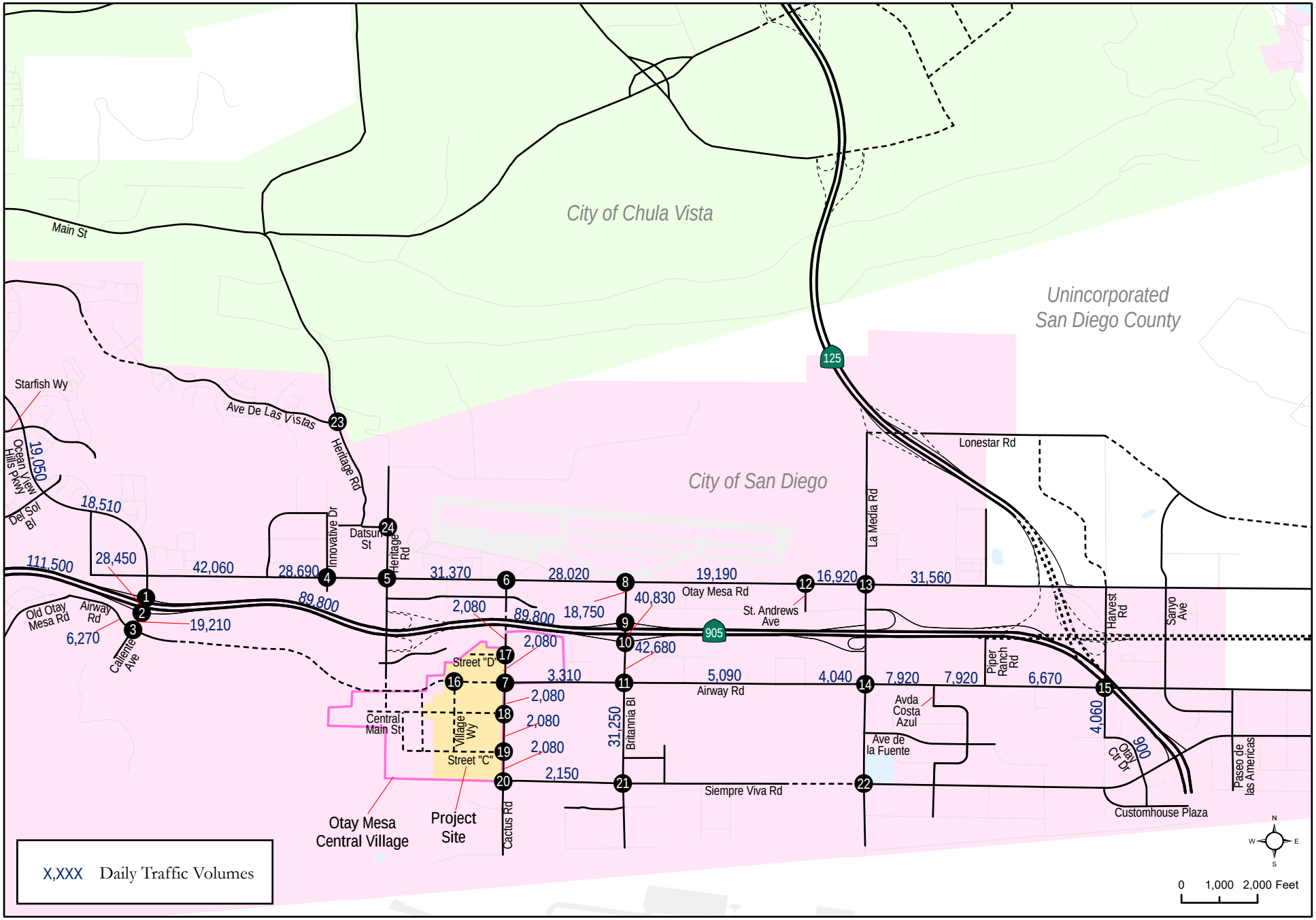

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Figure 8-3
Roadway ADT - Near-Term Year 2027 Traffic Conditions

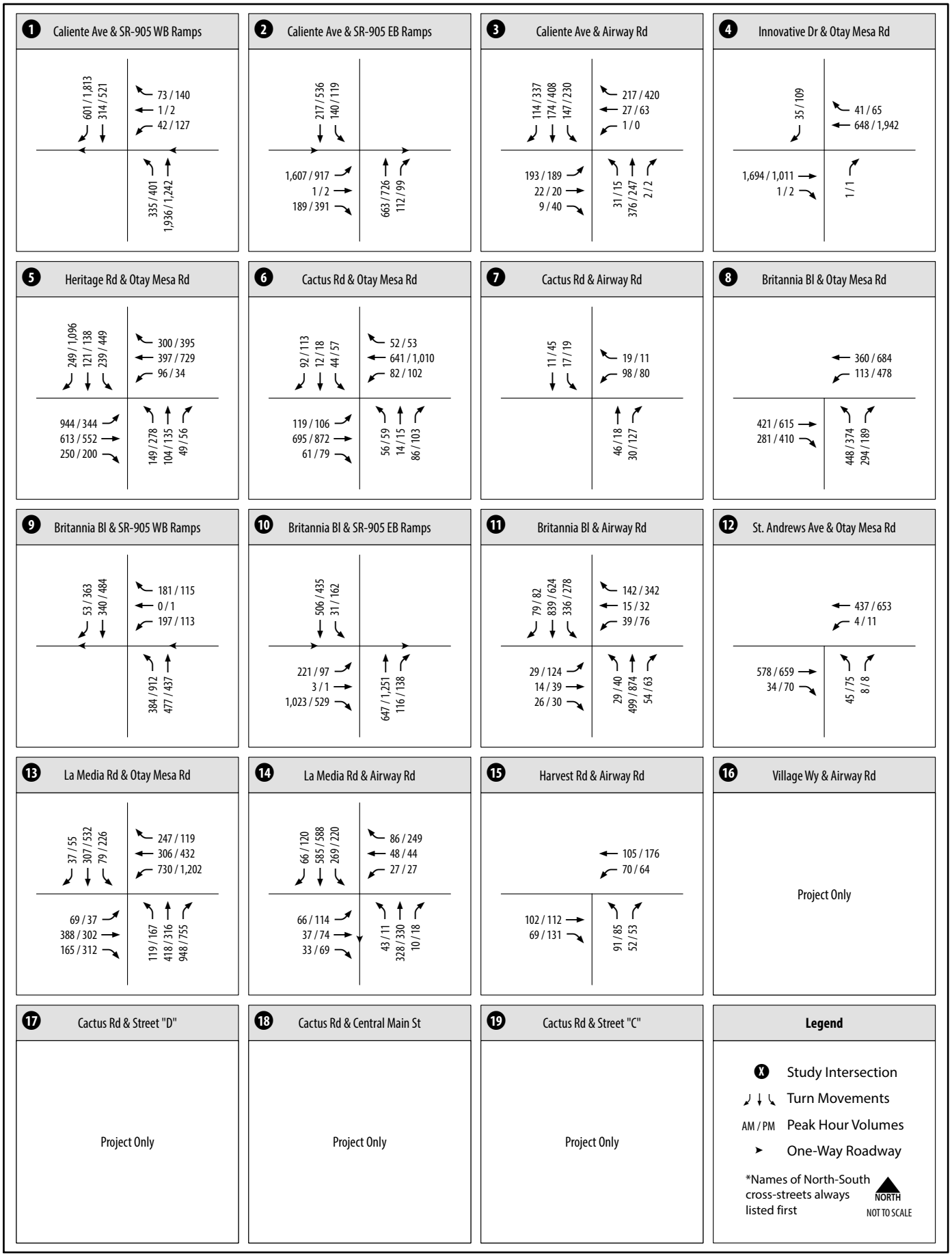

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Figure 8-4
AM/PM Peak Hour Intersection Volumes - Near-Term Year 2027 Traffic Conditions (Intersections 1-19)

Roadway Segment Analysis

Table 8.2 displays the Level of Service analysis results for key roadway segments located in the City of San Diego under Near-Term Year 2027 traffic conditions.

TABLE 8.2
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2027 CONDITIONS

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
Ocean View Hills Parkway	Starfish Way	Del Sol Boulevard	4-Ln Major Arterial	4-Ln w / RM	19,050	40,000	0.476	B
	Del Sol Boulevard	Otay Mesa Road	6-Ln Major Arterial	6-Ln w / RM	18,510	50,000	0.370	A
Caliente Avenue	SR-905 EB Ramps	Airway Road	5-Ln Prime Arterial	5-Ln w / SM (3-NB, 2-SB)	28,450	50,000[1]	0.569	B
	Airway Road	Southern Terminus	5-Ln Prime Arterial	5-Ln w / RM (3-NB, 2-SB)	19,210	50,000[1]	0.384	A
Cactus Road	SR-905	Street "D"	2-Ln Collector w/ Commercial Fronting	2-Ln	2,080	8,000	0.260	A
	Street "D"	Airway Road	2-Ln Collector w/ Commercial Fronting	2-Ln	2,080	8,000	0.260	A
	Airway Road	Central Main Street	2-Ln Collector w/ Commercial Fronting	2-Ln	2,080	8,000	0.260	A
	Central Main Street	Street "C"	2-Ln Collector w/ Commercial Fronting	2-Ln	2,080	8,000	0.260	A
	Street "C"	Siempre Viva Road	2-Ln Collector w/ Commercial Fronting	2-Ln	2,080	8,000	0.260	A
Britannia Boulevard	Otay Mesa Road	SR-905 WB Ramps	6-Ln Prime Arterial	6-Ln w/ RM	18,750	60,000	0.313	A
	SR-905 WB Ramps	SR-905 EB Ramps	6-Ln Prime Arterial	6-Ln w/ RM	40,830	60,000	0.681	C
	SR-905 EB Ramps	Airway Road	5-Ln Prime Arterial	5-Ln w/ RM	42,680	50,000[1]	0.854	D
	Airway Road	Siempre Viva Road	4-Ln Major Arterial	4-Ln w/ RM	31,250	40,000	0.781	D

TABLE 8.2
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2027 CONDITIONS

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
Harvest Road	Airway Road	Otay Center Drive	2-Ln Collector w/ Commercial Fronting	2-Ln	4,060	8,000	0.508	C
Otay Center Drive	Harvest Road	Siempre Viva Road	4-Ln Collector	4-Ln	900	15,000	0.060	A
Otay Mesa Road	Ocean View Hills Parkway	Corporate Center Drive	6-Ln Prime Arterial	6-Ln w / RM	42,060	60,000	0.701	C
	Corporate Center Drive	Heritage Road	6-Ln Prime Arterial	6-Ln w / RM	28,690	60,000	0.478	B
	Heritage Road	Cactus Road	6-Ln Prime Arterial	6-Ln w / RM	31,370	60,000	0.523	B
	Cactus Road	Britannia Boulevard	6-Ln Prime Arterial	6-Ln w / RM	28,020	60,000	0.467	B
	Britannia Boulevard	Saint Andrews Avenue	6-Ln Prime Arterial	6-Ln w / RM	19,190	60,000	0.320	A
	Saint Andrews Avenue	La Media Road	6-Ln Prime Arterial	6-Ln w / RM	16,920	60,000	0.282	A
	La Media Road	Piper Ranch Road	6-Ln Prime Arterial	6-Ln w / RM	31,560	60,000	0.526	B
Airway Road	Old Otay Mesa Road	Caliente Avenue	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w / CLTL	6,270	30,000	0.209	A
	Cactus Road	Britannia Boulevard	2-Ln Collector w/ Commercial Fronting	2-Ln	3,310	8,000	0.414	B
	Britannia Boulevard	1,600 feet west of La Media Road	2-Ln Collector w/ Commercial Fronting	2-Ln	5,090	8,000	0.636	D
	1,600 feet west of La Media Road	La Media Road	4-Ln Major Arterial	4-Ln w/ RM	4,040	40,000	0.101	A
	La Media Road	Avenida Costa Azul	4-Ln Major Arterial	4-Ln w/ RM	7,920	40,000	0.198	A

TABLE 8.2
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2027 CONDITIONS

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
Airway Road	Avenida Costa Azul	Piper Ranch Road	4-Ln Major Arterial	4-Ln w / RM	7,920	40,000	0.198	A
	Piper Ranch Road	Harvest Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	6,670	15,000	0.445	B
Siempre Viva Road	Cactus Road	Britannia Blvd	2-Ln Collector w/ Commercial Fronting	2-Ln	2,150	8,000	0.269	A

Source: Chen Ryan Associates; February 2019

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).

As shown in Table 8.2, all of the roadway segments are projected to operate at acceptable LOS D or better under the Near-Term Year 2027 traffic conditions.

Intersection Analysis

Table 8.3 displays LOS and average vehicle delay results for intersections under Near-Term Year 2027 conditions. LOS calculation worksheets for the Near-Term Year 2027 conditions are provided in **Appendix M**.

TABLE 8.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2027 CONDITIONS

ID	Intersection	Control Type	AM Peak Hour		PM Peak Hour	
			Avg. Delay (sec.)	LOS	Avg. Delay (sec.)	LOS
1	Caliente Avenue / SR-905 WB Ramps	Signalized	9.5	A	47.0	D
2	Caliente Avenue / SR-905 EB Ramps	Signalized	71.2	**E**	34.3	C
3	Caliente Avenue / Airway Road	Signalized	19.1	B	23.4	C
4	Innovative Drive / Otay Mesa Road	SSSC	13.7	B	20.0	C
5	Heritage Road / Otay Mesa Road	Signalized	49.8	D	69.9	**E**
6	Cactus Road / Otay Mesa Road	Signalized	17.5	B	19.8	B
7	Cactus Road / Airway Road	SSSC	9.7	A	10.0	B

TABLE 8.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2027 CONDITIONS

ID	Intersection	Control Type	AM Peak Hour		PM Peak Hour	
			Avg. Delay (sec.)	LOS	Avg. Delay (sec.)	LOS
8	Britannia Boulevard / Otay Mesa Road	Signalized	12.2	B	26.5	C
9	Britannia Boulevard / SR-905 WB Ramps	Signalized	13.0	B	20.3	C
10	Britannia Boulevard / SR-905 EB Ramps	Signalized	19.1	B	18.8	B
11	Britannia Boulevard / Airway Road	Signalized	30.4	C	40.3	D
12	St Andrews Avenue / Otay Mesa Road	Signalized	6.6	A	8.0	A
13	La Media Road / Otay Mesa Road	Signalized	346.0	**F**	499.8	**F**
14	La Media Road / Airway Road	Signalized	14.4	B	15.7	B
15	Harvest Road / Airway Road	AWSC	8.8	A	9.5	A
16	Village Way / Airway Road	With Project (Phase 1 & Full Development) Only				
17	Cactus Road / Street "D"	With Project (Phase 1 & Full Development) Only				
18	Cactus Road / Central Main Street	With Project (Phase 1 & Full Development) Only				
19	Cactus Road / Street "C"	With Project (Full Development) Only				
20	Cactus Road / Siempre Viva Road	Buildout Conditions Only				
21	Britannia Boulevard / Siempre Viva Road	Buildout Conditions Only				
22	La Media Road / Siempre Viva Road	Buildout Conditions Only				

Source: Chen Ryan Associates; February 2019

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.

As shown in Table 8.3, 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 Near-Term Year 2027 traffic conditions, with the following two (2) exceptions:

5. Heritage Road / Otay Mesa Road – LOS E during the PM peak hour; and
13. La Media Road / Otay Mesa Road – LOS F during both the AM and PM peak hour.

Freeway Segment Analysis

Table 8.4 displays freeway segment level of service results for the study area freeway mainline facilities under Near-Term Year 2027 traffic conditions. The freeway segment level of service analysis was performed utilizing the methodology presented in Section 2.5.

As shown in Table 8.4, all of the freeway segments would operate at acceptable LOS C or better under Near-Term Year 2027 traffic conditions.

TABLE 8.4
FREEWAY SEGMENT ANALYSIS
NEAR-TERM YEAR 2027 CONDITIONS

Freeway	Segment	ADT	Direction	# of Lanes	Capacity[a]	D[b]	K[c]	HVF[d]	Peak Hour Volume	V/C	LOS[f]	Peak Hour
SR-905	I-805 and Caliente Avenue	111,500	EB	4M	9,400	66.2%	7.6%	11.9%	5,930	0.630	C	AM
			WB	3M+1A	8,460	58.8%	9.0%	11.9%	6,230	0.740	C	PM
	Caliente Avenue and Heritage Road	89,800	EB	3M	7,050	66.2%	7.6%	11.9%	2,330	0.330	A	AM
			WB	3M	7,050	58.8%	9.0%	11.9%	1,620	0.230	A	PM
	Heritage Road and Britannia Boulevard	89,800	EB	3M	7,050	66.2%	7.6%	11.9%	1,150	0.160	A	AM
			WB	3M	7,050	58.8%	9.0%	11.9%	970	0.140	A	PM

Source: Chen Ryan Associates; February 2019

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.

9.0 Near-Term Year 2027 Plus Project (Full Development)

Year 2027 is assumed to be when the project reaches its full development. This section provides an analysis of the expected year 2027 (Full Development) cumulative traffic conditions with the Otay Mesa Lumina project. The scenario analyzed in this section is:

- Near-Term Year 2027 Conditions Plus Project (Full Development).

9.1 Near-Term Year 2027 Plus Project (Full Development) Roadway Network and Traffic Volumes

Roadway and intersection geometrics under Near-Term Year 2027 Plus Project (Full Development) conditions were assumed to be identical to the Near-Term Year 2023 Plus Project (Phase 1) traffic conditions, with the inclusion of project frontage features in addition to those previously presented under Near-Term Year 2023 Plus Project (Phase 1) conditions, as well as the following mitigated facilities under Near-Term Year 2023 Plus Project (Phase 1) conditions:

Phase 2 – to be constructed by the proposed project

Roadway Segments

- Cactus Road, between Central Main Street and Street "C" - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes), which is within the ultimate classification (4-Lane Major Arterial) 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 Street "C" and Siempre Viva Road - This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes), which is within the ultimate classification (4-Lane Major Arterial) identified in the currently adopted Otay Mesa Community Plan and the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).

Intersection

19. Cactus Road / Street "C" – Construction of an all-way stop control (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross section mentioned above. However, the Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation should be taken into consideration when constructing this intersection. Full buildout of the Otay Mesa Central Village Specific Plan will trigger the need for signalization of this intersection. See Appendix J for traffic signal warrant.

Note that the identified improvements will be in place by the 1st EDU of Phase 2 of the project.

Mitigation Measures carried forward from Near-Term Year 2023 Plus Project (Phase 1)

Roadways:

- Britannia Boulevard, between SR-905 EB Ramps and Airway Road – This roadway segment was widened from a 5-Lane Prime Arterial to a 6-Lane Prime Arterial under Near-Term Year 2023 Plus Project (Phase 1) conditions and this mitigation measure carried forward to Near-Term Year 2027 Plus Project (Full Development) conditions.

- Airway Road, between Cactus Road and Britannia Boulevard – This roadway segment was widened from a 2-Lane Collector to a 4-Lane Collector under Near-Term Year 2023 Plus Project (Phase 1) conditions and this mitigation measure carried forward to Near-Term Year 2027 Plus Project (Full Development) conditions.

- Airway Road, between Britannia Boulevard and 1,600 feet west of La Media Road – This roadway segment was widened from a 2-Lane Collector to a 2-Lane Collector with a continuous left-turn lane under Near-Term Year 2023 Plus Project (Phase 1) conditions and this mitigation measure carried forward to Near-Term Year 2027 Plus Project (Full Development) conditions.

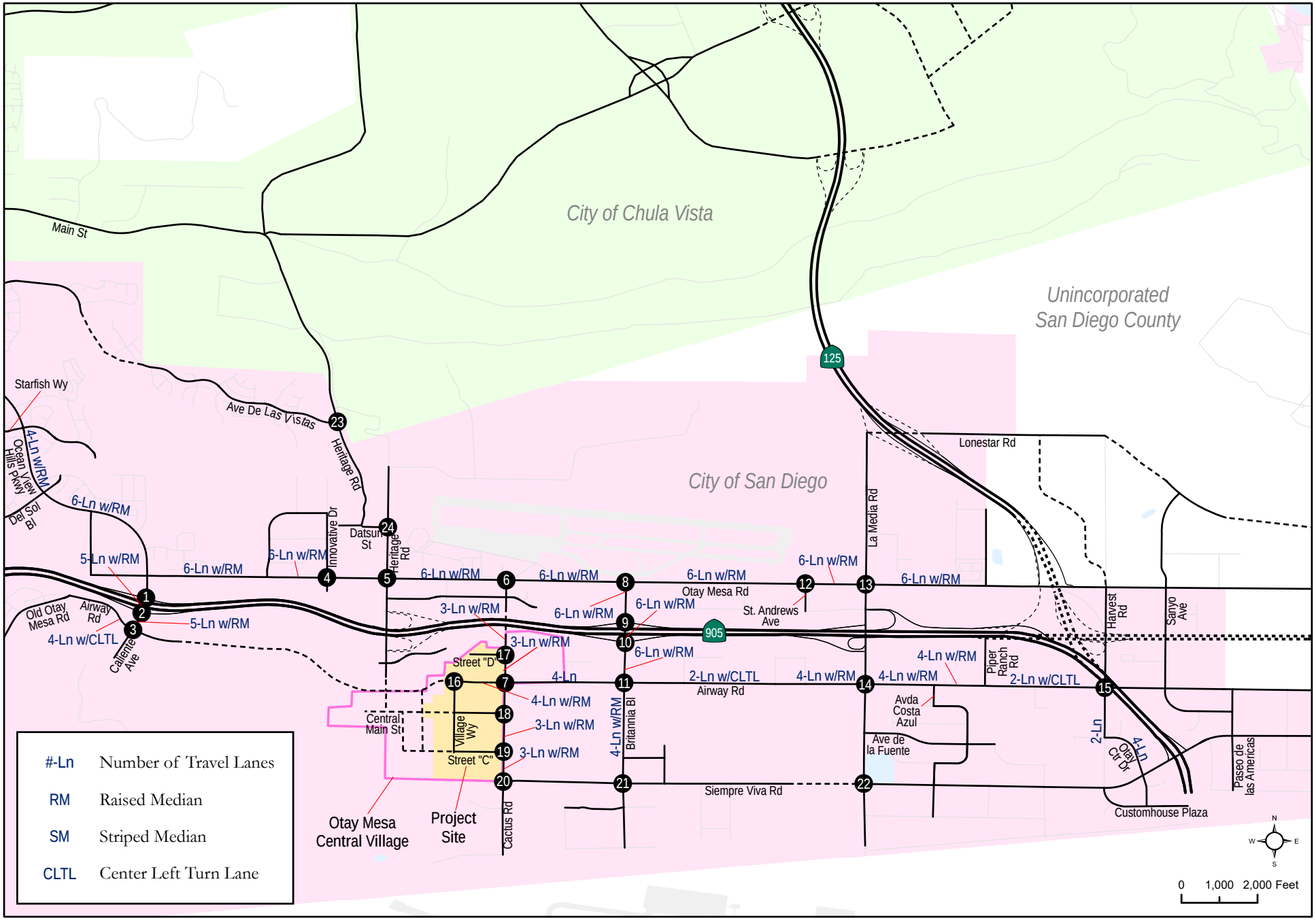
Intersection:

- Britannia Blvd / Airway Road – This intersection was widened at the west leg (Airway Road) to include dual left-turn lanes, a through lane with a shared right turn lane and a right-turn overlap phase at the southbound (Britannia Blvd) approach under Near-Term Year 2023 Plus Project (Phase 1) conditions and this mitigation measure carried forward to Near-Term Year 2027 Plus Project (Full Development) conditions.

Roadway and intersection geometrics under Near-Term Year 2027 Plus Project (Full Development) conditions are displayed in **Figure 9-1** and **Figure 9-2**, respectively. Near-Term Year 2027 Plus Project (Full Development) traffic volumes were derived by combining the Near-Term Year 2027 traffic volumes (displayed in Figures 8-3 and 8-4) and the project (Full Development) trip assignment volumes (displayed in Figures 3-7 and 3-8). Daily roadway volumes for this scenario are displayed in **Figure 9-3** while **Figure 9-4** displays intersection peak hour traffic volumes.

9.2 Near-Term Year 2027 Plus Project (Full Development) Traffic Conditions

Analyses were conducted using the methodologies described in Chapter 2.0. Roadway segment, intersection, and freeway segment level of service analyses results are discussed in the following sections.



Otay Mesa Lumina
Transportation Impact Study

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Figure 9-1
Roadway Geometrics - Near-Term Year 2027 Plus Project (Full Development) Conditions

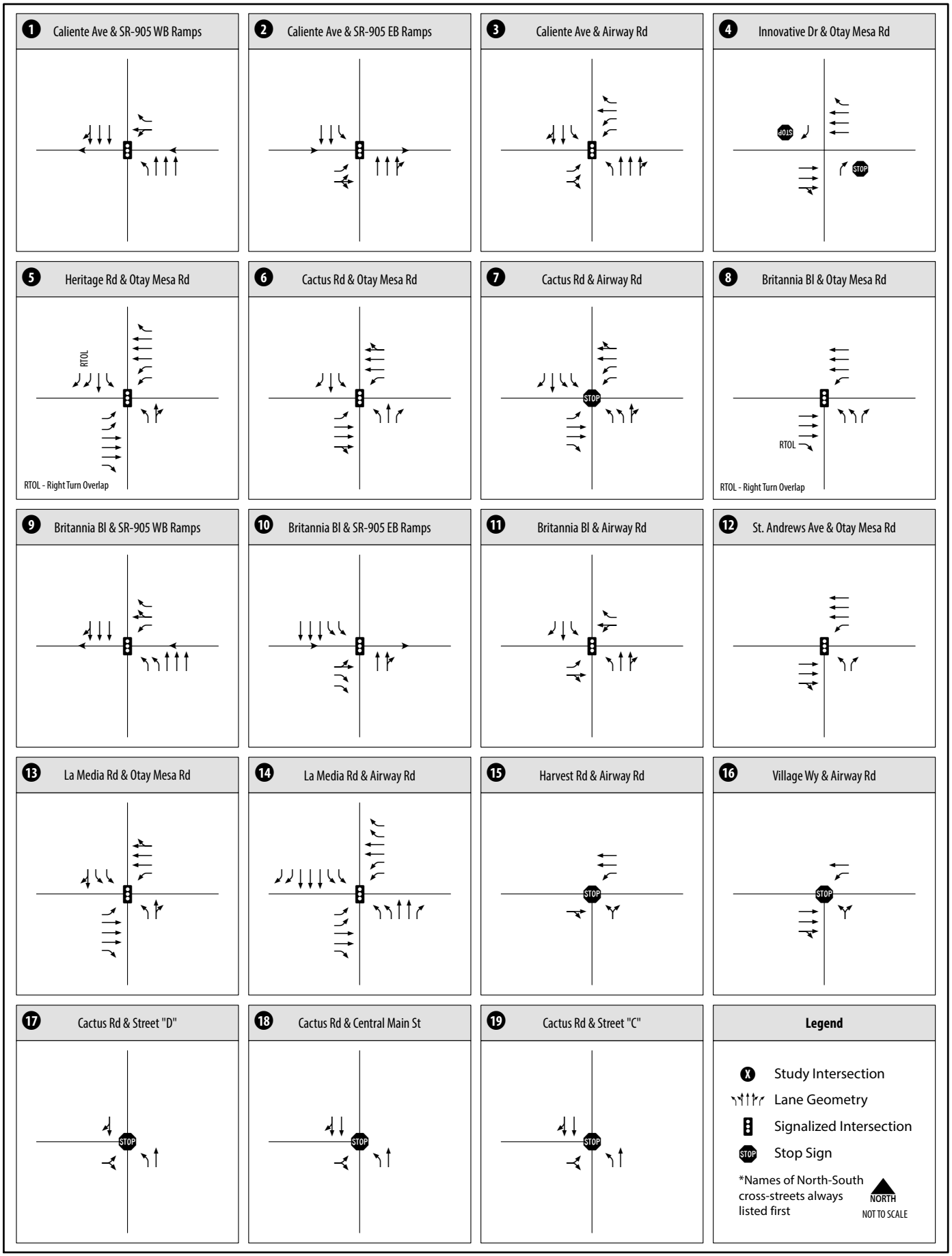

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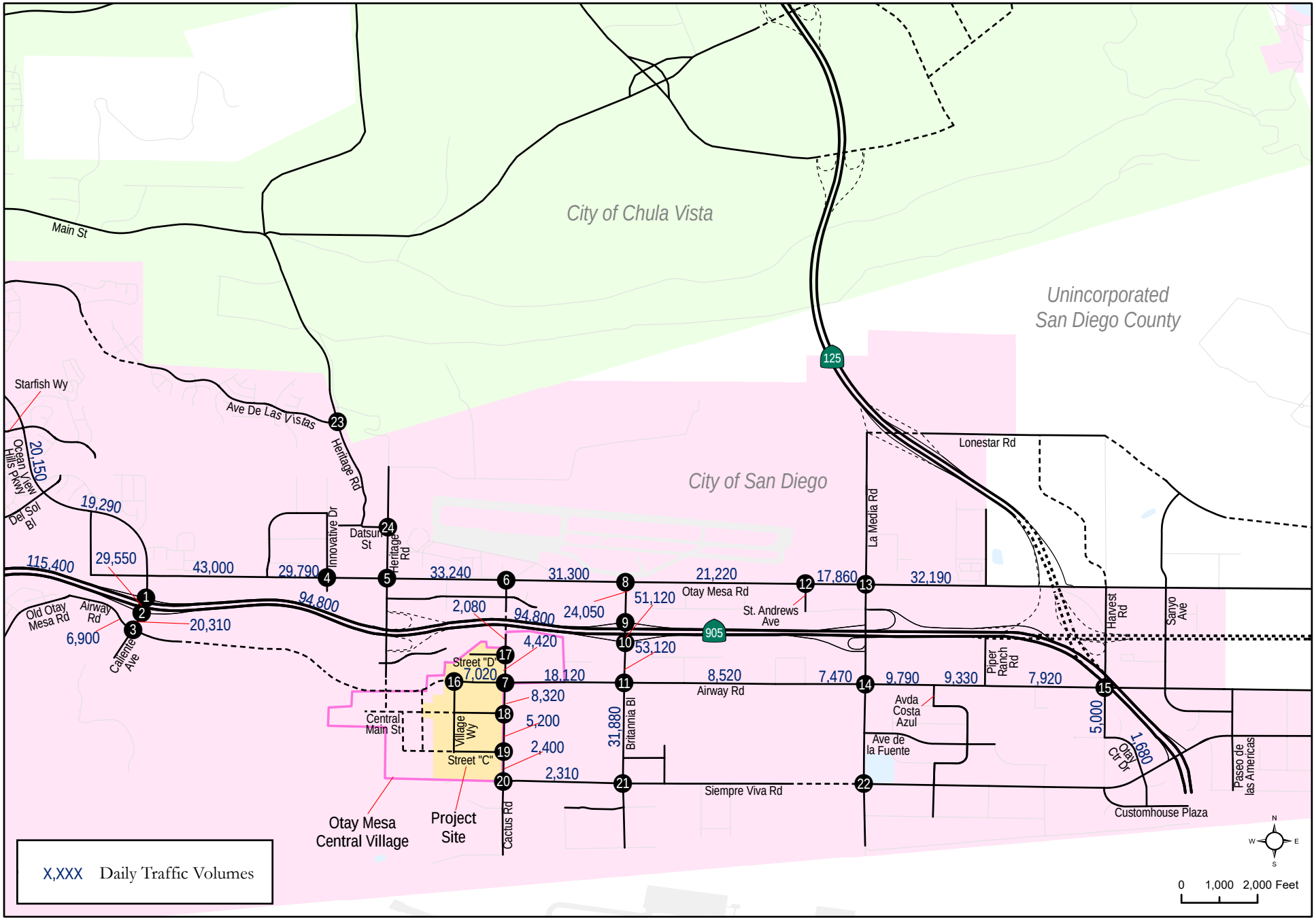
Figure 9-2
Intersection Geometrics - Near-Term
Year 2027 Plus Project (Full Development) Conditions (Intersections 1-19)



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Transportation Impact Study

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Figure 9-3
Roadway ADT - Near-Term Year 2027 Plus Project (Full Development) Conditions

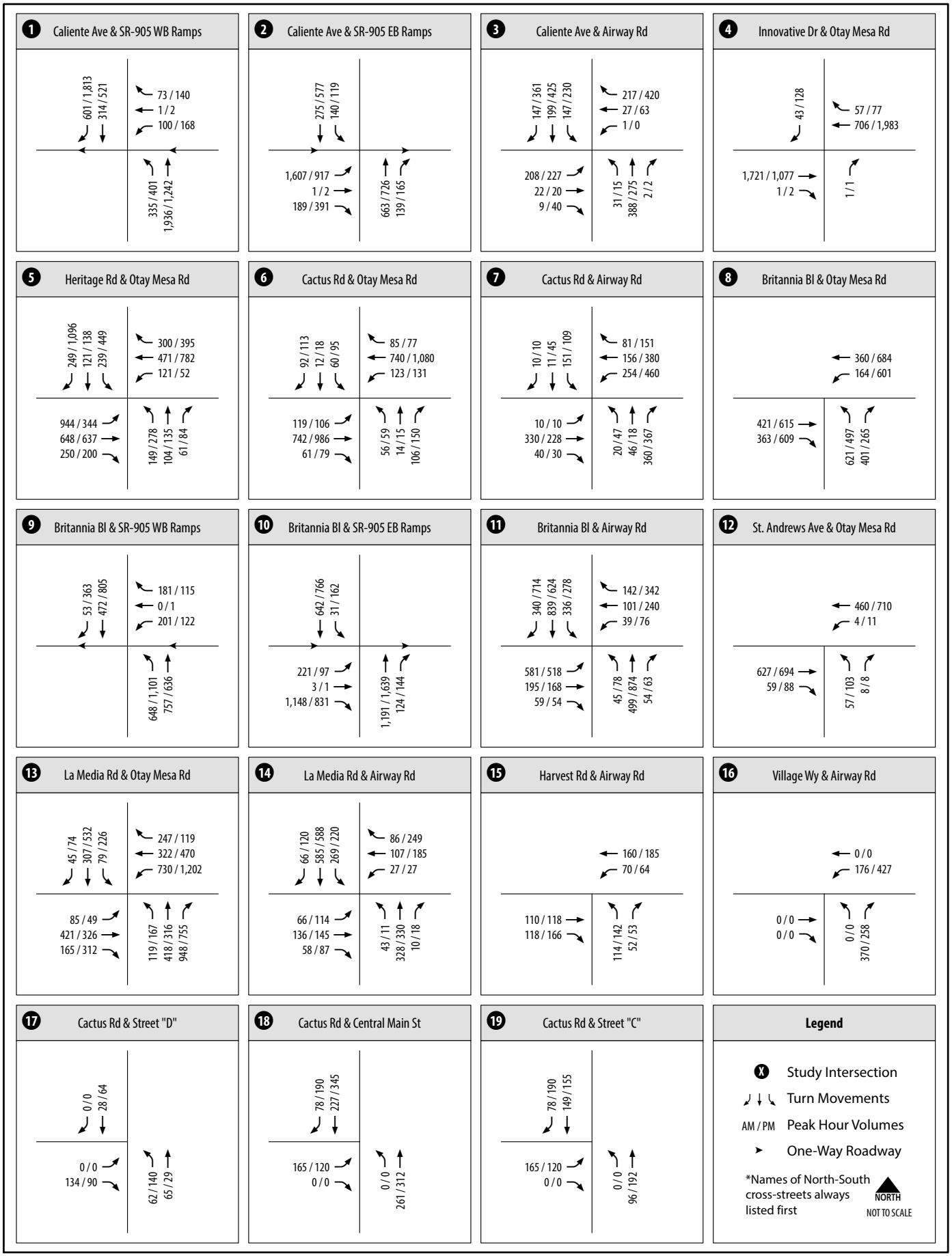

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Figure 9-4
AM/PM Peak Hour Intersection Volumes - Near-Term
Year 2027 Plus Project (Full Development) Conditions (Intersections 1-19)

Roadway Segment Analysis

Table 9.1 displays the Level of Service analysis results for key roadway segments located within the City of San Diego under Near-Term Year 2027 Plus Project (Full Development) conditions.

TABLE 9.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2027 PLUS PROJECT (FULL DEVELOPMENT) 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		
Ocean View Hills Parkway	Starfish Way to Del Sol Boulevard	4-Ln Major Arterial	4-Ln w / RM	20,150	40,000	0.504	B	0.476	B	0.028	No
	Del Sol Boulevard to Otay Mesa Road	6-Ln Major Arterial	6-Ln w / RM	19,290	50,000	0.386	A	0.370	A	0.016	No
Caliente Avenue	SR-905 WB Ramps to SR-905 EB Ramps	5-Ln Prime Arterial	5-Ln w / SM (3-NB, 2-SB)	29,550	50,000[1]	0.591	C	0.569	A	0.022	No
	SR-905 EB Ramps to Airway Road	5-Ln Prime Arterial	5-Ln w / SM (3-NB, 2-SB)	20,310	50,000[1]	0.406	A	0.384	A	0.022	No
Cactus Road	SR-905 to Street "D"	2-Ln Collector w/Commercial Fronting	2-Ln	2,080	8,000	0.260	A	0.260	A	0.000	No
	Street "D" to Airway Road	3-Ln Major Arterial	3-Ln w / RM (1NB-2SB)	4,420	30,000[2]	0.147	A	0.260	A	-0.113	No
	Airway Road to Central Main Street	3-Ln Major Arterial	3-Ln w / RM (1NB-2SB)	8,320	30,000[2]	0.277	A	0.260	A	0.017	No
	Central Main Street to Street "C"	3-Ln Major Arterial	3-Ln w / RM (1NB-2SB)	5,200	30,000[2]	0.173	A	0.260	A	-0.087	No
	Street "C" to Siempre Viva Road	3-Ln Major Arterial	3-Ln w / RM (1NB-2SB)	2,400	30,000[2]	0.080	A	0.260	A	-0.180	No

TABLE 9.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2027 PLUS PROJECT (FULL DEVELOPMENT) 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	Otay Mesa Road to SR-905 WB Ramps	6-Ln Prime Arterial	6-Ln w / RM	24,050	60,000	0.401	A	0.289	A	0.088	No
	SR-905 WB Ramps to SR-905 EB Ramps	6-Ln Prime Arterial	6-Ln w / RM	51,120	60,000	0.852	D	0.657	C	0.172	No
	SR-905 EB Ramps to Airway Road	6-Ln Prime Arterial	6-Ln w / RM	53,120	60,000	0.885	D	0.826	C	0.032	No
	Airway Road to Siempre Viva Road	4-Ln Major Arterial	4-Ln w / RM	31,880	40,000	0.797	D	0.779	D	0.016	No
Harvest Road	Airway Road to Otay Center Drive	2-Ln Collector w/ Commercial Fronting	2-Ln	5,000	8,000	0.625	C	0.508	C	0.118	No
Otay Center Drive	Harvest Road to Siempre Viva Road	4-Ln Collector	4-Ln	1,680	15,000	0.112	A	0.060	A	0.052	No
Otay Mesa Road	Ocean View Hills Parkway to Corporate Center Drive	6-Ln Prime Arterial	6-Ln w / RM	43,000	60,000	0.717	C	0.701	C	0.016	No
	Corporate Center Drive to Heritage Road	6-Ln Prime Arterial	6-Ln w / RM	29,790	60,000	0.497	B	0.478	B	0.018	No

TABLE 9.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2027 PLUS PROJECT (FULL DEVELOPMENT) 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	33,240	60,000	0.554	B	0.523	B	0.031	No
	Cactus Road to Britannia Boulevard	6-Ln Prime Arterial	6-Ln w / RM	31,300	60,000	0.522	B	0.467	B	0.055	No
	Britannia Boulevard to Saint Andrews Avenue	6-Ln Prime Arterial	6-Ln w / RM	21,220	60,000	0.354	A	0.320	A	0.034	No
	Saint Andrews Avenue to La Media Road	6-Ln Prime Arterial	6-Ln w / RM	17,860	60,000	0.298	A	0.282	A	0.016	No
	La Media Road to Piper Ranch Road	6-Ln Prime Arterial	6-Ln w / RM	32,190	60,000	0.537	B	0.526	B	0.011	No
Airway Road	Old Otay Mesa Road to Caliente Avenue	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w / CLTL	6,900	30,000	0.230	A	0.209	A	0.021	No
	Village Way to Cactus Road	4-Ln Prime Arterial	4-Ln w/ RM	7,020	40,000	0.176	A	Does not exist		0.176	No
	Cactus Road to Britannia Boulevard	4-Ln Collector	4-Ln	18,120	15,000	1.208	**F**	0.414	B	0.794	**Yes**
	Britannia Boulevard to 1,600 feet west of La Media Road	2-Ln Collector	2-Ln w/ CLTL	8,520	15,000	0.568	C	0.636	C	-0.068	No

TABLE 9.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2027 PLUS PROJECT (FULL DEVELOPMENT) 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	1,600 feet west of La Media Road to La Media Road	4-Ln Major Arterial	4-Ln w/ RM	7,470	40,000	0.187	A	0.101	A	0.086	No
	La Media Road to Avenida Costa Azul	4-Ln Major Arterial	4-Ln w/ RM	9,790	4,000	0.245	A	0.198	A	0.047	No
	Avenida Costa Azul to Piper Ranch Road	4-Ln Major Arterial	4-Ln w / RM	9,330	40,000	0.233	A	0.198	A	0.035	No
	Piper Ranch Road to Harvest Road	2-Ln w/ Continuous-Left-Turn-Lane	2-Ln w / CLTL	7,920	15,000	0.528	C	0.445	B	0.083	No
Siempre Viva Road	Cactus Road to Britannia Blvd	2-Ln Collector w/ Commercial Fronting	2-Ln	2,310	8,000	0.289	A	0.269	A	0.020	No

Source: Chen Ryan Associates; February 2019

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-Lane Major Arterial, reduced to exclude a lane. (3/4*40,000 = 30,000).

As shown in Table 9.1, all of the study area roadway segments are projected to continue operating at acceptable LOS D or better under Near-Term Year 2027 Plus Project (Full Development) conditions, with the following exception:

- Airway 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 0.414 under Near-Term Year 2027 conditions to 1.208 under Near-Term Year 2027 Plus Project conditions, resulting in a net increase of 0.794. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

  Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under Near-Term Year 2027 Plus Project (Full Development) conditions and mitigation measures would be required.

Intersection Analysis

Table 9.2 displays Level of Service and average vehicle delay results for study area intersections under Near-Term Year 2027 Plus Project (Full Development) conditions. Level of Service calculation worksheets for the Near-Term Year 2027 Plus Project (Full Development) conditions are provided in **Appendix N**.

TABLE 9.2
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2027 PLUS PROJECT (FULL DEVELOPMENT) 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	Caliente Avenue / SR-905 WB Ramps	Signalized	10.9	B	54.4	D	9.5 / 47.0	A / D	1.4 / 7.4	No
2	Caliente Avenue / SR-905 EB Ramps	Signalized	71.2	**E**	35.2	D	71.2 / 34.3	**E** / C	0.0 / 0.9	No
3	Caliente Avenue / Airway Road	Signalized	19.3	B	25.5	C	19.1 / 23.4	B / C	0.2 / 2.1	No
4	Innovative Drive / Otay Mesa Road	SSSC	13.8	B	21.7	C	13.7 / 20.0	B / C	0.1 / 1.7	No
5	Heritage Road / Otay Mesa Road	Signalized	53.8	D	70.0	**E**	49.8 / 69.9	D / **E**	4.0 / 0.1	No
6	Cactus Road / Otay Mesa Road	Signalized	19.7	B	24.8	C	17.5 / 19.8	B / B	2.2 / 5.0	No
7	Cactus Road / Airway Road	Signalized	27.3	C	39.8	D	9.7 / 10.0	A / B	17.6 / 29.8	No
8	Britannia Boulevard / Otay Mesa Road	Signalized	16.3	B	40.0	D	12.2 / 26.5	B / C	4.1 / 13.5	No
9	Britannia Boulevard / SR-905 WB Ramps	Signalized	16.1	B	31.5	C	13.0 / 20.3	B / C	3.1 / 11.2	No
10	Britannia Boulevard / SR-905 EB Ramps	Signalized	48.7	D	52.7	D	19.1 / 18.8	B / B	29.6 / 33.9	No
11	Britannia Boulevard / Airway Road	Signalized	69.1	**E**	76.8	**E**	30.4 / 40.3	C / D	38.7 / 36.5	**Yes**
12	St Andrews Avenue / Otay Mesa Road	Signalized	6.8	A	8.1	A	6.6 / 8.0	A / A	0.2 / 0.1	No
13	La Media Road / Otay Mesa Road	Signalized	346.0	**F**	499.3	**F**	346.0 / 499.8	**F / F**	0.0 / -0.5	No
14	La Media Road / Airway Road	Signalized	15.4	B	16.8	B	14.4 / 15.7	B / B	1.0 / 1.1	No
15	Harvest Road / Airway Road	AWSC	9.6	A	10.6	B	8.8 / 9.5	A / A	0.8 / 1.1	No

TABLE 9.2
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2027 PLUS PROJECT (FULL DEVELOPMENT) 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	Village Way / Airway Road	AWSC	10.1	B	17.9	C	Does Not Exist			No
17	Cactus Road / Street "D"	AWSC	7.5	A	8.0	A	Does Not Exist			No
18	Cactus Road / Central Main Street	AWSC	10.1	B	11.5	B	Does Not Exist			No
19	Cactus Road / Street "C"	AWSC	8.4	A	8.9	A	Does Not Exist			No
20	Cactus Road / Siempre Viva Road	Buildout Conditions Only								
21	Britannia Boulevard / Siempre Viva Road	Buildout Conditions Only								
22	La Media Road / Siempre Viva Road	Buildout Conditions Only								

Source: Chen Ryan Associates; February 2019

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.

As shown in Table 9.2, 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 Near-Term Year 2027 Plus Project (Full Development) conditions, with the following four (4) exceptions:

2. The intersection of Caliente Avenue / SR-905 EB Ramps is projected to continue operating at LOS E under Near-Term Year 2027 Plus Project (Full Development) conditions, during the AM peak hour. During the AM peak hour, the overall intersection delay is projected remain at 71.2 seconds of delay under Near-Term Year 2027 Plus Project (Full Development) conditions, resulting in a net increase of 0 seconds of overall delay.

   Based upon the significance criteria presented in Section 2.6, this intersection would not be significantly impacted under Near-Term Year 2027 Plus Project (Full Development) conditions and mitigation measures would not be required.

5. The intersection of Heritage Road / Otay Mesa Road is projected to operate at LOS E under Near-Term Year 2027 Plus Project (Full Development) conditions, during the PM peak hour. During the PM peak hour, the overall intersection delay is projected to increase from 69.9 seconds of delay under Near-Term Year 2027 conditions to 70.0 seconds of delay under Near-Term Year 2027 Plus Project (Full Development) conditions, resulting in a net increase of 0.1 seconds of overall delay. The delay increases during the PM peak hours is below the allowable threshold of 2 seconds.

   Based upon the significance criteria presented in Section 2.6, this intersection would not be significantly impacted under Near-Term Year 2027 Plus Project (Full Development) conditions and mitigation measures would not be required.

11. The intersection of Britannia Boulevard / Airway Road is projected to operate at LOS E under Near-Term Year 2027 Plus Project (Full Development) conditions, during both the AM and PM peak hours. During the AM peak hour, the overall intersection delay is projected to increase from 30.4 seconds of delay under Near-Term Year 2027 conditions to 69.1 seconds of delay under Near-Term Year 2027 Plus Project (Full Development) conditions, resulting in a net increase of 38.7 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 40.3 seconds of delay under Near-Term Year 2027 conditions to 76.8 seconds of delay under Near-Term Year 2027 Plus Project (Full Development) conditions, resulting in a net increase of 36.5 seconds of overall delay. The delay increases during both the AM and PM peak hours are above the allowable threshold of 2 seconds.

    Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Near-Term Year 2027 Plus Project (Full Development) conditions and mitigation measures would be required.

13. The intersection of La Media Road / Otay Mesa Road is projected to operate at LOS F under Near-Term Year 2027 Plus Project (Full Development) conditions, during both the AM and PM peak hour. During the AM peak hour, the overall intersection delay is projected to remain at 346.0 seconds under Near-Term Year 2027 Plus Project (Full Development) conditions. During the PM peak hour, the overall intersection delay is projected to decrease from 499.8 seconds of delay under Near-Term Year 2027 conditions to 499.3 seconds of delay under Near-Term Year 2027 Plus Project (Full Development) conditions, resulting in a net decrease of 0.5 seconds of overall delay.

    Based upon the significance criteria presented in Section 2.6, this intersection would not be significantly impacted under Near-Term Year 2027 Plus Project (Full Development) conditions and mitigation measures would not be required.

As described above, one (1) of the four intersections anticipated to operate at a LOS less than D would have a direct and significant impact caused by the full development of the proposed project.

Freeway Segment Analysis

Table 9.3 displays freeway segment level of service results for the study area freeway mainline facilities under Near-Term Year 2027 Plus Project (Full Development) conditions. The freeway segment level of service analysis was performed utilizing the methodology presented in Section 2.5.

As shown in Table 9.3, all of the freeway segments operate at acceptable LOS C or better.

TABLE 9.3
FREEWAY SEGMENT ANALYSIS
NEAR-TERM YEAR 2027 PLUS PROJECT (FULL DEVELOPMENT) 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		
SR-905	I-805 and Caliente Avenue	115,400	EB	4M	9,400	66.2%	7.6%	11.9%	6,140	0.650	C	AM	0.630	C	0.020	No
			WB	3M+1A	8,460	58.8%	9.0%	11.9%	6,450	0.760	C	PM	0.740	C	0.020	No
	Caliente Avenue and Heritage Road	94,800	EB	3M	7,050	66.2%	7.6%	11.9%	2,460	0.350	A	AM	0.330	A	0.020	No
			WB	3M	7,050	58.8%	9.0%	11.9%	1,710	0.240	A	PM	0.230	A	0.010	No
	Heritage Road and Britannia Boulevard	94,800	EB	3M	7,050	66.2%	7.6%	11.9%	1,220	0.170	A	AM	0.160	A	0.010	No
			WB	3M	7,050	58.8%	9.0%	11.9%	1,020	0.140	A	PM	0.140	A	0.000	No

Source: Chen Ryan Associates; February 2019

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.

9.3 Recommended Mitigation Measures

This section identifies required mitigation measures for roadway, intersection, and freeway facilities that are associated with the Otay Mesa Lumina Project under Near-Term Year 2027 Plus Project (Full Development) conditions. ADT threshold, facility mitigation measures trigger identification, as well as associated worksheets are provided in **Appendix O**.

Table 9.4 displays level of service analysis results both before and after implementation of the recommended mitigation measures at the impacted roadway segments under Near-Term Year 2027 Plus Project (Full Development) conditions.

Roadway Segments

- *Airway Road, between Cactus Road and Britannia Boulevard* – The Project shall widen this roadway segment from a 4-Lane Collector to a 4-Lane Collector with a continuous left-turn lane prior to the project's **total trip generation** of 11,258 ADT. This cross-section is within 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 this mitigation measure is consistent with the OMCPU EIR at buildout of the OMCPU. As shown in Table 9.4, this segment would operate at LOS C with the recommended mitigation measure under Near-Term Year 2027 Plus Project (Full Development) conditions.

TABLE 9.4
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2027 PLUS PROJECT (FULL DEVELOPMENT) CONDITIONS – WITH MITIGATION MEASURES

Roadway	Segment	Before Mitigation measures			After Mitigation measures		
		ADT	Cross Section	LOS	ADT	Functional Classification	LOS
Airway Road	Cactus Road to Britannia Boulevard	18,120	4-Ln	**F**	18,120	4-Ln Collector w/ CLTL	C

Source: Chen Ryan Associates; February 2019

Notes:
Bold letter indicates substandard LOS.
RM = Raised Median.

As shown in Table 9.4, the impacted roadway segment would operate at an acceptable LOS C with implementation of the recommended mitigation measure.

Intersections

Table 9.5 displays level of service analysis results both before and after implementation of the recommended mitigation measures at the impacted intersections under Near-Term Year 2027 Plus Project (Full Development) conditions.

Mitigation measures associated with Full Development of the Otay Mesa Lumina project would be required at the following intersections:

11. *Britannia Boulevard / Airway Road* - The Project shall widen the eastbound approach (Airway Road) of this intersection to accommodate dual left-turn lanes and a through lane with a shared right-turn lane, widen the southbound approach (Britannia Boulevard) to accommodate an exclusive left-turn lane, two through lanes, two exclusive right-turn lanes with right-turn overlap phasing, and stripe an exclusive left-turn lane at the westbound approach (Airway Road) and add right-turn overlap phasing, prior to the project's **total trip generation** of 9,026 ADT. These recommended mitigation measures are consistent with the intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 9.5, this intersection would operate at LOS D during both peak hours with the recommended mitigation measures under Near-Term Year 2027 Plus Project (Full Development) conditions.

TABLE 9.5
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
NEAR-TERM YEAR 2027 PLUS PROJECT (FULL DEVELOPMENT) CONDITIONS – WITH MITIGATION MEASURES

ID	Intersection	Control Type	Before Mitigation measures				After Mitigation measures			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
			Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS
11	Britannia Boulevard / Airway Road	Signalized	69.1	**E**	76.8	**E**	38.7	D	54.4	D

Source: Chen Ryan Associates; February 2019

Notes:
Bold letter indicates substandard LOS.

As shown in Table 9.5, all of the intersections would operate at an acceptable LOS D with implementation of the recommended mitigation measures.

Freeway Segments

No significant impacts were identified at any of the analyzed freeway segments.

10.0 Buildout of Community Plan Traffic Conditions

This section provides an analysis of the buildout of the Otay Mesa Community Plan traffic conditions without the Otay Mesa Lumina project. Note that the Central Village Specific Plan land uses were used to replace those in the Community Plan Update. The scenario analyzed in this section is:

- Buildout of Community Plan Conditions.

10.1 Buildout of Community Plan Roadway Network and Traffic Volumes

Buildout of the Community Plan analysis assumes full buildout of the planned land uses as well as the transportation network as identified in the Otay Mesa Community Plan. Note that the Central Village Specific Plan land uses were used to replace those in the Community Plan Update.

Buildout of Community Plan traffic volumes were derived by the following procedure:

- Step #1 - Trip generation update to reflect the approved (April 2017) Otay Mesa Central Village Specific Plan land uses by subtracting the difference in trip generation between land uses in the OMCPU and Central Village Specific Plan.

- Step #2 – Distribute and assignment traffic volumes from Step #1 using the Buildout of Community Plan trip distribution patterns, as shown in Figures 3-4.

- Step #3 – Adjust Buildout of Community Plan traffic volume (ADT and peak hour) by subtracting Step #2 traffic volumes from the OMCPU EIR traffic volumes.

- Step #4 – Develop Buildout of Community Plan without the Lumina project traffic by subtracting the Lumina project trip assignment, as shown in Figures 3-9 and 3-10 from traffic volumes from Step #3.

Roadway geometrics under the Buildout of Community Plan traffic conditions are displayed in **Figure 10-1**. Intersection geometrics under Buildout of Community Plan conditions are displayed in **Figure 10-2**. **Figure 10-3** displays daily roadway and freeway traffic volumes, while **Figure 10-4** displays intersection peak hour traffic volumes.

10.2 Buildout of Community Plan Traffic Conditions

LOS analyses for the Buildout of Community Plan traffic conditions were conducted using the methodologies described in Chapter 2.0. Roadway segment, intersection, and freeway segment level of service analysis results for Buildout of Community Plan traffic conditions are discussed separately below.

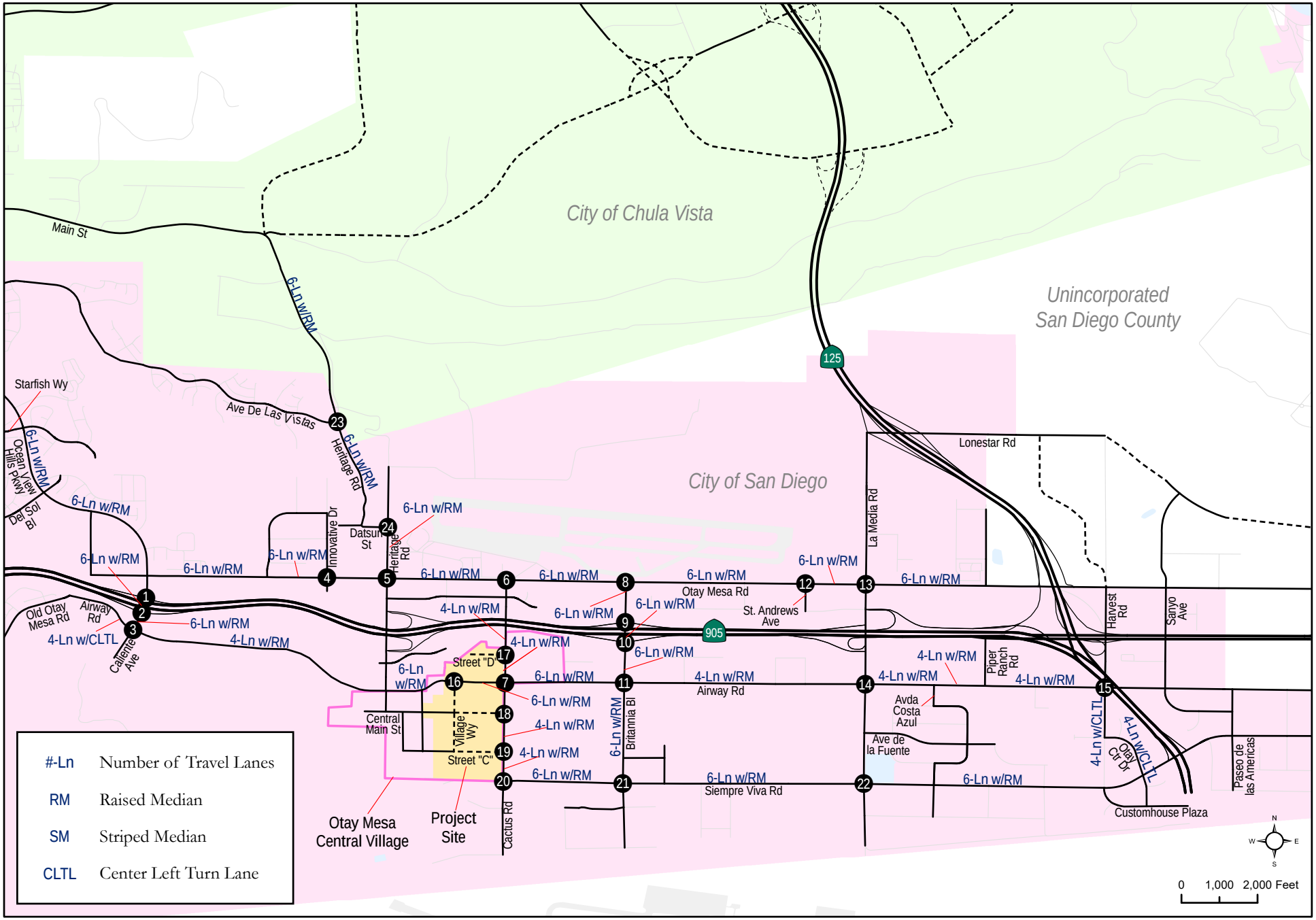

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Figure 10-1
Roadway Geometrics - Buildout of Community Plan Traffic Conditions

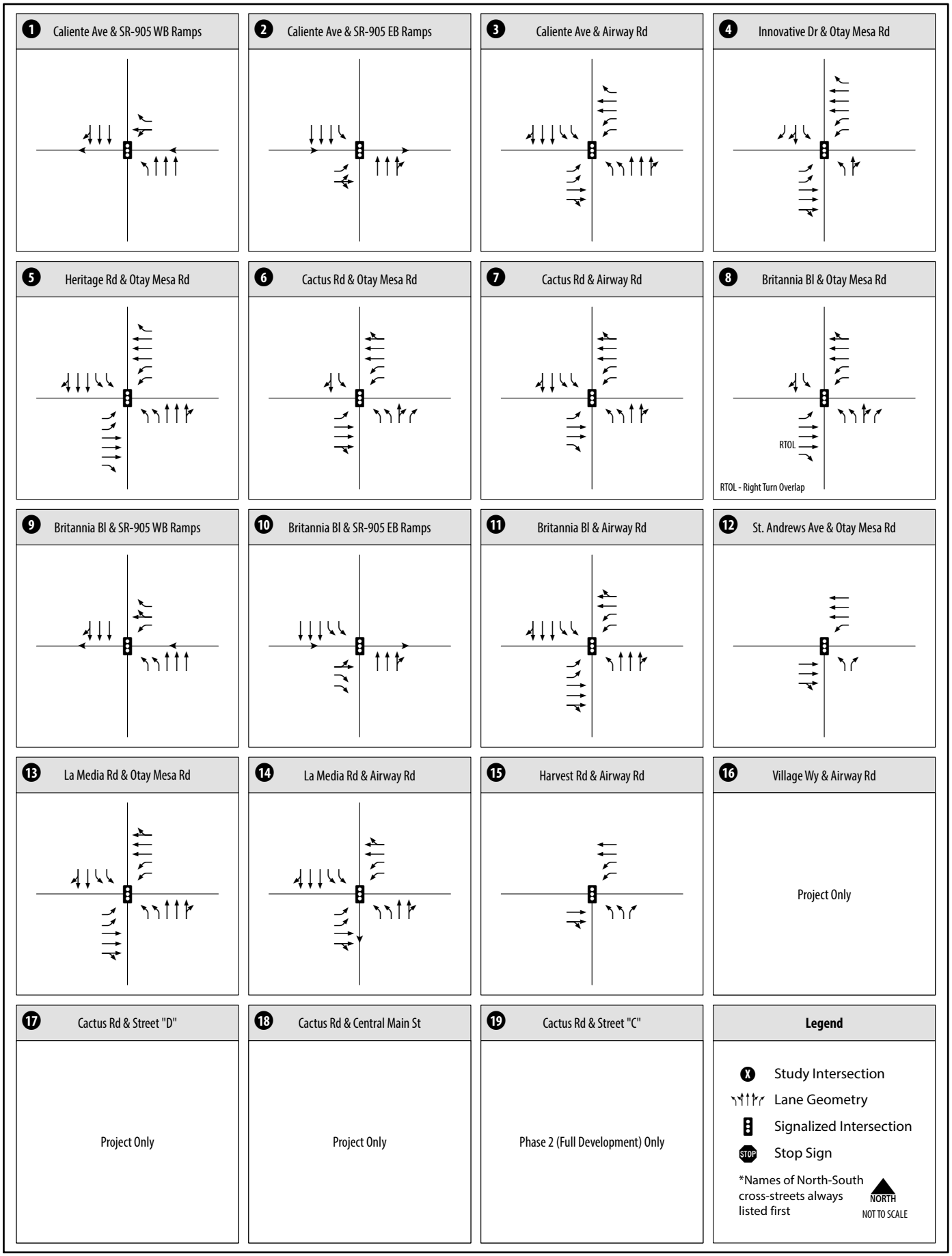

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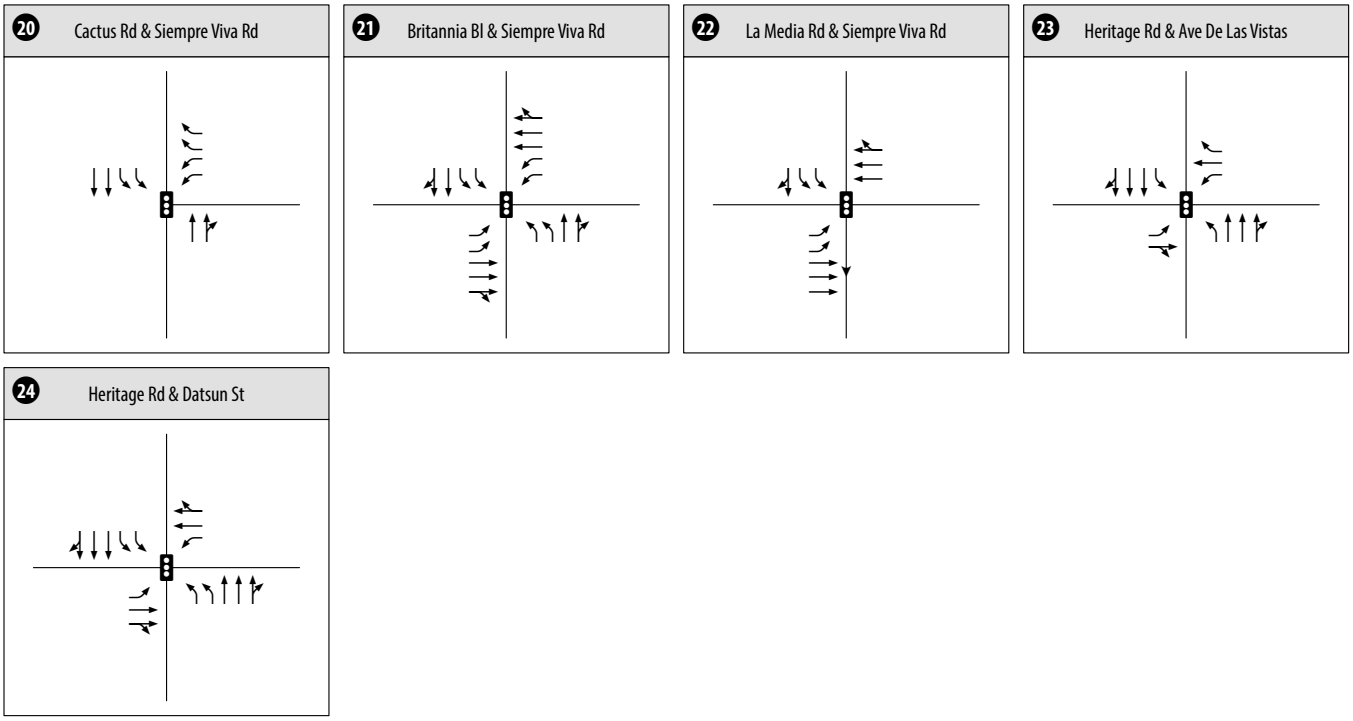
Figure 10-2
Intersection Geometrics - Buildout of Community Plan Traffic Conditions (Intersections 1-19)



Legend

- Study Intersection
- Lane Geometry
- Signalized Intersection
- Stop Sign

*Names of North-South cross-streets always listed first

NORTH
NOT TO SCALE

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Figure 10-2
Intersection Geometrics - Buildout of Community Plan Traffic Conditions (Intersections 20-24)

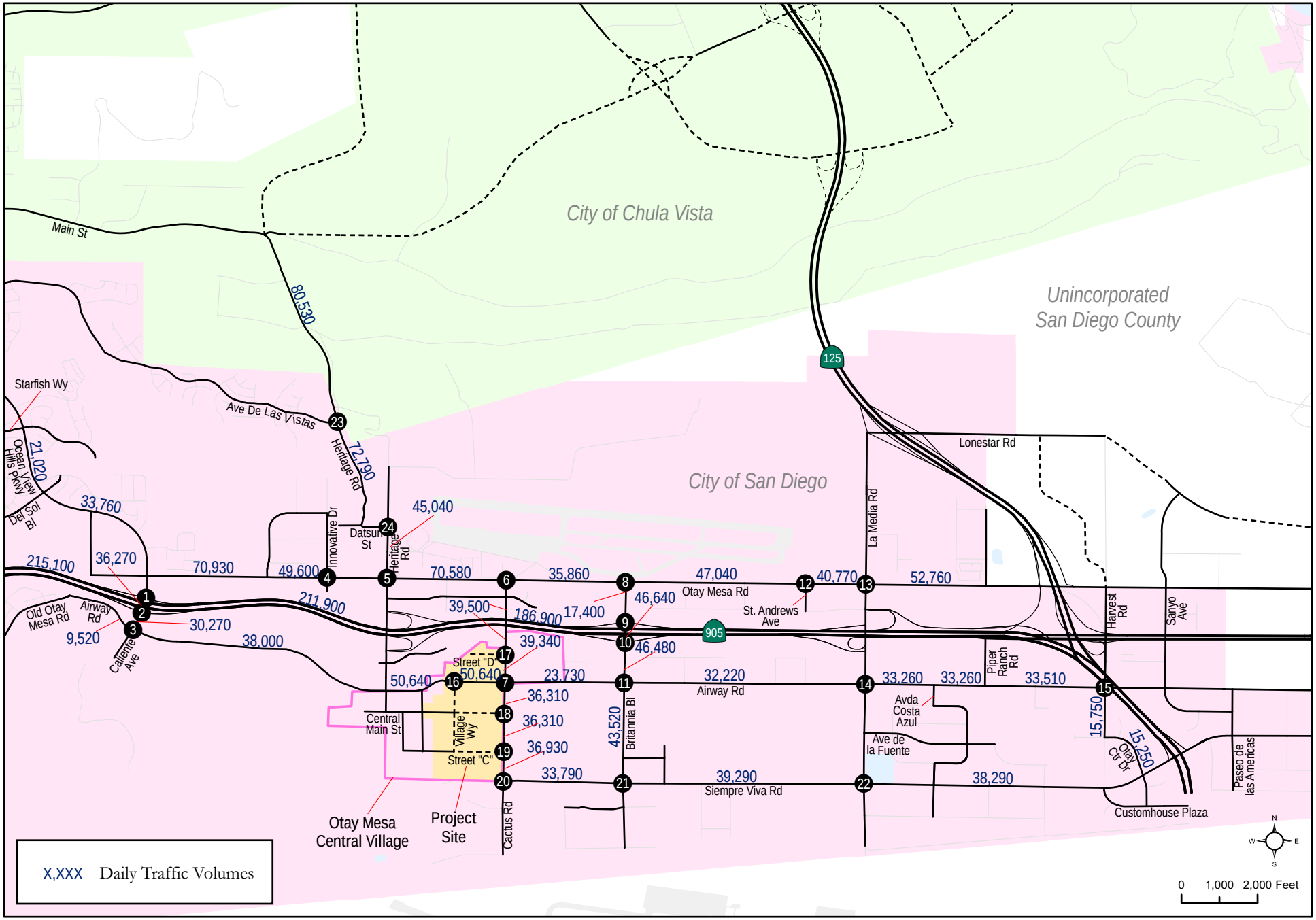

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Figure 10-3
Roadway ADT - Buildout of Community Plan Traffic Conditions

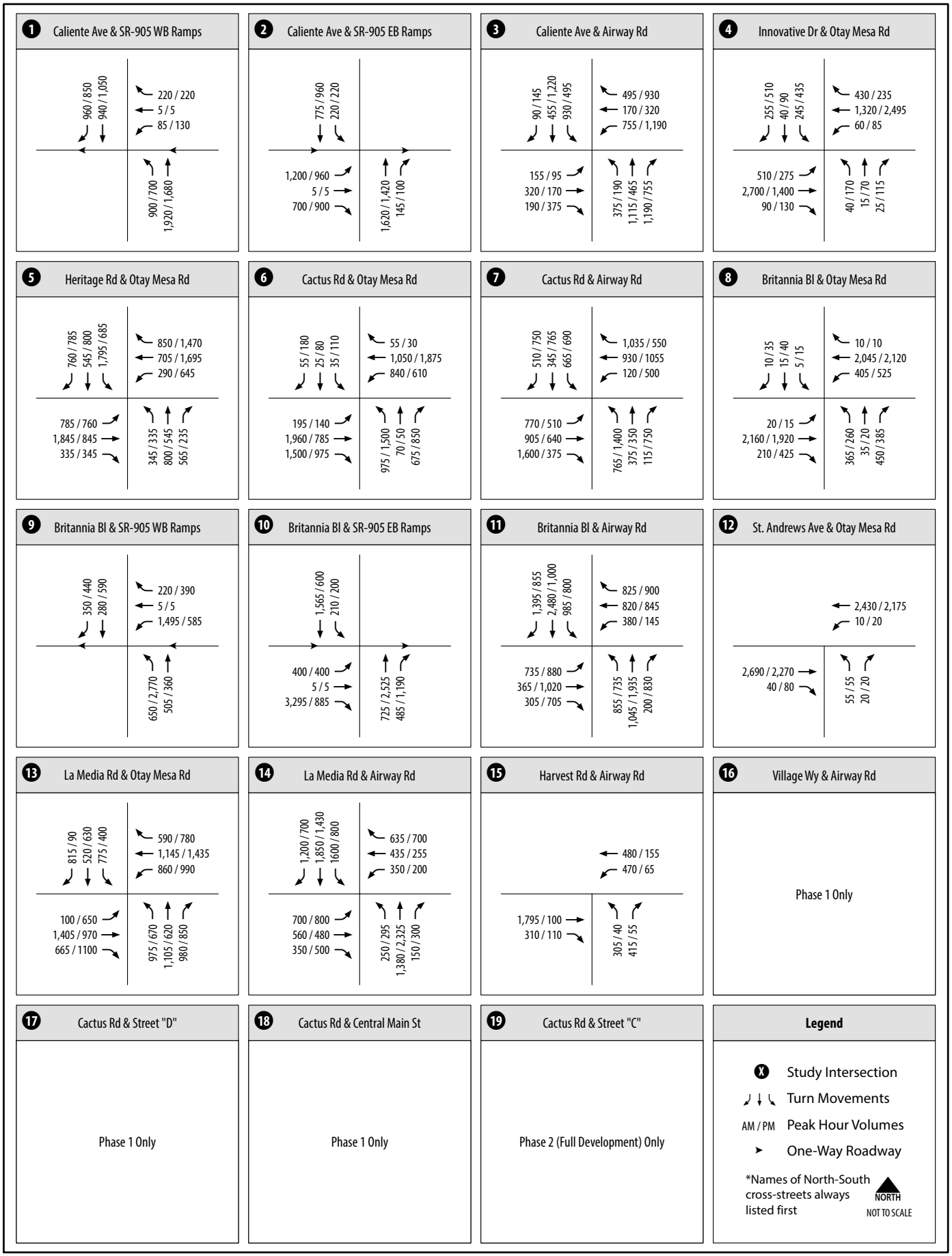

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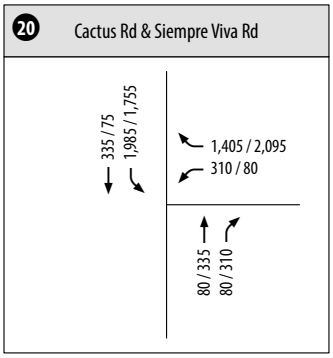
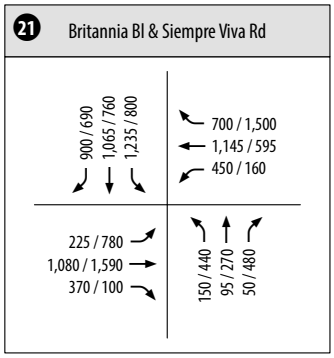
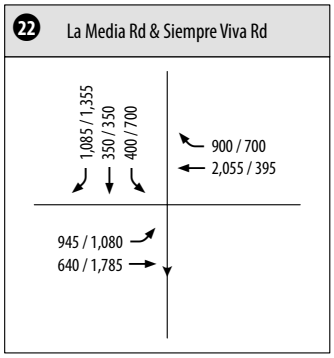
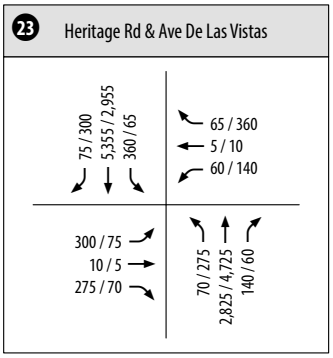
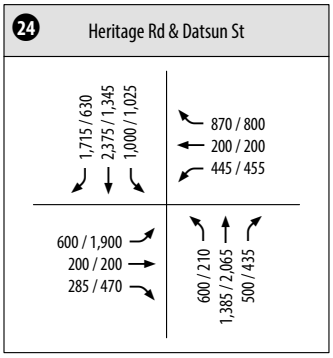
Figure 10-4
AM/PM Peak Hour Intersection Volumes - Buildout of Community Plan Traffic Conditions (Intersections 1-19)











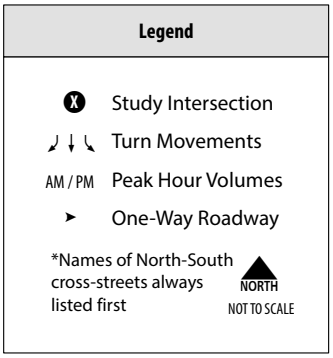


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Figure 10-4
AM/PM Peak Hour Intersection Volumes - Buildout of Community Plan Traffic Conditions (Intersections 20-24)

Roadway Segment Analysis

Table 10.1 displays the Level of Service analysis results for key roadway segments located in the City of San Diego under Buildout of Community Plan traffic conditions.

TABLE 10.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
BUILDOUT OF COMMUNITY PLAN CONDITIONS – CITY OF SAN DIEGO

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
Ocean View Hills Parkway	Starfish Way	Del Sol Boulevard	6-Ln Major Arterial	6-Ln w / RM	21,020	50,000	0.420	B
	Del Sol Boulevard	Otay Mesa Road	6-Ln Major Arterial	6-Ln w / RM	33,760	50,000	0.675	C
Caliente Avenue	SR-905 EB Ramps	Airway Road	6-Ln Prime Arterial	6-Ln w / RM	36,270	60,000	0.605	C
	Airway Road	Southern Terminus	6-Ln Prime Arterial	6-Ln w / RM	30,270	60,000	0.505	B
Heritage Road	Avenida De Las Vistas	Datsun Street	6-Ln Prime Arterial	6-Ln w / RM	72,790	10,000	1.213	**F**
	Datsun Street	Otay Mesa Road	6-Ln Prime Arterial	6-Ln w / RM	45,040	15,000	0.751	C
Cactus Road	SR-905	Street "D"	4-Ln Major Arterial	4-Ln w / RM	39,500	40,000	0.988	**E**
	Street "D"	Airway Road	4-Ln Major Arterial	4-Ln w / RM	39,340	40,000	0.984	**E**
	Airway Road	Central Main Street	4-Ln Major Arterial	4-Ln w / RM	36,310	40,000	0.908	**E**
	Central Main Street	Street "C"	4-Ln Major Arterial	4-Ln w / RM	36,310	40,000	0.908	**E**
	Street "C"	Siempre Viva Road	4-Ln Major Arterial	4-Ln w / RM	36,930	40,000	0.923	**E**
Britannia Boulevard	Otay Mesa Road	SR-905 WB Ramps	6-Ln Prime Arterial	6-Ln w/ RM	17,400	60,000	0.290	A
	SR-905 WB Ramps	SR-905 EB Ramps	6-Ln Prime Arterial	6-Ln w/ RM	46,640	60,000	0.777	C
	SR-905 EB Ramps	Airway Road	6-Ln Prime Arterial	6-Ln w/ RM	46,480	60,000	0.775	C
	Airway Road	Siempre Viva Road	6-Ln Major Arterial	6-Ln w/ RM	43,520	50,000	0.870	D

TABLE 10.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
BUILDOUT OF COMMUNITY PLAN CONDITIONS – CITY OF SAN DIEGO

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
Harvest Road	Airway Road	Otay Center Drive	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w/ CLTL	15,750	30,000	0.525	C
Otay Center Drive	Harvest Road	Siempre Viva Road	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w/ CLTL	15,250	30,000	0.508	C
Otay Mesa Road	Ocean View Hills Parkway	Corporate Center Drive	6-Ln Prime Arterial	6-Ln w / RM	70,930	60,000	1.182	**F**
	Corporate Center Drive	Heritage Road	6-Ln Prime Arterial	6-Ln w / RM	49,600	60,000	0.827	C
	Heritage Road	Cactus Road	6-Ln Prime Arterial	6-Ln w / RM	70,580	60,000	1.176	**F**
	Cactus Road	Britannia Boulevard	6-Ln Prime Arterial	6-Ln w / RM	35,860	60,000	0.598	C
	Britannia Boulevard	Saint Andrews Avenue	6-Ln Prime Arterial	6-Ln w / RM	47,040	60,000	0.784	C
	Saint Andrews Avenue	La Media Road	6-Ln Prime Arterial	6-Ln w / RM	40,770	60,000	0.680	C
	La Media Road	Piper Ranch Road	6-Ln Prime Arterial	6-Ln w / RM	52,760	60,000	0.879	D
Airway Road	Old Otay Mesa Road	Caliente Avenue	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w / CLTL	9,520	30,000	0.317	A
	Caliente Avenue	Heritage Road	4-Ln Major Arterial	4-Ln w / RM	38,000	40,000	0.950	**E**
	Heritage Road	Village Way	6-Ln Prime Arterial	6-Ln w / RM	50,640	60,000	0.844	D
	Village Way	Cactus Road	6-Ln Prime Arterial	6-Ln w / RM	50,640	60,000	0.844	D
	Cactus Road	Britannia Boulevard	6-Ln Major Arterial	6-Ln w / RM	23,730	50,000	0.475	B

TABLE 10.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
BUILDOUT OF COMMUNITY PLAN CONDITIONS – CITY OF SAN DIEGO

Roadway	From	To	Functional Classification	Cross-Section	ADT	Capacity (LOS E)	V/C	LOS
Airway Road	Britannia Boulevard	La Media Road	4-Ln Major Arterial	4-Ln w / RM	32,220	40,000	0.806	D
	La Media Road	Avenida Costa Azul	4-Ln Major Arterial	4-Ln w / RM	33,260	40,000	0.832	D
	Avenida Costa Azul	Piper Ranch Road	4-Ln Major Arterial	4-Ln w / RM	33,260	40,000	0.832	D
	Piper Ranch Road	Harvest Road	4-Ln Major Arterial	4-Ln w / RM	33,510	40,000	0.838	D
Siempre Viva Road	Cactus Road	Britannia Boulevard	6-Ln Prime Arterial	6-Ln w / RM	33,790	60,000	0.563	B
	Britannia Boulevard	La Media Road	6-Ln Prime Arterial	6-Ln w / RM	39,290	60,000	0.655	C
	La Media Road	Customhouse Plaza	6-Ln Prime Arterial	6-Ln w / RM	38,290	60,000	0.638	C

Source: Chen Ryan Associates; February 2019

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).

As shown in Table 10.1, all of the roadway segments located in the City of San Diego are projected to operate at acceptable LOS D or better under the Buildout traffic conditions, with the exception of the following nine (9) roadway segments:

- Heritage Road, between Avenida De Las Vistas to Datsun Street – LOS F;
- Cactus Road, between SR-905 and Street "D" – LOS E;
- Cactus Road, between Street "D" and Airway Road – LOS E;
- Cactus Road, between Airway Road and Central Main Street – LOS E;
- Cactus Road, between Central Main Street and Street "C" – LOS E;
- Cactus Road, between Street "C" and Siempre Viva Road – LOS E;
- Otay Mesa Road, between Ocean View Hills Parkway and Corporate Center Drive – LOS F;
- Otay Mesa Road, between Heritage Road and Cactus Road – LOS F; and
- Airway Road, between Caliente Avenue and Heritage Road – LOS E.

Table 10.2 displays the LOS analysis results for the key roadway segment located in the City of Chula Vista under Buildout of Community Plan traffic conditions.

TABLE 10.2
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
BUILDOUT OF COMMUNITY PLAN 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	80,530	50,000	**F**

Source: Chen Ryan Associates; February 2019

Notes:
Bold letter indicates substandard LOS.
RM = Raised Median.

As shown in Table 10.2, the roadway segment located in the City of Chula Vista is projected to operate at unacceptable LOS F under the Buildout of Community Plan traffic conditions.

Intersection Analysis

Table 10.3 displays LOS and average vehicle delay results for intersections under Buildout of Community Plan conditions. LOS calculation worksheets for the Buildout of Community Plan conditions are provided in **Appendix P**.

TABLE 10.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
BUILDOUT OF COMMUNITY PLAN CONDITIONS

ID	Intersection	Control Type	AM Peak Hour		PM Peak Hour	
			Avg. Delay (sec.)	LOS	Avg. Delay (sec.)	LOS
1	Caliente Avenue / SR-905 WB Ramps	Signalized	92.9	**F**	66.7	**E**
2	Caliente Avenue / SR-905 EB Ramps	Signalized	167.4	**F**	143.2	**F**
3	Caliente Avenue / Airway Road	Signalized	178.7	**F**	96.9	**F**
4	Innovative Drive / Otay Mesa Road	Signalized	41.4	D	100.8	**F**
5	Heritage Road / Otay Mesa Road	Signalized	411.0	**F**	336.3	**F**
6	Cactus Road / Otay Mesa Road	Signalized	359.9	**F**	211.6	**F**
7	Cactus Road / Airway Road	Signalized	164.0	**F**	290.8	**F**
8	Britannia Boulevard / Otay Mesa Road	Signalized	39.6	D	31.6	C
9	Britannia Boulevard / SR-905 WB Ramps	Signalized	203.4	**F**	334.5	**F**
10	Britannia Boulevard / SR-905 EB Ramps	Signalized	334.7	**F**	206.3	**F**
11	Britannia Boulevard / Airway Road	Signalized	510.9	**F**	379.4	**F**
12	St Andrews Avenue / Otay Mesa Road	Signalized	8.9	A	8.3	A
13	La Media Road / Otay Mesa Road	Signalized	340.7	**F**	252.0	**F**
14	La Media Road / Airway Road	Signalized	312.1	**F**	308.2	**F**
15	Harvest Road / Airway Road	Signalized	87.9	**F**	9.2	A
16	Village Way / Airway Road	Does Not Exist				
17	Cactus Road / Street "D"	Does Not Exist				
18	Cactus Road / Central Main Street	Does Not Exist				
19	Cactus Road / Street "C"	Does Not Exist				
20	Cactus Road / Siempre Viva Road	Signalized	40.5	D	219.4	**F**
21	Britannia Boulevard / Siempre Viva Road	Signalized	248.1	**F**	230.1	**F**
22	La Media Road / Siempre Viva Road	Signalized	456.5	**F**	249.9	**F**
23	Heritage Road / Avenida De Las Vistas	Signalized	318.0	**F**	256.9	**F**
24	Heritage Road / Datsun Street	Signalized	477.1	**F**	604.5	**F**

Source: Chen Ryan Associates; February 2019

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 Table 10.3, some study area intersections are projected to operate at acceptable LOS D or better during the AM and PM peak hour under Buildout of Community Plan traffic conditions, with the following eighteen (18) exceptions:

1. Caliente Avenue / SR-905 WB Ramps – LOS F during the AM peak hour and LOS E during the PM peak hour;
2. Caliente Avenue / SR-905 EB Ramps – LOS F during both the AM and PM peak hour;
3. Caliente Avenue / Airway Road – LOS F during both the AM and PM peak hour;
4. Innovative Drive / Otay Mesa Road – LOS F during the PM peak hour;
5. Heritage Road / Otay Mesa Road – LOS F during both the AM and PM peak hour;
6. Cactus Road / Otay Mesa Road – LOS F during both the AM and PM peak hour;
7. Cactus Road / Airway Road – LOS F during both the AM and PM peak hour;
9. Britannia Boulevard / SR-905 WB Ramps – LOS F during both the AM and PM peak hour;
10. Britannia Boulevard / SR-905 EB Ramps – LOS F during both the AM and PM peak hour;
11. Britannia Boulevard / Airway Road – LOS F during both the AM and PM peak hour;
13. La Media Road / Otay Mesa Road – LOS F during both the AM and PM peak hour;
14. La Media Road / Airway Road – LOS F during both the AM and PM peak hour;
15. Harvest Road / Airway Road – LOS F during the AM peak hour;
20. Cactus Road / Siempre Viva Road – LOS F during the PM peak hour;
21. Britannia Boulevard / Siempre Viva Road – LOS F during both the AM and PM peak hour;
22. La Media Road / Siempre Viva Road – LOS F during both the AM and PM peak hour;
23. Heritage Road / Avenida De Las Vistas – LOS F during both the AM and PM peak hour; and
24. Heritage Road / Datsun Street – LOS F during both the AM and PM peak hour.

Ramp Meter Analysis

Table 10.4 displays ramp meter analysis results for the study area locations under Buildout of Community Plan traffic conditions. The ramp meter analysis was performed utilizing the methodology presented in Section 2.4.

As shown in Table 10.4, none of the freeway on-ramps would experience delays under Buildout of Community Plan traffic conditions, with the exception of the following locations:

- SR-905 / Caliente Avenue WB On-ramp (AM and PM); and
- SR-905 / Britannia Blvd WB On-ramp (PM).

TABLE 10.4
BUILDOUT OF COMMUNITY PLAN - FREEWAY RAMP METERING ANALYSIS

Location	Peak Hour	Total Demand [1] (veh/hr)	SOV Demand[2]	Meter Rate [3] (veh/hr)	Excess Demand [4] (veh/hr)	Delay [5] (min)	Queue [6] (ft)
SR-905 WB On-ramp @ Caliente Ave	AM	1,865	1,865	960	905	56.56	22,625
	PM	1,555	1,555	960	595	37.19	14,875
SR-905 EB On-ramp @ Caliente Ave	AM	370	395	960	0	0	0
	PM	325	390	960	0	0	0
SR-905 WB On-ramp @ Britannia Blvd	AM	503	585	960	0	0	0
	PM	1,608	1,668	960	648	40.5	16,200
SR-905 EB On-ramp @ Britannia Blvd	AM	350	353	960	0	0	0
	PM	698	703	960	0	0	0

Source: Chen Ryan Associates, February 2019.

Notes:
SOV = Single Occupancy Vehicle
[1] Total Demand is the peak hour demand for both SOV and HOV lanes expected to use the on-ramp.
[2] SOV Demand = (Total Demand) – (HOV Demand).
[3] Meter Rate is the peak hour capacity expected to be processed through the ramp meter per lane. This value was obtained from Caltrans. The average between the "high" and "low" meter rate was used for this analysis.
[4] Excess Demand = (Demand) – (Meter Rate) or zero, whichever is greater.
[5] Delay = (Excess Demand / Meter Rate) X 60 min/hr.
[6] Queue = (Excess Demand) X 25 ft/veh per OM CPU. SOV volumes were used in the calculation of Queue. A zero represents no excess queue.

Freeway Segment Analysis

Table 10.5 displays freeway segment level of service results for the study area freeway mainline facilities under Buildout of Community Plan traffic conditions. The freeway segment level of service analysis was performed utilizing the methodology presented in Section 2.5.

As shown in Table 10.5, all of the freeway segments would operate at acceptable LOS D or better under Buildout of Community Plan traffic conditions, with the exception of the following freeway segments:

- SR-905 EB, between I-805 and Caliente Avenue – LOS F; and
- SR-905 WB, between I-805 and Caliente Avenue – LOS F.

TABLE 10.5
FREEWAY SEGMENT ANALYSIS
BUILDOUT OF COMMUNITY PLAN CONDITIONS

Freeway	Segment	ADT	Direction	# of Lanes	Capacity[a]	D[b]	K[c]	HVF[d]	Peak Hour Volume	V/C	LOS[f]	Peak Hour
SR-905	I-805 and Caliente Avenue	215,100	EB	4M	9,400	7.6%	66.2%	11.9%	11,400	1.213	**F**	AM
			WB	3M+1A	8,460	9.0%	58.8%	11.9%	12,000	1.418	**F**	PM
	Caliente Avenue and Heritage Road	211,900	EB	3M	7,050	7.6%	66.2%	11.9%	5,500	0.780	C	AM
			WB	3M	7,050	9.0%	58.8%	11.9%	3,800	0.539	B	PM
	Heritage Road and Britannia Boulevard	186,900	EB	3M	7,050	7.6%	66.2%	11.9%	2,400	0.340	A	AM
			WB	3M	7,050	9.0%	58.8%	11.9%	2,000	0.284	A	PM

Source: Chen Ryan Associates; February 2019

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.

11.0 Buildout of Community Plan Plus Project (Full Development)

This section provides an analysis of the Buildout of the Community Plan Plus Project (Full Development) cumulative traffic conditions with the Otay Mesa Lumina project. The scenario analyzed in this section is:

- Buildout of Community Plan Plus Project (Full Development).

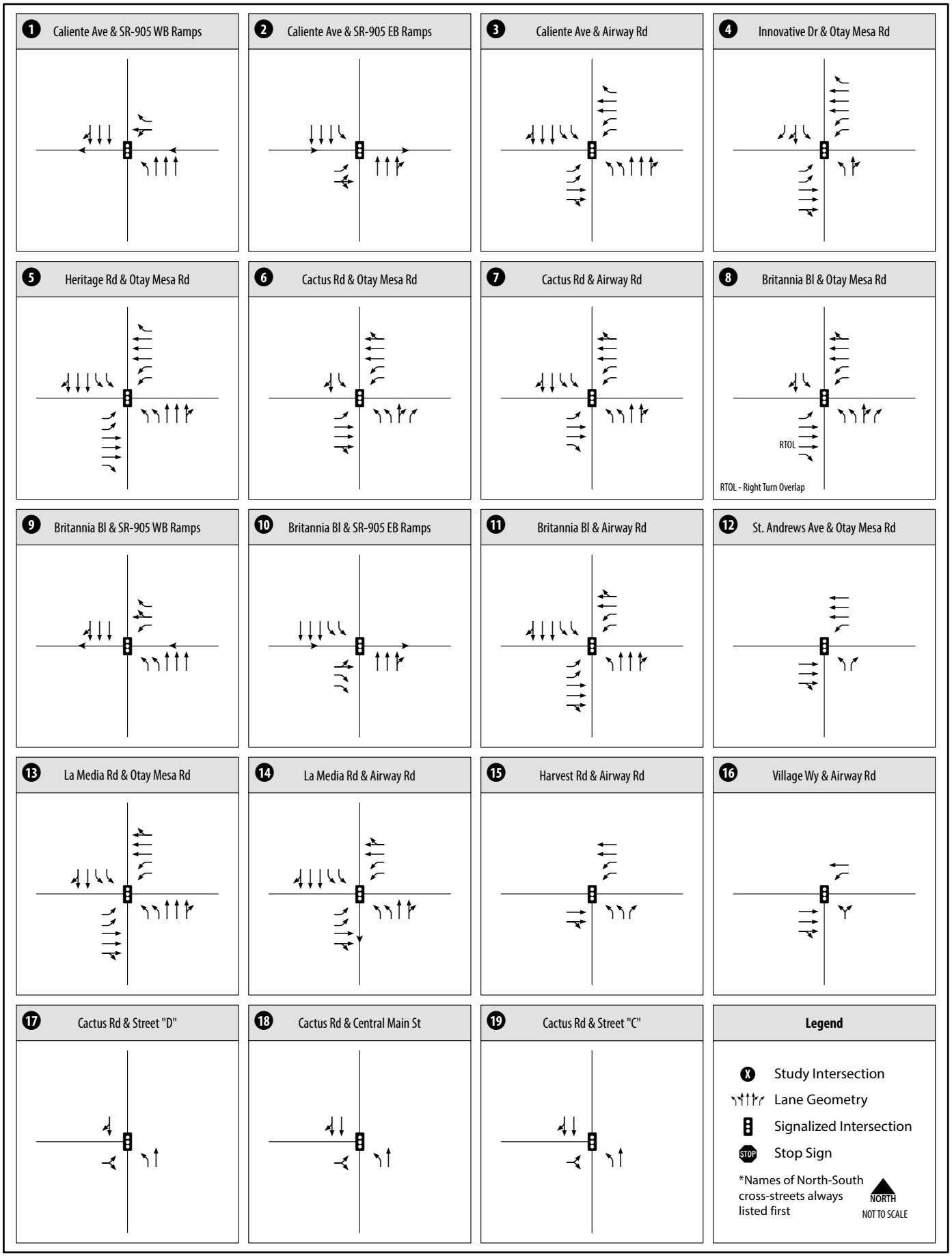
11.1 Buildout of Community Plan Plus Project (Full Development) Roadway Network and Traffic Volumes

Roadway geometrics under Buildout of Community Plan Plus Project conditions were assumed to be identical to Buildout of Community Plan conditions geometrics, as shown in Figures 10-1. Intersection geometrics under Buildout of Community Plan Plus Project conditions are shown in **Figure 11-1**.

Buildout of Community Plan Plus Project (Full Development) traffic volumes were derived by combining the Buildout of Community Plan traffic volumes (displayed in Figures 10-2 and 10-3) and the project trip assignment volumes (displayed in Figures 3-9 and 3-10). Daily roadway volumes for this scenario are displayed in **Figure 11-2** while **Figure 11-3** displays intersection peak hour traffic volumes.

11.2 Buildout of Community Plan Plus Project (Full Development) Traffic Conditions

Analyses were conducted using the methodologies described in Chapter 2.0. Roadway segment, intersection, and freeway segment level of service analyses results are discussed in the following sections.



Otay Mesa Lumina
Transportation Impact Study

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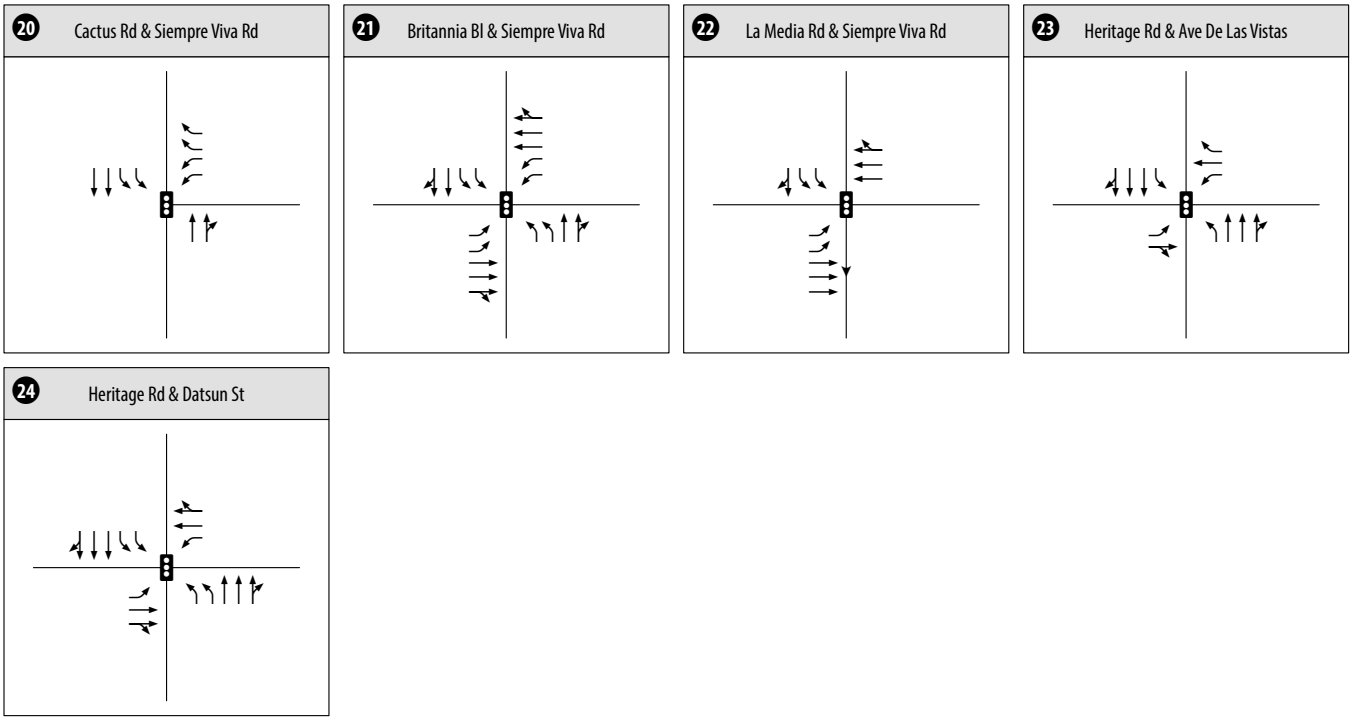
Figure 11-1
Intersection Geometrics - Buildout of Community Plan Plus Project (Full Development) Conditions (Intersections 1-19)



Legend

- Study Intersection
- Lane Geometry
- Signalized Intersection
- Stop Sign

*Names of North-South cross-streets always listed first

NORTH

NOT TO SCALE

Otay Mesa Lumina
Transportation Impact Study

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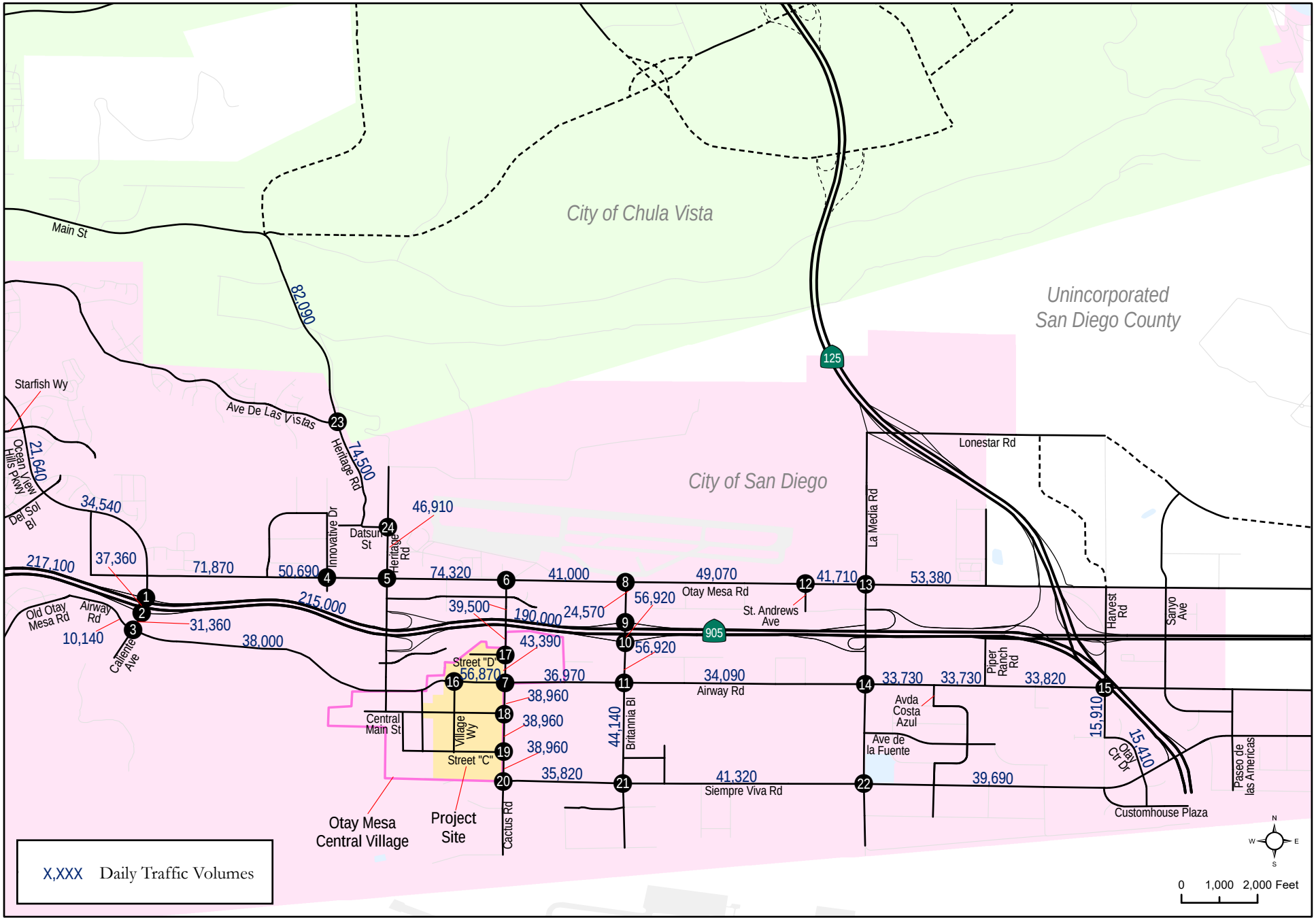
Figure 11-1
Intersection Geometrics - Buildout of Community Plan Plus Project (Full Development) Conditions (Intersections 20-24)



Otay Mesa Lumina
Transportation Impact Study

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Figure 11-2
Roadway ADT - Buildout of Community Plan Plus Project (Full Development) Conditions

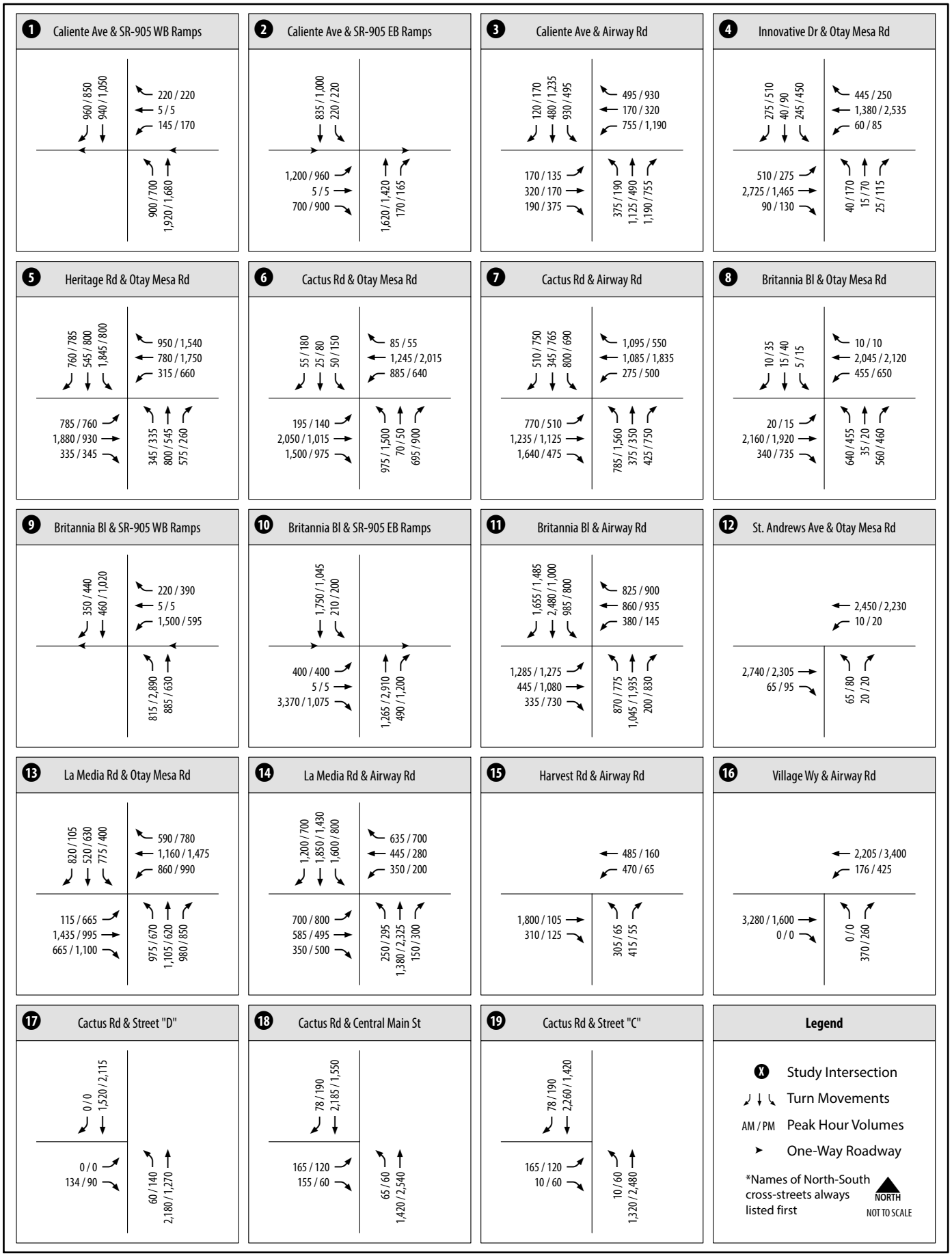

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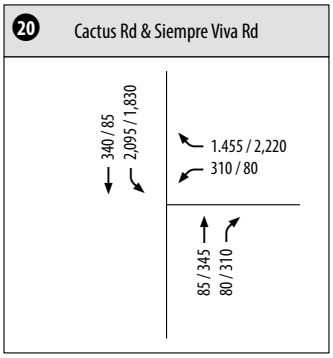
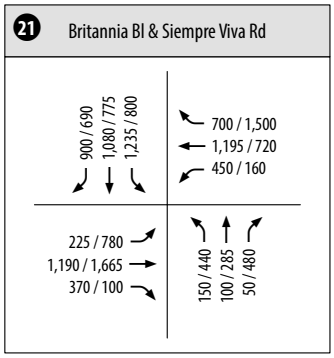
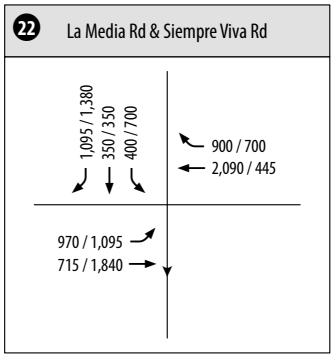
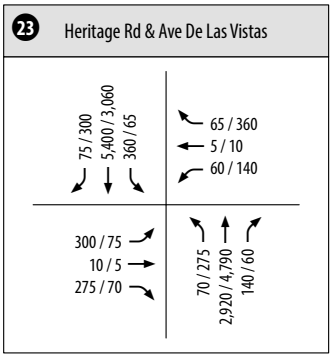
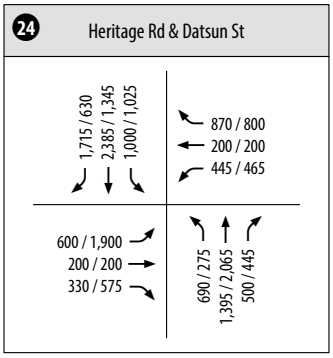
Figure 11-3
AM/PM Peak Hour Intersection Volumes - Buildout of Community Plan Plus Project Conditions (Intersections 1-19)











Legend

- Study Intersection
- Turn Movements
- AM / PM Peak Hour Volumes
- One-Way Roadway

*Names of North-South cross-streets always listed first

NORTH
NOT TO SCALE

Otay Mesa Lumina
Transportation Impact Study

CHEN RYAN

Figure 11-3
AM/PM Peak Hour Intersection Volumes - Buildout of Community Plan Plus Project Conditions (Intersections 20-24)

Roadway Segment Analysis

Table 11.1 displays the Level of Service analysis results for key roadway segments located within the City of San Diego under Buildout of Community Plan Plus Project (Full Development) conditions.

TABLE 11.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
BUILDOUT OF COMMUNITY PLAN PLUS PROJECT (FULL DEVELOPMENT) 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		
Ocean View Hills Parkway	Starfish Way to Del Sol Boulevard	6-Ln Major Arterial	6-Ln w/ RM	21,640	50,000	0.433	B	0.420	B	0.012	No
	Del Sol Boulevard to Otay Mesa Road	6-Ln Major Arterial	6-Ln w/ RM	34,540	50,000	0.691	C	0.675	C	0.016	No
Caliente Avenue	SR-905 WB Ramps to SR-905 EB Ramps	6-Ln Prime Arterial	6-Ln w/ RM	37,360	60,000	0.623	C	0.605	C	0.018	No
	SR-905 EB Ramps to Airway Road	6-Ln Prime Arterial	6-Ln w/ RM	31,360	60,000	0.523	B	0.505	B	0.018	No
Heritage Road	Avenida De Las Vistas to Datsun Street	6-Ln Prime Arterial	6-Ln w/ RM	74,500	60,000	1.242	**F**	1.213	**F**	0.029	**Yes**
	Datsun Street to Otay Mesa Road	6-Ln Prime Arterial	6-Ln w/ RM	46,910	60,000	0.782	C	0.751	C	0.031	No
Cactus Road	SR-905 to Street "D"	2-Ln Collector w/Commercial Fronting	2-Ln	39,500	40,000	0.988	**E**	0.988	**E**	0.000	No
	Street "D" to Airway Road	4-Ln Major Arterial	4-Ln w/ RM	43,390	40,000	1.085	**F**	0.984	**E**	0.101	**Yes**
	Airway Road to Central Main Street	4-Ln Major Arterial	4-Ln w/ RM	38,960	40,000	0.974	**E**	0.908	**E**	0.066	**Yes**

TABLE 11.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
BUILDOUT OF COMMUNITY PLAN PLUS PROJECT (FULL DEVELOPMENT) 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		
Cactus Road	Central Main Street to Street "C"	4-Ln Major Arterial	4-Ln w/ RM	38,960	40,000	0.974	**E**	0.908	**E**	0.066	**Yes**
	Street "C" to Siempre Viva Road	4-Ln Major Arterial	4-Ln w/ RM	38,960	40,000	0.974	**E**	0.923	**E**	0.051	**Yes**
Britannia Boulevard	Otay Mesa Road to SR-905 WB Ramps	6-Ln Prime Arterial	6-Ln w/ RM	24,570	60,000	0.410	A	0.290	A	0.120	No
	SR-905 WB Ramps to SR-905 EB Ramps	6-Ln Prime Arterial	6-Ln w/ RM	56,920	60,000	0.949	**E**	0.777	C	0.171	**Yes**
	SR-905 EB Ramps to Airway Road	6-Ln Prime Arterial	6-Ln w/ RM	56,920	60,000	0.949	**E**	0.775	C	0.174	**Yes**
	Airway Road to Siempre Viva Road	6-Ln Major Arterial	6-Ln w/ RM	44,140	50,000	0.883	D	0.870	D	0.012	No
Harvest Road	Airway Road to Otay Center Drive	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w/ CLTL	15,910	30,000	0.530	C	0.525	C	0.005	No
Otay Center Drive	Harvest Road to Siempre Viva Road	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w/ CLTL	15,410	30,000	0.514	C	0.508	C	0.005	No
Otay Mesa Road	Ocean View Hills Parkway to Corporate Center Drive	6-Ln Prime Arterial	6-Ln w/ RM	71,870	60,000	1.198	**F**	1.182	**F**	0.016	**Yes**
	Corporate Center Drive to Heritage Road	6-Ln Prime Arterial	6-Ln w/ RM	50,690	60,000	0.845	D	0.827	C	0.018	No
	Heritage Road to Cactus Road	6-Ln Prime Arterial	6-Ln w/ RM	74,320	60,000	1.239	**F**	1.176	**F**	0.062	**Yes**

TABLE 11.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
BUILDOUT OF COMMUNITY PLAN PLUS PROJECT (FULL DEVELOPMENT) 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	Cactus Road to Britannia Boulevard	6-Ln Prime Arterial	6-Ln w/ RM	41,000	60,000	0.683	C	0.598	B	0.086	No
	Britannia Boulevard to Saint Andrews Avenue	6-Ln Prime Arterial	6-Ln w/ RM	49,070	60,000	0.818	C	0.784	C	0.034	No
	Saint Andrews Avenue to La Media Road	6-Ln Prime Arterial	6-Ln w/ RM	41,710	60,000	0.695	C	0.680	C	0.015	No
	La Media Road to Piper Ranch Road	6-Ln Prime Arterial	6-Ln w/ RM	53,380	60,000	0.890	D	0.879	D	0.011	No
Airway Road	Old Otay Mesa Road to Caliente Avenue	4-Ln w/ Continuous-Left-Turn-Lane	4-Ln w/ CLTL	10,140	30,000	0.338	B	0.317	A	0.021	No
	Caliente Avenue to Heritage Road	4-Ln Major Arterial	4-Ln w/ RM	38,000	40,000	0.950	**E**	0.950	**E**	0.000	No
	Heritage Road to Village Way	6-Ln Prime Arterial	6-Ln w/ RM	56,770	60,000	0.948	**E**	0.844	D	0.104	**Yes**
	Village Way to Cactus Road	6-Ln Prime Arterial	6-Ln w/ RM	56,870	60,000	0.948	**E**	0.844	D	0.104	**Yes**
	Cactus Road to Britannia Boulevard	6-Ln Major Arterial	6-Ln w/ RM	36,970	50,000	0.739	C	0.475	B	0.265	No
	Britannia Boulevard to La Media Road	4-Ln Major Arterial	4-Ln w/ RM	34,090	40,000	0.852	D	0.806	D	0.047	No
	La Media Road to Avenida Costa Azul	4-Ln Major Arterial	4-Ln w/ RM	33,730	40,000	0.843	D	0.832	D	0.012	No

TABLE 11.1
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
BUILDOUT OF COMMUNITY PLAN PLUS PROJECT (FULL DEVELOPMENT) 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	33,730	40,000	0.843	D	0.832	D	0.012	No
	Piper Ranch Road to Harvest Road	4-Ln Major Arterial	4-Ln w/ RM	33,820	40,000	0.846	D	0.838	D	0.008	No
Siempre Viva Road	Cactus Road to Britannia Boulevard	6-Ln Prime Arterial	6-Ln w/ RM	35,820	60,000	0.597	C	0.563	B	0.034	No
	Britannia Boulevard to La Media Road	6-Ln Prime Arterial	6-Ln w/ RM	41,320	60,000	0.689	C	0.655	C	0.034	No
	La Media Road to Customhouse Plaza	6-Ln Prime Arterial	6-Ln w/ RM	39,690	60,000	0.662	C	0.638	C	0.023	No

Source: Chen Ryan Associates; February 2019

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?

As shown in Table 11.1, 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 Buildout of Community Plan Plus Project (Full Development) conditions, with the following thirteen (13) exceptions:

- Heritage Road, between Avenida De Las Vistas and 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 1.213 under Buildout of Community Plan conditions to 1.242 under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 0.029. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

  Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

- Cactus Road, between SR-905 and Street "D" is projected to operate at substandard LOS F. However, the proposed project is not anticipated to add trips to this roadway segment.

  Based upon the significance criteria presented in Section 2.6, this roadway segment would not be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would not be required.

- Cactus Road, between Street "D" and 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 0.984 under Buildout of Community Plan conditions to 1.085 under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 0.101. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

  Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

- Cactus Road, between Airway Road and Central Main Street is projected to operate at substandard LOS E with the addition of project traffic. The volume to capacity ratio is projected to increase from 0.908 under Buildout of Community Plan conditions to 0.974 under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 0.066. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

  Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

- Cactus Road, between Central Main Street and Street "C" is projected to operate at substandard LOS E with the addition of project traffic. The volume to capacity ratio is projected to increase from 0.908 under Buildout of Community Plan conditions to 0.974 under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 0.066. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

  Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

- Cactus Road, between Street "C" and Siempre Viva 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 0.923 under Buildout of Community Plan conditions to 0.974 under Buildout of Community Plan Plus Project (Full Development) conditions, resulting

in a net increase of 0.051. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

- Britannia Boulevard, between SR-905 WB Ramps and SR-905 EB Ramps is projected to operate at substandard LOS E with the addition of project traffic. The volume to capacity ratio is projected to increase from 0.777 under Buildout of Community Plan conditions to 0.949 under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 0.171. This increase in volume to capacity ratio is above the allowable 0.02 threshold.

  Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

- 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 0.775 under Buildout of Community Plan conditions to 0.949 under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 0.174. This increase in volume to capacity ratio is above the allowable 0.02 threshold.

  Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

- Otay Mesa Road, between Ocean View Hills Parkway and Corporate Center Drive is projected to operate at substandard LOS F with the addition of project traffic. The volume to capacity ratio is projected to increase from 1.182 under Buildout of Community Plan conditions to 1.198 under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 0.016. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

  Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

- Otay Mesa Road, between Heritage Road and Cactus 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 1.176 under Buildout of Community Plan conditions to 1.239 under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 0.062. This increase in volume to capacity ratio is above the allowable 0.01 threshold.

  Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

- Airway Road, between Heritage Road and Village Way (project access) is projected to operate at substandard LOS E with the addition of project traffic. The volume to capacity ratio is projected to increase from 0.844 under Buildout of Community Plan conditions to 0.948 under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 0.104. This increase in volume to capacity ratio is above the allowable 0.02 threshold.

  Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

- Airway Road, between Village Way (project access) and Cactus 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 0.844 under Buildout of Community Plan conditions to 0.948 under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 0.104. This increase in volume to capacity ratio is above the allowable 0.02 threshold.

  Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

As described above, 11 out of the 13 deficient roadway segments would be significantly impacted by the proposed project.

Table 11.2 displays the Level of Service analysis results for key roadway segments located in the City of Chula Vista under Buildout of Community Plan Plus Project (Full Development) conditions.

TABLE 11.2
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
BUILDOUT OF COMMUNITY PLAN PLUS PROJECT (FULL DEVELOPMENT) 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	82,090	50,000	**F**	Yes	Yes	No	**Yes**

Source: Chen Ryan Associates; February 2019

Notes:
Bold letter indicates substandard LOS.
RM = Raised Median.
SI? = Significant Impact?

As shown in the Table 11.2, the study area roadway segment located in the City of Chula Vista is projected to operate at LOS F under Buildout of Community Plan Plus Project (Full Development) conditions.

Based upon the significance criteria presented in Section 2.6, this roadway segment would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required. However, this facility is under the purview of the City of Chula Vista, and no current plans exist to widen this roadway segment beyond its ultimate classification; thus, this roadway 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 roadway segment would operate at a deficient LOS F, and disclosed impacts as a significant and unavoidable in the OMCPU. The proposed Project is consistent with the findings and conclusions of the OMCPU EIR with respect to this roadway segment.

Intersection Analysis

Table 11.3 displays Level of Service and average vehicle delay results for study area intersections under Buildout of Community Plan Plus Project (Full Development) conditions. Level of Service calculation worksheets for the Buildout of Community Plan Plus Project (Full Development) conditions are provided in **Appendix P**.

TABLE 11.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
BUILDOUT OF COMMUNITY PLAN PLUS PROJECT (FULL DEVELOPMENT) 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	Caliente Avenue / SR-905 WB Ramps	Signalized	93.5	**F**	67.8	**E**	92.9 / 66.7	**F / E**	0.6 / 1.1	No
2	Caliente Avenue / SR-905 EB Ramps	Signalized	170.0	**F**	151.2	**F**	167.4 / 143.2	**F / F**	2.6 / 8.0	**Yes**
3	Caliente Avenue / Airway Road	Signalized	179.0	**F**	103.3	**F**	178.7 / 96.9	**F / F**	0.3 / 6.4	**Yes**
4	Innovative Drive / Otay Mesa Road	Signalized	42.5	D	103.1	**F**	41.4 / 100.8	D / **F**	1.1 / 2.3	**Yes**
5	Heritage Road / Otay Mesa Road	Signalized	452.8	**F**	384.7	**F**	411.0 / 336.3	**F / F**	41.8 / 48.4	**Yes**
6	Cactus Road / Otay Mesa Road	Signalized	367.5	**F**	246.1	**F**	359.9 / 211.6	**F / F**	7.6 / 34.5	**Yes**
7	Cactus Road / Airway Road	Signalized	256.5	**F**	394.1	**F**	164.0 / 290.8	**F / F**	92.5 / 103.3	**Yes**
8	Britannia Boulevard / Otay Mesa Road	Signalized	69.3	**E**	50.2	D	39.6 / 31.6	D / C	29.7 / 18.6	**Yes**
9	Britannia Boulevard / SR-905 WB Ramps	Signalized	222.2	**F**	380.7	**F**	203.4 / 334.5	**F / F**	18.8 / 46.2	**Yes**
10	Britannia Boulevard / SR-905 EB Ramps	Signalized	386.9	**F**	255.1	**F**	334.7 / 206.3	**F / F**	52.2 / 48.8	**Yes**
11	Britannia Boulevard / Airway Road	Signalized	623.6	**F**	471.7	**F**	510.9 / 379.4	**F / F**	112.7 / 92.3	**Yes**
12	St Andrews Avenue / Otay Mesa Road	Signalized	9.6	A	9.9	A	8.9 / 8.3	A / A	0.7 / 1.6	No
13	La Media Road / Otay Mesa Road	Signalized	343.6	**F**	256.4	**F**	340.7 / 252.0	**F / F**	2.9 / 4.4	**Yes**
14	La Media Road / Airway Road	Signalized	332.9	**F**	322.1	**F**	312.1 / 308.2	**F / F**	20.8 / 13.9	**Yes**
15	Harvest Road / Airway Road	Signalized	88.3	**F**	8.5	A	87.9 / 9.2	**F** / A	0.4 / -0.7	No

TABLE 11.3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
BUILDOUT OF COMMUNITY PLAN PLUS PROJECT (FULL DEVELOPMENT) 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	Village Way / Airway Road	AWSC	N/A[1]	**F**	N/A[1]	**F**	Does Not Exist			**Yes**
17	Cactus Road / Street "D"	AWSC	N/A[1]	**F**	500.3	**F**	Does Not Exist			**Yes**
18	Cactus Road / Central Main Street	AWSC	N/A[1]	**F**	N/A[1]	**F**	Does Not Exist			**Yes**
19	Cactus Road / Street "C"	AWSC	N/A[1]	**F**	N/A[1]	**F**	Does Not Exist			**Yes**
20	Cactus Road / Siempre Viva Road	Signalized	46.1	D	265.0	**F**	40.5 / 219.4	D / **F**	5.6 / 45.6	**Yes**
21	Britannia Blvd / Siempre Viva Road	Signalized	265.5	**F**	246.8	**F**	248.1 / 230.1	**F / F**	17.4 / 16.7	**Yes**
22	La Media Road / Siempre Viva Road	Signalized	462.8	**F**	257.2	**F**	456.5 / 249.9	**F / F**	6.3 / 7.3	**Yes**
23	Heritage Road / Avenida De Las Vistas	Signalized	326.4	**F**	268.3	**F**	318.0 / 256.9	**F / F**	8.4 / 11.4	**Yes**
24	Heritage Road / Datsun Street	Signalized	502.5	**F**	636.4	**F**	477.1 / 604.5	**F / F**	25.4 / 31.9	**Yes**

Source: Chen Ryan Associates; February 2019

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.
[1] Exceeds maximum reasonable calculable delay of 600 seconds per Synchro 9.0 traffic analysis software.

As shown in Table 11.3, of the 24 study intersections, only one intersection is anticipated operate at acceptable LOS D or better during both the AM and PM peak hours under Buildout of Community Plan Plus Project (Full Development) conditions. The operation of the other twenty-three (23) intersections are as follows:

1. The intersection of Caliente Avenue / SR-905 WB Ramps is projected to operate at LOS F during the AM peak hour and LOS E during the PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the AM peak hour, the overall intersection delay is projected to increase from 92.9 seconds of delay under Buildout of Community Plan conditions to 93.5 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 0.6 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 66.7 seconds of delay under Buildout of Community Plan

conditions to 67.8 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 1.1 seconds of overall delay. The delay increases during both the AM and PM peak hours do not exceed the allowable thresholds.

Based upon the significance criteria presented in Section 2.6, this intersection would not be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would not be required.

2. The intersection of Caliente Avenue / SR-905 EB Ramps is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the AM peak hour, the overall intersection delay is projected to increase from 167.4 seconds of delay under Buildout of Community Plan conditions to 170.0 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 2.6 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 143.2 seconds of delay under Buildout of Community Plan conditions to 151.2 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 8.0 seconds of overall delay. The delay increases during both the AM and PM peak hour exceed the allowable threshold.

   Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

3. The intersection of Caliente Avenue / Airway Road is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the AM peak hour, the overall intersection delay is projected to increase from 178.7 seconds of delay under Buildout of Community Plan conditions to 179.0 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 0.3 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 96.9 seconds of delay under Buildout of Community Plan conditions to 103.3 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 6.4 seconds of overall delay. The delay increase during the PM peak hour exceeds the allowable threshold.

   Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

4. The intersection of Innovative Drive / Otay Mesa Road is projected to operate at LOS F during the PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the PM peak hour, the overall intersection delay is projected to increase from 100.8 seconds of delay under Buildout of Community Plan conditions to 103.1 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 2.3 seconds of overall delay. The delay increase during the PM peak hour exceeds the allowable threshold.

   Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

5. The intersection of Heritage Road / Otay Mesa Road is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the AM peak hour, the overall intersection delay is projected to increase from 411.0 seconds of delay under Buildout of Community Plan conditions to 452.8 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 41.8 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 336.3 seconds of delay under Buildout of Community Plan conditions to 384.7 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 48.4 seconds of overall delay. The delay increases during both the AM and PM peak hours exceed the allowable threshold.

   Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

6. The intersection of Cactus Road / Otay Mesa Road is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the AM peak hour, the overall intersection delay is projected to increase from 359.9 seconds of delay under Buildout of Community Plan conditions to 367.5 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 7.6 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 211.6 seconds of delay under Buildout of Community Plan conditions to 246.1 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 34.5 seconds of overall delay. The delay increases during both the AM and PM peak hours exceed the allowable threshold.

   Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

7. The intersection of Cactus Road / Airway Road is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the AM peak hour, the overall intersection delay is projected to increase from 164.0 seconds of delay under Buildout of Community Plan conditions to 256.5 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 92.5 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 290.8 seconds of delay under Buildout of Community Plan conditions to 394.1 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 103.3 seconds of overall delay. The delay increases during both the AM and PM peak hours exceed the allowable threshold.

   Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

8. The intersection of Otay Mesa Road / Britannia Blvd is projected to operate at LOS E during the AM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the AM peak hour, the overall intersection delay is projected to increase from 39.6 seconds of delay under Buildout of Community Plan conditions to 69.3 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 29.7 seconds of overall delay. The delay increase during the AM peak hour exceeds the allowable threshold.

   Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

9. The intersection of Britannia Boulevard / SR-905 WB Ramps is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the AM peak hour, the overall intersection delay is projected to increase from 203.4 seconds of delay under Buildout of Community Plan conditions to 222.2 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 18.8 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 334.5 seconds of delay under Buildout of Community Plan conditions to 380.7 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 46.2 seconds of overall delay. The delay increases during both the AM and PM peak hours exceed the allowable threshold.

   Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

10. The intersection of Britannia Boulevard / SR-905 EB Ramps is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the AM peak hour, the overall intersection delay is projected to increase from 334.7 seconds of delay under Buildout of Community Plan conditions to 386.9 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 52.2 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 206.3 seconds of delay under Buildout of Community Plan conditions to 255.1 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 48.8 seconds of overall delay. The delay increases during both the AM and PM peak hours exceed the allowable threshold.

    Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

11. The intersection of Britannia Boulevard / Airway Road is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the AM peak hour, the overall intersection delay is projected to increase from 510.9 seconds of delay under Buildout of Community Plan conditions to 623.6 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 112.7 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 379.4 seconds of delay under Buildout of Community Plan conditions to 471.7 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 92.3 seconds of overall delay. The delay increases during both the AM and PM peak hours exceed the allowable threshold.

    Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

13. The intersection of La Media Road / Otay Mesa Road is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the AM peak hour, the overall intersection delay is projected to increase from 340.7 seconds of delay under Buildout of Community Plan conditions to 343.6 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 2.9 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 252.0 seconds of delay under Buildout of Community Plan conditions to 256.4 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 4.4 seconds of overall delay. The delay increases during both the AM and PM peak hours exceed the allowable thresholds.

Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

14. The intersection of La Media Road / Airway Road is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the AM peak hour, the overall intersection delay is projected to increase from 312.1 seconds of delay under Buildout of Community Plan conditions to 332.9 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 20.8 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 308.2 seconds of delay under Buildout of Community Plan conditions to 322.1 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 13.9 seconds of overall delay. The delay increases during both the AM and PM peak hours exceed the allowable thresholds.

    Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

15. The intersection of Harvest Road / Airway Road is projected to operate at LOS F during the AM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the AM peak hour, the overall intersection delay is projected to increase from 87.9 seconds of delay under Buildout of Community Plan conditions to 88.3 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 0.4 seconds of overall delay. The delay increase during the AM peak hour does not exceed the allowable threshold.

    Based upon the significance criteria presented in Section 2.6, this intersection would not be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would not be required.

16. The intersection of Village Way / Airway Road is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions.

    Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

17. The intersection of Cactus Road / Street “D” is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions.

    Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

18. The intersection of Cactus Road / Central Main Street is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions.

    Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

19. The intersection of Cactus Road / Central Main Street is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions.

    Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

20. The intersection of Cactus Road / Siempre Viva Road is projected to operate at LOS F during the PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the PM peak hour, the overall intersection delay is projected to increase from 219.4 seconds of delay under Buildout of Community Plan conditions to 265.0 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 45.6 seconds of overall delay. The delay increase during the PM peak hour exceeds the allowable threshold.

    Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

21. The intersection of Britannia Boulevard / Siempre Viva Road is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the AM peak hour, the overall intersection delay is projected to increase from 248.1 seconds of delay under Buildout of Community Plan conditions to 265.5 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 17.4 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 230.1 seconds of delay under Buildout of Community Plan to 246.8 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 16.7 seconds of overall delay. The delay increases during both the AM and PM peak hours exceed the allowable thresholds.

    Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

22. The intersection of La Media Road / Siempre Viva Road is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the AM peak hour, the overall intersection delay is projected to increase from 456.5 seconds of delay under Buildout of Community Plan conditions to 462.8 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 6.3 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 249.9 seconds of delay under Buildout of Community Plan conditions to 257.2 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 7.3 seconds of overall delay. The delay increases during both the AM and PM peak hours exceed the allowable thresholds.

    Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

23. The intersection of Heritage Road / Avenida De Las Vistas is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project (Full Development) conditions. During the AM peak hour, the overall intersection delay is projected to increase from 318.0 seconds of delay under Buildout of Community Plan conditions to 326.4 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 8.4 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 256.9 seconds of delay under Buildout of Community Plan conditions to 268.3 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 11.4 seconds of overall delay. The delay increases during both the AM and PM peak hours exceed the allowable threshold.

    Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

24. The intersection of Heritage Road / Datsun Street is projected to operate at LOS F during both the AM and PM peak hour under Buildout of Community Plan Plus Project conditions. During the AM peak hour, the overall intersection delay is projected to increase from 477.1 seconds of delay under Buildout of Community Plan conditions to 502.5 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 25.4 seconds of overall delay. During the PM peak hour, the overall intersection delay is projected to increase from 604.5 seconds of delay under Buildout of Community Plan conditions to 636.4 seconds of delay under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 31.9 seconds of overall delay. The delay increases during both the AM and PM peak hour exceed the allowable threshold.

Based upon the significance criteria presented in Section 2.6, this intersection would be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would be required.

As described above, 21 out of the 23 deficient intersections would be significantly impacted by the proposed project.

Ramp Meter Analysis

Table 11.4 displays ramp meter analysis results for the study area locations under Buildout of Community Plan traffic conditions. The ramp meter analysis was performed utilizing the methodology presented in Section 2.4.

TABLE 11.4
BUILDOUT OF COMMUNITY PLAN PLUS PROJECT - FREEWAY RAMP METERING ANALYSIS

Location	Peak Hour	Total Demand [1] (veh/hr)	SOV Demand[2]	Meter Rate [3] (veh/hr)	Excess Demand [4] (veh/hr)	Delay [5] (min)	Queue [6] (ft)	Delay without project (sec.)	Queue without project (ft)	Delay increase (sec.)
SR-905 WB On-ramp @ Caliente Ave	AM	1,865	1,865	960	905	56.56	22,625	56.56	22,625	0
	PM	1,555	1,555	960	595	37.19	14,875	37.19	14,875	0
SR-905 EB On-ramp @ Caliente Ave	AM	395	395	960	0	0	0	0	0	0
	PM	390	390	960	0	0	0	0	0	0
SR-905 WB On-ramp @ Britannia Blvd	AM	1,170	585	960	0	0	0	0	0	0
	PM	3,335	1,668	960	708	44.25	17,700	40.5	16,200	3.75
SR-905 EB On-ramp @ Britannia Blvd	AM	705	353	960	0	0	0	0	0	0
	PM	1,405	703	960	0	0	0	0	0	0

Source: Chen Ryan Associates, February 2019.

Notes:
SOV = Single Occupancy Vehicle
[1] Total Demand is the peak hour demand for both SOV and HOV lanes expected to use the on-ramp.
[2] SOV Demand = (Total Demand) – (HOV Demand).
[3] Meter Rate is the peak hour capacity expected to be processed through the ramp meter per lane. This value was obtained from Caltrans. The average between the "high" and "low" meter rate was used for this analysis.
[4] Excess Demand = (Demand) – (Meter Rate) or zero, whichever is greater.
[5] Delay = (Excess Demand / Meter Rate) X 60 min/hr.
[6] Queue = (Excess Demand) X 25 ft/veh per OM CPU. SOV volumes were used in the calculation of Queue. A zero represents no excess queue.

As shown in Table 11.4, the following freeway on-ramps would experience delays higher than 15 minutes under Buildout of Community Plan traffic conditions:

- SR-905 / Caliente Avenue WB On-ramp (AM and PM); and
- SR-905 / Britannia Blvd WB On-ramp (PM).

The SR-905 / Caliente WB on-ramp does not experience increase in delay due to the proposed project, therefore, the project would not have a significant impact at this location. Also, since the downstream freeway segment Westbound SR-905 between Heritage Road and Britannia would operate at LOS A in the PM peak hour (as shown in Table 11.5), the SR-905 / Britannia Blvd WB on-ramp would not be significantly impacted under Buildout of Community Plan Plus Project (Full Development) conditions and mitigation measures would not be required.

It should be noted that the OMCPU EIR disclosed that this segment of freeway on-ramps would operate at delays over 15 minutes, and disclosed impacts to this location as a significant and unavoidable impact of the OMCPU. The proposed Project is consistent with the findings and conclusions of the OMCPU EIR with respect to this location.

Freeway Segment Analysis

Table 11.5 displays freeway segment level of service results for the study area freeway mainline facilities under Buildout of Community Plan Plus Project (Full Development) conditions. The freeway segment level of service analysis was performed utilizing the methodology presented in Section 2.6.

As shown in the Table 11.5, all of the freeway segments operate at acceptable LOS C or better, with the exception of the following two freeway segments:

- SR-905, between I-805 and Caliente Avenue (LOS F in the EB direction) – The addition of the proposed project traffic would cause the volume to capacity ration to increase from 1.213 under Buildout of Community Plan conditions to 1.227 under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 0.014. This increase in volume to capacity ratio exceeds the allowable 0.005 threshold.

Based upon the significance criteria presented in Section 2.6, facility mitigation measures 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 is consistent with the findings and conclusions of the OMCPU EIR with respect to this 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 ration to increase from 1.418 under Buildout of Community Plan conditions to 1.434 under Buildout of Community Plan Plus Project (Full Development) conditions, resulting in a net increase of 0.015. This increase in volume to capacity ratio exceeds the allowable 0.005 threshold.

Based upon the significance criteria presented in Section 2.6, facility mitigation measures 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 is consistent with the findings and conclusions of the OMCPU EIR with respect to this freeway segment.

TABLE 11.5
FREEWAY SEGMENT ANALYSIS
BUILDOUT OF COMMUNITY PLAN PLUS PROJECT (FULL DEVELOPMENT) 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		
SR-905	I-805 and Caliente Avenue	217,100	EB	4M	9,400	7.6%	66.2%	11.9%	11,530	1.227	**F**	AM	1.213	**F**	0.014	**Yes**
			WB	3M+1A	8,460	9.0%	58.8%	11.9%	12,130	1.434	**F**	PM	1.418	**F**	0.015	**Yes**
	Caliente Avenue and Heritage Road	215,000	EB	3M	7,050	7.6%	66.2%	11.9%	5,560	0.789	C	AM	0.780	C	0.009	No
			WB	3M	7,050	9.0%	58.8%	11.9%	3,870	0.549	B	PM	0.539	B	0.010	No
	Heritage Road and Britannia Boulevard	190,000	EB	3M	7,050	7.6%	66.2%	11.9%	2,430	0.345	A	AM	0.340	A	0.004	No
			WB	3M	7,050	9.0%	58.8%	11.9%	2,040	0.289	A	PM	0.284	A	0.006	No

Source: Chen Ryan Associates; February 2019

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

11.3 Recommended Mitigation Measures

This section identifies required mitigation measures for roadway, intersection, and freeway facilities that are associated with the Otay Mesa Lumina Project under Buildout of Community Plan Plus Project (Full Development) conditions. ADT threshold, facility mitigation measures trigger identification, as well as associated worksheets are provided in **Appendix R**.

Roadway Segments

Mitigation measures associated with full development of the Otay Mesa Lumina project would be required at the following roadway segments:

- *Heritage Road, between Avenida De Las Vistas and Datsun Street* – This roadway segment would operate at LOS F and this finding is consistent with the OMCPU EIR. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unavoidable, consistent with the OM CPU EIR.

- *Cactus Road, between Street "D" and Airway Road* – This roadway segment would operate at LOS E and the OMCPU EIR disclosed its operations as LOS F, both exceed the LOS D threshold. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unmitigated, consistent with the OM CPU EIR.

- *Cactus Road, between Airway Road and Central Main Street* – This roadway segment would operate at LOS E and the OMCPU EIR disclosed its operations as LOS F, both exceed the LOS D threshold. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unmitigated, consistent with the OM CPU EIR.

- *Cactus Road, between Central Main Street* and Street "C" – This roadway segment would operate at LOS E and the OMCPU EIR disclosed its operations as LOS F, both exceed the LOS D threshold. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unmitigated, consistent with the OM CPU EIR.

- *Cactus Road, between* Street "C" and Siempre Viva Road – This roadway segment would operate at LOS E and the OMCPU EIR disclosed its operations as LOS F, both exceed the LOS D threshold. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unmitigated, consistent with the OM CPU EIR.

- *Britannia Boulevard, between SR-905 WB Ramps and SR-905 EB Ramps* – This roadway segment would operate at LOS E and the OMCPU EIR disclosed its operations as LOS F, both exceed the LOS D threshold. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, existing development conflicts, and/or multi-modal and urban design context. The impact is considered significant and unavoidable, consistent with the OM CPU EIR.

- *Britannia Boulevard, between SR-905 EB Ramps* and Airway Road – This roadway segment would operate at LOS E and the OMCPU EIR disclosed its operations as LOS F, both exceed the LOS D threshold. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, existing development conflicts, and/or multi-modal and urban design context. The impact is considered significant and unavoidable, consistent with the OM CPU EIR.

- *Otay Mesa Road, between Ocean View Hills Parkway and Corporate Center Drive* – This roadway segment would operate at LOS F and this finding is consistent with the OMCPU EIR. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, existing development conflicts, and/or multi-modal and urban design context. The impact is considered significant and unavoidable, consistent with the OM CPU EIR.

- *Otay Mesa Road, between Heritage Road and Cactus Road* – This roadway segment would operate at LOS F and this finding is consistent with the OMCPU EIR. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, existing development conflicts, and/or multi-modal and urban design context. The impact is considered significant and unavoidable, consistent with the OM CPU EIR.

- *Airway Road, between* Heritage Road and Village Way (project access) – This roadway segment would operate at LOS E and the OMCPU EIR disclosed its operations as LOS F, both exceed the LOS D threshold. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unmitigated, consistent with the OM CPU EIR.

- *Airway Road, between* Village Way (project access) and Cactus Road – This roadway segment would operate at LOS E and the OMCPU EIR disclosed its operations as LOS F, both exceed the LOS D threshold. Since this roadway is assumed to be built up to its ultimate classification as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unmitigated, consistent with the OM CPU EIR.

Intersections

Table 11.6 displays level of service analysis results both the before and after implementation of the recommended mitigation measures at the impacted intersections under Buildout of Community Plan Plus Project (Full Development) conditions.

Facility mitigation measures associated with Full Development of the Otay Mesa Lumina project would be required at the following intersections:

2. *Caliente Avenue / SR-905 EB Ramps – The project shall pay a 2.23%* fair share contribution towards the widening of the eastbound approach (SR-905 EB Ramps) to accommodate an an exclusive left-turn lane, a through lane with a shared right-turn lane, and an exclusive right-turn lane, restripe the southbound approach (Caliente Avenue) to accommodate dual left-turn lanes and three through lanes, and widen the northbound approach to accommodate three through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would operate at LOS E during the AM peak hour and LOS D during the PM peak hour with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

3. *Caliente Avenue / Airway Road – The project shall pay a 1.40%* fair share contribution towards the widening of the eastbound approach (Airway Road) to accommodate dual left-turn lanes, two through lanes, and an exclusive right-turn lane, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

4. *Innovative Drive / Otay Mesa Road – The project shall pay a 2.67%* fair share contribution towards the widening of the southbound approach to accommodate dual left-turn lanes, a through lane with a shared right-turn lane, and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would operate at LOS C during the AM peak hour and LOS E during the PM peak hour with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

5. *Heritage Road / Otay Mesa Road – The project shall pay a 3.27%* fair share contribution towards the widening of the southbound approach (Heritage Road) to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane, widen the westbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

6. *Cactus Road / Otay Mesa Road – The project shall pay a 5.62%* fair share contribution towards the widening of the eastbound approach (Otay Mesa Road) to accommodate an exclusive left-turn lane, three through lanes and dual right-turn lanes, and widen the westbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

7. *Cactus Road / Airway Road – The project shall pay a 15.61%* fair share contribution towards the widening of the eastbound approach (Airway Road) to accommodate an dual left-turn lanes, three through lanes with a shared right-turn lane, and an exclusive right-turn lane, widen the southbound approach (Cactus Road) to accommodate dual left-turn lanes, two through lanes with a shared right-turn lane and an exclusive right-turn lane, widen the westbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

8. *Britannia Boulevard / Otay Mesa Road – The project shall pay a 14.21%* fair share contribution towards the widening of the eastbound approach (Otay Mesa Road) to accommodate an exclusive left-turn lane, three through lanes and an exclusive right-turn lane and widen the westbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would operate at LOS D during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions.

9. *Britannia Boulevard / SR-905 WB Ramps – The project shall pay an 18.61%* fair share contribution towards the restriping of the westbound approach to accommodate an exclusive left-turn lane, a shared left-through-right lane, and an exclusive right-turn lane, and widening of the southbound approach to accommodate three through lanes with a shared right-turn lane and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would operate at LOS E during the AM peak hour and continue to operate at LOS F during the PM peak hour with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

10. *Britannia Boulevard / SR-905 EB Ramps – The project shall pay a 13.45%* fair share contribution towards the widening of the northbound approach to accommodate three through lanes and dual right-turn lanes. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation

of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

11. *Britannia Blvd / Airway Road – The project shall pay a 9.43%* fair share contribution towards the widening of the eastbound approach (Airway Road) to accommodate dual left-turn lanes, three through lanes, and an exclusive right-turn lane, widen the southbound approach (Britannia Blvd) to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, widen the westbound approach to accommodate dual left-turn lanes, two through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

13. *La Media Road / Otay Mesa Road* – The project shall pay a 0.87% fair share contribution towards the widening of the eastbound approach (Otay Mesa Road) to accommodate dual left-turn lanes, three through lanes, and dual right-turn lanes, widen the southbound approach (La Media Road) to accommodate dual left-turn lanes, two through lanes and dual right-turn lanes, widen the westbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

14. *La Media Road / Airway Road – The project shall pay a 0.42%* fair share contribution towards the widening of the eastbound approach (Airway Road) to accommodate dual left-turn lanes, two through lanes, and an exclusive right-turn lane, widen the southbound approach (La Media Road) to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, widen the westbound approach to accommodate dual left-turn lanes, two through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

16. *Village Way / Airway Road – The project's fair-share contribution is calculated at 9.05%*. However, the intersection is fully within the Lumina project boundaries (TM No. 1972222), therefore, the project shall signalize this intersection when warranted. As shown in Table 11.6, this intersection would operate as a signalized intersection at LOS D during the AM peak hour and LOS B during the PM peak hour with implementation of the OM CPU recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions. Therefore, the significant impact would be considered mitigated.

17. *Cactus Road / Street "D" – The project's fair-share contribution is calculated at 5.03%*. However, because the project fronts one of four corners of the intersection, the applicant shall contribute 25% towards the future signalization of this intersection. As shown in Table 11.6, this intersection would operate as a signalized intersection at LOS A during the AM peak hour and LOS B during the PM peak hour with implementation of the OM CPU recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

18. *Cactus Road / Central Main Street – The project's fair-share contribution is calculated at 13.72%.* However, because the project fronts one of four corners of the intersection, the applicant shall contribute 25% towards the future signalization of this intersection. As shown in Table 11.6, this intersection would operate as a signalized intersection at LOS D during the AM peak hour and LOS B during the PM peak hour with implementation of the OM CPU recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions.

19. *Cactus Road / Street "C" – The project's fair-share contribution is calculated at 7.62%.* However, because the project fronts one of four corners of the intersection, the applicant shall contribute 25% towards the future signalization of this intersection. As shown in Table 11.6, this intersection would operate as a signalized intersection at LOS B during both the AM and PM peak hours with implementation of the OM CPU recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions.

20. *Cactus Road / Siempre Viva Road – The project shall pay a 4.68%* fair share contribution towards the widening of the northbound approach to accommodate an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS D during the AM peak hour and LOS F during the PM peak hour with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

21. *Britannia Blvd / Siempre Viva Road – The project shall pay a 2.50%* fair share contribution towards the widening of the eastbound approach (Siempre Viva Road) to accommodate dual left-turn lanes, three through lanes, and an exclusive right-turn lane, widen the

southbound approach (Britannia Boulevard) to accommodate dual left-turn lanes, two through lanes and dual right-turn lanes, widen the westbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

22. *La Media Road / Siempre Viva Road – The project shall pay a 2.36%* fair share contribution towards the widening of the southbound approach (La Media Road) to accommodate dual left-turn lanes, one through lane and dual right-turn lanes, and widen the westbound approach to accommodate three through lanes and dual right-turn lanes. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would operate at LOS E during the AM peak hour and LOS C during the PM peak hour with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

23. *Heritage Road / Avenida De Las Vistas* – This intersection would operate at LOS F during both the AM and PM peak hours and this is consistent with findings of the OMCPU EIR. Since this intersection is assumed to be built up to its ultimate intersection geometrics assumption as identified in the currently adopted Otay Mesa Community Plan, no additional mitigation measures would be recommended due to various factors such as adjacency to environmentally sensitive land and/or steep hillsides, and/or multi-modal and urban design context. The impact is considered significant and unavoidable, consisted with the OM CPU EIR.

24. *Heritage Road / Datsun Street – The project shall pay a 2.07%* fair share contribution towards the widening of the eastbound approach (Datsun Street) to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane, widen the southbound approach (Heritage Road) to accommodate dual left-turn lanes, three through lanes dual right-turn lanes, widen the westbound approach to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. As shown in Table 11.6, this intersection would continue to operate at LOS F during both the AM and PM peak hours with implementation of the recommended mitigation measures under Buildout of Community Plan Plus Project (Full Development) conditions, and this is consistent with findings of the OMCPU EIR.

TABLE 11.6
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
BUILDOUT OF COMMUNITY PLAN PLUS PROJECT (FULL DEVELOPMENT)
CONDITIONS – WITH MITIGATION MEASURES

			Before Mitigation measures				After Mitigation measures			
			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
2	Caliente Avenue / SR-905 EB Ramps	Signalized	170.0	**F**	151.1	**F**	58.4	**E**	46.8	D
3	Caliente Avenue / Airway Road	Signalized	179.0	**F**	103.4	**F**	177.1	**F**	94.2	**F**
4	Innovative Drive / Otay Mesa Road	Signalized	42.5	D	103.6	**F**	32.6	C	69.9	**E**
5	Heritage Road / Otay Mesa Road	Signalized	452.8	**F**	384.6	**F**	389.0	**F**	237.2	**F**
6	Cactus Road / Otay Mesa Road	Signalized	367.5	**F**	245.9	**F**	157.1	**F**	177.5	**F**
7	Cactus Road / Airway Road	Signalized	256.5	**F**	393.9	**F**	138.0	**F**	252.9	**F**
8	Britannia Boulevard / Otay Mesa Road	Signalized	69.3	**E**	50.0	D	54.9	D	54.6	D
9	Britannia Boulevard / SR-905 WB Ramps	Signalized	222.2	**F**	380.4	**F**	75.8	**E**	273.5	**F**
10	Britannia Boulevard / SR-905 EB Ramps	Signalized	386.9	**F**	255.0	**F**	335.4	**F**	104.1	**F**
11	Britannia Boulevard / Airway Road	Signalized	623.6	**F**	471.9	**F**	313.2	**F**	261.6	**F**
13	La Media Road / Otay Mesa Road	Signalized	343.6	**F**	256.3	**F**	150.2	**F**	118.6	**F**
14	La Media Road / Airway Road	Signalized	332.9	**F**	322.2	**F**	173.4	**F**	206.5	**F**
16	Village Way / Airway Road	Signalized	N/A[1]	**F**	N/A[1]	**F**	43.1	D	13.9	B
17	Cactus Road / Street "D"	Signalized	N/A[1]	**F**	500.3	**F**	8.5	A	16.8	B
18	Cactus Road / Central Main Street	Signalized	N/A[1]	**F**	N/A[1]	**F**	37.1	D	20.0	B
19	Cactus Road / Street "C"	Signalized	N/A[1]	**F**	N/A[1]	**F**	18.8	B	18.5	B
20	Cactus Road / Siempre Viva Road	Signalized	46.1	D	264.6	**F**	45.6	D	206.3	**F**
21	Britannia Blvd / Siempre Viva Road	Signalized	265.5	**F**	246.4	**F**	109.8	**F**	145.6	**F**

TABLE 11.6
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
BUILDOUT OF COMMUNITY PLAN PLUS PROJECT (FULL DEVELOPMENT)
CONDITIONS – WITH MITIGATION MEASURES

			Before Mitigation measures				After Mitigation measures			
			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
22	La Media Road / Siempre Viva Road	Signalized	462.8	**F**	257.2	**F**	79.1	**E**	27.8	C
24	Heritage Road / Datsun Street	Signalized	502.5	**F**	635.8	**F**	241.3	**F**	370.7	**F**

Source: Chen Ryan Associates; February 2019

Notes:
Bold letter indicates substandard LOS.

As shown in Table 11.6, all of the impacted intersections would continue to operate at substandard LOS E or F during one or both of the AM and PM peak hours after the implementation of the recommended mitigation measures and this is consistent with findings of the OMCPU EIR. However, with the implementation of the recommended mitigation measures, all of the significantly impacted intersections would operate better than pre-project conditions. Therefore, the significant impact would be considered mitigated.

Ramp Meters

No significant impacts were identified at the analyzed ramp meters.

Freeway Segments

The following freeway segments would be impacted by the proposed project under Buildout of Community Plan Plus Project (Full Development) conditions:

- SR-905, between I-805 and Caliente Avenue – LOS F in the EB direction; and
- 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 mitigation measures. Therefore, mitigation measures 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.

12.0 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.

12.1 Alternative Transportation Facilities and Connectivity

The proposed Lumina project is part of the Otay Mesa Central Village Specific Plan which contains 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 pedestrian 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 the Lumina project. **Figure 12-1** displays alternative transportation facilities within the Otay Mesa Central Village Specific Plan as well as the proposed Lumina project.

Bicycle Facilities

Bicycle facilities will be provided along most of the roadways within the proposed Project. Two types of bicycle facilities are planned within the Lumina project:

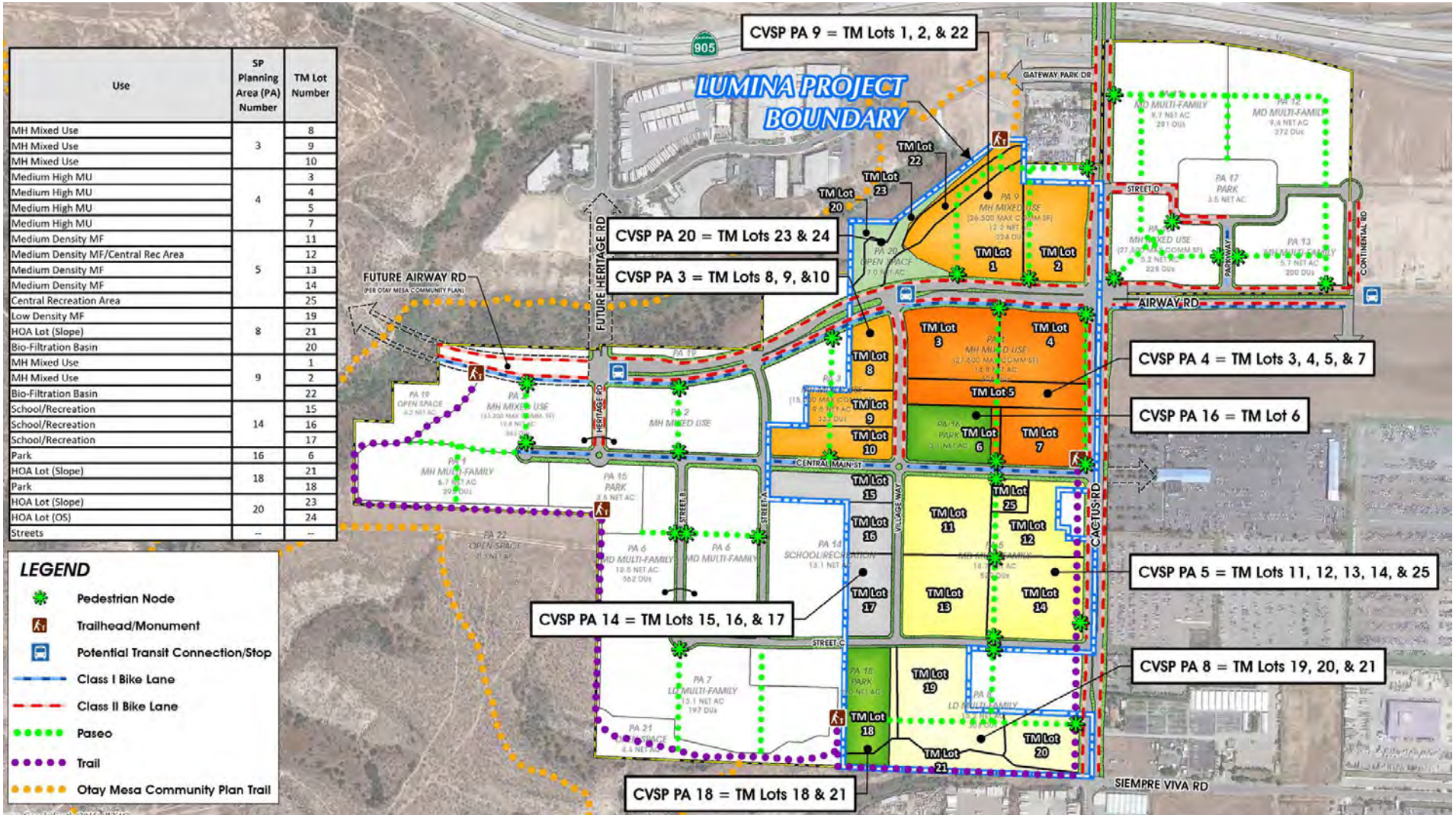
Class I bike paths are separated from vehicular traffic by a curb-adjacent clear zone or tree-lined parkway and accommodate two lanes (one bike lane in each direction). Class I bike paths will be constructed by the project along the following streets:

- Airway Road, along the south side of the street between Western Lumina project boundary and Cactus Blvd (consistent with OM CPU).
- Central Main Street, on the south side of the street between Village Way and Cactus Road.

Class II bike lanes are on-street, six-foot wide lanes that are generally bordered by a landscaped parkway adjacent to a sidewalk and buffered from traffic by a striped buffer. Class II lanes will be provided by the project along the following streets:

- Airway Road, along both sides of the street between Western Lumina project boundary and Eastern project boundary (consistent with OM CPU).
- Cactus Road, along the west side of the street between Street “D” and Siempre Viva Road (consistent with OM CPU).
- Village Way, along both sides of the street between Airway Road and Central Main Street.

Class II bike lanes along Village Entry roads are located adjacent to on-street parking.



Use	SP Planning Area (PA) Number	TM Lot Number
MH Mixed Use	3	8
MH Mixed Use		9
MH Mixed Use		10
Medium High MU	4	3
Medium High MU		4
Medium High MU		5
Medium High MU		7
Medium Density MF	5	11
Medium Density MF/Central Rec Area		12
Medium Density MF		13
Medium Density MF		14
Central Recreation Area		25
Low Density MF	8	19
HOA Lot (Slope)		21
Bio-Filtration Basin		20
MH Mixed Use	9	1
MH Mixed Use		2
Bio-Filtration Basin		22
School/Recreation	14	15
School/Recreation		16
School/Recreation		17
Park	16	6
HOA Lot (Slope)	18	21
Park		18
HOA Lot (Slope)	20	23
HOA Lot (OS)		24
Streets	--	--

Otay Mesa Lumina
Transportation Impact Study

CHEN RYAN

Figure 12-1
Alternative Transportation Facilities

Pedestrian Facilities

In addition to traditional sidewalks, pedestrian connections in the proposed Lumina project include paseos, pedestrian nodes, and trails, which connect pedestrians to parks and other destinations within the Lumina project. 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. These features are shown in Figure 12-1.

Public Transit Facilities

The Central Village Specific Plan area, which the Lumina project is part of, is currently served by Metropolitan Transit System (MTS) Express Routes 905, 909, and 950.

- Route 905 - Generally runs east-west connecting the Iris Transit Station and the Otay Mesa Transit Center via 30th Street, Iris Avenue, Beyer Blvd, SR-905, Caliente Avenue, Otay Mesa Road, La Media Road, Airway Road, Avenida Costa Azul, Costa Norte, Avenida Costa Este, Avenida Costa Sur, Avenida Costa Brava, and Siempre Viva Road, Otay Center Drive, and Nicola Tesla Court. Route 905 currently operates between 4:53 AM and 10:00 PM during weekdays, between 5:53 AM and 9:14 PM during Saturdays, and between 6:00 AM and 8:53 PM during Sundays. During weekdays, Route 905 generally operates at 15-minute headways until 9:34 PM, and afterwards, it operates at 30-minute headways until 10:00 PM. During Saturday and Sunday, Route 905 operates at 60-minute headways.

- Route 909 – Generally runs east-west connecting the industrial uses located south of Airway Road and Britannia Boulevard to the Otay Mesa Transit Center via Siempre Viva Road, Roll Drive, Via de La Amistad, Paseo de las Americas, Hertz Drive, Sanyo Avenue, Otay Mesa Road, Britannia Blvd, Britannia Park Place, Siempre Viva Court, Siempre Viva Road, Britannia Blvd, Airway Road, Centurion Street, Gigantic Street, Excellante Street, and Airway Road. Route 909 currently operates between 5:24 AM and 7:46 PM during weekdays. Route 909 operates at 60-minute headways. Route 909 does not operate on weekends.

- Route 950 - Runs east-west connecting the Iris Transit Station and the Otay Mesa Transit Center via 30th Street, Iris Avenue, Beyer Blvd, SR-905, Siempre Viva Road, Otay Center Drive, and Nicola Tesla Court. Route 950 currently operates between 4:30 AM and 12:29 PM during weekdays, between 4:54 AM and 12:07 PM during Saturdays, and between 5:14 AM and 12:16 PM during Sundays. During weekdays, Route 950 generally operates at 15-minute and 30-minute headways. During Saturday and Sunday, Route 905 operates at 30-minute headways.

- Rapid Bus, Route 225 – Generally runs north-south connecting the Santa Fe Depot Transit Center in Downtown San Diego and the Otay Mesa Transit Center via Kettner Blvd, Broadway, 14th Street, G Street, SR-94, I-805, East Palomar Street, Eastlake Parkway, Stylus Street, Orion Avenue, Birch Road, SR-125, Siempre Viva Road, Otay Center Drive, and Nicola Tesla Court. Route 225 currently operates between 4:29 AM and 12:09 AM

during weekdays, and between 4:49 AM and 11:37 PM during Saturday and Sunday. During weekdays, Route 225 operates at 15-minute headways until 10:00 AM, at 30-minute headways until 2:20 PM, at 15-minute headways until 6:35 PM, and at 30-minute headways until 12:09 AM. During Saturday and Sunday, Route 225 operates at 30-minute headways.

All three of these routes provide service between the SR-905 Port of Entry in the east and the Iris Avenue transfer station in the west.

San Diego Forward: The Regional Plan Revenue Constrained Scenario (2050) identifies several public transit service mitigation measures within the Otay Mesa community (See **Appendix O**), and each of the service measures are summarized below, including frequency changes, new routes, and anticipated implementation years:

- 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 Lumina project site, according to the OM CPU, there are two (2) planned transit stops along Airway Road at Continental Road and Village Way along Rapid Bus Route 638. Potential transit priority treatment is also planned on Airway Road in the form of queue jumpers and signal priority measures to allow transit to bypass congestion and result in faster transit travel times at critical locations. Figure 12-1 displays the proposed transit stops for the project. The project applicant will provide bus stops with benches, shelters, and receptacles.

12.2 Transportation Demand Management Plan

To reduce single occupant vehicle trips to the extent feasible, the proposed project will 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, to the satisfaction of the City Engineer:

- A comprehensive trails network designed to provide safe bicycle and pedestrian access between the various Proposed Project phases, land uses, parks/open space, schools and the project's core area. The trails network shall also provide connections to the various recreational trails and multi-modal facilities accessing the Project site. Figure 12-1 displays the proposed projects trails, paseos, and pedestrian nodes.
- The provision of bicycle racks along main travel corridors, adjacent to commercial developments, and at public parks and open spaces within the Project site.
- Coordination with SANDAG's iCommute program for Carpool, Vanpool, and rideshare programs that are specific to the Proposed Project that are aimed both to residents and employees.
- Participate in car sharing and bike sharing programs through Homeowner Association (HOA) noticing, should such programs become available.
- Coordination with the Metropolitan Transit System (MTS) and SANDAG regarding future siting of transit stops/stations within the Project site.
- 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, provide the enhanced transit facilities, such as bus shelters, signs, lighting, and trash receptacles.
- Provision of a "School Pool" program to coordinate school-related carpool activities with the local school district and SANDAG. As part of the program, dedicated parking spaces for the School Pool program will be provided at the Village Core area.

13.0 On-Site Circulation

This chapter presents access to the project site and recommends functional classifications for internal roadways to the Project.

13.1 Project Access

The project site proposes four (4) vehicular access points at the following locations:

16. Village Way / Airway Road – Construction of an all-way stop-controlled T-intersection.
17. Cactus Road / Street "D" – Construction of an all-way stop-controlled T- intersection, but the fourth leg (east of Cactus Road) will be constructed by the developer(s) of PA 14, 15, 16, 17, and 21 of the Otay Mesa Central Village Specific Plan.
18. Cactus Road / Central Main Street – Construction of an all-way stop-controlled T-intersection.
19. Cactus Road / Street "C" – Construction of an all-way stop-controlled T-intersection.

The traffic operations at these access points are provided in Chapters 5.0, 7.0, 9.0, and 11.0 and all four access points would operate at acceptable LOS assuming traffic generated from the full development of the proposed project except under the Buildout of Community Plan scenario.

13.2 Internal Vehicular Circulation

Based upon full development of the proposed project land uses and trip generation as shown previously, ADT volumes were estimated for the internal roadway segments within the proposed project. Project trips were distributed and assigned to the internal roadway system based on the location and characteristics of the proposed land uses.

Table 13.1 displays recommended roadway classifications and resulting Level of Service for the proposed project internal roadway segments. LOS D is considered acceptable for internal roadways within the proposed project.

TABLE 13.1
OTAY MESA LUMINA – INTERNAL CIRCULATION LOS ANALYSIS

Internal Roadway	Segment	Estimated ADT	Recommended Classification	Capacity Threshold LOS E	LOS
Street "D"	from Western terminus to Cactus Road	2,300	2-lane Collector w/ Raised Median & Turn Pocket	<15,000	B
Central Main Street	from Street "A" to Village Way	3,100	2-lane Collector w/ Raised Median & Turn Pocket	<15,000	A
	from Village Way to Cactus Road	3,100	2-lane Collector w/ Raised Median & Turn Pocket	<15,000	C
Street "C"	from Village Way to Cactus Road	3,100	2-lane Collector (multi-family)	<8,000	B
Village Way	from Airway Road to Central Main Street	7,000	2-lane Collector w/ Raised Median & Turn Pocket	<15,000	C
	from Central Main Street to Street "C"	7,000	2-lane Collector (multi-family)	<8,000	B

Source: Chen Ryan Associates; February 2019

As shown in Table 13.1, all of the internal roadways would operate at acceptable LOS C or better at Project buildout.

14.0 Findings and Recommendations

This chapter provides a summary of the key findings and study recommendations, including the Level of Service results and traffic mitigation measures requirements, associated with the various analysis scenarios. Specific recommendations related to mitigation measures of the proposed project traffic impacts on intersection, roadway and freeway/state highway segments are also summarized.

Summary of Roadway Segment Analyses

Table 14.1 and **Table 14.2** display the roadway segment Level of Service results for each of the study scenarios analyzed.

TABLE 14.1
SUMMARY OF ROADWAY SEGMENT LOS RESULTS – CITY OF SAN DIEGO

Roadway	From	To	Existing	Existing + Project	2023	2023 + Project (P1)	2027	2027 + Project (FD)	Buildout of CP	Buildout of CP + Project
Ocean View Hills Parkway	Starfish Way	Del Sol Boulevard	A	A	B	B	B	B	B	B
	Del Sol Boulevard	Otay Mesa Road	A	A	A	A	A	A	C	C
Caliente Avenue	SR-905 WB Ramps	SR-905 EB Ramps	A	A	B	B	A	C	C	C
	SR-905 EB Ramps	Airway Road	A	A	A	A	A	A	B	B
Heritage Road	Avenida De Las Vistas	Datsun Street	N/A	N/A	N/A	N/A	N/A	N/A	**F**	**F**
	Datsun Street	Otay Mesa Road	N/A	N/A	N/A	N/A	N/A	N/A	C	C
Cactus Road	SR-905	Street "D"	A	A	A	A	A	A	**E**	**E**
	Street "D"	Airway Road	A	A	A	A	A	A	**E**	**F**
	Airway Road	Central Main Street	A	A	A	A	A	A	**E**	**E**
	Central Main Street	Street "C"	A	A	A	A	A	A	**E**	**E**
	Street "C"	Siempre Viva Road	A	A	A	A	A	A	**E**	**E**

TABLE 14.1
SUMMARY OF ROADWAY SEGMENT LOS RESULTS – CITY OF SAN DIEGO

Roadway	From	To	Existing	Existing + Project	2023	2023 + Project (P1)	2027	2027 + Project (FD)	Buildout of CP	Buildout of CP + Project
Britannia Boulevard	Otay Mesa Road	SR-905 WB Ramps	A	A	B	B	A	A	A	A
	SR-905 WB Ramps	SR-905 EB Ramps	A	B	C	D	C	D	C	**E**
	SR-905 EB Ramps	Airway Road	B	C	**E**	**F**/D	C	D	C	**E**
	Airway Road	Siempre Viva Road	A	A	**E**	**E**	D	D	D	D
Harvest Road	Airway Road	Otay Center Drive	C	C	C	C	C	C	C	C
Otay Center Drive	Harvest Road	Siempre Viva Road	A	A	A	A	A	A	C	C
Otay Mesa Road	Ocean View Hills Parkway	Corporate Center Drive	A	A	B	C	C	C	**F**	**F**
	Corporate Center Drive	Heritage Road	A	A	A	A	B	B	C	D
	Heritage Road	Cactus Road	A	A	A	A	B	B	**F**	**F**
	Cactus Road	Britannia Boulevard	A	A	A	A	B	B	B	C
	Britannia Boulevard	Saint Andrews Avenue	A	A	A	A	A	A	C	C
	Saint Andrews Avenue	La Media Road	A	A	A	A	A	A	C	C

TABLE 14.1
SUMMARY OF ROADWAY SEGMENT LOS RESULTS – CITY OF SAN DIEGO

Roadway	From	To	Existing	Existing + Project	2023	2023 + Project (P1)	2027	2027 + Project (FD)	Buildout of CP	Buildout of CP + Project
Otay Mesa Road	La Media Road	Piper Ranch Road	A	A	B	B	B	B	D	D
Airway Road	Old Otay Mesa Road	Caliente Avenue	A	A	A	A	A	A	A	B
	Village Way	Cactus Road	DNE	A	DNE	A	DNE	A	D	**E**
	Cactus Road	Britannia Boulevard	A	**F**/C	A	**F**/D	B	**F**/C	B	C
	Britannia Boulevard	1,600 feet west of La Media Road	B	D	D	**F**/C	C	C	D	D
	1,600 feet west of La Media Road	La Media Road	B	D	A	A	A	A	D	D
	La Media Road	Avenida Costa Azul	**E**	**F**/C	A	A	A	A	D	D
	Avenida Costa Azul	Piper Ranch Road	A	A	A	A	A	A	D	D
	Piper Ranch Road	Harvest Road	B	B	B	C	B	C	D	D
Siempre Viva Road	Cactus Road	Britannia Boulevard	A	A	A	A	A	A	B	C
	Britannia Boulevard	La Media Road	N/A	N/A	N/A	N/A	N/A	N/A	C	C
	La Media Road	Customhouse Plaza	N/A	N/A	N/A	N/A	N/A	N/A	C	C

Source: Chen Ryan Associates; February 2019

Notes:
Bold letter indicates substandard LOS.
X / Y = Before Recommended Mitigation measures / After Recommended Mitigation measures.

Based upon the significance criteria presented in Section 2.6, and consistent with the conclusions of the OMCPU EIR, facility mitigation measures would be required at the following roadway segments:

Existing Plus Project (Full Development)

- Airway Road, between Cactus Road and Britannia Boulevard; and
- Airway Road, between La Media Road and Avenida Costa Azul.

Near-Term Year 2023 Plus Project (Phase 1)

- Britannia Boulevard, between SR-905 EB Ramps to Airway Road;
- Airway Road, between Cactus Road and Britannia Boulevard;
- Airway Road, between Britannia Boulevard and 1,600 feet west of La Media Road.

Near-Term Year 2027 Plus Project (Full Development)

- Airway Road, between Cactus Road and Britannia Boulevard.

Buildout of Community Plan Plus Project (Full Development)

- Heritage Road, between Avenida De Las Vistas and Datsun Street;
- Cactus Road, between Street "D" and Airway Road;
- Cactus Road, between Airway Road and Central Main Street;
- Cactus Road, between Central Main Street and Street "C";
- Cactus Road, between Street "C" and Siempre Viva Road;
- Britannia Boulevard, between SR-905 WB Ramps and SR-905 EB Ramps;
- Britannia Boulevard, between SR-905 EB Ramps and Airway Road;
- Otay Mesa Road, between Ocean View Hills Parkway and Corporate Center Drive;
- Otay Mesa Road, between Heritage Road and Cactus Road;
- Airway Road, between Heritage Road and Village Way (project access);
- Airway Road, between Village Way (project access) and Cactus Road.

TABLE 14.2
SUMMARY OF ROADWAY SEGMENT LOS RESULTS – CITY OF CHULA VISTA

Roadway	From	To	Existing	Existing + Project	2023	2023 + Project (P1)	2027	2027 + Project (FD)	Buildout of CP	Buildout of CP + Project (FD)
Heritage Road	Main Street	Avenida De Las Vistas	N/A	N/A	N/A	N/A	N/A	N/A	**F**	**F**

Source: Chen Ryan Associates; February 2019

Note:
Bold letter indicates substandard LOS.

Summary of Intersection Analyses

Table 14.3 displays the intersection Level of Service results for each of the study scenarios analyzed.

TABLE 14.3
SUMMARY OF INTERSECTION LOS RESULTS

ID	Intersection	Existing		Existing + Project		2023		2023 + Project (P1)		2027		2027 + Project (FD)		Buildout of CP		Buildout of CP + Project (FD)	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	Caliente Avenue / SR-905 WB Ramps	A	A	A	A	A	B	A	B	A	D	B	D	**F**	**E**	**F**	**E**
2	Caliente Avenue / SR-905 EB Ramps	B	B	C	B	B	C	B	C	**E**	C	**E**	D	**F**	**F**	**F/E**	**F/D**
3	Caliente Avenue / Airway Road	A	A	A	A	B	B	B	C	B	C	B	C	**F**	**F**	**F/F**	**F/F**
4	Innovative Drive / Otay Mesa Road	A	B	A	B	A	B	A	B	B	C	B	C	D	**F**	D/C	**F/E**
5	Heritage Road / Otay Mesa Road	B	C	B	C	B	C	C	C	D	**E**	D	**E**	**F**	**F**	**F/F**	**F/F**
6	Cactus Road / Otay Mesa Road	B	B	B	B	A	B	B	B	B	B	B	C	**F**	**F**	**F/F**	**F/F**
7	Cactus Road / Airway Road	A	A	C	C	A	A	B	C	A	B	C	D	**F**	**F**	**F/F**	**F/F**
8	Britannia Boulevard / Otay Mesa Road	B	C	B	C	B	C	B	D	B	C	B	D	D	C	**E**/D	D/D
9	Britannia Boulevard / SR-905 WB Ramps	B	B	B	B	B	B	B	C	B	C	B	C	**F**	**F**	**F/E**	**F/F**
10	Britannia Boulevard / SR-905 EB Ramps	A	B	B	B	B	B	C	C	B	B	D	D	**F**	**F**	**F/F**	**F/F**
11	Britannia Boulevard / Airway Road	B	D	**E**	**E**	C	D	**E/D**	**F/D**	C	D	**E**/D	**E**/D	**F**	**F**	**F/F**	**F/F**

TABLE 14.3
SUMMARY OF INTERSECTION LOS RESULTS

ID	Intersection	Existing		Existing + Project		2023		2023 + Project (P1)		2027		2027 + Project (FD)		Buildout of CP		Buildout of CP + Project (FD)	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
12	St Andrews Avenue / Otay Mesa Road	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
13	La Media Road / Otay Mesa Road	D	D	D	D	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F/F**	**F/F**
14	La Media Road / Airway Road	C	B	C	C	A	B	A	B	B	B	B	B	**F**	**F**	**F/F**	**F/F**
15	Harvest Road / Airway Road	A	A	B	B	A	A	A	B	A	A	A	B	**F**	A	**F**	A
16	Village Way / Airway Road	DNE		B	C	DNE		A	B	DNE		B	C	DNE		**F**/D	**F**/B
17	Cactus Road / Street "D"	DNE		A	A	DNE		A	A	DNE		A	A	DNE		**F**/A	**F**/B
18	Cactus Road / Central Main Street	DNE		A	B	DNE		A	B	DNE		B	B	DNE		**F**/D	**F**/B
19	Cactus Road / Street "C"	DNE		A	A	DNE		DNE		DNE		A	A	DNE		**F**/B	**F**/B
20	Cactus Road / Siempre Viva Road	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A		D	**F**	D/D	**F/F**
21	Britannia Boulevard / Siempre Viva Road	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A		**F**	**F**	**F/F**	**F/F**
22	La Media Road / Siempre Viva Road	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A		**F**	**F**	**F/E**	**F**/C
23	Heritage Road / Avenida De Las Vistas	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A		F	F	F	**F**
24	Heritage Road / Datsun Street	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A		**F**	F	**F/F**	**F/F**

Source: Chen Ryan Associates; February 2019

Note:
Bold letter indicates substandard LOS.
DNE = Does Not Exist.
X / Y = Before Recommended Mitigation measures / After Recommended Mitigation measures.

Based upon the significance criteria presented in Section 2.6, and consistent with the conclusions of the OMCPU EIR, facility mitigation measures would be required at the following intersections:

Existing Plus Project (Full Development)

11. Britannia Boulevard / Airway Road.

Near-Term Year 2023 Plus Project (Phase 1)

11. Britannia Boulevard / Airway Road.

Near-Term Year 2027 Plus Project (Full Development)

11. Britannia Boulevard / Airway Road.

Buildout of Community Plan Plus Project (Full Development)

2. Caliente Avenue / SR-905 EB Ramps;
3. Caliente Avenue / Airway Road;
4. Innovative Drive / Otay Mesa Road;
5. Heritage Road / Otay Mesa Road;
6. Cactus Road / Otay Mesa Road;
7. Cactus Road / Airway Road;
8. Britannia Boulevard / Otay Mesa Road;
9. Britannia Boulevard / SR-905 WB Ramps;
10. Britannia Boulevard / SR-905 EB Ramps;
11. Britannia Boulevard / Airway Road;
13. La Media Road / Otay Mesa Road;
14. La Media Road / Airway Road;
20. Cactus Road / Siempre Viva Road;
21. Britannia Boulevard / Siempre Viva Road;
22. La Media Road / Siempre Viva Road; and
24. Heritage Road / Datsun Street.

Summary of Ramp Meter Analyses

Table 14.4 displays the ramp metering results for each of the study scenarios analyzed.

TABLE 14.4
SUMMARY OF RAMP METER ANALYSES

Location	Peak Hour	Buildout of CP, Delay (sec.)	Buildout of CP + Project (FD), Delay (sec.)	Significant Impact?
SR-905 WB On-ramp @ Caliente Ave	AM	56.56	56.56	No
	PM	37.19	37.19	No
SR-905 EB On-ramp @ Caliente Ave	AM	0	0	No
	PM	0	0	No
SR-905 WB On-ramp @ Britannia Blvd	AM	0	0	No
	PM	40.5	44.25	No
SR-905 EB On-ramp @ Britannia Blvd	AM	0	0	No
	PM	0	0	No

Source: Chen Ryan Associates; February 2019

Summary of Freeway Segment Analyses

Table 14.5 displays freeway Level of Service results for each of the analyzed scenarios.

TABLE 14.5
SUMMARY OF FREEWAY SEGMENT LOS RESULTS

Freeway	Segment	Direction	Existing	Existing + Project	2023	2023 + Project (P1)	2027	2027 + Project (FD)	Buildout of CP	Buildout of CP + Project (FD)
SR-905	I-805 and Caliente Avenue	EB	B	B	B	B	C	C	**F**	**F**
		WB	B	B	C	C	C	C	**F**	**F**
	Caliente Avenue and Heritage Road	EB	A	A	A	A	A	A	C	C
		WB	A	A	A	A	A	A	B	B
	Heritage Road and Britannia Boulevard	EB	A	A	A	A	A	A	A	A
		WB	A	A	A	A	A	A	A	A

Source: Chen Ryan Associates; February 2019

Note:
Bold letter indicates substandard LOS.

Based upon the significance criteria presented in Section 2.6, and consistent with the conclusions of the OMCPU EIR, facility mitigation measures would be required at the following freeway segment:

<u>Buildout of Community Plan Plus Project (Full Development)</u>

- SR-905, between I-805 and Caliente Avenue – LOS F in the EB direction; and
- 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 mitigation measures. Therefore, mitigation measures 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.

Summary of Recommended Mitigation Measures

Table 14.6 summarizes the recommended mitigation measures to roadway segments, intersections, and freeway segments under each of the scenarios analyzed associated with buildout of the proposed Lumina project.

TABLE 14.6
SUMMARY OF MITIGATION MEASURES RECOMMENDATIONS

Location	Existing + Project	2023 + Project (P1)	2027 + Project (FD)	Buildout of CP + Project (FD)
Roadway Segment				
Airway Road, between Heritage Road and Village Way (project access)	N/A	N/A	N/A	Significant and Unavoidable Impact. Consistent with the conclusion of the OMCPU EIR.
Airway Road, between Village Way (project access) and Cactus Road	N/A	N/A	N/A	Significant and Unavoidable Impact. Consistent with the conclusion of the OMCPU EIR.
Airway Road, between Cactus Road and Britannia Boulevard	Widen this roadway segment from a 2-Lane Collector to a 4-Lane Collector with a continuous left-turn lane prior to the project's **total trip generation** of 4,959 ADT.	Widen this roadway segment from a 2-Lane Collector to a 4-Lane Collector with a continuous left-turn lane prior to the project's **total trip generation** of 4,310 ADT.	Widen this roadway segment from a 4-lane Collector to a 4-Lane Collector with a continuous left-turn lane prior to the project's **total trip generation** of 11,258 ADT.	N/A
Airway Road, between Britannia Boulevard and 1,600 feet west of La Media Road	N/A	Widen this roadway segment from a 2-Lane Collector to a 2-Lane Collector with a continuous left-turn lane prior to the project's **total trip generation** of 682 ADT.	N/A	N/A
Airway Road, between La Media Road and Avenida Costa Azul	Widen this roadway segment from a 2-Lane Collector to a 2-Lane Collector with a continuous left-turn lane prior to the project's **total trip generation** of 1,471 ADT.	N/A	N/A	N/A
Heritage Road, between Avenida De Las Vistas and Datsun Street	N/A	N/A	N/A	Significant and Unavoidable Impact. Consistent with the conclusion of the OMCPU EIR.

TABLE 14.6
SUMMARY OF MITIGATION MEASURES RECOMMENDATIONS

Location	Existing + Project	2023 + Project (P1)	2027 + Project (FD)	Buildout of CP + Project (FD)
Heritage Road, between Datsun Street and Otay Mesa Road	N/A	N/A	N/A	N/A
Cactus Road, between Street "D" and Airway Road	N/A	N/A	N/A	Significant and Unavoidable Impact. Consistent with the conclusion of the OMCPU EIR.
Cactus Road, between Airway Road and Central Main Street	N/A	N/A	N/A	Significant and Unavoidable Impact. Consistent with the conclusion of the OMCPU EIR.
Cactus Road, between Central Main Street and Street "C"	N/A	N/A	N/A	Significant and Unavoidable Impact. Consistent with the conclusion of the OMCPU EIR.
Cactus Road, between Street "C" and Siempre Viva Road	N/A	N/A	N/A	Significant and Unavoidable Impact. Consistent with the conclusion of the OMCPU EIR.
Britannia Boulevard, between SR-905 WB Ramps and SR-905 EB Ramps	N/A	N/A	N/A	Significant and Unavoidable Impact. Consistent with the conclusion of the OMCPU EIR.
Britannia Boulevard, between SR-905 EB Ramps and Airway Road	N/A	Widen this roadway from a 5-Prime Arterial (2 NB & 3 SB) to a 6-lane Prime Arterial prior to the project's **total trip generation** of 1,493 ADT.	N/A	Significant and Unavoidable Impact. Consistent with the conclusion of the OMCPU EIR.
Otay Mesa Road, between Ocean View Hills Parkway and Corporate Center Drive	N/A	N/A	N/A	Significant and Unavoidable Impact. Consistent with the conclusion of the OMCPU EIR.

TABLE 14.6
SUMMARY OF MITIGATION MEASURES RECOMMENDATIONS

Location	Existing + Project	2023 + Project (P1)	2027 + Project (FD)	Buildout of CP + Project (FD)
Otay Mesa Road, between Heritage Road and Cactus Road	N/A	N/A	N/A	Significant and Unavoidable Impact. Consistent with the conclusion of the OMCPU EIR.
Intersection				
2. Caliente Avenue / SR-905 EB Ramps	N/A	N/A	N/A	Widen of the eastbound approach (SR-905 EB Ramps) to accommodate an an exclusive left-turn lane, a through lane with a shared right-turn lane, and an exclusive right-turn lane, restripe the southbound approach (Caliente Avenue) to accommodate dual left-turn lanes and three through lanes, and widen the northbound approach to accommodate three through lanes and an exclusive right-turn lane.
3. Caliente Avenue / Airway Road	N/A	N/A	N/A	Widen of the eastbound approach (Airway Road) to accommodate dual left-turn lanes, two through lanes, and an exclusive right-turn lane, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane.
4. Innovative Drive / Otay Mesa Road	N/A	N/A	N/A	Widen of the southbound approach to accommodate dual left-turn lanes, a through lane with a shared right-turn lane, and an exclusive right-turn lane.

TABLE 14.6
SUMMARY OF MITIGATION MEASURES RECOMMENDATIONS

Location	Existing + Project	2023 + Project (P1)	2027 + Project (FD)	Buildout of CP + Project (FD)
5. Heritage Road / Otay Mesa Road	N/A	N/A	N/A	Widen the southbound approach (Heritage Road) to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane, widen the westbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane.
6. Cactus Road / Otay Mesa Road	N/A	N/A	N/A	Widen the eastbound approach (Otay Mesa Road) to accommodate an exclusive left-turn lane, three through lanes and dual right-turn lanes, and widen the westbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane.

TABLE 14.6
SUMMARY OF MITIGATION MEASURES RECOMMENDATIONS

Location	Existing + Project	2023 + Project (P1)	2027 + Project (FD)	Buildout of CP + Project (FD)
7. Cactus Road / Airway Road	N/A	N/A	N/A	Widen the eastbound approach (Airway Road) to accommodate an dual left-turn lanes, three through lanes with a shared right-turn lane, and an exclusive right-turn lane, widen the southbound approach (Cactus Road) to accommodate dual left-turn lanes, two through lanes with a shared right-turn lane and an exclusive right-turn lane, widen the westbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane.
8. Britannia Boulevard / Otay Mesa Road	N/A	N/A	N/A	Widen the eastbound approach (Otay Mesa Road) to accommodate an exclusive left-turn lane, three through lanes and an exclusive right-turn lane and widen the westbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane.
9. Britannia Boulevard / SR-905 WB Ramps	N/A	N/A	N/A	Restriping of the westbound approach to accommodate an exclusive left-turn lane, a shared left-through-right lane, and an exclusive right-turn lane, and widening of the southbound approach to accommodate three through lanes with a shared right-turn lane and an exclusive right-turn lane.

TABLE 14.6
SUMMARY OF MITIGATION MEASURES RECOMMENDATIONS

Location	Existing + Project	2023 + Project (P1)	2027 + Project (FD)	Buildout of CP + Project (FD)
10. Britannia Boulevard / SR-905 EB Ramps	N/A	N/A	N/A	Widen the northbound approach to accommodate three through lanes and dual right-turn lanes.
11. Britannia Boulevard / Airway Road	Widen the eastbound approach (Airway Road) of this intersection to accommodate dual left-turn lanes and a through lane with a shared right-turn lane, prior to the project's **total trip generation** of 3,145 ADT.	Widen the eastbound approach (Airway Road) of this intersection to accommodate dual left-turn lanes and a through lane with a shared right-turn lane, and add a right-turn overlap phase at the southbound approach (Britannia Blvd), prior to the project's **total trip generation** of 4,912 ADT.	Widen the eastbound approach (Airway Road) of this intersection to accommodate dual left-turn lanes and a through lane with a shared right-turn lane, widen the southbound approach (Britannia Boulevard) to accommodate an exclusive left-turn lane, two through lanes, two exclusive right-turn lanes with right-turn overlap phasing, and stripe an exclusive left-turn lane at the westbound approach (Airway Road) and add right-turn overlap phasing, prior to the project's **total trip generation** of 9,026 ADT.	Widen the eastbound approach (Airway Road) to accommodate an dual left-turn lanes, three through lanes, and an exclusive right-turn lane, widen the southbound approach (Britannia Blvd) to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, widen the westbound approach to accommodate dual left-turn lanes, two through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane.

TABLE 14.6
SUMMARY OF MITIGATION MEASURES RECOMMENDATIONS

Location	Existing + Project	2023 + Project (P1)	2027 + Project (FD)	Buildout of CP + Project (FD)
13. La Media Road / Otay Mesa Road	N/A	N/A	N/A	Widen the eastbound approach (Otay Mesa Road) to accommodate dual left-turn lanes, three through lanes, and dual right-turn lanes, widen the southbound approach (La Media Road) to accommodate dual left-turn lanes, two through lanes and dual right-turn lanes, widen the westbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes.
14. La Media Road / Airway Road	N/A	N/A	N/A	Widen the eastbound approach (Airway Road) to accommodate dual left-turn lanes, two through lanes, and an exclusive right-turn lane, widen the southbound approach (La Media Road) to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, widen the westbound approach to accommodate dual left-turn lanes, two through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane.
20. Cactus Road / Siempre Viva Road	N/A	N/A	N/A	Widen the northbound approach to accommodate an exclusive right-turn lane.

TABLE 14.6
SUMMARY OF MITIGATION MEASURES RECOMMENDATIONS

Location	Existing + Project	2023 + Project (P1)	2027 + Project (FD)	Buildout of CP + Project (FD)
21. La Media Road / Airway Road	N/A	N/A	N/A	Widen the eastbound approach (Siempre Viva Road) to accommodate dual left-turn lanes, three through lanes, and an exclusive right-turn lane, widen the southbound approach (Britannia Boulevard) to accommodate dual left-turn lanes, two through lanes and dual right-turn lanes, widen the westbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane.
22. La Media Road / Siempre Viva Road	N/A	N/A	N/A	Widen the southbound approach (La Media Road) to accommodate dual left-turn lanes, one through lane and dual right-turn lanes, and widen the westbound approach to accommodate three through lanes and dual right-turn lanes.

TABLE 14.6
SUMMARY OF MITIGATION MEASURES RECOMMENDATIONS

Location	Existing + Project	2023 + Project (P1)	2027 + Project (FD)	Buildout of CP + Project (FD)
24. Heritage Road / Datsun Street	N/A	N/A	N/A	Widen the eastbound approach (Datsun Street) to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane, widen the southbound approach (Heritage Road) to accommodate dual left-turn lanes, three through lanes dual right-turn lanes, widen the westbound approach to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane, and widen the northbound approach to accommodate dual left-turn lanes, three through lanes and an exclusive right-turn lane.
Freeway Segment				
SR-905, between I-805 and Caliente Avenue – EB direction	N/A	N/A	N/A	Caltrans Facility – Significant and Unavoidable Impact. Consistent with the conclusion of the OMCPU EIR.
SR-905, between I-805 and Caliente Avenue – WB direction	N/A	N/A	N/A	Caltrans Facility – Significant and Unavoidable Impact. Consistent with the conclusion of the OMCPU EIR.

Source: Chen Ryan Associates; February 2019

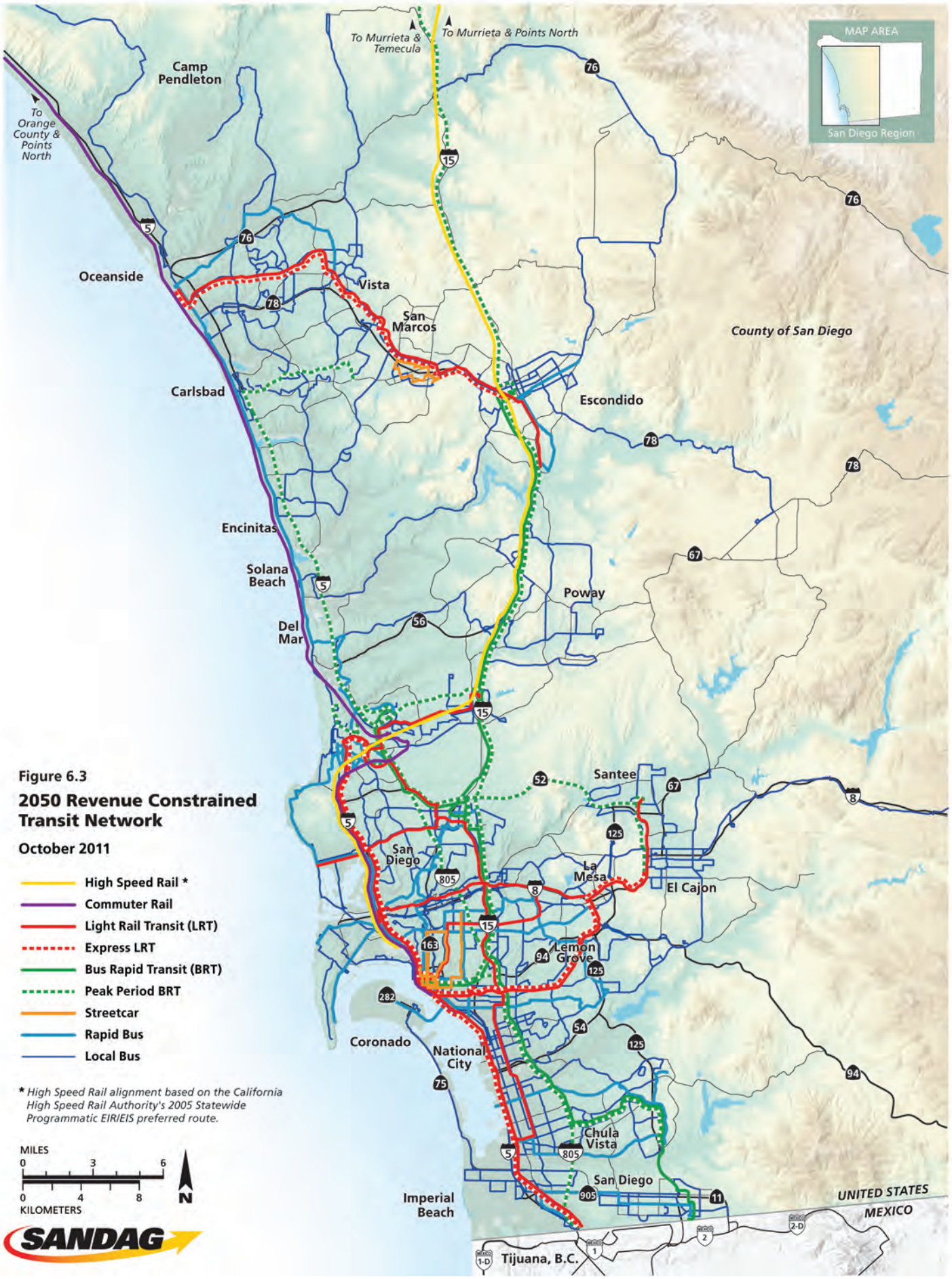


Figure 6.3

2050 Revenue Constrained Transit Network

October 2011

Table 6.2 – Phased Transit Services – Revenue Constrained Plan (Continued)

Decade	Service	Route	Description	Peak Headway (Minutes)	Off-Peak Headway (Minutes)
2035	Rapid	637	North Park to 32nd Street Trolley via Golden Hill	10	10
2035	Rapid	638	San Ysidro to Otay Mesa via Otay, SR 905 Corridor	10	10
2035	Shuttle	448/449	San Marcos - Increase Frequencies	10	10
2035			Local Bus Routes - 10 minutes in key corridors	10	10
2040	Trolley	520	Orange Line - Increased Frequencies	7.5	7.5
2040	Trolley	522	Orange Line Express - El Cajon to downtown San Diego	10	10
2040	Trolley	530	Green Line Extend to downtown - Bayside	7.5	7.5
2040	Trolley	540	Blue Line Express - UTC to San Ysidro via downtown	10	10
2050	Trolley	560	SDSU to downtown (Phase 2) via Mid-City, El Cajon and Park Blvds	7.5	7.5
2050	Trolley	562	UTC to San Ysidro via Kearny Mesa, Mission Valley, Mid-City, Southeastern San Diego, National City, Chula Vista via Highland Ave/4th Avenue	7.5	10

Appendix A
Signal Timing Plans

LOCATION: **905 WB @ Caliente Ave**

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3/4/15

	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
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 WB @ Caliente Ave**

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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	*1c1*	

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**
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7/12/12

	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: **905 WB @ Caliente Ave**

CALTRANS C8 Version 3 7/12/12

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TIME OF DAY ACTIVITY TABLE										
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS										
				ON/	S	M	T	W	T	F	S
	HR	MIN	ACT	OFF	1	2	3	4	5	6	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											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	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											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	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

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

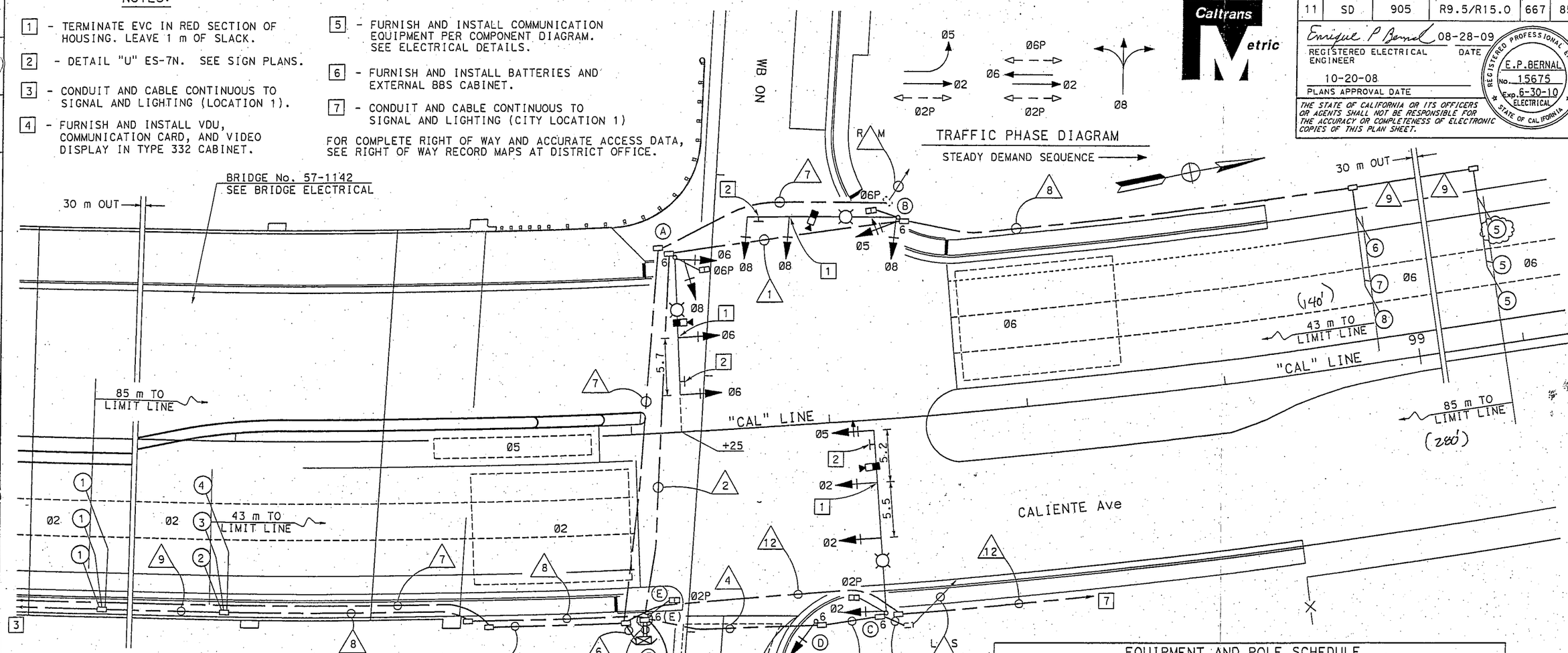
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

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 / 12CSC		POLE - A		1	1		1 1
		B	1	1 1	1		1 1
		C			1	1	1 1
		D				1 1	1 1
		E					1 1
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	MASTARM	PEDESTRIAN SIGNAL	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

THIS PLAN SHEET ACCURATE FOR ELECTRICAL WORK ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

E-19

REVISED BY	DATE REVISED
H. SAWAYA	ENRIQUE BERNAL
CALCULATED-DESIGNED BY	CHECKED BY
FUNCTIONAL SUPERVISOR	DALE WILSON

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans TRAFFIC ELECTRICAL

LAST REVISION DATE PLOTTED = 20-JUN-2011

LOCATION: **905 EB @ Caliente Ave**
CALTRANS C8 Version 3
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3/4/15

	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	1c1	

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

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: **905 EB @ Caliente Ave**

CALTRANS C8 Version 3 7/18/12

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											

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

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

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

CONDUIT AND CONDUCTOR SCHEDULE

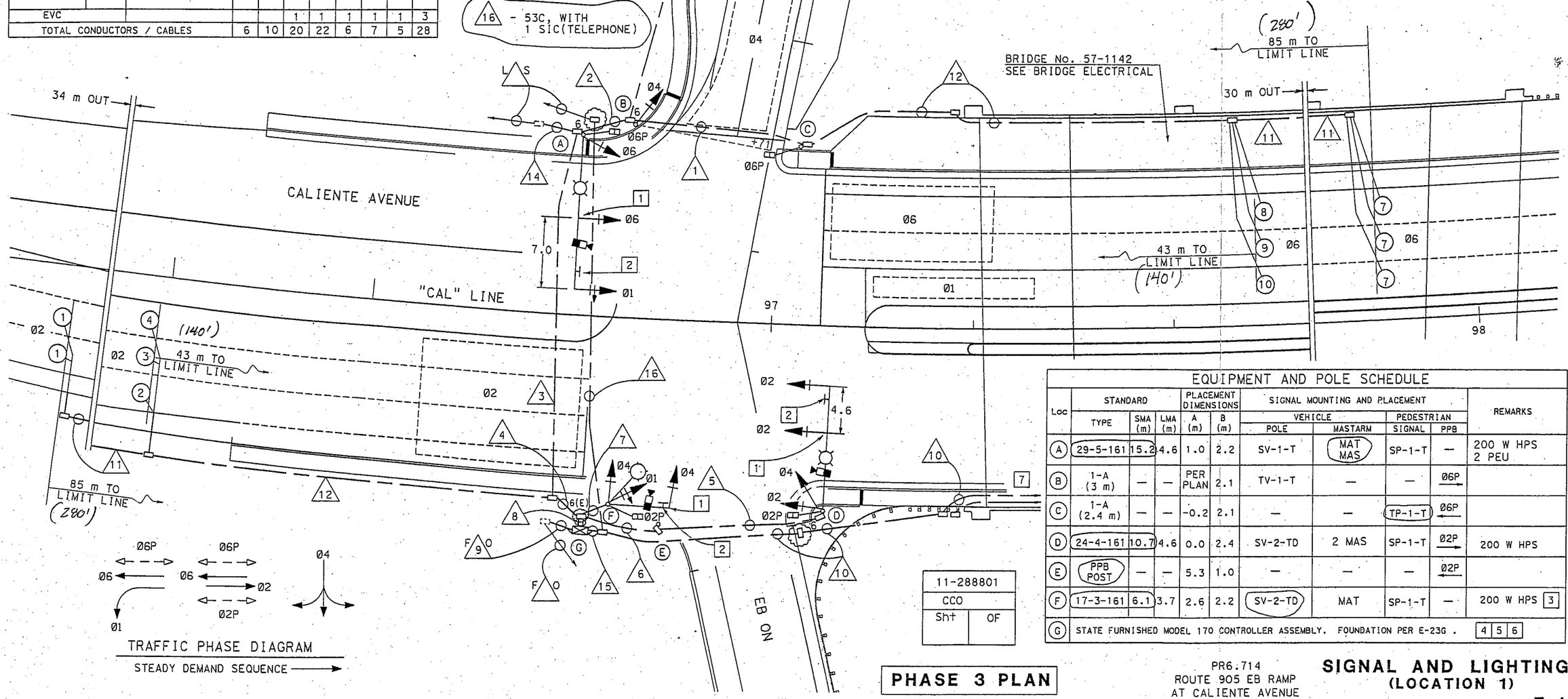
AWG SIZE OR CABLE TYPE	PHASE	POLE OR CIRCUIT	CONDUIT SIZE AND RUN 103 (1)	103 (2)	103 (3)	103 (4)	103 (5)	103 (6)	53 (7)	2-103 (8)
No. 14 CONDUCTORS										
3CSC / 12CSC		POLE - A			1	1	1	1		1 1
		B		1	1	1	1	1		1 1
		C	1	1	1	1	1	1		1 1
		D					1	1	1	1 1
		E						1	1	1
		F							1	1 1
TOTAL 3CSC / 12CSC			1 1	2 2	3 3	3 3	1 1	2 1	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:

1. F O 9 - 27C, 1 FO12, 27C, 1 OCC
2. 10 - 53C, 1 OCC, 1 SIC
3. 11 - 53C, 1 DLC
4. 12 - 53C, 4 DLC
5. 13 - 53C, 2 DLC
6. 14 - 53C, 2#8(L), 2#8(SIG), 2#8(F), 4#14(PEU)
7. 15 - 53C, WITH 1 OCC, 1 SIC, 1 SIC(TELEPHONE)
8. 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).



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

TRAFFIC PHASE DIAGRAM

STEADY DEMAND SEQUENCE

Ø6P Ø6P Ø6 Ø6 Ø2 Ø2P Ø1 Ø4

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 = > 20-DEC-2011

INTERSECTION: HERITAGE RD @ OTAY MESA RD

Group Assignment:
Field Master Assignment:
System Reference Number:

N/S Street Name: **Heritage Rd**
E/W Street Name: **Otay Mesa Rd**

Last Database Change:

Sent to Street Div 7/13/17

Change Record		
Timing Sheet By	Approved By	Date
MB	MZS	

Notes: *Phase 4&5 overlap is hard wired*

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

Free Lag <C/1+F+0> _2_4_6_8

Drop Number		<C/0+0+0>
Zone Number		<C/0+0+1>
Area Number		<C/0+0+2>
Area Address		<C/0+0+3>
QuicNet Channel		(QuicNet)

Communication Addresses

Manual Plan	14	<C/0+A+1>
Manual Offset	0	<C/0+B+1>

Manual Selection

Flash Start	0	<F/1+0+E>
Red Revert	5.0	<F/1+0+F>
All Red Start	0.0	<F/1+C+0>
FYA Red Revert	0.0	<F/1+0+5>
OVLP CHG Red	0.0	<F/1+0+3>

Start / Revert Times

Exclusive Walk	0	<F/1+0+0>
Exclusive FDW	0	<F/1+0+1>
All Red Clear	0.0	<F/1+0+2>

Exclusive Ped Phase
(Outputs specified in Assignable Outputs at E/127+A+E & F)

Row	Column Numbers —>	1	2	3	4	5	6	7	8
		OTAY MESA		HERITAGE		OTAY MESA		HERITAGE	
		Phase							
	N					4+5			
0	Ped Walk		7				7		7
1	Ped FDW		23				29		42
2	Min Green	4	10	4	7	4	10	4	7
3	Type 3 Disconnect								
4	Added per Vehicle								
5	Veh Extension	2.0	4.3	2.0	2.0	2.0	4.4	2.0	5.0
6	Max Gap	2.0	4.3	2.0	2.0	2.0	4.4	2.0	5.0
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	Adv. / Delay Walk								
B	PE Min Ped FDW		1				1		1
C	Cond Serv Check								
D	Reduce Every		0.7				0.7		0.6
E	Yellow Change	3.4	5.0	3.4	3.9	3.4	5.0	3.4	3.9
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Phase Timing - Bank 1 <F/1+Phase+Row>

	9	A	B	C	D
	---	---	---	---	---
Phase 1					
Phase 2					
Phase 3					
Phase 4					
Phase 5					
Phase 6					
Phase 7					
Phase 8					
Max Initial					
Alternate Walk					
Alternate FDW					
Alternate Initial					
Alternate Extension					

Alternate Timing <F/1+Column+Phase>

	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/1+E+Row>

	F	Row
Permit	12345678	0
Red Lock		1
Yellow Lock		2
Min Recall		3
Ped Recall		4
View Set Peds	_2__6_8	5
Rest In Walk		6
Red Rest		7
Dual Entry		8
Max Recall		9
Soft Recall	_2__6__	A
Max 2		B
Cond. Service		C
Man Cntrl Calls	12345678	D
Yellow Start	_2__6__	E
First Phases	__4__8	F

Phase Functions <F/1+F+Row>

How to Set Page Access Code: F/1 -- C + 0 + F = 1

INTERSECTION: HERITAGE RD @ OTAY MESA RD

		Overlap							
	Column Numbers ---->	1	2	3	4	5	6	7	8
Row	*Overlap Name ---->*								
0	Load Switch Number								
1	Veh Set 1 - Phases								
2	Veh Set 2 - Phases								
3	Veh Set 3 - Phases								
4	Neg Veh Phases								
5	Neg Ped Phases								
6	Green Omit Phases								
7	Green Clear Omit Phs.								
8	Overlap Recall								
9	Queue Jump Phase								
A	Queue Jump Time								
B	Minimum Green								
C	Maximum Green								
D	Green Clear								
E	Yellow Change								
F	Red Clear								

Overlap Assignments <E/29+Column+Row>

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = Solid FDW on EV
5 = Extended Status
6 = International Ped
7 = Flash - Clear Outputs
8 = Split Ring

Extra 2 Flags
1 = AWB During Initial
2 = Reserved
3 = Disable Min Walk
4 = QuicNet System
5 = Ignore P/P on EV
6 = Manual Hold in FDW
7 = Allow QuicNet PE
8 = Flash Grn B4 Yellow

	C
EV-A	0
EV-B	0
EV-C	0
EV-D	0
RR-1 *	- - -
RR-2 *	- - -
SE-1	0
SE-2	0

Preempt Priority <E/125+C+Row>

(* RR-1 is always Highest, and RR-2 is always Second Highest)

Row: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F

Row	*Column Numbers ---->*	E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Flash to PE Circuits	
6	Flash Entry Phases	
7	Disable Yellow Range	
8	Disable Ovp Yel Range	
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_34____
F	IC Select (Interconnect)	_2_____

Configuration <E/125+E+Row>

	F
Ext. Permit 1 Phases	
Ext. Permit 2 Phases	
Exclusive Ped Assign	
Preempt Non-Lock	12345678
Ped for 2P Output	_2_____
Ped for 6P Output	_____6__
Ped for 4P Output	
Ped for 8P Output	_____8
Yellow Flash Phases	
Low Priority A Phases	
Low Priority B Phases	
Low Priority C Phases	
Low Priority D Phases	
Restricted Phases	
Extra 2 Config. Bits	__3____

Configuration <E/125+F+Row>

	F
Fast Green Flash Phase	
Green Flash Phases	
Flashing Walk Phases	
Guaranteed Passage	
Simultaneous Gap Term	12345678
Sequential Timing	
Advance Walk Phases	
Delay Walk Phases	
External Recall	
Start-up Overlap Green	
Max Extension	
Inhibit Ped Reservice	
Semi-Actuated	
Start-up Overlap Yellow	
Start-up Vehicle Calls	12345678
Start-up Ped Calls	12345678

Specials <F/2+F+Row>

Flash to PE & PE Non-Lock
1 = EV A 5 = RR 1
2 = EV B 6 = RR 2
3 = EV C 7 = SE 1
4 = EV D 8 = SE 2

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 =
5 =
6 = Simplex Master
7 =
8 = Offset Interrupter

	2
Phase 1	10
Phase 2	10
Phase 3	10
Phase 4	10
Phase 5	10
Phase 6	10
Phase 7	10
Phase 8	10

Coordination Transition Minimums <C/5+2+Row>

Row: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F

INTERSECTION: HERITAGE RD @ OTAY MESA RD

Row	Time	Plan	Offset	Day of Week
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination <9/0.1+Row>
(Bank 1)

Time	Funct.	Day of Week	Column 4 Phases/Bits

TOD Function <7/0.1+Row> <E/27+4+Row>

Day	Year	Month	Holiday Type

Holiday Dates <8/1.1+Row>
(Bank 1)

Time	Plan	Offset	Holiday Type

Holiday Events <9/1.1+Row>
(Bank 1)

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 4 - Disable Detector OFF Monitor
Bit 5 - Disable Low Priority Preempt
Bit 6 - FYA Inhibit
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 8

Plan Select
1 thru 9 = Coordination Plan 1 thru 9
14 or E = Free
15 or F = Flash

Offset Select
A = Offset A
B = Offset B
C = Offset C

Row	Time	Plan	Offset	Day of Week
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination <C+0+9=0.2>
(Bank 2)

Time	Funct.	Holiday Type	Column 4 Phases/Bits

Holiday TOD Function <C+0+7=0.2> <C+0+E=28>

Day	Year	Month	Holiday Type

Holiday Dates <C+0+8=1.2>
(Bank 2)

Time	Plan	Offset	Holiday Type

Holiday Events <C+0+9=1.2>
(Bank 2)

Month Select: October = A, November = B, Decmber = C

INTERSECTION: HERITAGE RD @ OTAY MESA RD

Row	Detector Name	0 C1 Pin Number	1 Attributes	2 Phase(s)	3 Assign	1 Delay	3 Carry-over
0		39	45 7	2	123		
1		40	45 7	6	123		
2		41	45 7	4	123		
3		42	45 7	8	123		
4		43	45 7	2	123		
5		44	45 7	6	123		
6		45	45 7	4	123		
7		46	45 7	8	123		
8	2I4	47	45 7	2	123		1.8
9	6J4	48	45 7	6	123		1.8
A		49	67	4	123		
B	8J8	50	45 7	8	123		1.8
C		55	45 7	5	123		
D		56	45 7	1	123		
E		57	45 7	7	123		
F		58	45 7	3	123		

Row	Detector Name	4 C1 Pin Number	5 Attributes	6 Phase(s)	7 Assign	2 Delay	4 Carry-over
0		59	45 7	5	123		
1		60	45 7	1	123		
2		61	45 7	7	123		
3		62	45 7	3	123		
4		63	45 7	2	123		
5		64	45 7	6	123		
6		65	45 7	4	123		
7		66	45 7	8	123		
8		67	2	2	123		
9		68	2	6	123		
A		69	2	4	123		
B		70	2	8	123		
C		76	45 7	2	123		
D		77	45 7	6	123		
E		78	45 7	4	123		
F		79	45 7	8	123		

Detector Assignments <E/126+Column+Row> **<D/0+Column+Row>**

Detector Attributes
1 = Full Time Delay
2 = Ped Call
3 = Overlap
4 = Count
5 = Extension
6 = Type 3
7 = Calling
8 = Alternate

Det. Assignments
1 = Det. Set 1
2 = Det. Set 2
3 = Det. Set 3
4 =
5 =
6 = Failure - Min Recall
7 = Failure - Max Recall
8 = Report on Failure

Row	Ped / Phase / Overlap 1	2	3	4	5	6	7	8
Walk								
Don't Walk								
Phase Green								
Phase Yellow								
Phase Red								
Overlap Green								
Overlap Yellow								
Overlap Red								

Redirect Phase Outputs <E/127+Column+Row>

Cabinet Type	0	<E/125+D+0>

Enable Redirection
(Enable Redirection = 30)

Max OFF (minutes)	20	<D/0+0+1>
Max ON (minutes)	7	<D/0+0+2>
Chatter Fail Time	0	<D/0+0+4>

Detector Failure Monitor

	B	Row
One-Shot	0	8
Ext. Timer	0	9
DELAY-A	0	A
DELAY-B	0	B
DELAY-C	0	C
DELAY-D	0	D
DELAY-E	0	E
DELAY-F	0	F

Delay Logic Times
<D/0+B+Row> (seconds)

INTERSECTION: HERITAGE RD @ OTAY MESA RD

Coord Extra
1 = Programmed WALK Time for Sync Phases
2 = Always Terminate Sync Phase Peds

Row	Column Numbers ---->	Plan 1	2	3	4	5	6	7	8	9
	Plan Name ---->									
0	Cycle Length									
1	Phase 1 - ForceOff									
2	Phase 2 - ForceOff									
3	Phase 3 - ForceOff									
4	Phase 4 - ForceOff									
5	Phase 5 - ForceOff									
6	Phase 6 - ForceOff									
7	Phase 7 - ForceOff									
8	Phase 8 - ForceOff									
9	Ring Offset									
A	Offset 1									
B	Offset 2									
C	Offset 3									
D	Perm 1 - End									
E	Hold Release									
F	Reserved									

Coordination - Bank 1 <C/1+Plan+Row>

Row		E
0		
1	Plan 1 - Sync	
2	Plan 2 - Sync	
3	Plan 3 - Sync	
4	Plan 4 - Sync	
5	Plan 5 - Sync	
6	Plan 6 - Sync	
7	Plan 7 - Sync	
8	Plan 8 - Sync	
9	Plan 9 - Sync	
A	NEMA Sync	
B	NEMA Hold	
C		
D		
E	Coord Extra	
F		

Sync Phases <C/1+E+Row>

Row										
0	Ped Adjustment									
1	Perm 2 - Start									
2	Perm 2 - End									
3	Perm 3 - Start									
4	Perm 3 - End									
5	Reservice Time									
6	Reservice Phases									
7										
8	Pretimed Phases									
9	Max Recall									
A	Perm 1 Veh Phase									
B	Perm 1 Ped Phase									
C	Perm 2 Veh Phase									
D	Perm 2 Ped Phase									
E	Perm 3 Veh Phase									
F	Perm 3 Ped Phase									

Coordination - Bank 2 <C/2+Plan+Row>

Row		F
0	Free Lag	
1	Plan 1 - Lag	
2	Plan 2 - Lag	
3	Plan 3 - Lag	
4	Plan 4 - Lag	
5	Plan 5 - Lag	
6	Plan 6 - Lag	
7	Plan 7 - Lag	
8	Plan 8 - Lag	
9	Plan 9 - Lag	
A	External Lag	
B	Lag Hold	
C		
D		
E		
F		

Lag Phases <C/1+F+Row>

Coordination Timing By:
Date:

INTERSECTION: HERITAGE RD @ OTAY MESA RD

Row	Column 8		Column 9		Column A		Column B		Column C		Column D		Column E		Column F		Row
0	One-Shot Timer		Latch 1 Set		NOT-3		Max 2		Pretimed		Set Monday		Dial 2 (7-Wire)		Sim Term	0	0
1	AND-5 (a)		Latch 1 Reset		NOT-4		Reserved		Plan 1		Ext. Perm 1		Dial 3 (7-Wire)		EV-A	71	1
2	AND-5 (b)		Latch 2 Set		OR-4 (a)		Reserved		Plan 2		Ext. Perm 2		Offset 1 (7-Wire)		EV-B	72	2
3	AND-6 (a)		Latch 2 Reset		OR-4 (b)		Reserved		Plan 3		Gate Down		Offset 2 (7-Wire)		EV-C	73	3
4	AND-6 (b)		NAND-3 (a)		OR-5 (a)		Reserved		Plan 4		Set Clock		Offset 3 (7-Wire)		EV-D	74	4
5	Reserved		NAND-3 (b)		OR-5 (b)		Reserved		Plan 5		Stop Time	82	Free (7-Wire)		RR-1	51	5
6	Reserved		NAND-4 (a)		OR-6 (a)		Reserved		Plan 6		Flash Sense	81	Flash (7-Wire)		RR-2	52	6
7	Reserved		NAND-4 (b)		OR-6 (b)		Reserved		Plan 7		Manual Enable		Excl. Ped Omit		Spec. Event 1		7
8	Spec. Funct. 1		OR-7 (a)		EXTMR		Reserved		Plan 8		Man. Advance		NOT-1		Spec. Event 2		8
9	Spec. Funct. 2		OR-7 (b)		Reserved		Max Inhibit (nema)		Plan 9		External Alarm		NOT-2		External Lag		9
A	Spec. Funct. 3		OR-7 (c)		AND-4 (a)		Force A (nema)		DELAY-A		Phase Bank 2		OR-1 (a)		AND-1 (a)		A
B	Spec. Funct. 4		OR-7 (d)		AND-4 (b)		Force B (nema)		DELAY-B		Phase Bank 3		OR-1 (b)		AND-1 (b)		B
C	Reserved		OR-8 (a)		NAND-1 (a)		C.N.A. (nema)		DELAY-C		Overlap Set 2		OR-2 (a)		AND-2 (a)		C
D	Reserved		OR-8 (b)		NAND-1 (b)		Hold (nema)		DELAY-D		Overlap Set 3		OR-2 (b)		AND-2 (b)		D
E	Reserved		OR-8 (c)		NAND-2 (a)		Max Recall		DELAY-E		Detector Set 2		OR-3 (a)		AND-3 (a)		E
F	Reserved		OR-8 (d)		NAND-2 (b)		Min Recall		DELAY-F		Detector Set 3		OR-3 (b)		AND-3 (b)		F

Assignable Inputs <E/126+Column+Row>

Row	Column 8		Column 9		Column A		Column B		Column C		Column D		Column E		Column F		Row
0	Reserved		Phase ON - 1		Preempt Fail		Flasher 0		Free		NOT-1		TOD Out 1		Dial 2 (7-Wire)		0
1	Reserved		Phase ON - 2		Sp Evnt Out 1		Flasher 1		Plan 1		OR-1		TOD Out 2		Dial 3 (7-Wire)		1
2	Reserved		Phase ON - 3		Sp Evnt Out 2		Fast Flasher		Plan 2		OR-2		TOD Out 3		Offset 1 (7-Wire)		2
3	Reserved		Phase ON - 4		Sp Evnt Out 3		EXTMR		Plan 3		OR-3		TOD Out 4		Offset 2 (7-Wire)		3
4	Reserved		Phase ON - 5		Sp Evnt Out 4		One-Shot Timer		Plan 4		AND-1		TOD Out 5		Offset 3 (7-Wire)		4
5	Reserved		Phase ON - 6		Sp Evnt Out 5		Reserved		Plan 5		AND-2		TOD Out 6		Free (7-Wire)		5
6	Reserved		Phase ON - 7		Sp Evnt Out 6		Latch 1		Plan 6		AND-3		TOD Out 7		Flash (7-Wire)		6
7	Reserved		Phase ON - 8		Sp Evnt Out 7		Latch 2		Plan 7		NOT-2		TOD Out 8		Preempt		7
8	Flh Yell Arrow 1		Ph. Check - 1		Sp Evnt Out 8		NOT-3		Plan 8		EV-A		Adv. Warn - 1		Low Priority A		8
9	Green 1		Ph. Check - 2		Coord On		NOT-4		Plan 9		EV-B		Adv. Warn - 2		Low Priority B		9
A	Flh Yell Arrow 3		Ph. Check - 3		Detector Fail		OR-4		Spec. Funct. 3		EV-C		DELAY-A		Low Priority C		A
B	Green 3		Ph. Check - 4		Spec. Funct. 1		OR-5		Spec. Funct. 4		EV-D		DELAY-B		Low Priority D		B
C	Flh Yell Arrow 5		Ph. Check - 5		Spec. Funct. 2		OR-6		NAND-3		RR-1		DELAY-C		AND-5		C
D	Green 5		Ph. Check - 6		Central Control		AND-4		NAND-4		RR-2		DELAY-D		AND-6		D
E	Flh Yell Arrow 7		Ph. Check - 7		Excl. Ped DW		NAND-1		OR-7		Spec. Event 1		DELAY-E		Reserved		E
F	Green 7		Ph. Check - 8		Excl. Ped WK		NAND-2		OR-8		Spec. Event 2		DELAY-F		Reserved		F

Assignable Outputs <E/127+Column+Row>

INTERSECTION: CACTUS RD @ OTAY MESA RD

Group Assignment:
Field Master Assignment:
System Reference Number:

N/S Street Name: **Cactus Rd**
E/W Street Name: **Otay Mesa Rd**

Last Database Change:

Sent to Street Div. 7/13/17

Change Record		
Timing Sheet By	Approved By	Date
MB	MZS	

Notes:

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

Free Lag <C/1+F+0> _2_4_6_8

Drop Number		<C/0+0+0>
Zone Number		<C/0+0+1>
Area Number		<C/0+0+2>
Area Address		<C/0+0+3>
QuicNet Channel		(QuicNet)

Communication Addresses

Manual Plan	14	<C/0+A+1>
Manual Offset	0	<C/0+B+1>

Manual Selection

Flash Start	0	<F/1+0+E>
Red Revert	5.0	<F/1+0+F>
All Red Start	0.0	<F/1+C+0>
FYA Red Revert	0.0	<F/1+0+5>
OVLP CHG Red	0.0	<F/1+0+3>

Start / Revert Times

Exclusive Walk	0	<F/1+0+0>
Exclusive FDW	0	<F/1+0+1>
All Red Clear	0.0	<F/1+0+2>

Exclusive Ped Phase
(Outputs specified in Assignable Outputs at E/127+A+E & F)

Row	Column Numbers —>	1	2	3	4	5	6	7	8
		OTAY MESA		CACTUS		OTAY MESA		CACTUS	
		Phase							
0	Ped Walk		7				7		7
1	Ped FDW		25				20		39
2	Min Green	4	10	4	7	4	10	4	7
3	Type 3 Disconnect								
4	Added per Vehicle								
5	Veh Extension	2.0	4.4	2.0	2.0	2.0	4.2	2.0	3.2
6	Max Gap	2.0	4.4	2.0	2.0	2.0	4.2	2.0	3.2
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	Adv. / Delay Walk								
B	PE Min Ped FDW		1				1		1
C	Cond Serv Check								
D	Reduce Every		0.7				0.7		1.0
E	Yellow Change	3.4	5.0	3.4	3.9	3.4	5.0	3.4	3.9
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Phase Timing - Bank 1 <F/1+Phase+Row>

	9	A	B	C	D
	---	---	---	---	---
Phase 1					
Phase 2					
Phase 3					
Phase 4					
Phase 5					
Phase 6					
Phase 7					
Phase 8					
Max Initial					
Alternate Walk					
Alternate FDW					
Alternate Initial					
Alternate Extension					

Alternate Timing <F/1+Column+Phase>

	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/1+E+Row>

	F	Row
Permit	12345678	0
Red Lock		1
Yellow Lock		2
Min Recall		3
Ped Recall		4
View Set Peds	_2__6_8	5
Rest In Walk		6
Red Rest		7
Dual Entry		8
Max Recall		9
Soft Recall	_2__6__	A
Max 2		B
Cond. Service		C
Man Cntrl Calls		D
Yellow Start	_2__6__	E
First Phases	__4__8	F

Phase Functions <F/1+F+Row>

How to Set Page Access Code: F/1 -- C + 0 + F = 1

INTERSECTION: CACTUS RD @ OTAY MESA RD

		Overlap							
	Column Numbers ---->	1	2	3	4	5	6	7	8
Row	*Overlap Name ---->*								
0	Load Switch Number								
1	Veh Set 1 - Phases								
2	Veh Set 2 - Phases								
3	Veh Set 3 - Phases								
4	Neg Veh Phases								
5	Neg Ped Phases								
6	Green Omit Phases								
7	Green Clear Omit Phs.								
8	Overlap Recall								
9	Queue Jump Phase								
A	Queue Jump Time								
B	Minimum Green								
C	Maximum Green								
D	Green Clear								
E	Yellow Change								
F	Red Clear								

Overlap Assignments <E/29+Column+Row>

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = Solid FDW on EV
5 = Extended Status
6 = International Ped
7 = Flash - Clear Outputs
8 = Split Ring

Extra 2 Flags
1 = AWB During Initial
2 = Reserved
3 = Disable Min Walk
4 = QuicNet System
5 = Ignore P/P on EV
6 = Manual Hold in FDW
7 = Allow QuicNet PE
8 = Flash Grn B4 Yellow

	C
EV-A	0
EV-B	0
EV-C	0
EV-D	0
RR-1 *	- - -
RR-2 *	- - -
SE-1	0
SE-2	0

Preempt Priority <E/125+C+Row>

(* RR-1 is always Highest, and RR-2 is always Second Highest)

Row: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F

Row	*Column Numbers ---->*	E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Flash to PE Circuits	
6	Flash Entry Phases	
7	Disable Yellow Range	
8	Disable Ovp Yel Range	
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 34
F	IC Select (Interconnect)	2

Configuration <E/125+E+Row>

	F
Ext. Permit 1 Phases	
Ext. Permit 2 Phases	
Exclusive Ped Assign	
Preempt Non-Lock	12345678
Ped for 2P Output	2
Ped for 6P Output	6
Ped for 4P Output	
Ped for 8P Output	8
Yellow Flash Phases	
Low Priority A Phases	
Low Priority B Phases	
Low Priority C Phases	
Low Priority D Phases	
Restricted Phases	
Extra 2 Config. Bits	3

Configuration <E/125+F+Row>

	F
Fast Green Flash Phase	
Green Flash Phases	
Flashing Walk Phases	
Guaranteed Passage	
Simultaneous Gap Term	12345678
Sequential Timing	
Advance Walk Phases	
Delay Walk Phases	
External Recall	
Start-up Overlap Green	
Max Extension	
Inhibit Ped Reservice	
Semi-Actuated	
Start-up Overlap Yellow	
Start-up Vehicle Calls	12345678
Start-up Ped Calls	12345678

Specials <F/2+F+Row>

Flash to PE & PE Non-Lock
1 = EV A 5 = RR 1
2 = EV B 6 = RR 2
3 = EV C 7 = SE 1
4 = EV D 8 = SE 2

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 =
5 =
6 = Simplex Master
7 =
8 = Offset Interrupter

	2
Phase 1	10
Phase 2	10
Phase 3	10
Phase 4	10
Phase 5	10
Phase 6	10
Phase 7	10
Phase 8	10

Coordination Transition Minimums <C/5+2+Row>

Row: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F

INTERSECTION: CACTUS RD @ OTAY MESA RD

Row	Detector Name	0 C1 Pin Number	1 Attributes	2 Phase(s)	3 Assign	1 Delay	3 Carry-over
0	2I2U	39	45_7_	2	123		1.8
1	6J2U	40	45_7_	6	123		1.8
2		41	45_7_	4	123		
3	8J6U	42	45_7_	8	123		1.8
4		43	45_7_	2	123		
5		44	45_7_	6	123		
6		45	45_7_	4	123		
7	8J6L	46	45_7_	8	123		1.8
8		47	67_	2	123		
9		48	67_	6	123		
A		49	67_	4	123		
B		50	67_	8	123		
C		55	45_7_	5	123		
D		56	45_7_	1	123		
E		57	45_7_	7	123		
F		58	45_7_	2	123		

Row	Detector Name	4 C1 Pin Number	5 Attributes	6 Phase(s)	7 Assign	2 Delay	4 Carry-over
0		59	45_7_	5	123		
1		60	45_7_	1	123		
2		61	45_7_	7	123		
3		62	45_7_	3	123		
4		63	45_7_	2	123		
5		64	45_7_	6	123		
6		65	45_7_	4	123		
7		66	45_7_	8	123		
8		67	2	2	123		
9		68	2	6	123		
A		69	2	4	123		
B		70	2	8	123		
C		76	45_7_	2	123		
D		77	45_7_	6	123		
E		78	45_7_	4	123		
F		79	45_7_	8	123		

Detector Assignments <E/126+Column+Row> **<D/0+Column+Row>**

Detector Attributes
1 = Full Time Delay
2 = Ped Call
3 = Overlap
4 = Count
5 = Extension
6 = Type 3
7 = Calling
8 = Alternate

Det. Assignments
1 = Det. Set 1
2 = Det. Set 2
3 = Det. Set 3
4 =
5 =
6 = Failure - Min Recall
7 = Failure - Max Recall
8 = Report on Failure

Column Numbers --->	Ped / Phase / Overlap 1	2	3	4	5	6	7	8	Row
Walk									0
Don't Walk									1
Phase Green									2
Phase Yellow									3
Phase Red									4
Overlap Green									5
Overlap Yellow									6
Overlap Red									7

Redirect Phase Outputs <E/127+Column+Row>

Cabinet Type	0	<E/125+D+0>

Enable Redirection
(Enable Redirection = 30)

Max OFF (minutes)	20	<D/0+0+1>
Max ON (minutes)	7	<D/0+0+2>
Chatter Fail Time	0	<D/0+0+4>

Detector Failure Monitor

	B	Row
One-Shot	0	8
Ext. Timer	0	9
DELAY-A	0	A
DELAY-B	0	B
DELAY-C	0	C
DELAY-D	0	D
DELAY-E	0	E
DELAY-F	0	F

Delay Logic Times
<D/0+B+Row> (seconds)

INTERSECTION: CACTUS RD @ OTAY MESA RD

Row	Time	Plan	Offset	Day of Week
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination <9/0.1+Row>
(Bank 1)

Time	Funct.	Day of Week	Column 4 Phases/Bits

TOD Function <7/0.1+Row> <E/27+4+Row>

Day	Year	Month	Holiday Type

Holiday Dates <8/1.1+Row>
(Bank 1)

Time	Plan	Offset	Holiday Type

Holiday Events <9/1.1+Row>
(Bank 1)

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 4 - Disable Detector OFF Monitor
Bit 5 - Disable Low Priority Preempt
Bit 6 - FYA Inhibit
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 8

Row	Time	Plan	Offset	Day of Week
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination <C+0+9=0.2>
(Bank 2)

Time	Funct.	Holiday Type	Column 4 Phases/Bits

Holiday TOD Function <C+0+7=0.2> <C+0+E=28>

Day	Year	Month	Holiday Type

Holiday Dates <C+0+8=1.2>
(Bank 2)

Time	Plan	Offset	Holiday Type

Holiday Events <C+0+9=1.2>
(Bank 2)

Plan Select
1 thru 9 = Coordination Plan 1 thru 9
14 or E = Free
15 or F = Flash

Offset Select
A = Offset A
B = Offset B
C = Offset C

Month Select: October = A, November = B, Decmber = C

INTERSECTION: CACTUS RD @ OTAY MESA RD

Coord Extra
1 = Programmed WALK Time for Sync Phases
2 = Always Terminate Sync Phase Peds

Row	Column Numbers ---->	Plan 1	2	3	4	5	6	7	8	9	Row
	Plan Name ---->										
0	Cycle Length										0
1	Phase 1 - ForceOff										1
2	Phase 2 - ForceOff										2
3	Phase 3 - ForceOff										3
4	Phase 4 - ForceOff										4
5	Phase 5 - ForceOff										5
6	Phase 6 - ForceOff										6
7	Phase 7 - ForceOff										7
8	Phase 8 - ForceOff										8
9	Ring Offset										9
A	Offset 1										A
B	Offset 2										B
C	Offset 3										C
D	Perm 1 - End										D
E	Hold Release										E
F	Reserved										F

Coordination - Bank 1 <C/1+Plan+Row>

	E	Row
		0
Plan 1 - Sync		1
Plan 2 - Sync		2
Plan 3 - Sync		3
Plan 4 - Sync		4
Plan 5 - Sync		5
Plan 6 - Sync		6
Plan 7 - Sync		7
Plan 8 - Sync		8
Plan 9 - Sync		9
NEMA Sync		A
NEMA Hold		B
		C
		D
Coord Extra		E
		F

Sync Phases <C/1+E+Row>

Row											Row
0	Ped Adjustment										0
1	Perm 2 - Start										1
2	Perm 2 - End										2
3	Perm 3 - Start										3
4	Perm 3 - End										4
5	Reservice Time										5
6	Reservice Phases										6
7											7
8	Pretimed Phases										8
9	Max Recall										9
A	Perm 1 Veh Phase										A
B	Perm 1 Ped Phase										B
C	Perm 2 Veh Phase										C
D	Perm 2 Ped Phase										D
E	Perm 3 Veh Phase										E
F	Perm 3 Ped Phase										F

Coordination - Bank 2 <C/2+Plan+Row>

	F	Row
Free Lag		0
Plan 1 - Lag		1
Plan 2 - Lag		2
Plan 3 - Lag		3
Plan 4 - Lag		4
Plan 5 - Lag		5
Plan 6 - Lag		6
Plan 7 - Lag		7
Plan 8 - Lag		8
Plan 9 - Lag		9
External Lag		A
Lag Hold		B
		C
		D
		E
		F

Lag Phases <C/1+F+Row>

Coordination Timing By:
Date:

INTERSECTION: CACTUS RD @ OTAY MESA RD

Row	Column 8		Column 9		Column A		Column B		Column C		Column D		Column E		Column F		Row
0	One-Shot Timer		Latch 1 Set		NOT-3		Max 2		Pretimed		Set Monday		Dial 2 (7-Wire)		Sim Term	0	0
1	AND-5 (a)		Latch 1 Reset		NOT-4		Reserved		Plan 1		Ext. Perm 1		Dial 3 (7-Wire)		EV-A	71	1
2	AND-5 (b)		Latch 2 Set		OR-4 (a)		Reserved		Plan 2		Ext. Perm 2		Offset 1 (7-Wire)		EV-B	72	2
3	AND-6 (a)		Latch 2 Reset		OR-4 (b)		Reserved		Plan 3		Gate Down		Offset 2 (7-Wire)		EV-C	73	3
4	AND-6 (b)		NAND-3 (a)		OR-5 (a)		Reserved		Plan 4		Set Clock		Offset 3 (7-Wire)		EV-D	74	4
5	Reserved		NAND-3 (b)		OR-5 (b)		Reserved		Plan 5		Stop Time	82	Free (7-Wire)		RR-1	51	5
6	Reserved		NAND-4 (a)		OR-6 (a)		Reserved		Plan 6		Flash Sense	81	Flash (7-Wire)		RR-2	52	6
7	Reserved		NAND-4 (b)		OR-6 (b)		Reserved		Plan 7		Manual Enable		Excl. Ped Omit		Spec. Event 1		7
8	Spec. Funct. 1		OR-7 (a)		EXTMR		Reserved		Plan 8		Man. Advance		NOT-1		Spec. Event 2		8
9	Spec. Funct. 2		OR-7 (b)		Reserved		Max Inhibit (nema)		Plan 9		External Alarm		NOT-2		External Lag		9
A	Spec. Funct. 3		OR-7 (c)		AND-4 (a)		Force A (nema)		DELAY-A		Phase Bank 2		OR-1 (a)		AND-1 (a)		A
B	Spec. Funct. 4		OR-7 (d)		AND-4 (b)		Force B (nema)		DELAY-B		Phase Bank 3		OR-1 (b)		AND-1 (b)		B
C	Reserved		OR-8 (a)		NAND-1 (a)		C.N.A. (nema)		DELAY-C		Overlap Set 2		OR-2 (a)		AND-2 (a)		C
D	Reserved		OR-8 (b)		NAND-1 (b)		Hold (nema)		DELAY-D		Overlap Set 3		OR-2 (b)		AND-2 (b)		D
E	Reserved		OR-8 (c)		NAND-2 (a)		Max Recall		DELAY-E		Detector Set 2		OR-3 (a)		AND-3 (a)		E
F	Reserved		OR-8 (d)		NAND-2 (b)		Min Recall		DELAY-F		Detector Set 3		OR-3 (b)		AND-3 (b)		F

Assignable Inputs <E/126+Column+Row>

Row	Column 8		Column 9		Column A		Column B		Column C		Column D		Column E		Column F		Row
0	Reserved		Phase ON - 1		Preempt Fail		Flasher 0		Free		NOT-1		TOD Out 1		Dial 2 (7-Wire)		0
1	Reserved		Phase ON - 2		Sp Evnt Out 1		Flasher 1		Plan 1		OR-1		TOD Out 2		Dial 3 (7-Wire)		1
2	Reserved		Phase ON - 3		Sp Evnt Out 2		Fast Flasher		Plan 2		OR-2		TOD Out 3		Offset 1 (7-Wire)		2
3	Reserved		Phase ON - 4		Sp Evnt Out 3		EXTMR		Plan 3		OR-3		TOD Out 4		Offset 2 (7-Wire)		3
4	Reserved		Phase ON - 5		Sp Evnt Out 4		One-Shot Timer		Plan 4		AND-1		TOD Out 5		Offset 3 (7-Wire)		4
5	Reserved		Phase ON - 6		Sp Evnt Out 5		Reserved		Plan 5		AND-2		TOD Out 6		Free (7-Wire)		5
6	Reserved		Phase ON - 7		Sp Evnt Out 6		Latch 1		Plan 6		AND-3		TOD Out 7		Flash (7-Wire)		6
7	Reserved		Phase ON - 8		Sp Evnt Out 7		Latch 2		Plan 7		NOT-2		TOD Out 8		Preempt		7
8	Flh Yell Arrow 1		Ph. Check - 1		Sp Evnt Out 8		NOT-3		Plan 8		EV-A		Adv. Warn - 1		Low Priority A		8
9	Green 1		Ph. Check - 2		Coord On		NOT-4		Plan 9		EV-B		Adv. Warn - 2		Low Priority B		9
A	Flh Yell Arrow 3		Ph. Check - 3		Detector Fail		OR-4		Spec. Funct. 3		EV-C		DELAY-A		Low Priority C		A
B	Green 3		Ph. Check - 4		Spec. Funct. 1		OR-5		Spec. Funct. 4		EV-D		DELAY-B		Low Priority D		B
C	Flh Yell Arrow 5		Ph. Check - 5		Spec. Funct. 2		OR-6		NAND-3		RR-1		DELAY-C		AND-5		C
D	Green 5		Ph. Check - 6		Central Control		AND-4		NAND-4		RR-2		DELAY-D		AND-6		D
E	Flh Yell Arrow 7		Ph. Check - 7		Excl. Ped DW		NAND-1		OR-7		Spec. Event 1		DELAY-E		Reserved		E
F	Green 7		Ph. Check - 8		Excl. Ped WK		NAND-2		OR-8		Spec. Event 2		DELAY-F		Reserved		F

Assignable Outputs <E/127+Column+Row>

INTERSECTION: BRITANNIA BLVD @ OTAY MESA RD

Group Assignment:
Field Master Assignment:
System Reference Number:

N/S Street Name: **Britannia Blvd**
E/W Street Name: **Otay Mesa Rd**

Last Database Change:

Sent to Street Div 7/13/17

Change Record		
Timing Sheet By	Approved By	Date
MB	MZS	

Notes: *Phase 2&8 overlap is hard wired*

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

Free Lag <C/1+F+0> _2__6_8

Drop Number		<C/0+0+0>
Zone Number		<C/0+0+1>
Area Number		<C/0+0+2>
Area Address		<C/0+0+3>
QuicNet Channel		(QuicNet)

Communication Addresses

Manual Plan	14	<C/0+A+1>
Manual Offset	0	<C/0+B+1>

Manual Selection

Flash Start	0	<F/1+0+E>
Red Revert	5.0	<F/1+0+F>
All Red Start	0.0	<F/1+C+0>
FYA Red Revert	0.0	<F/1+0+5>
OVLP CHG Red	0.0	<F/1+0+3>

Start / Revert Times

Exclusive Walk	0	<F/1+0+0>
Exclusive FDW	0	<F/1+0+1>
All Red Clear	0.0	<F/1+0+2>

Exclusive Ped Phase
(Outputs specified in Assignable Outputs at E/127+A+E & F)

		OTAY MESA					OTAY MESA		BRITANNIA
		Phase							
	Column Numbers —>	1	2	3	4	5	6	7	8
Row	N								2+8
0	Ped Walk		7						7
1	Ped FDW		35						34
2	Min Green	4	10				10		7
3	Type 3 Disconnect								
4	Added per Vehicle								
5	Veh Extension	2.0	4.4				4.3		2.0
6	Max Gap	2.0	4.4				4.3		2.0
7	Min Gap	2.0	0.2				0.2		0.2
8	Max Limit	30	60				60		40
9	Max Limit 2								
A	Adv. / Delay Walk								
B	PE Min Ped FDW		1						1
C	Cond Serv Check								
D	Reduce Every		0.7				0.7		1.7
E	Yellow Change	3.4	5.0				5.0		4.3
F	Red Clear	1.0	1.0				1.0		1.0

Phase Timing - Bank 1 <F/1+Phase+Row>

	9	A	B	C	D
	---	---	---	---	---
Phase 1					
Phase 2					
Phase 3					
Phase 4					
Phase 5					
Phase 6					
Phase 7					
Phase 8					

Max Initial
Alternate Walk
Alternate FDW
Alternate Initial
Alternate Extension

Alternate Timing <F/1+Column+Phase>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	
EV-B Clear	
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/1+E+Row>

	F	Row
Permit	12__6_8	0
Red Lock		1
Yellow Lock		2
Min Recall	_2__6__	3
Ped Recall		4
View Set Peds	_2____8	5
Rest In Walk		6
Red Rest		7
Dual Entry		8
Max Recall		9
Soft Recall		A
Max 2		B
Cond. Service		C
Man Cntrl Calls		D
Yellow Start	_2__6__	E
First Phases	_____8	F

Phase Functions <F/1+F+Row>

How to Set Page Access Code: F/1 -- C + 0 + F = 1

INTERSECTION: BRITANNIA BLVD @ OTAY MESA RD

		Overlap							
	Column Numbers ---->	1	2	3	4	5	6	7	8
Row	*Overlap Name ---->*								
0	Load Switch Number								
1	Veh Set 1 - Phases								
2	Veh Set 2 - Phases								
3	Veh Set 3 - Phases								
4	Neg Veh Phases								
5	Neg Ped Phases								
6	Green Omit Phases								
7	Green Clear Omit Phs.								
8	Overlap Recall								
9	Queue Jump Phase								
A	Queue Jump Time								
B	Minimum Green								
C	Maximum Green								
D	Green Clear								
E	Yellow Change								
F	Red Clear								

Overlap Assignments <E/29+Column+Row>

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = Solid FDW on EV
5 = Extended Status
6 = International Ped
7 = Flash - Clear Outputs
8 = Split Ring

Extra 2 Flags
1 = AWB During Initial
2 = Reserved
3 = Disable Min Walk
4 = QuicNet System
5 = Ignore P/P on EV
6 = Manual Hold in FDW
7 = Allow QuicNet PE
8 = Flash Grn B4 Yellow

	C	Row
EV-A	0	0
EV-B	0	1
EV-C	0	2
EV-D	0	3
RR-1 *	- - -	4
RR-2 *	- - -	5
SE-1	0	6
SE-2	0	7
		8
		9
		A
		B
		C
		D
		E
		F

Preempt Priority <E/125+C+Row>

(* RR-1 is always Highest, and RR-2 is always Second Highest)

Row	*Column Numbers ---->*	E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Flash to PE Circuits	
6	Flash Entry Phases	
7	Disable Yellow Range	
8	Disable Ovp Yel Range	
9	Overlap Yellow Flash	
A	EV-A Phases	2
B	EV-B Phases	
C	EV-C Phases	1 6
D	EV-D Phases	8
E	Extra 1 Config. Bits	1 34
F	IC Select (Interconnect)	2

Configuration <E/125+E+Row>

	F
Ext. Permit 1 Phases	
Ext. Permit 2 Phases	
Exclusive Ped Assign	
Preempt Non-Lock	
Ped for 2P Output	2
Ped for 6P Output	
Ped for 4P Output	
Ped for 8P Output	8
Yellow Flash Phases	
Low Priority A Phases	
Low Priority B Phases	
Low Priority C Phases	
Low Priority D Phases	
Restricted Phases	
Extra 2 Config. Bits	3

Configuration <E/125+F+Row>

	F
Fast Green Flash Phase	
Green Flash Phases	
Flashing Walk Phases	
Guaranteed Passage	
Simultaneous Gap Term	12345678
Sequential Timing	
Advance Walk Phases	
Delay Walk Phases	
External Recall	
Start-up Overlap Green	
Max Extension	
Inhibit Ped Reservice	
Semi-Actuated	
Start-up Overlap Yellow	
Start-up Vehicle Calls	12345678
Start-up Ped Calls	12345678

Specials <F/2+F+Row>

Flash to PE & PE Non-Lock
1 = EV A 5 = RR 1
2 = EV B 6 = RR 2
3 = EV C 7 = SE 1
4 = EV D 8 = SE 2

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 =
5 =
6 = Simplex Master
7 =
8 = Offset Interrupter

	2	Row
		0
Phase 1	10	1
Phase 2	10	2
Phase 3	10	3
Phase 4	10	4
Phase 5	10	5
Phase 6	10	6
Phase 7	10	7
Phase 8	10	8
		9
		A
		B
		C
		D
		E
		F

Coordination Transition Minimums <C/5+2+Row>

INTERSECTION: BRITANNIA BLVD @ OTAY MESA RD

Row	Detector Name	0 C1 Pin Number	1 Attributes	2 Phase(s)	3 Assign	1 Delay	3 Carry-over
0	2I2U	39	45_7_	2	123		1.8
1	6J2U	40	45_7_	6	123		1.8
2		41	45_7_	4	123		
3	8J6U	42	45_7_	8	123		1.8
4		43	45_7_	2	123		
5		44	45_7_	6	123		
6		45	45_7_	4	123		
7		46	45_7_	8	123		
8		47	67_	2	123		
9		48	67_	6	123		
A		49	67_	4	123		
B	8J8	50	45_7_	8	123	10.0	
C		55	45_7_	5	123		
D		56	45_7_	1	123		
E		57	45_7_	7	123		
F		58	45_7_	3	123		

Row	Detector Name	4 C1 Pin Number	5 Attributes	6 Phase(s)	7 Assign	2 Delay	4 Carry-over
0		59	45_7_	5	123		
1		60	45_7_	1	123		
2		61	45_7_	7	123		
3		62	45_7_	3	123		
4		63	45_7_	2	123		
5		64	45_7_	6	123		
6		65	45_7_	4	123		
7	8J7U	66	45_7_	8	123		1.8
8		67	2	2	123		
9		68	2	6	123		
A		69	2	4	123		
B		70	2	8	123		
C		76	45_7_	2	123		
D		77	45_7_	6	123		
E		78	45_7_	4	123		
F	8J7L	79	45_7_	8	123		1.8

Detector Assignments <E/126+Column+Row> **<D/0+Column+Row>**

Detector Attributes
1 = Full Time Delay
2 = Ped Call
3 = Overlap
4 = Count
5 = Extension
6 = Type 3
7 = Calling
8 = Alternate

Det. Assignments
1 = Det. Set 1
2 = Det. Set 2
3 = Det. Set 3
4 =
5 =
6 = Failure - Min Recall
7 = Failure - Max Recall
8 = Report on Failure

Column Numbers ---->	Ped / Phase / Overlap 1	2	3	4	5	6	7	8	Row
Walk									0
Don't Walk									1
Phase Green									2
Phase Yellow									3
Phase Red									4
Overlap Green									5
Overlap Yellow									6
Overlap Red									7

Redirect Phase Outputs <E/127+Column+Row>

Cabinet Type	0	<E/125+D+0>

Enable Redirection
(Enable Redirection = 30)

Max OFF (minutes)	20	<D/0+0+1>
Max ON (minutes)	7	<D/0+0+2>
Chatter Fail Time	0	<D/0+0+4>

Detector Failure Monitor

	B	Row
One-Shot	0	8
Ext. Timer	0	9
DELAY-A	0	A
DELAY-B	0	B
DELAY-C	0	C
DELAY-D	0	D
DELAY-E	0	E
DELAY-F	0	F

Delay Logic Times
<D/0+B+Row> (seconds)

INTERSECTION: BRITANNIA BLVD @ OTAY MESA RD

Row	Time	Plan	Offset	Day of Week
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination <9/0.1+Row>
(Bank 1)

Time	Funct.	Day of Week	Column 4 Phases/Bits

TOD Function <7/0.1+Row> <E/27+4+Row>

Day	Year	Month	Holiday Type

Holiday Dates <8/1.1+Row>
(Bank 1)

Time	Plan	Offset	Holiday Type

Holiday Events <9/1.1+Row>
(Bank 1)

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 4 - Disable Detector OFF Monitor
Bit 5 - Disable Low Priority Preempt
Bit 6 - FYA Inhibit
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 8

Plan Select
1 thru 9 = Coordination Plan 1 thru 9
14 or E = Free
15 or F = Flash

Offset Select
A = Offset A
B = Offset B
C = Offset C

Row	Time	Plan	Offset	Day of Week
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination <C+0+9=0.2>
(Bank 2)

Time	Funct.	Holiday Type	Column 4 Phases/Bits

Holiday TOD Function <C+0+7=0.2> <C+0+E=28>

Day	Year	Month	Holiday Type

Holiday Dates <C+0+8=1.2>
(Bank 2)

Time	Plan	Offset	Holiday Type

Holiday Events <C+0+9=1.2>
(Bank 2)

Month Select: October = A, November = B, Decmber = C

INTERSECTION: BRITANNIA BLVD @ OTAY MESA RD

Coord Extra
1 = Programmed WALK Time for Sync Phases
2 = Always Terminate Sync Phase Peds

Row	Column Numbers ---->	Plan 1	2	3	4	5	6	7	8	9
	Plan Name ---->									
0	Cycle Length									
1	Phase 1 - ForceOff									
2	Phase 2 - ForceOff									
3	Phase 3 - ForceOff									
4	Phase 4 - ForceOff									
5	Phase 5 - ForceOff									
6	Phase 6 - ForceOff									
7	Phase 7 - ForceOff									
8	Phase 8 - ForceOff									
9	Ring Offset									
A	Offset 1									
B	Offset 2									
C	Offset 3									
D	Perm 1 - End									
E	Hold Release									
F	Reserved									

Coordination - Bank 1 <C/1+Plan+Row>

Row		E
0		
1	Plan 1 - Sync	
2	Plan 2 - Sync	
3	Plan 3 - Sync	
4	Plan 4 - Sync	
5	Plan 5 - Sync	
6	Plan 6 - Sync	
7	Plan 7 - Sync	
8	Plan 8 - Sync	
9	Plan 9 - Sync	
A	NEMA Sync	
B	NEMA Hold	
C		
D		
E	Coord Extra	
F		

Sync Phases <C/1+E+Row>

Row		1	2	3	4	5	6	7	8	9
0	Ped Adjustment									
1	Perm 2 - Start									
2	Perm 2 - End									
3	Perm 3 - Start									
4	Perm 3 - End									
5	Reservice Time									
6	Reservice Phases									
7										
8	Pretimed Phases									
9	Max Recall									
A	Perm 1 Veh Phase									
B	Perm 1 Ped Phase									
C	Perm 2 Veh Phase									
D	Perm 2 Ped Phase									
E	Perm 3 Veh Phase									
F	Perm 3 Ped Phase									

Coordination - Bank 2 <C/2+Plan+Row>

Row		F
0	Free Lag	
1	Plan 1 - Lag	
2	Plan 2 - Lag	
3	Plan 3 - Lag	
4	Plan 4 - Lag	
5	Plan 5 - Lag	
6	Plan 6 - Lag	
7	Plan 7 - Lag	
8	Plan 8 - Lag	
9	Plan 9 - Lag	
A	External Lag	
B	Lag Hold	
C		
D		
E		
F		

Lag Phases <C/1+F+Row>

Coordination Timing By:
Date:

INTERSECTION: BRITANNIA BLVD @ OTAY MESA RD

Row	Column 8		Column 9		Column A		Column B		Column C		Column D		Column E		Column F		Row
0	One-Shot Timer		Latch 1 Set		NOT-3		Max 2		Pretimed		Set Monday		Dial 2 (7-Wire)		Sim Term	0	0
1	AND-5 (a)		Latch 1 Reset		NOT-4		Reserved		Plan 1		Ext. Perm 1		Dial 3 (7-Wire)		EV-A	71	1
2	AND-5 (b)		Latch 2 Set		OR-4 (a)		Reserved		Plan 2		Ext. Perm 2		Offset 1 (7-Wire)		EV-B	72	2
3	AND-6 (a)		Latch 2 Reset		OR-4 (b)		Reserved		Plan 3		Gate Down		Offset 2 (7-Wire)		EV-C	73	3
4	AND-6 (b)		NAND-3 (a)		OR-5 (a)		Reserved		Plan 4		Set Clock		Offset 3 (7-Wire)		EV-D	74	4
5	Reserved		NAND-3 (b)		OR-5 (b)		Reserved		Plan 5		Stop Time	82	Free (7-Wire)		RR-1	51	5
6	Reserved		NAND-4 (a)		OR-6 (a)		Reserved		Plan 6		Flash Sense	81	Flash (7-Wire)		RR-2	52	6
7	Reserved		NAND-4 (b)		OR-6 (b)		Reserved		Plan 7		Manual Enable		Excl. Ped Omit		Spec. Event 1		7
8	Spec. Funct. 1		OR-7 (a)		EXTMR		Reserved		Plan 8		Man. Advance		NOT-1		Spec. Event 2		8
9	Spec. Funct. 2		OR-7 (b)		Reserved		Max Inhibit (nema)		Plan 9		External Alarm		NOT-2		External Lag		9
A	Spec. Funct. 3		OR-7 (c)		AND-4 (a)		Force A (nema)		DELAY-A		Phase Bank 2		OR-1 (a)		AND-1 (a)		A
B	Spec. Funct. 4		OR-7 (d)		AND-4 (b)		Force B (nema)		DELAY-B		Phase Bank 3		OR-1 (b)		AND-1 (b)		B
C	Reserved		OR-8 (a)		NAND-1 (a)		C.N.A. (nema)		DELAY-C		Overlap Set 2		OR-2 (a)		AND-2 (a)		C
D	Reserved		OR-8 (b)		NAND-1 (b)		Hold (nema)		DELAY-D		Overlap Set 3		OR-2 (b)		AND-2 (b)		D
E	Reserved		OR-8 (c)		NAND-2 (a)		Max Recall		DELAY-E		Detector Set 2		OR-3 (a)		AND-3 (a)		E
F	Reserved		OR-8 (d)		NAND-2 (b)		Min Recall		DELAY-F		Detector Set 3		OR-3 (b)		AND-3 (b)		F

Assignable Inputs <E/126+Column+Row>

Row	Column 8		Column 9		Column A		Column B		Column C		Column D		Column E		Column F		Row
0	Reserved		Phase ON - 1		Preempt Fail		Flasher 0		Free		NOT-1		TOD Out 1		Dial 2 (7-Wire)		0
1	Reserved		Phase ON - 2		Sp Evnt Out 1		Flasher 1		Plan 1		OR-1		TOD Out 2		Dial 3 (7-Wire)		1
2	Reserved		Phase ON - 3		Sp Evnt Out 2		Fast Flasher		Plan 2		OR-2		TOD Out 3		Offset 1 (7-Wire)		2
3	Reserved		Phase ON - 4		Sp Evnt Out 3		EXTMR		Plan 3		OR-3		TOD Out 4		Offset 2 (7-Wire)		3
4	Reserved		Phase ON - 5		Sp Evnt Out 4		One-Shot Timer		Plan 4		AND-1		TOD Out 5		Offset 3 (7-Wire)		4
5	Reserved		Phase ON - 6		Sp Evnt Out 5		Reserved		Plan 5		AND-2		TOD Out 6		Free (7-Wire)		5
6	Reserved		Phase ON - 7		Sp Evnt Out 6		Latch 1		Plan 6		AND-3		TOD Out 7		Flash (7-Wire)		6
7	Reserved		Phase ON - 8		Sp Evnt Out 7		Latch 2		Plan 7		NOT-2		TOD Out 8		Preempt		7
8	Flh Yell Arrow 1		Ph. Check - 1		Sp Evnt Out 8		NOT-3		Plan 8		EV-A		Adv. Warn - 1		Low Priority A		8
9	Green 1		Ph. Check - 2		Coord On		NOT-4		Plan 9		EV-B		Adv. Warn - 2		Low Priority B		9
A	Flh Yell Arrow 3		Ph. Check - 3		Detector Fail		OR-4		Spec. Funct. 3		EV-C		DELAY-A		Low Priority C		A
B	Green 3		Ph. Check - 4		Spec. Funct. 1		OR-5		Spec. Funct. 4		EV-D		DELAY-B		Low Priority D		B
C	Flh Yell Arrow 5		Ph. Check - 5		Spec. Funct. 2		OR-6		NAND-3		RR-1		DELAY-C		AND-5		C
D	Green 5		Ph. Check - 6		Central Control		AND-4		NAND-4		RR-2		DELAY-D		AND-6		D
E	Flh Yell Arrow 7		Ph. Check - 7		Excl. Ped DW		NAND-1		OR-7		Spec. Event 1		DELAY-E		Reserved		E
F	Green 7		Ph. Check - 8		Excl. Ped WK		NAND-2		OR-8		Spec. Event 2		DELAY-F		Reserved		F

Assignable Outputs <E/127+Column+Row>

LOCATION: **905 WB @ Britannia Blvd**

CALTRANS C8 Version 3 2/24/2015

F PAGE

	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
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 WB @ Britannia Blvd**

CALTRANS C8 Version 3 11/29/2010 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 @ Britannia

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8	1c1	

LOCATION	OFF	ON
1	1	
2		2
3	4	
4	8	
5	16	
6	32	
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 11/29/2010 PAGE 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: **905 WB @ Britannia Blvd**

CALTRANS C8 Version 3 11/29/2010 PAGE 4

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											

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

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

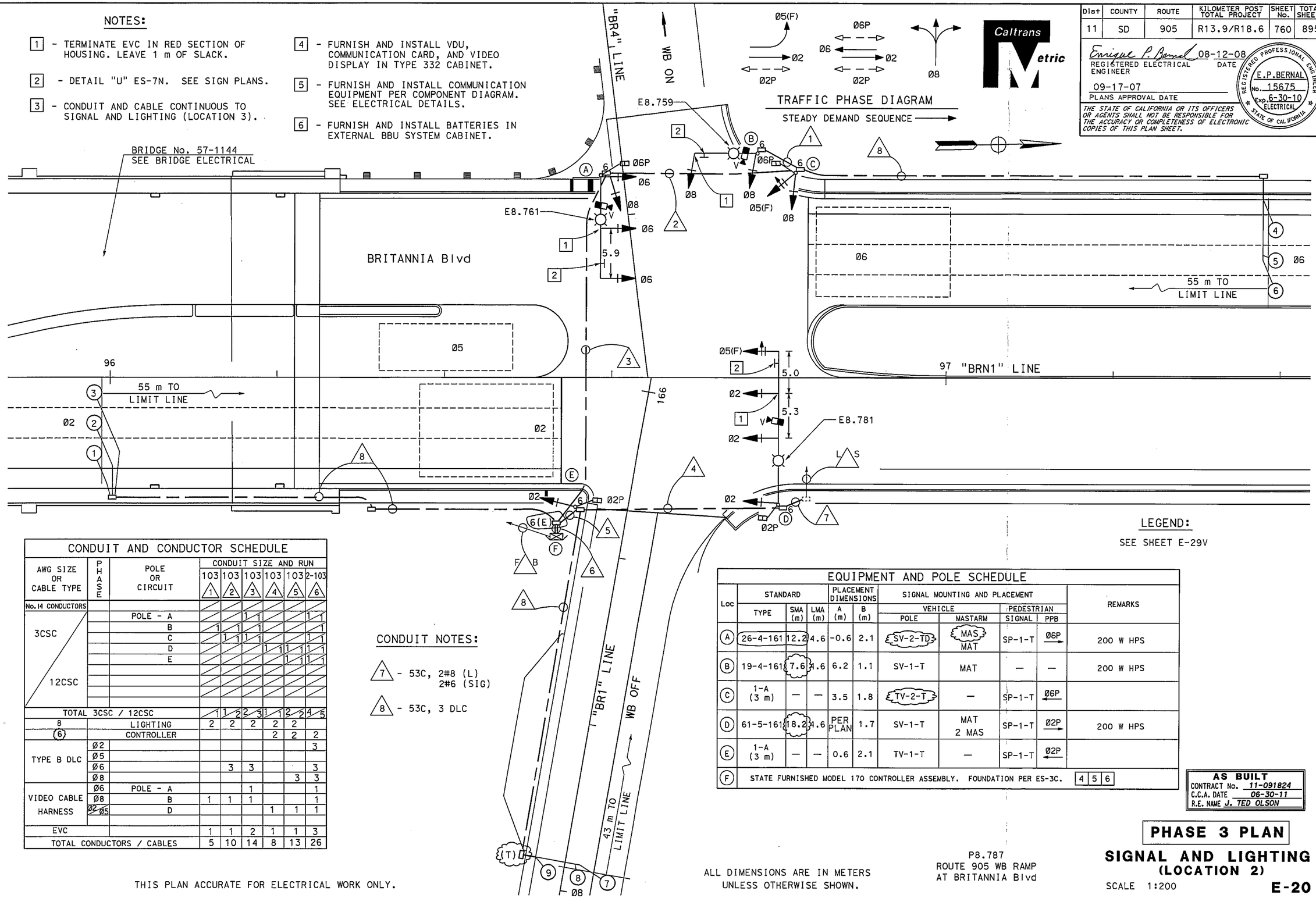
REGISTERED PROFESSIONAL ENGINEER — E.P.BERNAL — No. 15675 — Exp. 6-30-10 — ELECTRICAL — STATE OF CALIFORNIA

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 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.14 CONDUCTORS								
3CSC		POLE - A			1	1		1 1
		B	1	1	1			1
		C		1	1 1			1 1
		D				1	1 1	1 1
		E					1	1 1 1
12CSC								
TOTAL 3CSC / 12CSC			1	1 2	2 3	1 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
	Ø2 Ø5	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

LEGEND:

SEE SHEET E-29V

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	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

THIS PLAN ACCURATE FOR ELECTRICAL WORK ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

P8.787
ROUTE 905 WB RAMP
AT BRITANNIA Blvd

AS BUILT
CONTRACT No. 11-091824
C.C.A. DATE 06-30-11
R.E. NAME J. TED OLSON

PHASE 3 PLAN

SIGNAL AND LIGHTING (LOCATION 2)

SCALE 1:200

E-20

REVISED BY	DATE REVISED
H. SAWAYA	ENRIQUE BERNAL

CALCULATED-DESIGNED BY — CHECKED BY

FUNCTIONAL SUPERVISOR — DALE WILSON

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans TRAFFIC ELECTRICAL

LAST REVISION 08-15-08 — DATE PLOTTED => 20-MAY-2013 — TIME PLOTTED => 10:54

LOCATION: **905 EB @ Britannia Blvd**

CALTRANS C8 Version 3 2/24/2015 PAGE 1

F PAGE

	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	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									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		57'				58'			
	BIKE XING FT		65'				75'			

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 @ Britannia Blvd**

CALTRANS C8 Version 3 11/29/2010 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 @ Britannia

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8	161	

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 11/29/2010 PAGE 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: **905 EB @ Britannia Blvd**

CALTRANS C8 Version 3 11/29/2010 PAGE 4

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											

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 C09 = 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

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

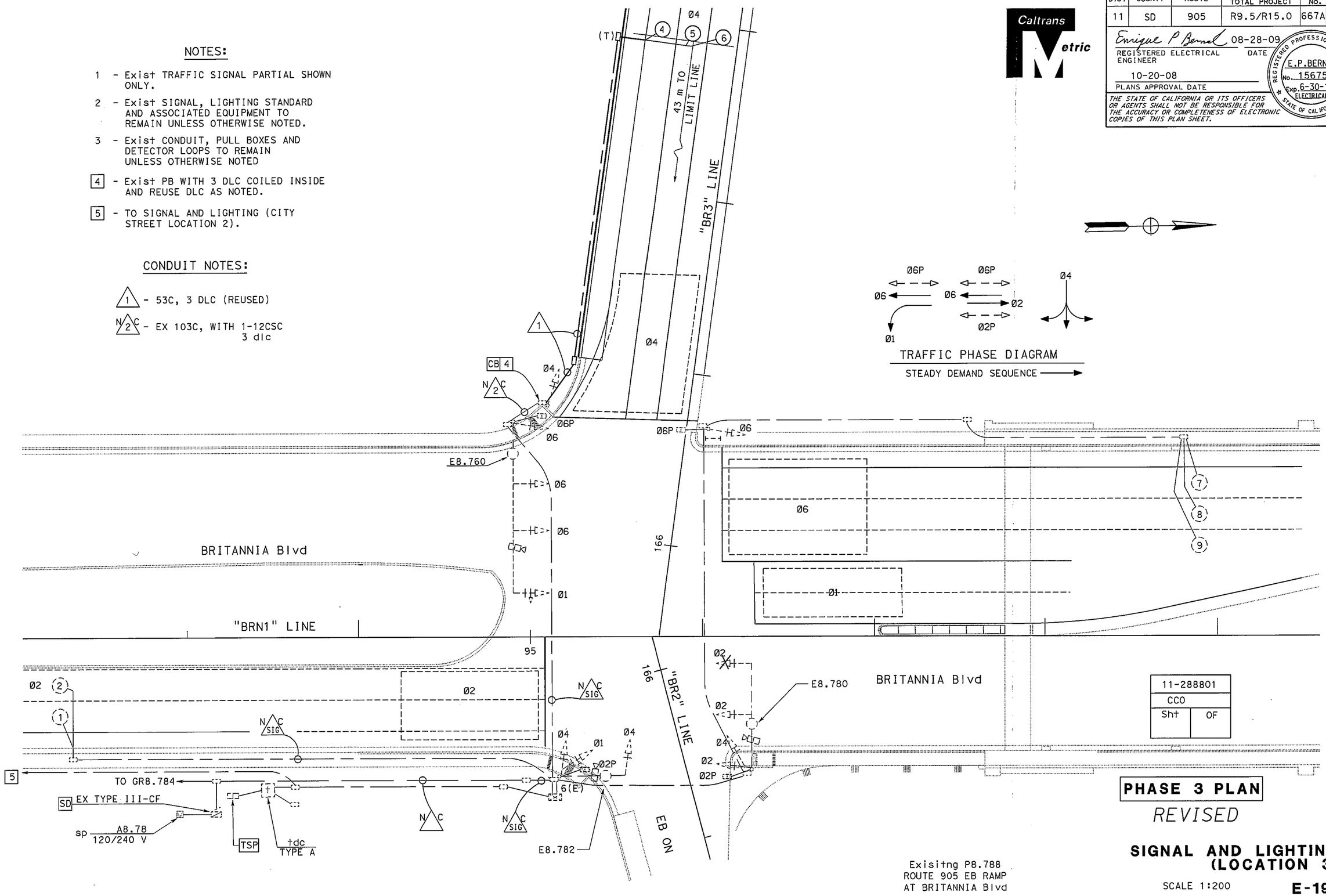
[4] - Exist PB WITH 3 DLC COILED INSIDE AND REUSE DLC AS NOTED.

[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



11-288801	
CCO	
Sht	OF

PHASE 3 PLAN

REVISED

Exisitng P8.788
ROUTE 905 EB RAMP
AT BRITANNIA Blvd

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

223 Program

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

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

E + E + ROW

For access, set F + 9 + E = 1

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

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)

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

Group Assignment:
Field Master Assignment:

N/S Street Name: Britannia
E/W Street Name: Airway

Last Database Change:
System Ref. Number:

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

	F	Row
Permit	12__5678	0
Red Lock		1
Yellow Lock		2
Min Recall		3
Ped Recall		4
Peds (View)	_2_____8	5
Rest In Walk		6
Red Rest		7
Dbl Entry		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	_____7_	F

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 + 0 +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

City of San Diego

Printed on 3/30/2011 12:28 PM

INTERSECTION: Airway Rd @ Britannia Bl

223 Program

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)

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		
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		8	0
RED LOCK									1
YEL LOCK									2
V RECALL		2				6			3
P RECALL									4
PED PHASE*		2						8	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

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

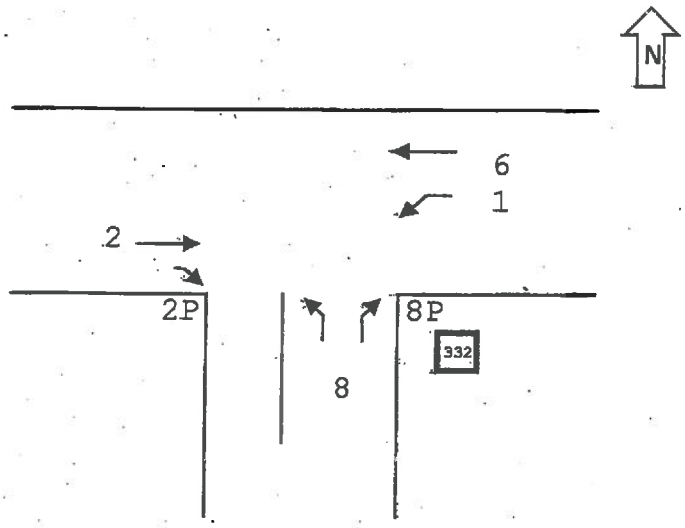
9 PAGE CO9 = 2

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											

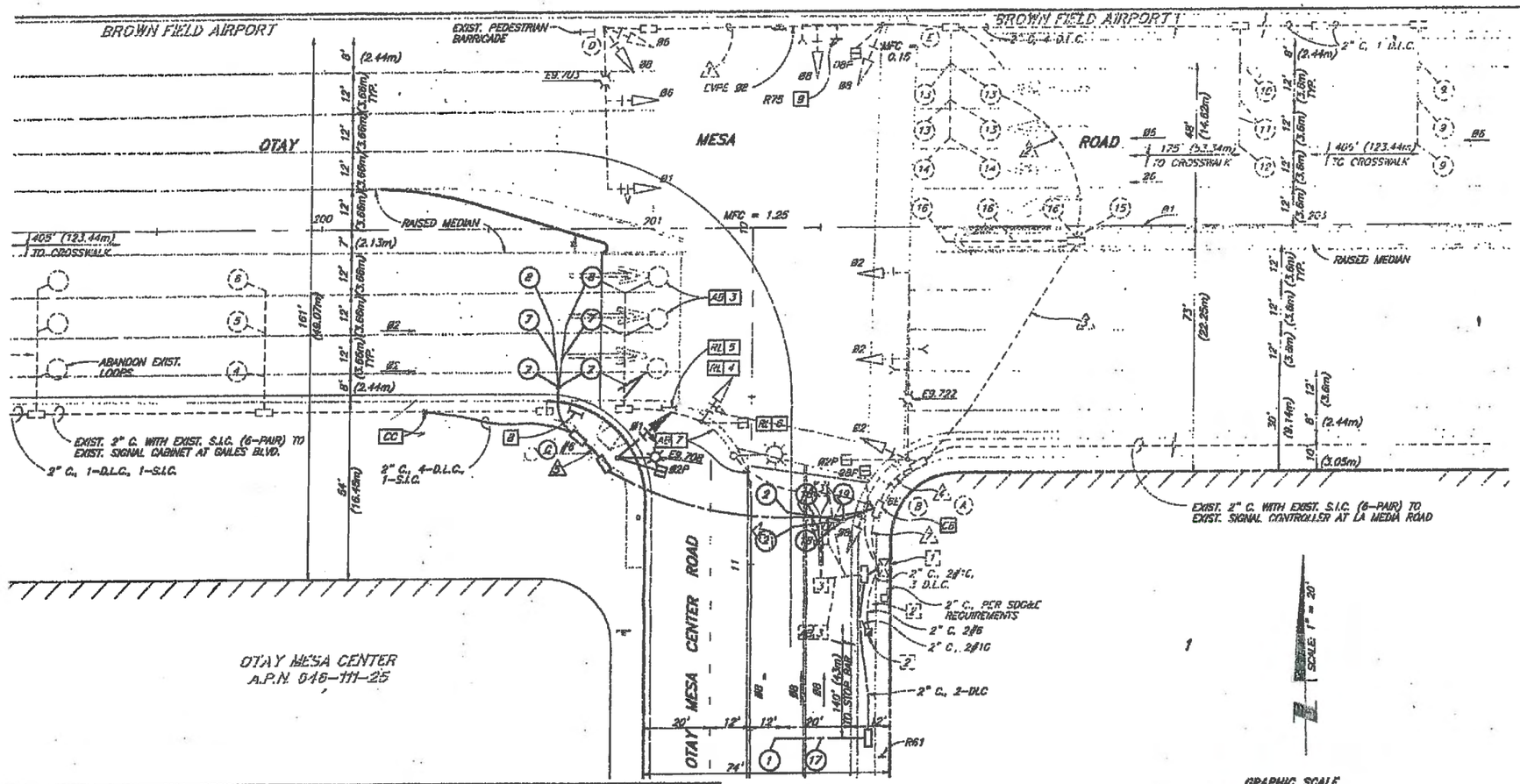
DATE: 1/13/13

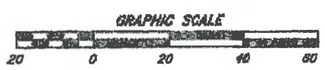
LOCATION: RTE 905 @ OTAY MESA CENTER ROAD

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.	ARMS SIG.	ARMS LUM	LUM H.P.S.V.	PUSH BT. TYPE	PUSH BT. Ø	PUSH BT. QUAD.	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	—	—
		POLE B				1	1	1	1	—	—
		POLE C				1	1	1	1	—	—
		POLE D	2	2	2	2			2	—	—
		POLE E		1	1	1			1	—	—
12 SIGNALS			—	—	—	—	—	—	—	—	—
			—	—	—	—	—	—	—	—	—
			—	—	—	—	—	—	—	—	—
CABLES: 3 C. / 12 C.			1/2	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	—	—
			—	—	—	—	—	—	—	—	—
			—	—	—	—	—	—	—	—	—
			—	—	—	—	—	—	—	—	—
	Ø3	LOOP DETECTOR	—	6	6	6	—	—	8	—	—
			—	—	—	—	—	—	—	—	—
	Ø3	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

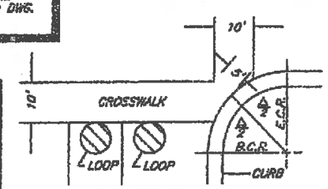
*PER DWG. NO. 28063-91-D

NOTE

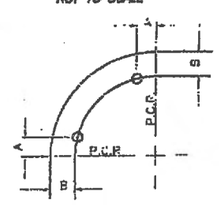
FOR EXIST. SIGNAL PLANS ON OTAY MESA ROAD AND OTAY MESA CENTER ROAD SEE CITY OF SAN DIEGO DWG. NO. 28063-91-D.

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



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	PLANED
ORIGINAL	S.B.&O.			

1784-6339
MAP NO. COORDINATES
144-1779
LAMBERT COORDINATES

CONTRACTOR ____ DATE STARTED ____
INSPECTOR ____ DATE COMPLETED ____

31807-10-D

SB&O
PLANNING DESIGN CONSULTATION
Land Planning
Civil Engineering
Land Surveying
SB&O, Inc.
3815 Kearny Villa Road, Suite 201
San Diego, California 92123 (858)560-1141
10-8-07
PETER R. SAFINO R.C.E. 44171 DATE

REGISTERED PROFESSIONAL ENGINEER PETER R. SAFINO No. 44171 Exp. 6/30/08 CIVIL STATE OF CALIFORNIA

#23

OCT 1 0 2007

N

OTAY MESA | LA MEDIA | OTAY MESA | LA MEDIA

200 SA 1.e

(7)

PHASE TIMING

INTERVAL		1	2	3	4	5	6	7	8
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

DETECTOR TIMES

Y \ X	SET DELAY 1	SET DELAY 2	SET CARRY 3	SET CARRY 4	OBS COUNT 5	OBS COUNT 6	OBS DELAY 7	OBS DELAY 8	OBS CARRY 9	OBS CARRY A
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

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

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

		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								

PHASE

C + E + FUNCTION

PHASE SEQUENCES

		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								

PHASE

C + F + FUNCTION

Date: 01/05/2000 DRH

LOCATION La Media Rd & Otay Mesa Rd

INTERSECTION: AIRWAY RD & LA MEDIA RD

233 Program

Group Assignment:
Field Master Assignment:
System Reference Number:

N/S Street: La Media Rd
E/W Street: Airway Rd

Last Database Change:

Timing sheets by: JMV
Approved by:
Timing implemented on: 5/20/2015

		La Media Rd		Airway Rd					
		Phase							
	Phase Numbers--->	1	2	3	4	5	6	7	8
Row									
0	Ped Walk								
1	Ped FDW								
2	Min Green	7	7	7	7				
3	Type 3 Disconnect								
4	Added per Vehicle								
5	Veh Extension	4.3	4.3	4.7	4.7				
6	Max Gap	4.3	4.3	4.7	4.7				
7	Min Gap	0.2	0.2	0.2	0.2				
8	Max Limit	50	50	35	35				
9	Max Limit 2								
A	Adv. / Delay Walk								
B	PE Min Ped FDW								
C	Cond Serv Check								
D	Reduce Every	0.7	0.7	0.7	0.7				
E	Yellow Change	3.9	3.9	4.2	4.2				
F	Red Clear	1.0	1.0	1.0	1.0				

Phase Timing - Bank 1 <F/1+Phase+Row>

	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/1+E+Row>

	F	Row
Permit	1234	0
Red Lock		1
Yellow Lock		2
Min Recall	1	3
Ped Recall		4
View Set Peds		5
Rest In Walk		6
Red Rest		7
Double Entry		8
Max Recall		9
Soft Recall		A
Max 2		B
Cond. Service		C
Man Cntrl Calls		D
Yellow Start	2	E
First Phases	4	F

Phase Functions <F/1+F+Row>

Current Calculated Cycle Length: C/0 + B + F

	9	A	B	C	D
	- - -	- - -	- - -	- - -	- - -
Phase 1					
Phase 2					
Phase 3					
Phase 4					
Phase 5					
Phase 6					
Phase 7					
Phase 8					
Max Initial					
Alternate Walk					
Alternate FDW					
Alternate Initial					
Alternate Extension					

Alternate Timing <F/1+Column+Phase>

Drop Number		<C/0+0+0>
Zone Number		<C/0+0+1>
Area Number		<C/0+0+2>
Area Address		<C/0+0+3>
QuicNet Channel		(QuicNet)

Communication Addresses

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

(Outputs specified in Assignable Outputs at E/127+A+E & F)

Exclusive Walk	0	<F/1+0+0>
Exclusive FDW	0	<F/1+0+1>
All Red Clear	0.0	<F/1+0+2>

Exclusive Ped Phase

Flash Start	0	<F/1+0+E>
Red Revert	5.0	<F/1+0+F>
All Red Start	0.0	<F/1+C+0>

Start / Revert Times

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Manual Plan	14	<C/0+A+1>
Manual Offset	0	<C/0+B+1>

Manual Selection

Free Lag	1_3	<C/1+F+0>

How to Set Page Access Code:
F/1 – C + 0 + F = 1
F + 9 + E = 1

Notes: 37099-7-D

Version: 233 RV
Rivision: San Diego 1

INTERSECTION: AIRWAY RD & LA MEDIA RD

Row		Overlap 1	2	3	4	5	6	7	8
0	Load Switch Number								
1	Veh Set 1 - Phases								
2	Veh Set 2 - Phases								
3	Veh Set 3 - Phases								
4	Neg Veh Phases								
5	Neg Ped Phases								
6	Green Omit Phases								
7	Green Clear Omit Phs.								
8									
9									
A									
B									
C									
D	Green Clear								
E	Yellow Change								
F	Red Clear								

Overlap Assignments <E/29+Column+Row>

	F
Fast Green Flash Phase	
Green Flash Phases	
Flashing Walk Phases	
Guaranteed Passage	
Simultaneous Gap Term	
Sequential Timing	
Advance Walk Phases	
Delay Walk Phases	
External Recall	
Start-up Overlap Green	
Max Extension	
Inhibit Ped Reservice	
Semi-Actuated	
Start-up Overlap Yellow	
Start-up Vehicle Calls	
Start-up Ped Calls	

Specials <F/2+F+Row>

Row
0
1
2
3
4
5
6
7
8
9
A
B
C
D
E
F

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	Flash to PE Circuits	
6	Flash Entry Phases	
7	Disable Yellow Range	
8	Disable Ovp Yel Range	
9	Overlap Yellow Flash	
A	EV-A Phases	2
B	EV-B Phases	4
C	EV-C Phases	1
D	EV-D Phases	3
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Configuration <E/125+E+Row>

	F
Ext. Permit 1 Phases	
Ext. Permit 2 Phases	
Exclusive Ped Assign	
Preempt Non-Lock	12345678
Ped for 2P Output	
Ped for 6P Output	
Ped for 4P Output	
Ped for 8P Output	
Yellow Flash Phases	
Low Priority A Phases	
Low Priority B Phases	
Low Priority C Phases	
Low Priority D Phases	
Restricted Phases	
Extra 2 Config. Bits	3

Configuration <E/125+F+Row>

	C
EV-A	
EV-B	
EV-C	
EV-D	
RR-1 *	---
RR-2 *	---
SE-1	0
SE-2	0

<E/125+C+Row>

Preemption Priority

(* RR-1 is always Highest, and RR-2 is always Second Highest)

Row
0
1
2
3
4
5
6
7
8
9
A
B
C
D
E
F

	2
Phase 1	0
Phase 2	0
Phase 3	0
Phase 4	0
Phase 5	0
Phase 6	0
Phase 7	0
Phase 8	0

<C/5+2+Row>

Coordination Transition Minimums

Row
0
1
2
3
4
5
6
7
8
9
A
B
C
D
E
F

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Extended Status
6 = International Ped
7 = Flash - Clear Outputs
8 = Split Ring

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Extra 2 Flags
1 = AWB During Initial
2 = LMU Installed
3 = Disable Min Walk
4 = QuicNet/4 System
5 = Ignore P/P on EV
6 =
7 = Reserved
8 =

Flash to PE & PE Non-Lock
1 = EV A 5 = RR 1
2 = EV B 6 = RR 2
3 = EV C 7 = SE 1
4 = EV D 8 = SE 2

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Time and Date

Begin Month	0	<C/5+2+A>
Begin Week	0	<C/5+2+B>
End Month	0	<C/5+2+C>
End Week	0	<C/5+2+D>

Daylight Savings Time

Daylight Savings Date:
If set to all zeros, standard dates will be used.

INTERSECTION: AIRWAY RD & LA MEDIA RD

233 Program

Row	Detector Name	0 C1 Pin Number	1 Attributes	2 Phase(s)	3 Assign	1 Delay	3 Carry-Over
0	2I2U	39					1.8
1	6J2U	40					
2	4I6U	41					1.8
3	8J6U	42					
4	2I2L	43					
5	6J2L	44					
6	4I6L	45					
7	8J6L	46					
8	2I4	47					
9	6J4	48					
A	4I8	49					
B	8J8	50					
C	5J1U	55					
D	1I1U	56					
E	7J5	57					
F	3I5	58					

Program Type:

Row	Detector Name	4 C1 Pin Number	5 Attributes	6 Phase(s)	7 Assign	2 Delay	4 Carry-Over
0	5J9U	59					
1	1I9U	60					
2	7J9L	61					
3	3I9L	62					1.8
4	2I3U	63					
5	6J3U	64					
6	4I7U	65					
7	8J7U	66					
8	2 PPB	67					
9	6 PPB	68					
A	4 PPB	69					
B	8 PPB	70					
C	2I3L	76					
D	6J3L	77					
E	4I7L	78					
F	8J7L	79					

Detector Assignments <E/126+Column+Row> <D/0+Column+Row>

Detector Attributes
1 = Full Time Delay
2 = Ped Call
3 =
4 = Count
5 = Extension
6 = Type 3
7 = Calling
8 = Alternate

Det. Assignments
1 = Det. Set 1
2 = Det. Set 2
3 = Det. Set 3
4 =
5 =
6 = Failure - Min Recall
7 = Failure - Max Recall
8 = Report on Failure

	Ped / Phase / Overlap 1	2	3	4	5	6	7	8	Row
Walk									0
Don't Walk									1
Phase Green									2
Phase Yellow									3
Phase Red									4
Overlap Green									5
Overlap Yellow									6
Overlap Red									7

Redirect Phase Outputs <E/127+Column+Row>

Cabinet Type	30

<E/125+D+0>

Enable Redirection
(Enable Redirection = 30)

Max OFF (minutes)	20	<D/0+0+1>
Max ON (minutes)	60	<D/0+0+2>

Detector Failure Monitor

	D	Row
		0
Output Port 1		1
Output Port 2		2
Output Port 3		3
Output Port 4		4
Output Port 5		5
Output Port 6		6
Output Port 7		7

Dimming <E/125+D+Row>

	D
Number of Digits	
1 st Digit	
2 ed Digit	
3 ed Digit	
4 th Digit	
5 th Digit	
6 th Digit	
7 th Digit	
8 th Digit	
9 th Digit	
10 th Digit	
11 th Digit	
12 th Digit	
13 th Digit	
14 th Digit	
15 th Digit	

<C/5+D+Row>

Dial-Back Telephone Number

Disable Alarms
1 = Stop Time
2 = Flash Sense
3 = Keyboard Entry
4 = Manual Plan
5 = Police Control
6 = External Alarm
7 = Detector Failure
8 =

	B	Row
DELAY-A	1	A
DELAY-B	1	B
DELAY-C	0	C
DELAY-D	0	D
DELAY-E	0	E
DELAY-F	0	F

<D/0+B+Row> (seconds)

Delay Logic Times

Omit Alarm	#NAME?

<C/5+F+0>

Disable Alarm Reporting

Time	0	<C/5+C+0>

Redial Time (minutes)
(View Redial Timer at E/2+D+6)

Version: 233 RV2
Revision San Diego 1

INTERSECTION: AIRWAY RD & LA MEDIA RD

Row	Time	Plan	Offset	Day of Week
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination <9/0.1+Row>
(Bank 1)

Time	Funct.	Day of Week	Column 4 Phases/Bits
:			
:			
:			
:			

TOD Function <7/0.1+Row> <E/27+4+Row>

Row	Day	Year	Month	Holiday Type
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

Holiday Dates <8/1.1+Row>
(Bank 1)

Time	Plan	Offset	Holiday Type	Row
				0
				1
				2
				3
				4
				5
				6
				7
				8
				9
				A
				B
				C
				D
				E
				F

Holiday Events <9/1.1+Row>
(Bank 1)

Row	Time	Plan	Offset	Day of Week
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination <9/0.2+Row>
(Bank 2)

Time	Funct.	Holiday Type	Column 4 Phases/Bits

Holiday TOD Function <7/0.2+Row> <E/28+Row>

Row	Day	Year	Month	Holiday Type
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

Holiday Dates <8/1.2+Row>
(Bank 2)

Time	Plan	Offset	Holiday Type	Row
				0
				1
				2
				3
				4
				5
				6
				7
				8
				9
				A
				B
				C
				D
				E
				F

Holiday Events <9/1.2+Row>
(Bank 2)

T.O.D. Functions:
0 =
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 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 8

Plan Select:
1 thru 9 = Coordination Plan 1 thru 9
14 or E = Free
15 or F = Flash

Month Select:
1 = January
2 = February
3 = March
4 = April
5 = May
6 = June
7 = July
8 = August
9 = September
A = October
B = November
C = December

Cycle Timer:
Master: C/0 + A + 0
Ring A: C/0 + B + 0
Ring B: C/0 + D + 0

Interval Timer:
Ring A: F/0 + A + Interval Row
Ring B: F/0 + B + Interval Row

Master Plan: C/0 + A + 2
Current Plan: C/0 + A + 3
TOD Plan: C/0 + A + 5

INTERSECTION: AIRWAY RD & LA MEDIA RD

233 Program

Row	Plan Name --->	Plan 1	Plan 2	Plan 3	Plan 4	Plan 5	Plan 6	Plan 7	Plan 8	Plan 9
0	Cycle Length									
1	Phase 1 - ForceOff									
2	Phase 2 - ForceOff									
3	Phase 3 - ForceOff									
4	Phase 4 - ForceOff									
5	Phase 5 - ForceOff									
6	Phase 6 - ForceOff									
7	Phase 7 - ForceOff									
8	Phase 8 - ForceOff									
9	Ring Offset									
A	Offset 1									
B	Offset 2									
C	Offset 3									
D	Perm 1 - End									
E	Hold Release									
F	Zone Offset									

Coordination - Timing Plans <C/1+Plan+Row>

Coord Extra
1 = Programmed WALK Time for Sync Phases
2 = Always Terminate Sync Phase Peds

Row		E
0		
1	Plan 1 - Sync	
2	Plan 2 - Sync	
3	Plan 3 - Sync	
4	Plan 4 - Sync	
5	Plan 5 - Sync	
6	Plan 6 - Sync	
7	Plan 7 - Sync	
8	Plan 8 - Sync	
9	Plan 9 - Sync	
A	NEMA Sync	
B	NEMA Hold	
C		
D		
E	Coord Extra	
F		

Sync Phases <C/1+E+Row>

Row										
0	Ped Adjustment									
1	Perm 2 - Start									
2	Perm 2 - End									
3	Perm 3 - Start									
4	Perm 3 - End									
5	Reservice Time									
6	Reservice Phases									
7										
8	Pretimed Phases									
9	Max Recall									
A	Perm 1 Veh Phase									
B	Perm 1 Ped Phase									
C	Perm 2 Veh Phase									
D	Perm 2 Ped Phase									
E	Perm 3 Veh Phase									
F	Perm 3 Ped Phase									

Coordination - Parameters <C/2+Plan+Row>

Row		F
0	Free Lag	
1	Plan 1 - Lag	
2	Plan 2 - Lag	
3	Plan 3 - Lag	
4	Plan 4 - Lag	
5	Plan 5 - Lag	
6	Plan 6 - Lag	
7	Plan 7 - Lag	
8	Plan 8 - Lag	
9	Plan 9 - Lag	
A	External Lag	
B		
C		
D		
E		
F		

Lag Phases <C/1+F+Row>

Coordination Timing By:

Version: 233 RV2
Revision: San Diego 1

INTERSECTION: AIRWAY RD & LA MEDIA RD

Row	Column 9		Column A		Column B		Column C		Column D		Column E		Column F		Row
0	Spec. Funct. 1		NOT-3		Max 2		Pretimed		Set Monday		Dial 2 (7-Wire)		Sim Term		0
1	Spec. Funct. 2		NOT-4		System Det 1		Plan 1		Ext. Perm 1		Dial 3 (7-Wire)		EV-A	71	1
2	Spec. Funct. 3		OR-4 (a)		System Det 2		Plan 2		Ext. Perm 2		Offset 1 (7-Wire)		EV-B	72	2
3	Spec. Funct. 4		OR-4 (b)		System Det 3		Plan 3		Dimming		Offset 2 (7-Wire)		EV-C	73	3
4	NAND-3 (a)		OR-5 (a)		System Det 4		Plan 4		Set Clock		Offset 3 (7-Wire)		EV-D	74	4
5	NAND-3 (b)		OR-5 (b)		System Det 5		Plan 5		Stop Time		Free (7-Wire)		RR-1	51	5
6	NAND-4 (a)		OR-6 (a)		System Det 6		Plan 6		Flash Sense	81	Flash (7-Wire)		RR-2	52	6
7	NAND-4 (b)		OR-6 (b)		System Det 7		Plan 7		Manual Enable		Excl. Ped Omit		Spec. Event 1		7
8	OR-7 (a)		Fig 3 Diamond		System Det 8		Plan 8		Man. Advance		NOT-1		Spec. Event 2		8
9	OR-7 (b)		Fig 4 Diamond		Max Inhibit (nema)		Plan 9		External Alarm		NOT-2		External Lag		9
A	OR-7 (c)		AND-4 (a)		Force A (nema)		DELAY-A		Phase Bank 2		OR-1 (a)		AND-1 (a)		A
B	OR-7 (d)		AND-4 (b)		Force B (nema)		DELAY-B		Phase Bank 3		OR-1 (b)		AND-1 (b)		B
C	OR-8 (a)		NAND-1 (a)		C.N.A. (nema)		DELAY-C		Overlap Set 2		OR-2 (a)		AND-2 (a)		C
D	OR-8 (b)		NAND-1 (b)		Hold (nema)		DELAY-D		Overlap Set 3		OR-2 (b)		AND-2 (b)		D
E	OR-8 (c)		NAND-2 (a)		Max Recall		DELAY-E		Detector Set 2		OR-3 (a)		AND-3 (a)		E
F	OR-8 (d)		NAND-2 (b)		Min Recall		DELAY-F		Detector Set 3		OR-3 (b)		AND-3 (b)		F

Assignable Inputs **<E/126+Column+Row>**

Row	Column 9		Column A		Column B		Column C		Column D		Column E		Column F		Row
0	Phase ON - 1		Preempt Fail		Flasher 0		Free		NOT-1		TOD Out 1		Dial 2 (7-Wire)		0
1	Phase ON - 2		Sp Evnt Out 1		Flasher 1		Plan 1		OR-1		TOD Out 2		Dial 3 (7-Wire)		1
2	Phase ON - 3		Sp Evnt Out 2		Fast Flasher		Plan 2		OR-2		TOD Out 3		Offset 1 (7-Wire)		2
3	Phase ON - 4		Sp Evnt Out 3		Fig 3 Diamond		Plan 3		OR-3		TOD Out 4		Offset 2 (7-Wire)		3
4	Phase ON - 5		Sp Evnt Out 4		Fig 4 Diamond		Plan 4		AND-1		TOD Out 5		Offset 3 (7-Wire)		4
5	Phase ON - 6		Sp Evnt Out 5				Plan 5		AND-2		TOD Out 6		Free (7-Wire)		5
6	Phase ON - 7		Sp Evnt Out 6				Plan 6		AND-3		TOD Out 7		Flash (7-Wire)		6
7	Phase ON - 8		Sp Evnt Out 7				Plan 7		NOT-2		TOD Out 8		Preempt		7
8	Ph. Check - 1		Sp Evnt Out 8		NOT-3		Plan 8		EV-A		Adv. Warn - 1		Low Priority A		8
9	Ph. Check - 2				NOT-4		Plan 9		EV-B		Adv. Warn - 2		Low Priority B		9
A	Ph. Check - 3		Detector Fail		OR-4		Spec. Funct. 3		EV-C		DELAY-A		Low Priority C		A
B	Ph. Check - 4		Spec. Funct. 1		OR-5		Spec. Funct. 4		EV-D		DELAY-B		Low Priority D		B
C	Ph. Check - 5		Spec. Funct. 2		OR-6		NAND-3		RR-1		DELAY-C				C
D	Ph. Check - 6		Central Control		AND-4		NAND-4		RR-2		DELAY-D				D
E	Ph. Check - 7		Excl. Ped DW		NAND-1		OR-7		Spec. Event 1		DELAY-E				E
F	Ph. Check - 8		Excl. Ped WK		NAND-2		OR-8		Spec. Event 2		DELAY-F				F

Assignable Outputs **<E/127+Column+Row>**

Appendix B
SANDAG Select Zone Assignments

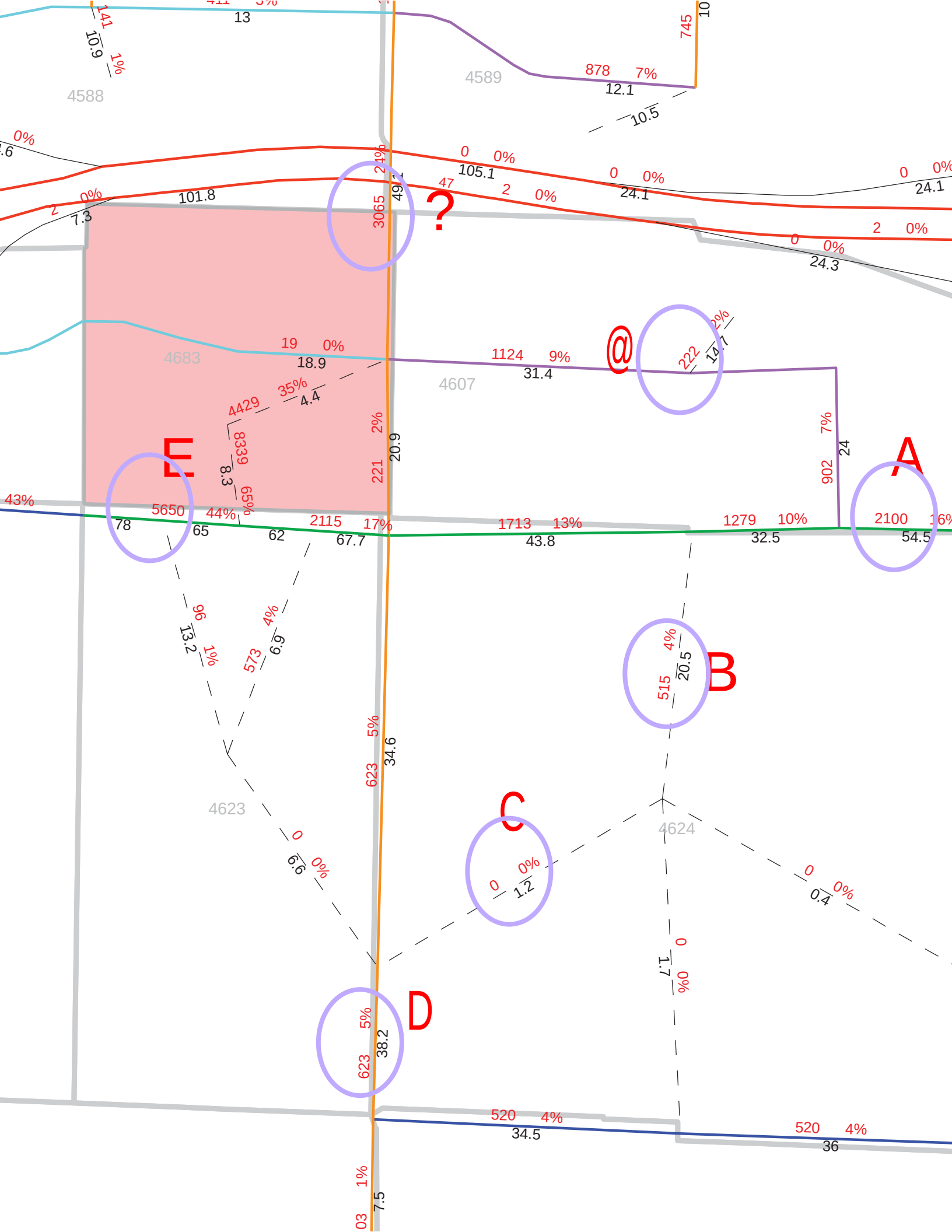
Attachment B
Internal Capture Calculation

Otay Mesa Central Village Specific Plan – Proposed Project Land Use Internal Capture Calculation

Proposed Project Land Use Internal Capture Calculation

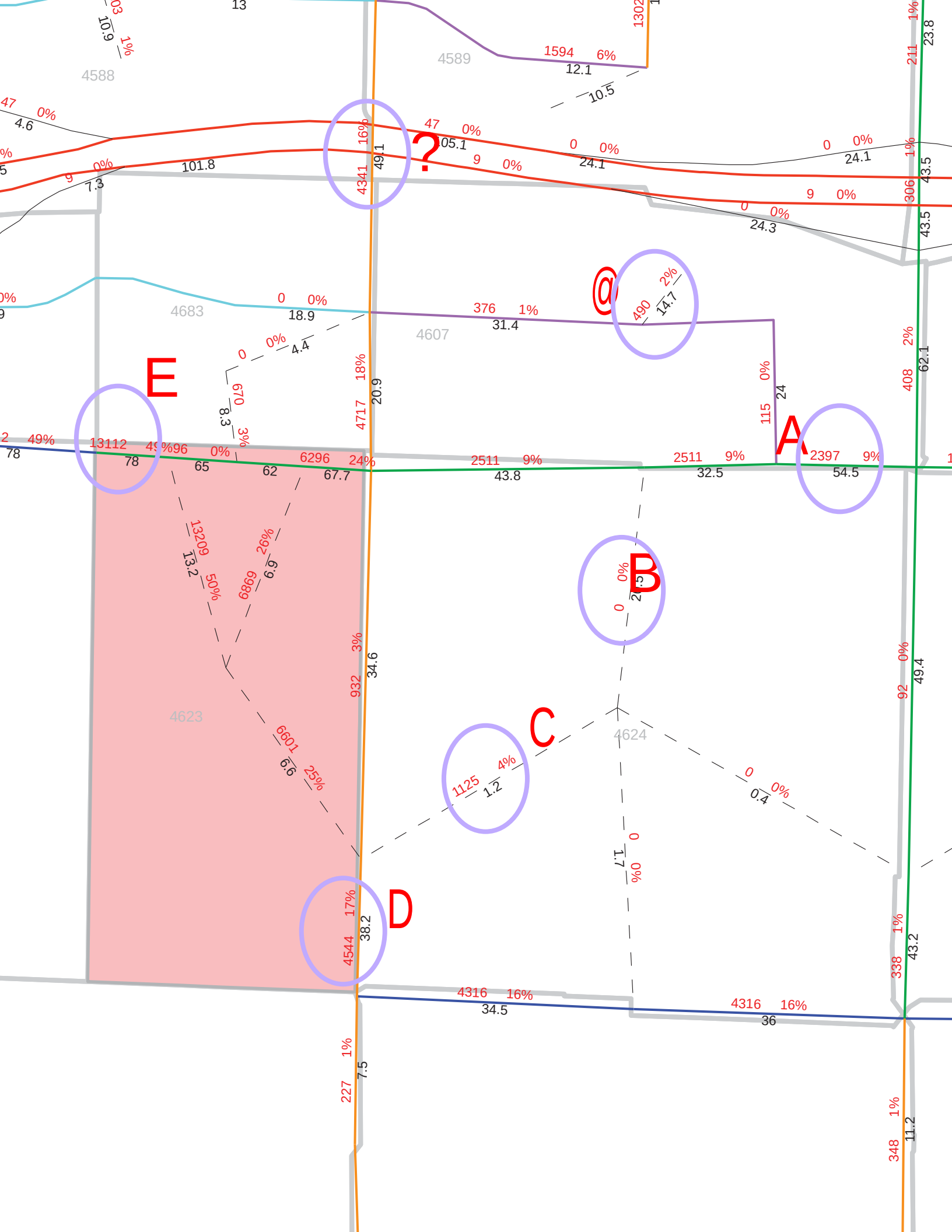
Location	ADT
TAZ 4683 - Location A	3,065
TAZ 4683 - Location B	222
TAZ 4683 - Location C	2,100
TAZ 4683 - Location D	515
TAZ 4683 - Location F	623
TAZ 4683 - Location G	5,554
TAZ 4623 - Location A	4,341
TAZ 4626 - Location B	490
TAZ 4623 - Location C	2,397
TAZ 4623 - Location E	1,125
TAZ 4623 - Location 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



4588
4589
4683
4607
4623
4624
A
B
C
D
E
?
@

Proposed Project Land Use – Model Results – TAZ 4623


4588
4589
4683
4607
4623
4624
?
@
A
B
C
D
E
1594 6% 12.1
10.5
101.8
7.3
4.6
24.1
24.3
43.5
62.1
49.4
43.2
11.2
18.9
4.4
31.4
14.7
20.9
43.8
32.5
54.5
67.7
34.6
38.2
34.5
36
7.5
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	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	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

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*

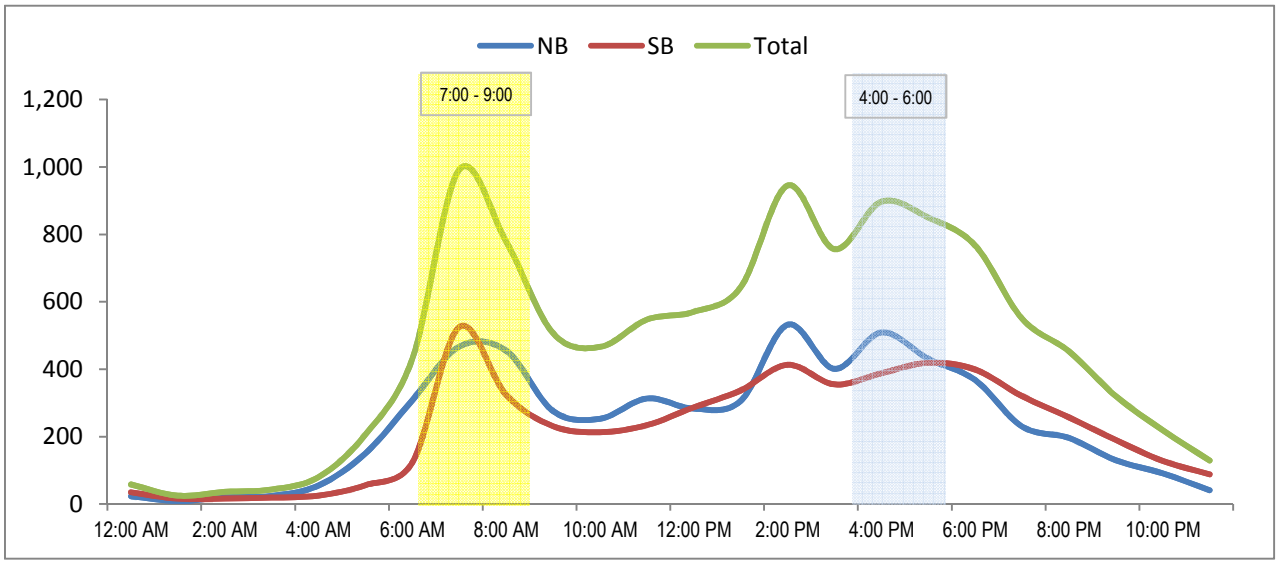
Analysts: *DASH*

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*

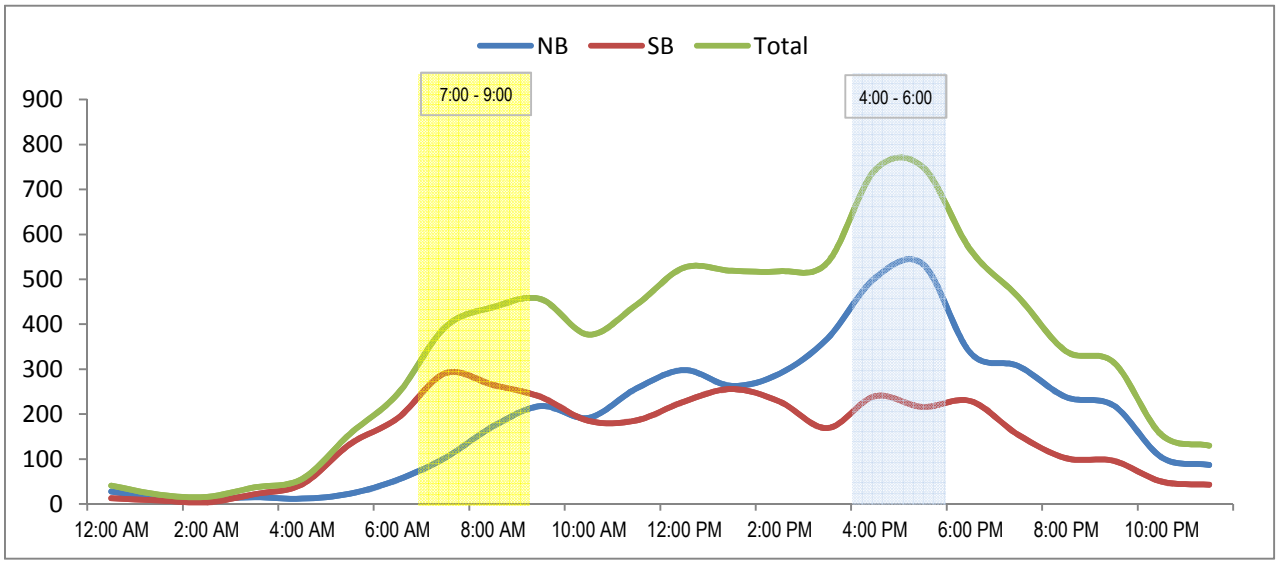
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume 8,238

Time	Hourly Volume NB	SB	Total	Time	Hourly Volume 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*

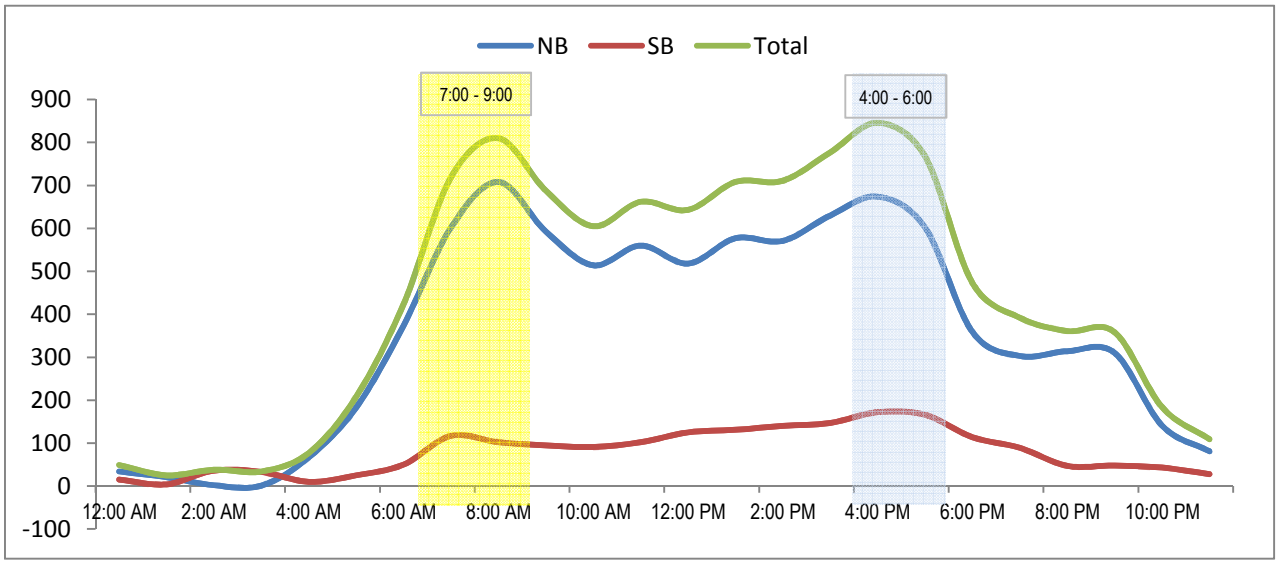
Weather: *Sunny*

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*

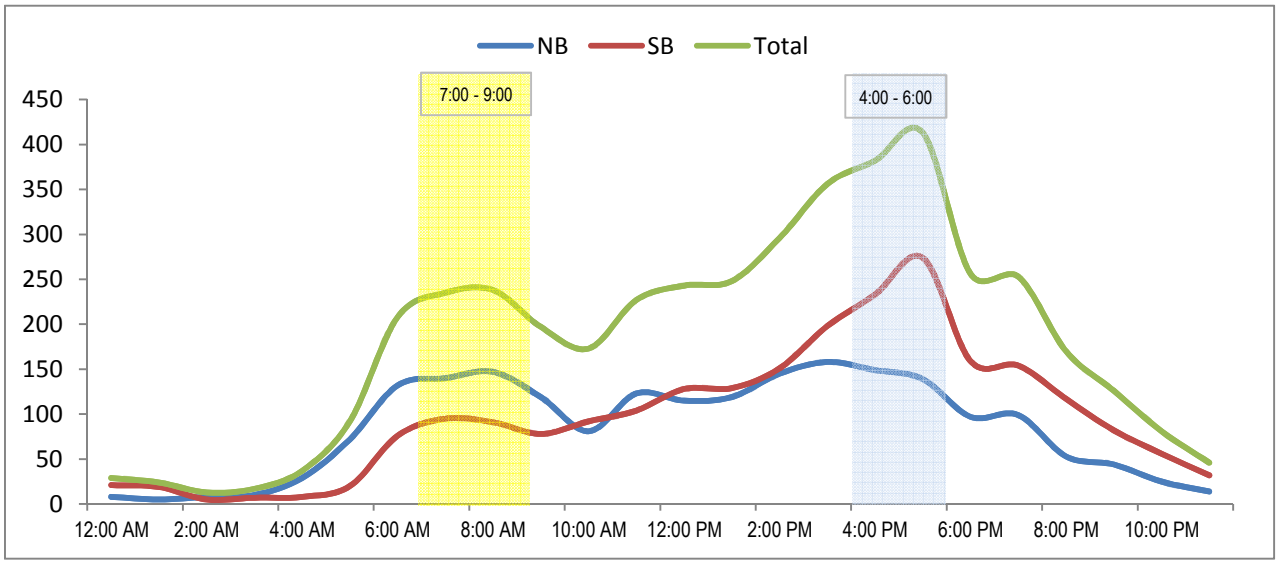
Analysts: *DASH*

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

CHEN RYAN

AVC

Location: 3. Heritage Road Between Main Street and Avenida de las Vistas

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

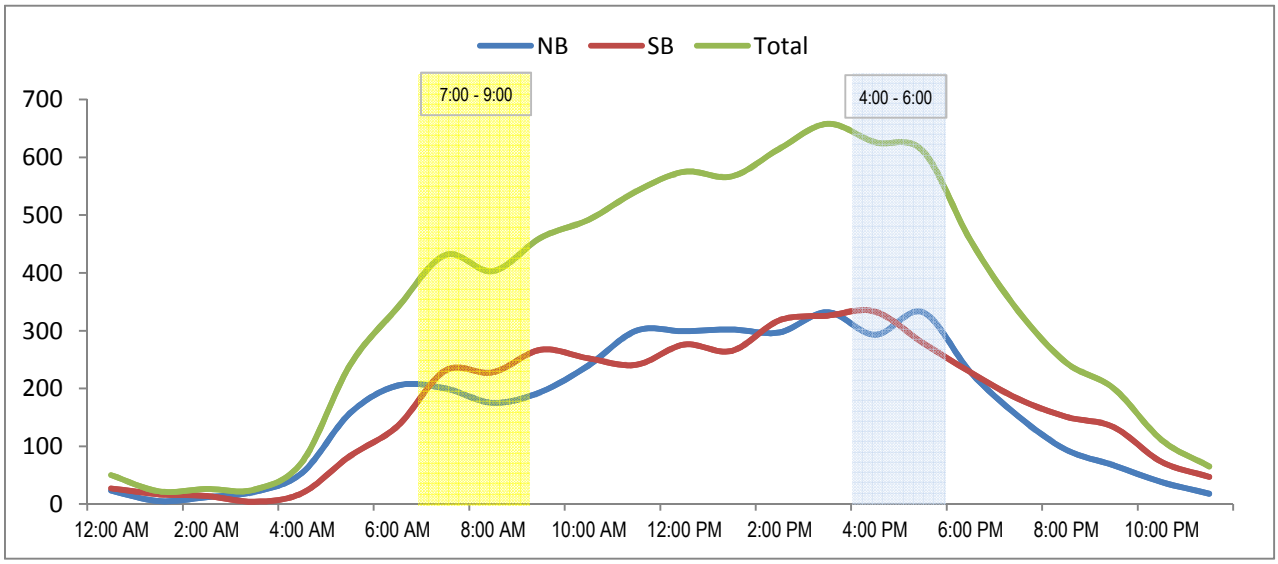
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume ***8,167***

Time	Hourly Volume			Time	Hourly Volume		
	NB	SB	Total		NB	SB	Total
12:00 AM - 1:00 AM	23	27	50	12:00 PM - 1:00 PM	299	276	575
1:00 AM - 2:00 AM	5	17	22	1:00 PM - 2:00 PM	302	265	567
2:00 AM - 3:00 AM	12	14	26	2:00 PM - 3:00 PM	297	318	615
3:00 AM - 4:00 AM	21	4	25	3:00 PM - 4:00 PM	332	326	658
4:00 AM - 5:00 AM	54	19	73	4:00 PM - 5:00 PM	293	333	626
5:00 AM - 6:00 AM	157	83	240	5:00 PM - 6:00 PM	332	279	611
6:00 AM - 7:00 AM	205	135	340	6:00 PM - 7:00 PM	228	228	456
7:00 AM - 8:00 AM	200	231	431	7:00 PM - 8:00 PM	152	182	334
8:00 AM - 9:00 AM	175	228	403	8:00 PM - 9:00 PM	94	151	245
9:00 AM - 10:00 AM	194	267	461	9:00 PM - 10:00 PM	67	133	200
10:00 AM - 11:00 AM	240	252	492	10:00 PM - 11:00 PM	38	73	111
11:00 AM - 12:00 PM	300	241	541	11:00 PM - 12:00 AM	18	47	65
Total	**1,586**	**1,518**	**3,104**	**Total**	**2,452**	**2,611**	**5,063**

24-Hour NB Volume 4,038 ***24-Hour SB Volume 4,129***



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

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*

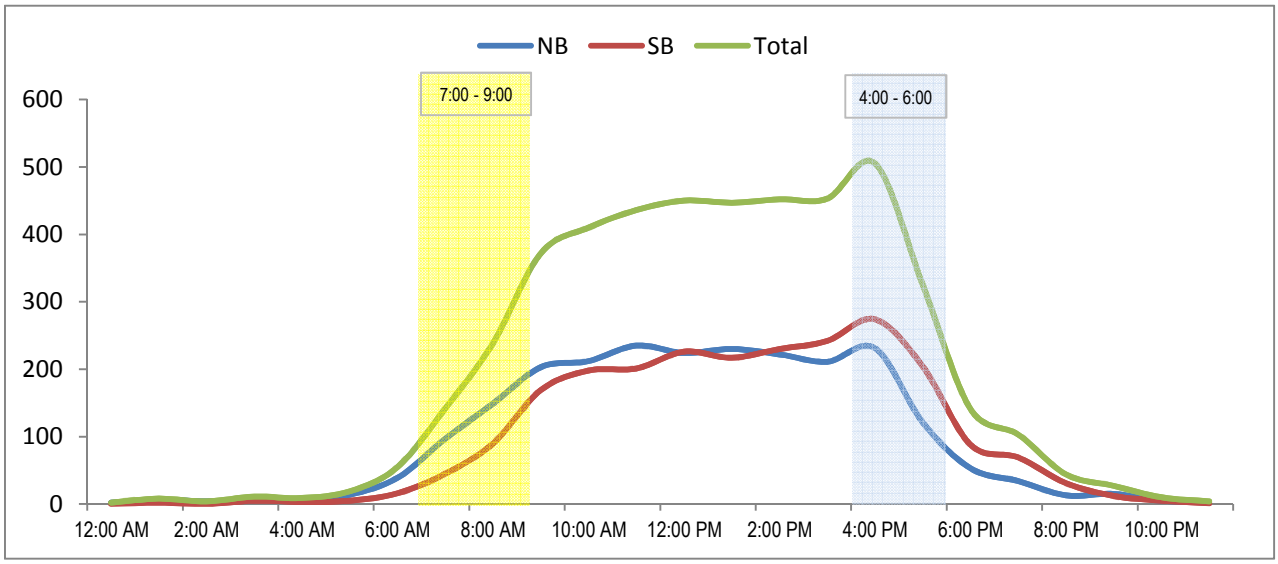
AVC Proj. No: *15-0415*

24 Hour Segment Volume 4,668

Time	Hourly Volume NB	Hourly Volume SB	Hourly Volume Total
12:00 AM - 1:00 AM	2	0	2
1:00 AM - 2:00 AM	6	2	8
2:00 AM - 3:00 AM	4	0	4
3:00 AM - 4:00 AM	6	5	11
4:00 AM - 5:00 AM	6	3	9
5:00 AM - 6:00 AM	14	5	19
6:00 AM - 7:00 AM	39	16	55
7:00 AM - 8:00 AM	97	45	142
8:00 AM - 9:00 AM	149	90	239
9:00 AM - 10:00 AM	203	169	372
10:00 AM - 11:00 AM	212	198	410
11:00 AM - 12:00 PM	235	201	436
Total	**973**	**734**	**1,707**

Time	Hourly Volume NB	Hourly Volume SB	Hourly Volume Total
12:00 PM - 1:00 PM	224	226	450
1:00 PM - 2:00 PM	230	217	447
2:00 PM - 3:00 PM	222	230	452
3:00 PM - 4:00 PM	211	242	453
4:00 PM - 5:00 PM	231	274	505
5:00 PM - 6:00 PM	121	204	325
6:00 PM - 7:00 PM	53	88	141
7:00 PM - 8:00 PM	34	69	103
8:00 PM - 9:00 PM	13	31	44
9:00 PM - 10:00 PM	15	12	27
10:00 PM - 11:00 PM	5	5	10
11:00 PM - 12:00 AM	3	1	4
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*

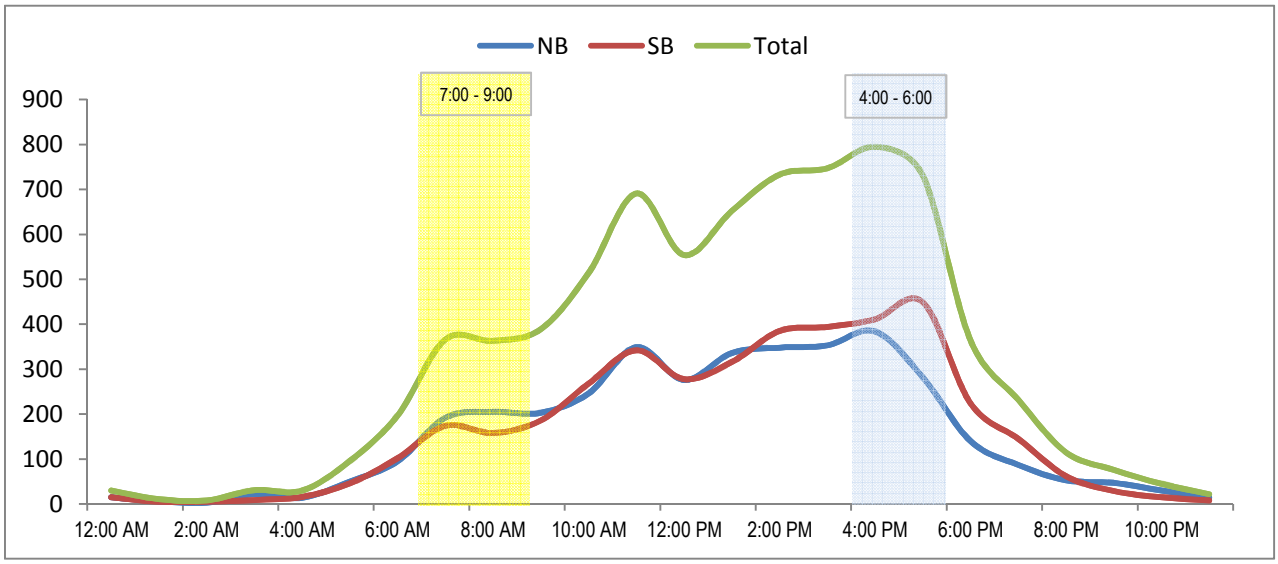
Analysts: *DASH*

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: 33. Cactus Road Between Otay Mesa Road and Airway Road

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

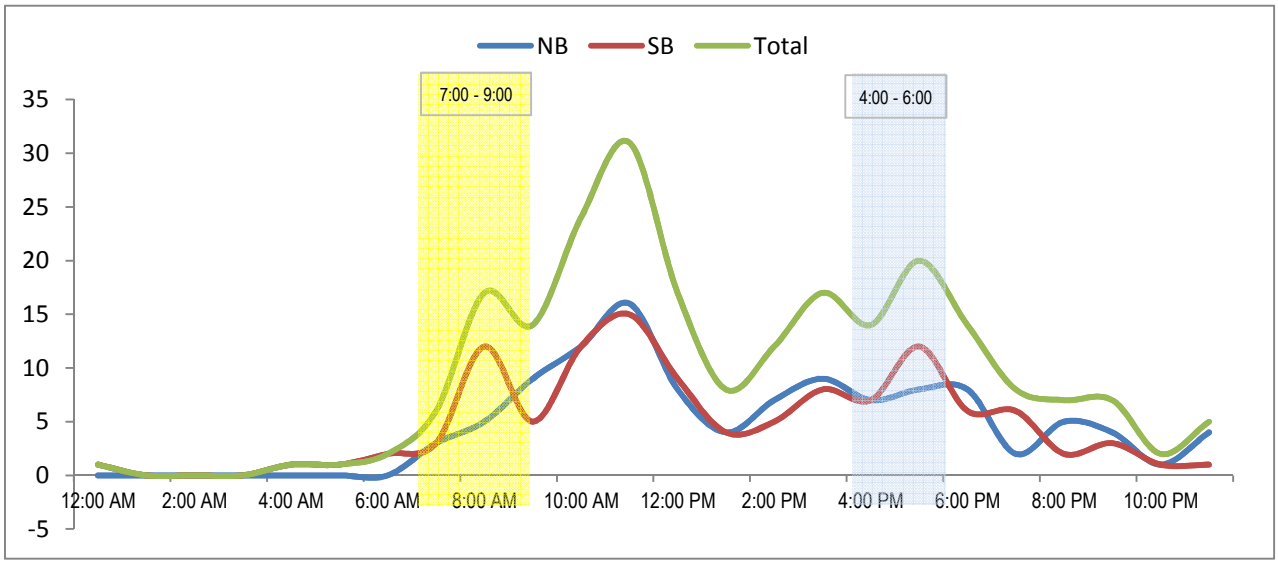
Analysts: *DASH*

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*

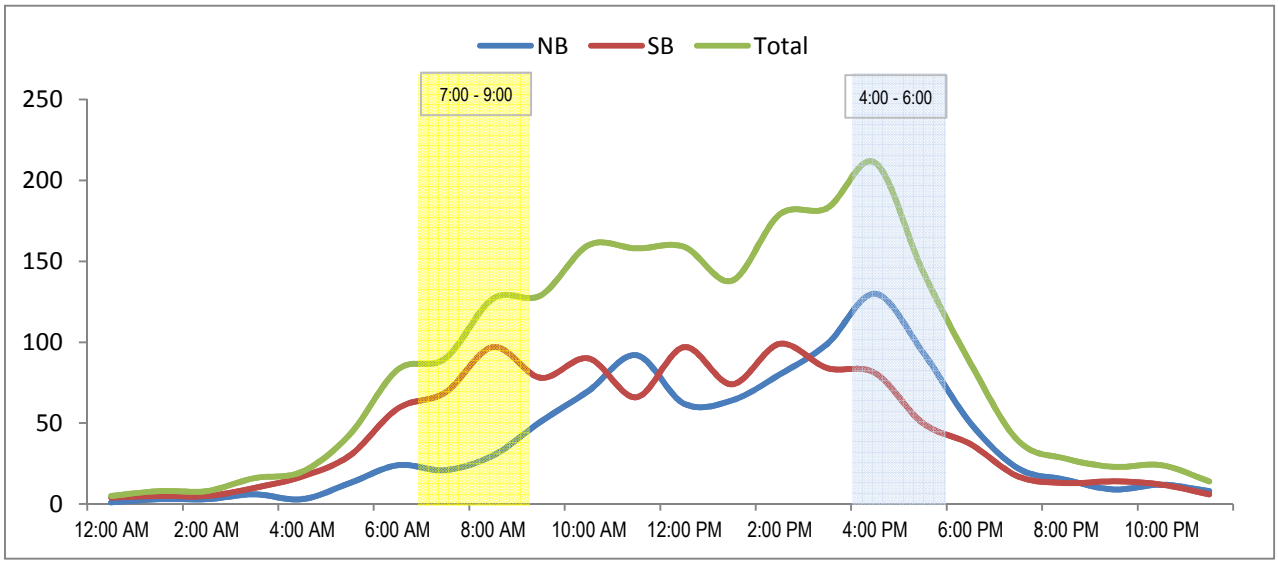
Analysts: *DASH*

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



Location: Britannia Blvd, btwn Otay Mesa Rd and SR-905 WB Ramps
Start Date: 2/2/2016

Date/Time	Northbound	Southbound	Total
	6803	5455	12258

Location: Britannia Blvd, btwn SR-905 WB Ramps and SR-905 EB Ramps
Start Date: 2/2/2016

Date/Time	Northbound	Southbound	Total
	13669	7325	20994

Location: Britannia Blvd, btwn SR-905 EB Ramps and Airway Rd
Start Date: 2/2/2016

Date/Time	Northbound	Southbound	Total
	11400	11569	22969

Location: Britannia Blvd, btwn Airway Rd and Siempre Viva Rd
Start Date: 2/2/2016

Date/Time	Northbound	Southbound	Total
	6085	5473	11558

Location: Britannia Blvd, btwn Siempre Viva Rd and Bristown Ct
Start Date: 2/2/2016

Date/Time	Northbound	Southbound	Total
	1836	1687	3523

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*

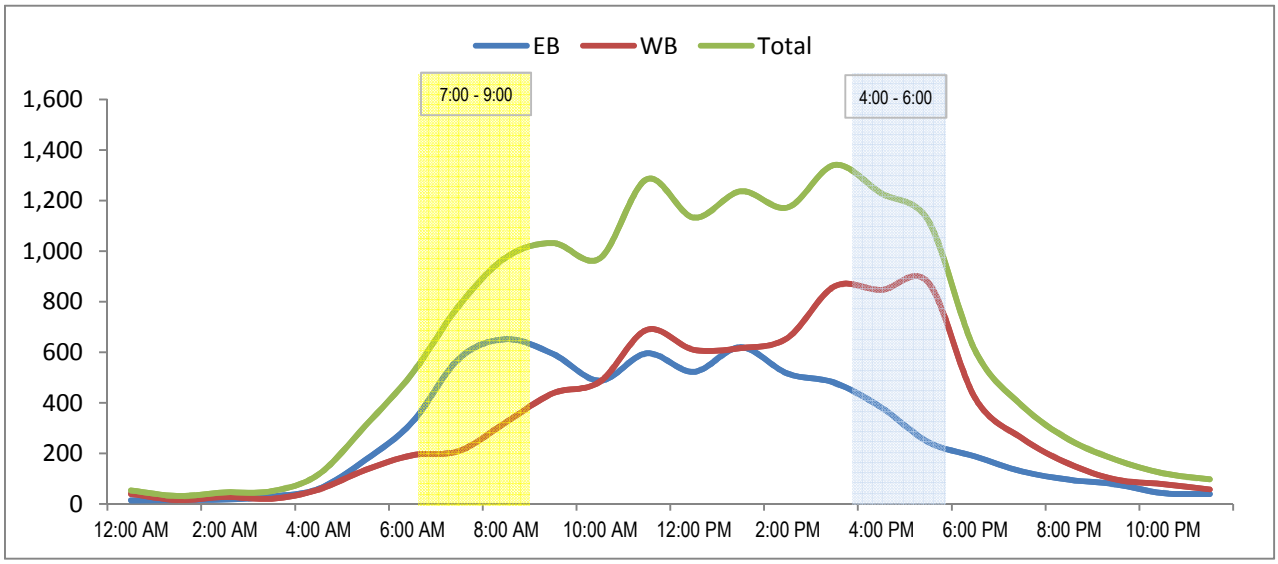
Weather: *Sunny*

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*

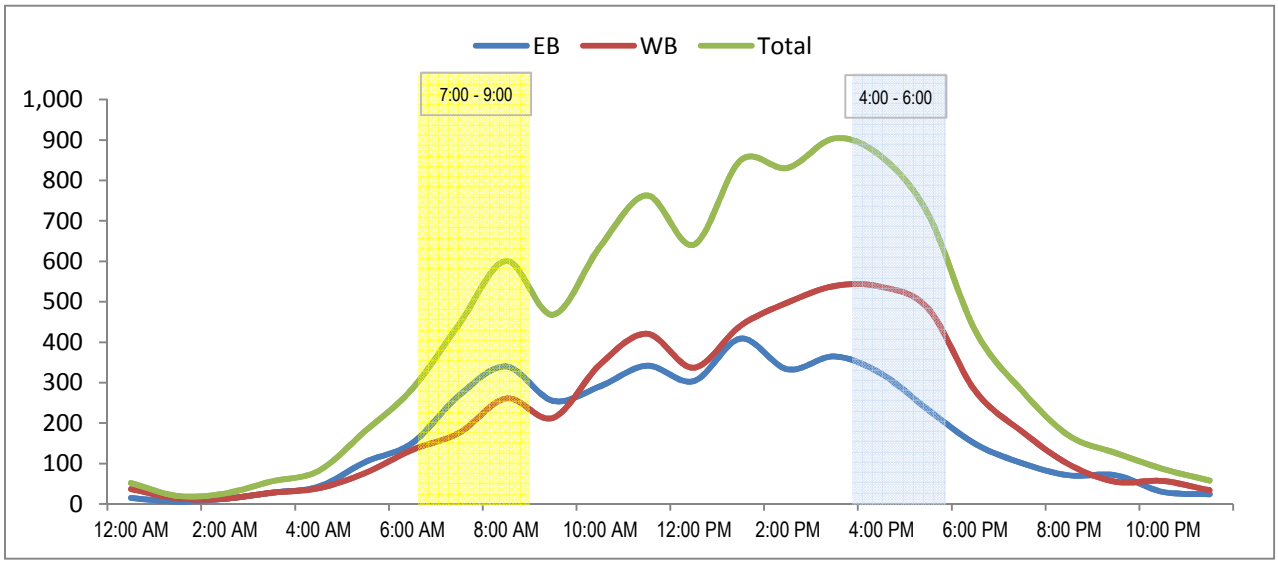
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume				9,565					
Time	Hourly Volume				Time	Hourly Volume			
	EB	WB	Total			EB	WB	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*

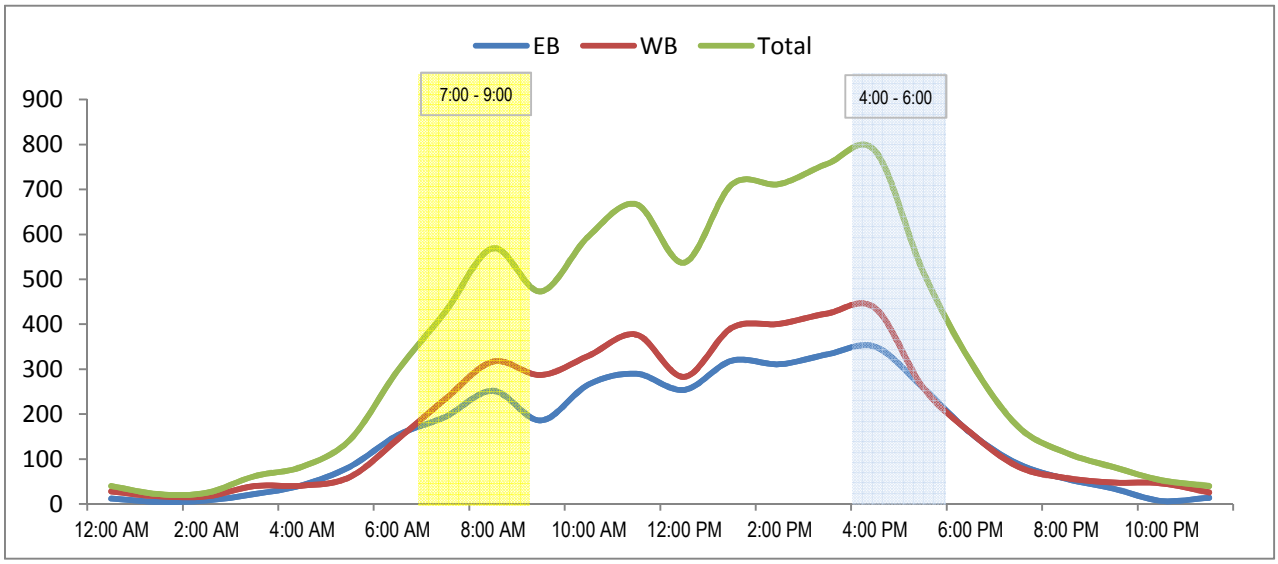
Analysts: *DASH*

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*

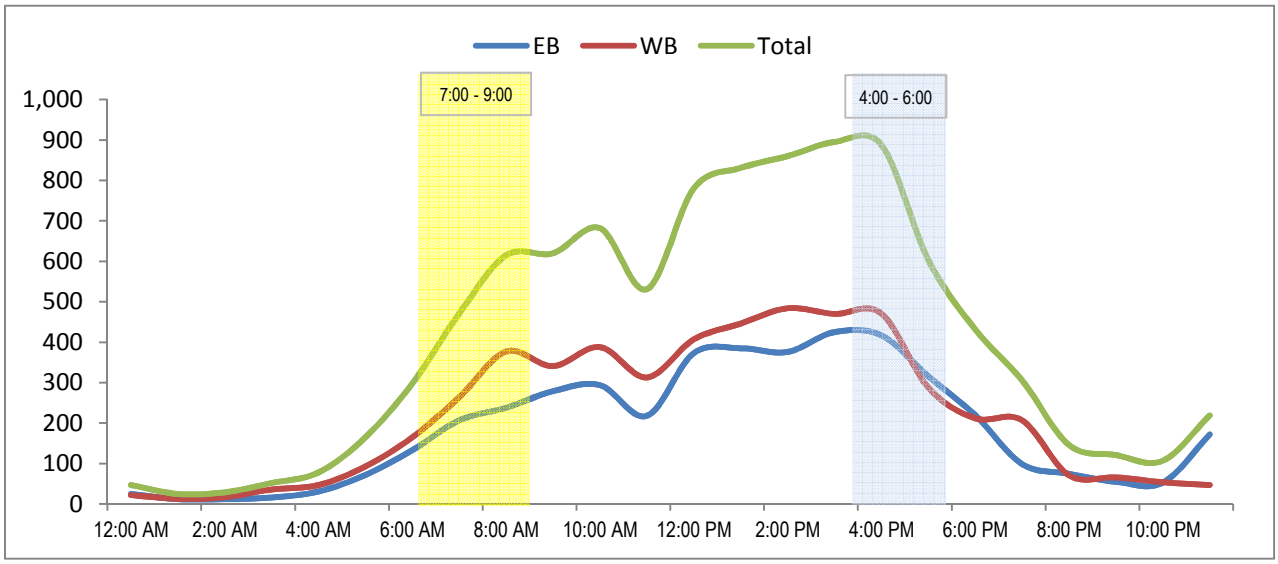
Analysts: *DASH*

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*

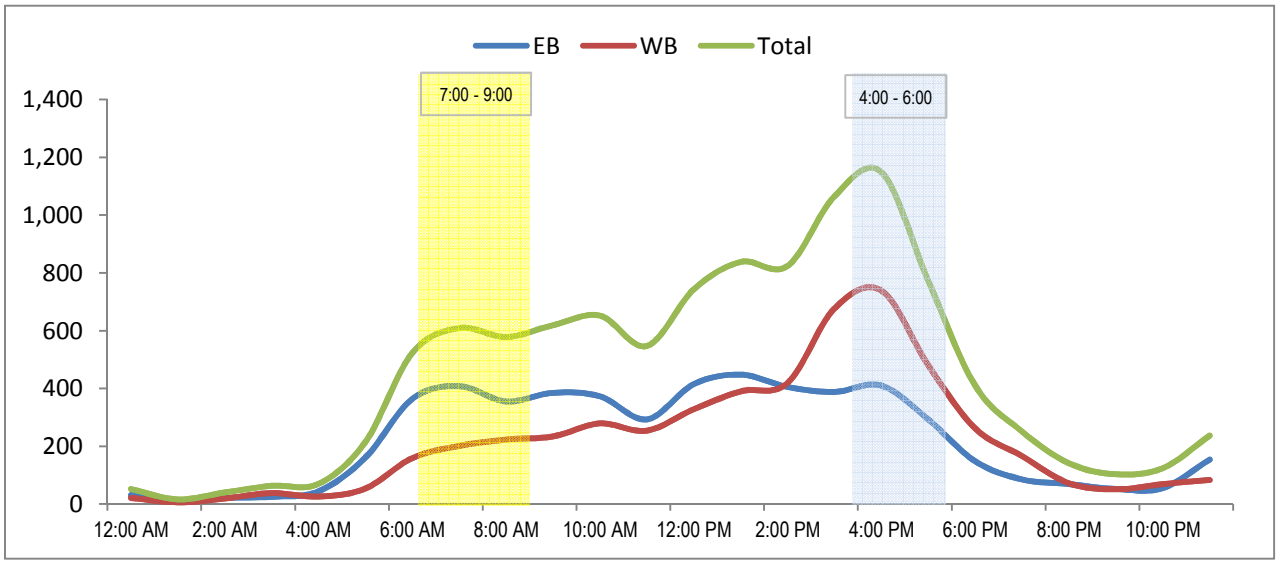
Analysts: *DASH*

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*

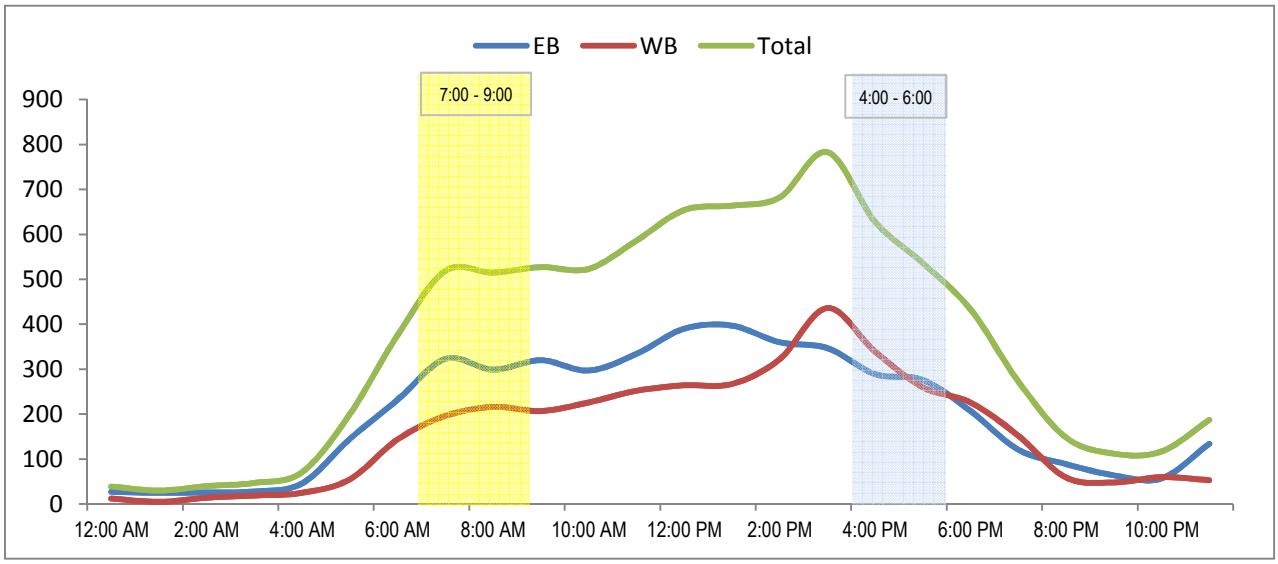
Analysts: *DASH*

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*

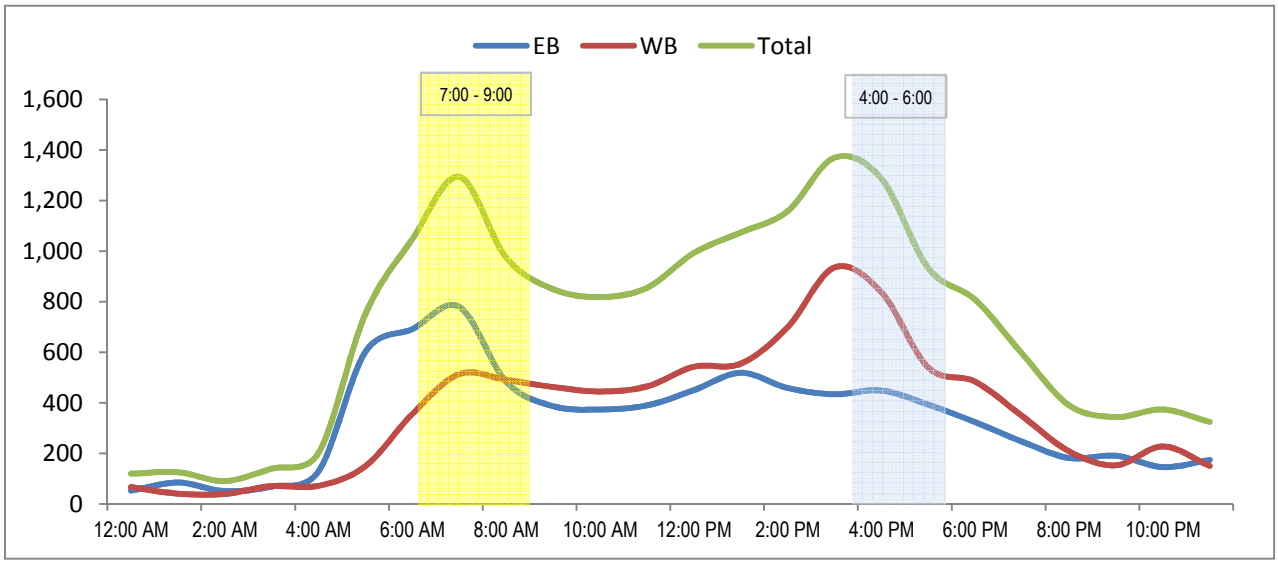
Weather: *Sunny*

AVC Proj. No: *15-0415*

24 Hour Segment Volume 16,924

Time	Hourly Volume EB	Hourly Volume WB	Hourly Volume Total	Time	Hourly Volume EB	Hourly Volume WB	Hourly Volume 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: 26. Airway Road Between Otay Mesa Road and Caliente Avenue

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

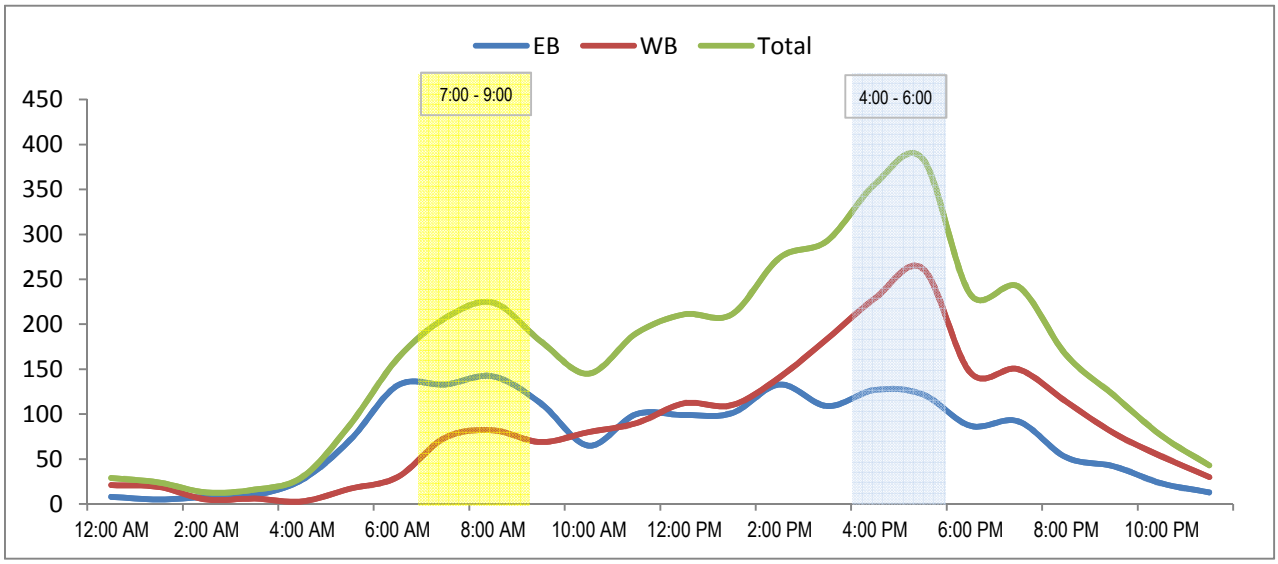
Weather: *Sunny*

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: 28. Airway Road Between Cactus Road and Britannia Blvd

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

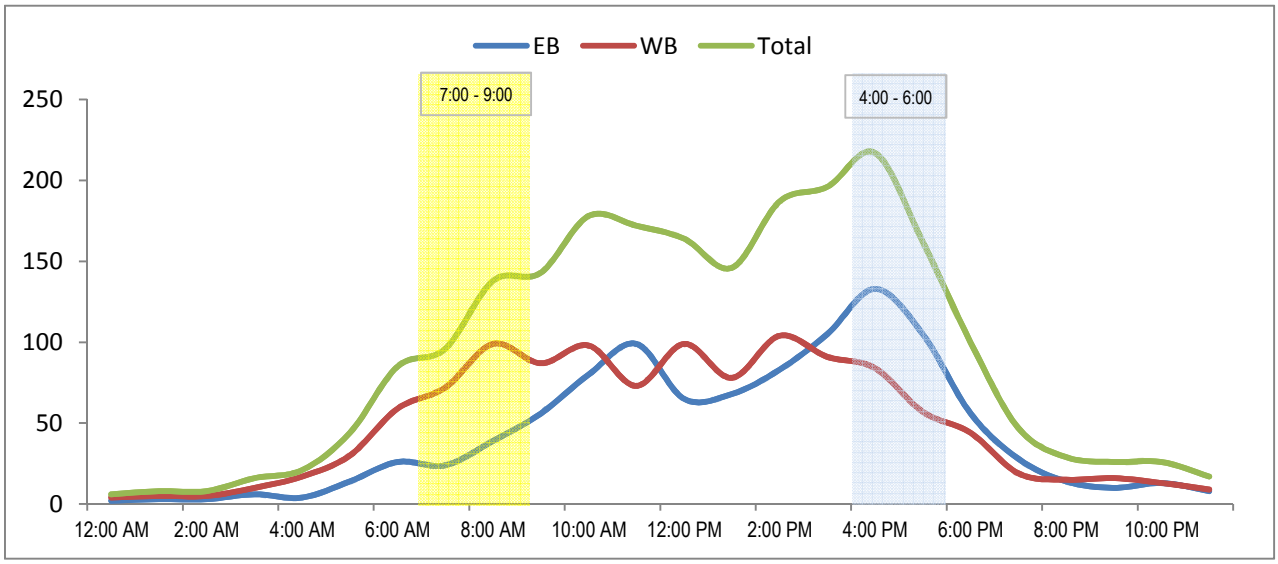
Analysts: *DASH*

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*

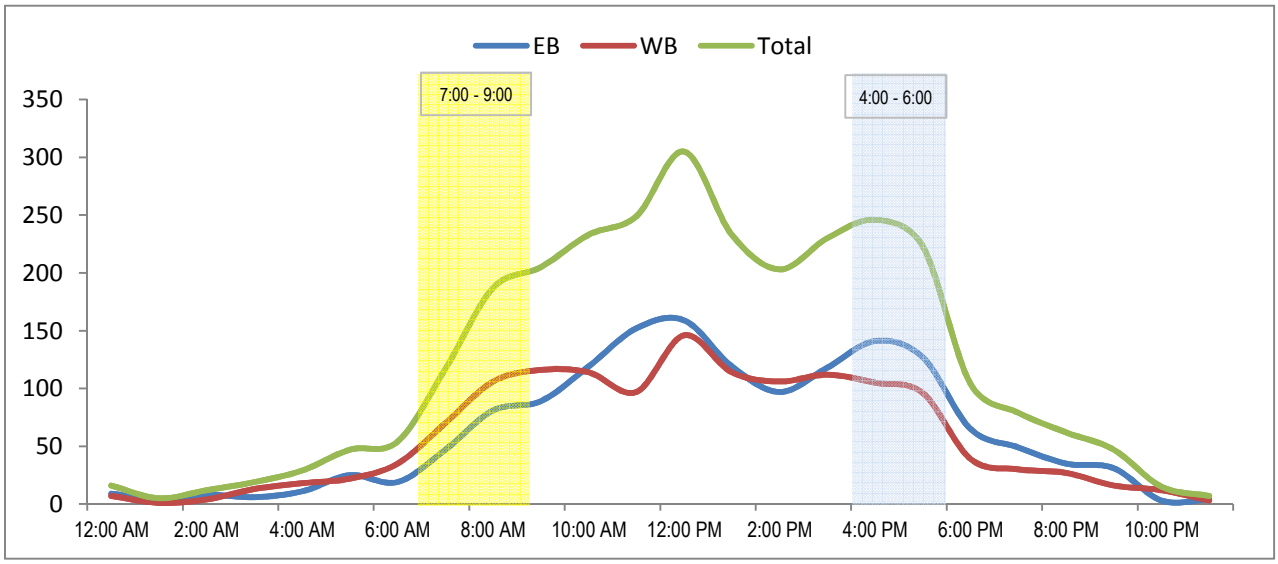
Analysts: *DASH*

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*

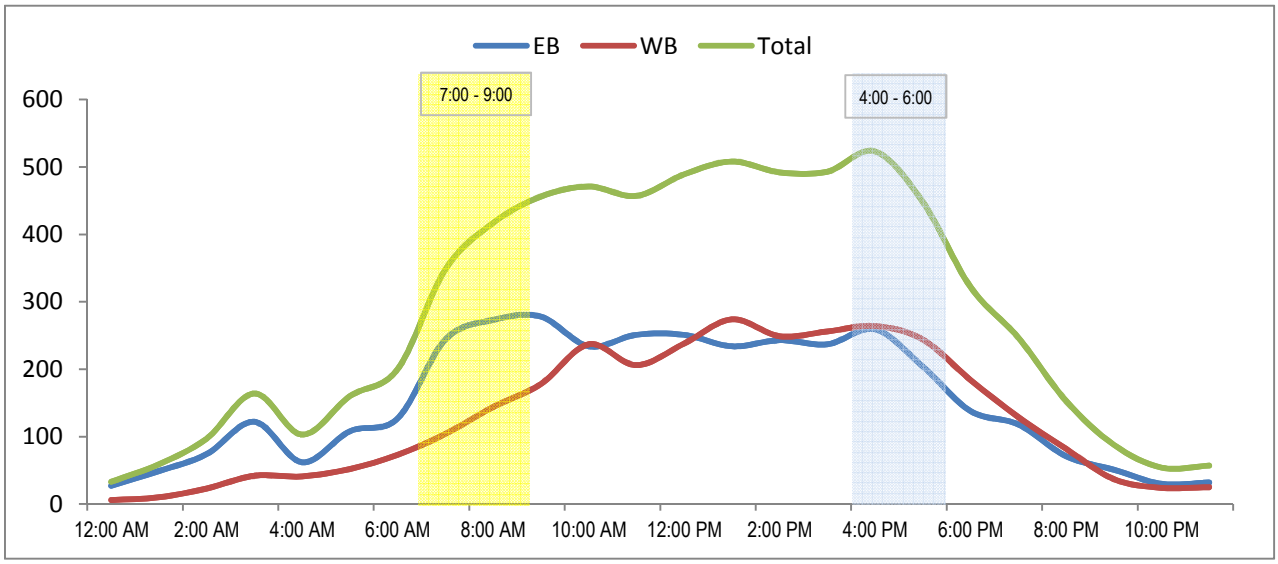
Analysts: *DASH*

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*

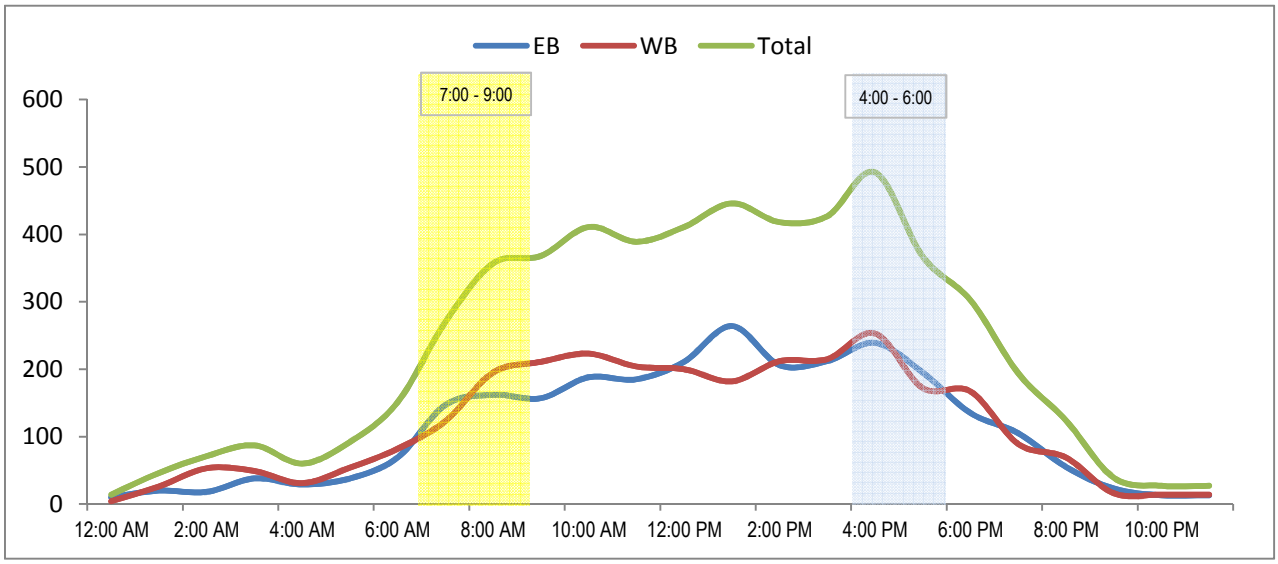
Analysts: *DASH*

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: 35. Siempre Viva Road Between Cactus Road and Britannia Blvd

Orientation: *East-West*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

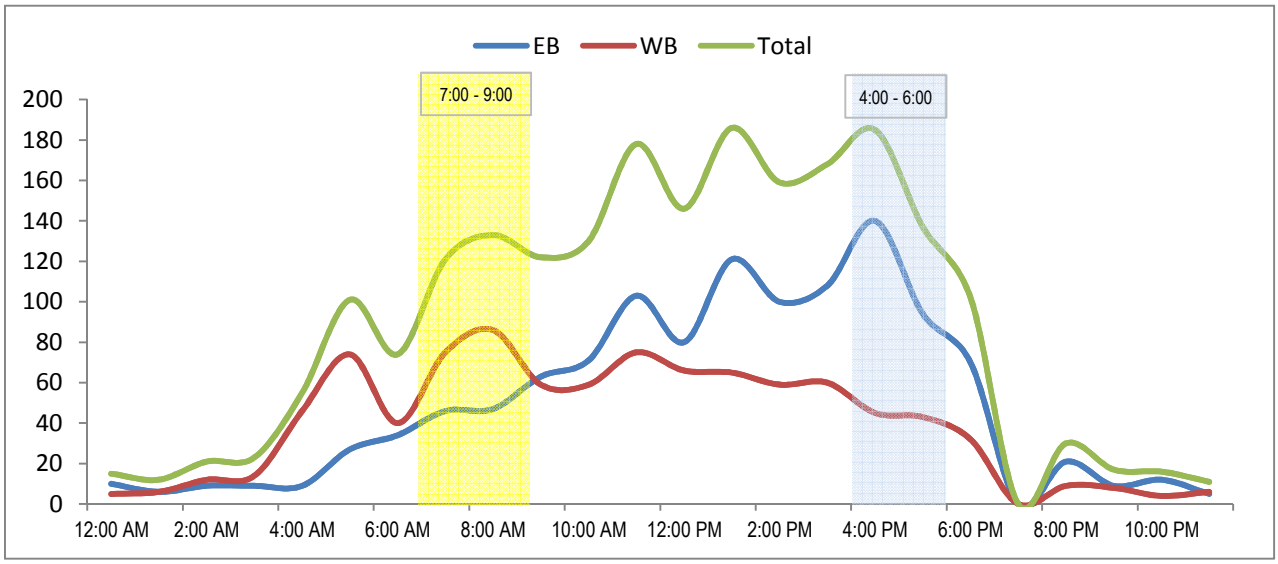
Weather: *Sunny*

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*

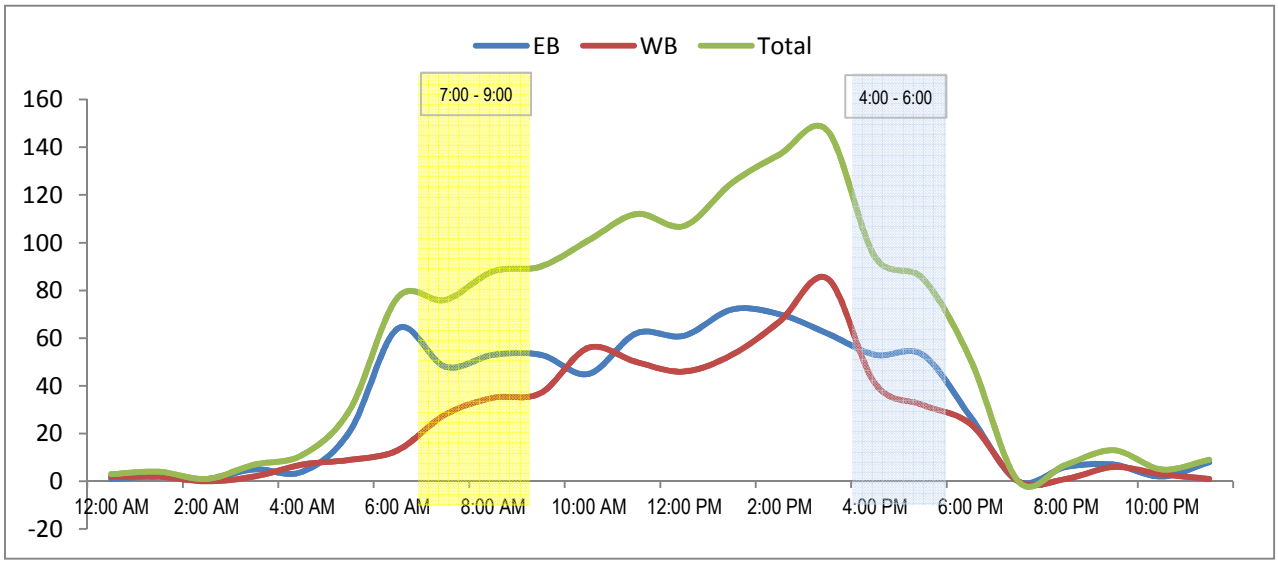
Analysts: *DASH*

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*

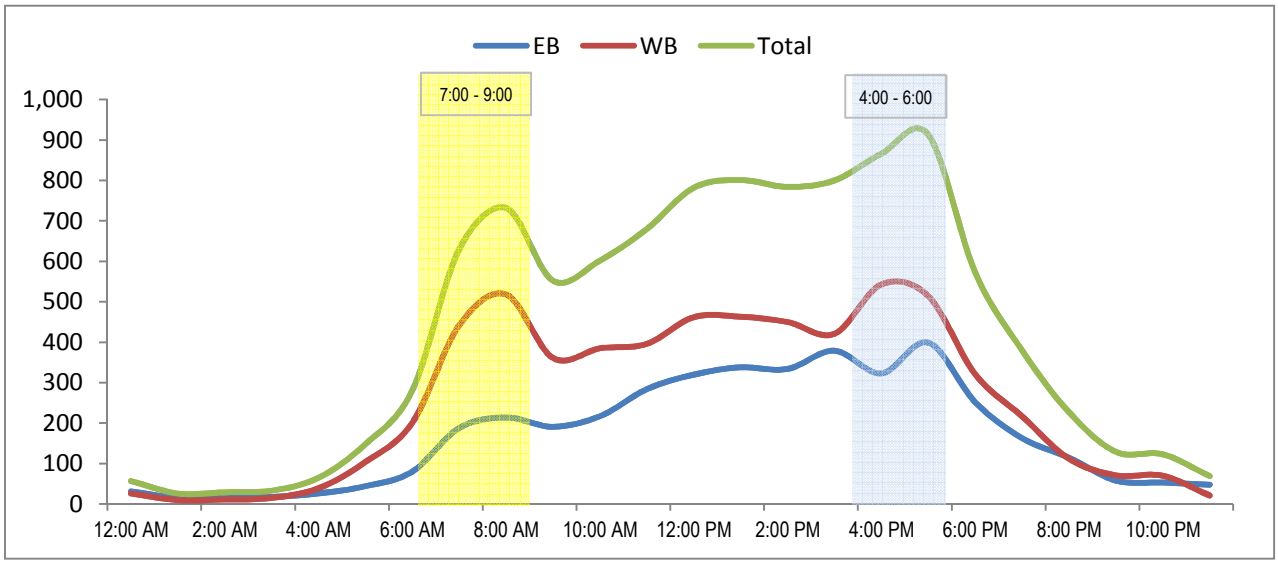
Weather: *Sunny*

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



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

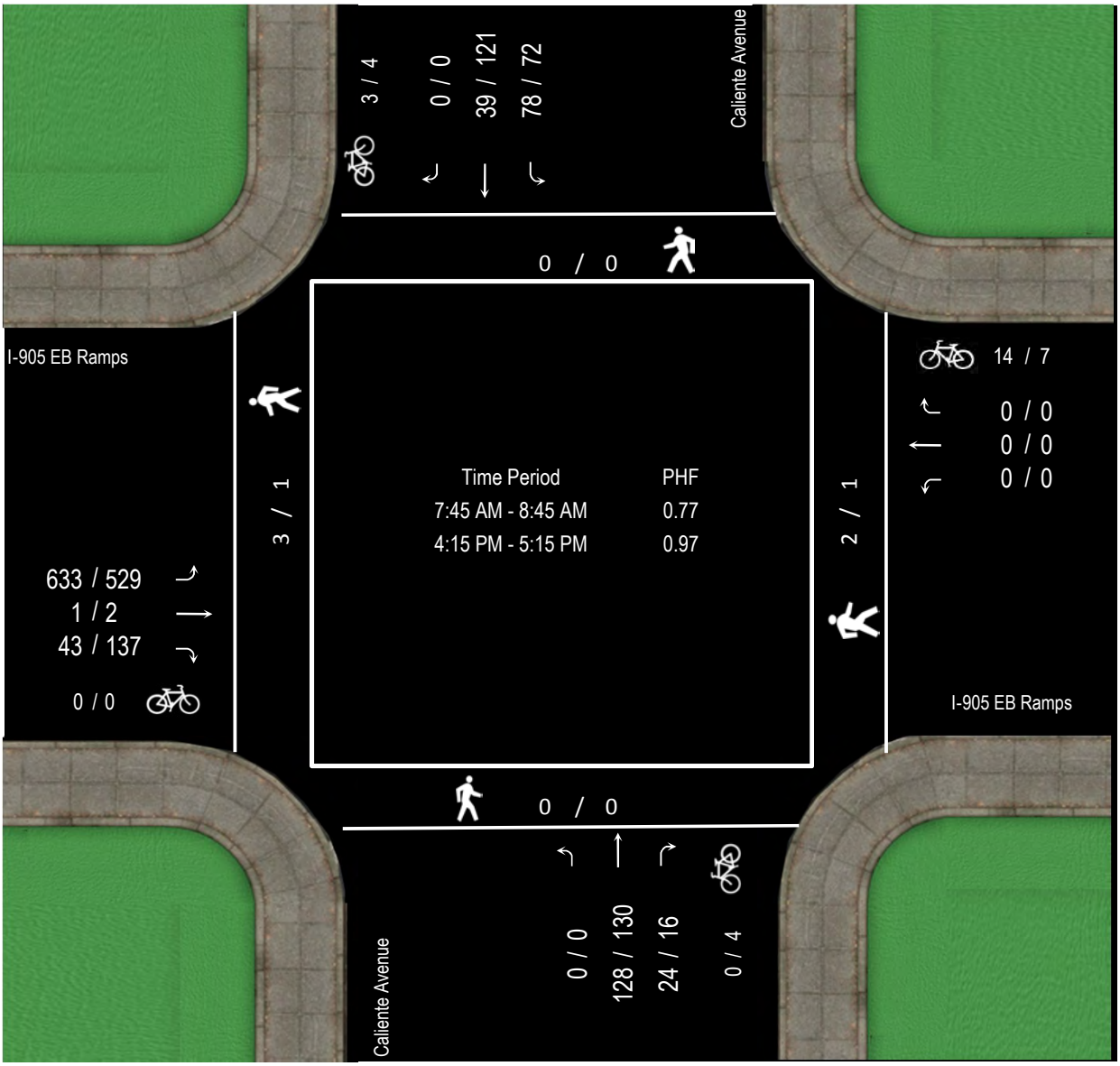
Location: I-905 EB Ramps @ Caliente Avenue

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*

CHEN RYAN

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*

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*

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

AVC

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: 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*

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: Otay Mesa Road @ Brittania Blvd

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Time Period	PHF
7:45 AM - 8:45 AM	0.86
4:00 PM - 5:00 PM	0.82

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*

CHEN RYAN

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: Otay Mesa Road @ St Andrews Avenue

Date of Count: *Thursday, October 01, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0415*

Time Period	PHF
7:15 AM - 8:15 AM	0.89
4:00 PM - 5:00 PM	0.87

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

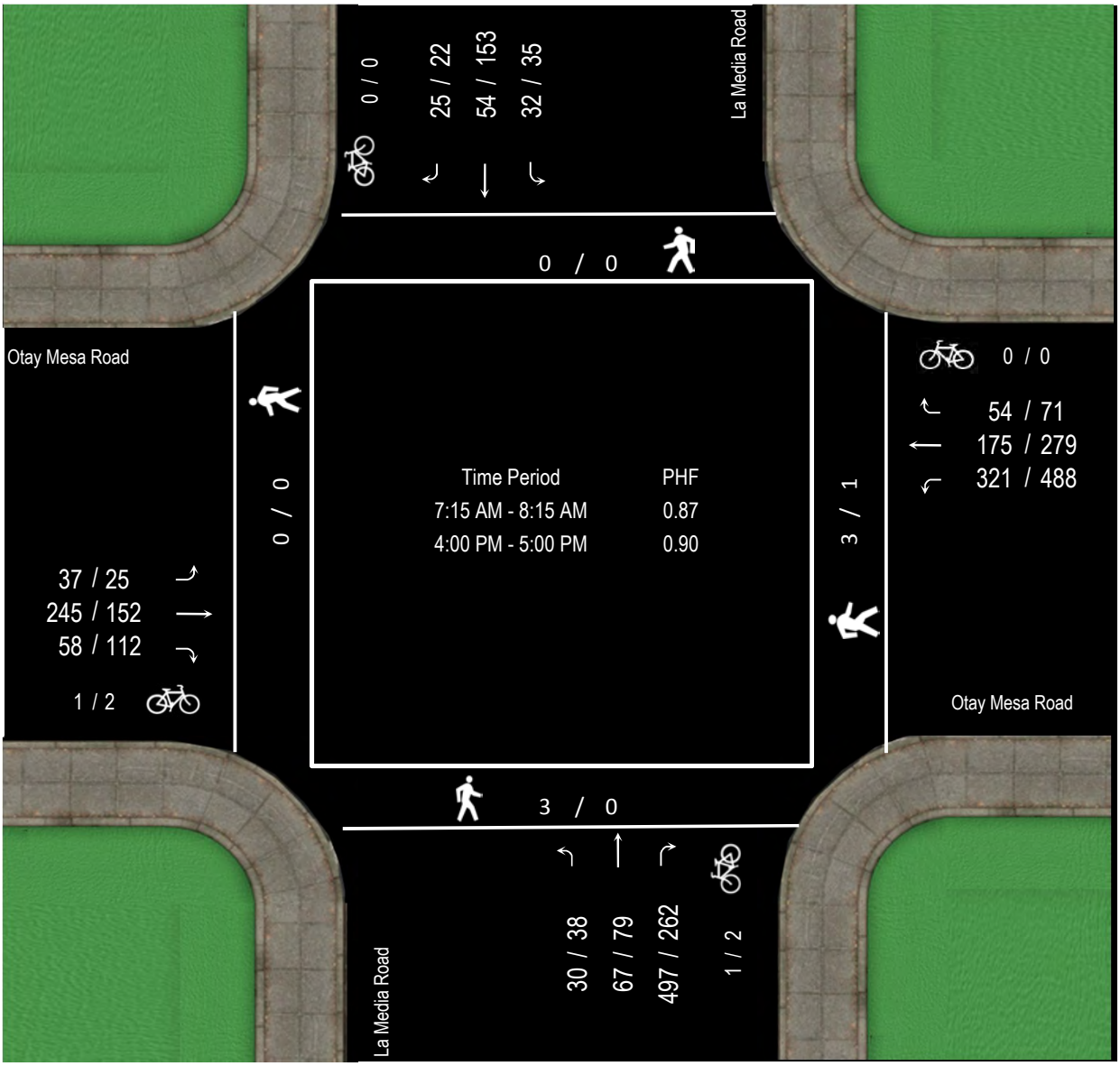
Location: Otay Mesa Road @ La Media Road

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: 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

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 @ 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: Siempre Viva Road @ Brittania Blvd

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 @ 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: 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

Appendix D
Peak Hour Intersection LOS – Existing Conditions

HCM Signalized Intersection Capacity Analysis
1: Caliente Avenue & SR-905 WB On-Ramp/SR-905 WB Off-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	15	1	40	98	663	0	0	102	296
Future 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	42.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Caliente Avenue & SR-905 EB Off-Ramp/SR-905 EB On-Ramp

12/18/2018

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	24	78	39	0
Future 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	0.95	0.95						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	0.98						0.98		1.00	1.00	
Flt Protected	0.95	0.96						1.00		0.95	1.00	
Satd. Flow (prot)	1559	1542						4587		1641	3282	
Flt Permitted	0.95	0.96						1.00		0.95	1.00	
Satd. Flow (perm)	1559	1542						4587		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	6	0	0	0	0	0	28	0	0	0	0
Lane Group Flow (vph)	450	435	0	0	0	0	0	180	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)	23.6	23.6						8.8		7.1	20.6	
Effective Green, g (s)	23.6	23.6						8.8		7.1	20.6	
Actuated g/C Ratio	0.43	0.43						0.16		0.13	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)	676	668						742		214	1242	
v/s Ratio Prot								c0.04		c0.07	0.02	
v/s Ratio Perm	c0.29	0.28										
v/c Ratio	0.67	0.65						0.24		0.55	0.05	
Uniform Delay, d1	12.3	12.1						19.9		22.2	10.7	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	2.5	2.3						0.2		1.7	0.0	
Delay (s)	14.7	14.4						20.1		23.9	10.7	
Level of Service	B	B						C		C	B	
Approach Delay (s)		14.6			0.0			20.1			19.5	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	54.4	Sum of lost time (s)	14.9
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
3: Caliente Avenue & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	144	0	1	1	0	5	0	4	2	5	12	86
Future 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	0.57	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		

HCM Unsignalized Intersection Capacity Analysis
4: Innovative Drive & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	339	1	0	223	38	0	0	1	0	0	32
Future 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			1114			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		

HCM Signalized Intersection Capacity Analysis
5: Heritage Road & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	133	127	89	135	93	89	32	37	82	39	37
Future 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)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
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	110	0	0	82	0	37	0	0	0	35
Lane Group Flow (vph)	91	151	34	107	163	30	103	43	0	98	46	9
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)	3.2	12.0	12.0	4.9	13.7	13.7	7.5	6.8		8.0	7.3	10.5
Effective Green, g (s)	3.2	12.0	12.0	4.9	13.7	13.7	7.5	6.8		8.0	7.3	10.5
Actuated g/C Ratio	0.06	0.23	0.23	0.10	0.27	0.27	0.15	0.13		0.16	0.14	0.20
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0		2.0	2.0	2.0
Lane Grp Cap (vph)	198	1100	342	303	1256	391	239	210		255	245	527
v/s Ratio Prot	0.03	0.03		c0.03	c0.03		c0.06	c0.03		0.06	0.03	0.00
v/s Ratio Perm			0.02			0.02						0.00
v/c Ratio	0.46	0.14	0.10	0.35	0.13	0.08	0.43	0.20		0.38	0.19	0.02
Uniform Delay, d1	23.3	15.6	15.5	21.8	14.3	14.1	20.0	19.9		19.5	19.4	16.3
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	0.6	0.1	0.2	0.3	0.1	0.1	0.5	1.0		0.4	0.1	0.0
Delay (s)	23.9	15.7	15.7	22.0	14.4	14.3	20.5	20.9		19.8	19.6	16.3
Level of Service	C	B	B	C	B	B	C	C		B	B	B
Approach Delay (s)		17.6			16.5			20.6			19.0	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	51.4	Sum of lost time (s)	19.7
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Cactus Road & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	176	43	70	301	6	16	0	56	6	0	0
Future 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)	4.4	6.0		4.4	6.0		4.4		4.9	4.4		
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	0.97		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	4556		1641	4700		1641		1450	1641		
Flt Permitted	0.95	1.00		0.95	1.00		0.95		1.00	0.95		
Satd. Flow (perm)	1641	4556		1641	4700		1641		1450	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	30	0	0	2	0	0	0	83	0	0	0
Lane Group Flow (vph)	7	219	0	81	355	0	26	0	7	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)	0.6	18.4		3.9	21.7		9.2		3.7	0.6		
Effective Green, g (s)	0.6	18.4		3.9	21.7		9.2		3.7	0.6		
Actuated g/C Ratio	0.01	0.40		0.08	0.47		0.20		0.08	0.01		
Clearance Time (s)	4.4	6.0		4.4	6.0		4.4		4.9	4.4		
Vehicle Extension (s)	2.0	4.4		2.0	4.2		2.0		3.2	2.0		
Lane Grp Cap (vph)	21	1810		138	2202		326		115	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	0.12		0.59	0.16		0.08		0.06	0.38		
Uniform Delay, d1	22.7	8.8		20.4	7.1		15.1		19.7	22.7		
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00	1.00		
Incremental Delay, d2	3.4	0.0		4.1	0.1		0.0		0.2	4.2		
Delay (s)	26.0	8.9		24.5	7.1		15.1		19.9	26.8		
Level of Service	C	A		C	A		B		B	C		
Approach Delay (s)		9.4			10.3			18.9			26.8	
Approach LOS		A			B			B			C	

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)	46.3	Sum of lost time (s)	19.7
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	98	6	1	30	11	0
Future 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)		3				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	52	20			39	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	52	20			39	
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)	927	1035			1521	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	124	39	16
Volume Left	117	0	16
Volume Right	7	38	0
cSH	982	1700	1521
Volume to Capacity	0.13	0.02	0.01
Queue Length 95th (ft)	11	0	1
Control Delay (s)	9.4	0.0	7.4
Lane LOS	A		A
Approach Delay (s)	9.4	0.0	7.4
Approach LOS	A		

Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	120	116	96	140	228	271
Future Volume (vph)	120	116	96	140	228	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	5.3	4.4	6.0	5.3	5.3
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	21	0	0	0	241
Lane Group Flow (vph)	132	106	132	192	253	60
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	8	1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	10.0	17.8	5.6	20.0	7.8	7.8
Effective Green, g (s)	10.0	17.8	5.6	20.0	7.8	7.8
Actuated g/C Ratio	0.26	0.46	0.14	0.51	0.20	0.20
Clearance Time (s)	6.0	5.3	4.4	6.0	5.3	5.3
Vehicle Extension (s)	4.4	2.0	2.0	4.3	2.0	2.0
Lane Grp Cap (vph)	1205	867	235	2411	634	292
v/s Ratio Prot	0.03	c0.02	c0.08	0.04	c0.08	
v/s Ratio Perm		0.05				0.04
v/c Ratio	0.11	0.12	0.56	0.08	0.40	0.21
Uniform Delay, d1	11.1	6.1	15.6	4.9	13.6	13.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0	1.8	0.0	0.2	0.1
Delay (s)	11.2	6.2	17.4	4.9	13.8	13.2
Level of Service	B	A	B	A	B	B
Approach Delay (s)	8.7			10.0	13.5	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	39.1	Sum of lost time (s)	15.7
Intersection Capacity Utilization	34.5%	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)	0	0	0	197	0	164	143	218	0	0	176	45
Future 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	36	0
Lane Group Flow (vph)	0	0	0	240	28	28	174	266	0	0	199	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	3.9	18.0			9.4	
Effective Green, g (s)				11.0	11.0	11.0	3.9	18.0			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)				460	391	391	316	2165			1096	
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	0.55	0.12			0.18	
Uniform Delay, d1				11.9	10.4	10.4	16.8	6.1			11.8	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				1.1	0.1	0.1	2.1	0.0			0.1	
Delay (s)				13.0	10.4	10.4	18.9	6.1			11.9	
Level of Service				B	B	B	B	A			B	
Approach Delay (s)		0.0			11.8			11.2			11.9	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	39.2	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												
Traffic Volume (vph)	166	3	583	0	0	0	0	203	116	28	345	0
Future 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	486	0	0	0	0	108	0	0	0	0
Lane Group Flow (vph)	0	212	243	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)		12.4	12.4					9.2		0.7	14.6	
Effective Green, g (s)		12.4	12.4					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)		549	861					767		59	1850	
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		0.51	0.20	
Uniform Delay, d1		9.5	9.1					11.6		18.1	7.4	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.5	0.2					0.3		6.7	0.1	
Delay (s)		9.9	9.3					11.9		24.8	7.5	
Level of Service		A	A					B		C	A	
Approach Delay (s)		9.4			0.0			11.9			8.8	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	37.2	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												
Traffic Volume (vph)	29	7	2	24	10	70	0	127	19	288	286	79
Future 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	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	306	19	3	227	34	4
Future 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												
Traffic Volume (vph)	37	245	58	321	175	54	30	67	497	32	54	25
Future 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

HCM Unsignalized Intersection Capacity Analysis
14: La Media Road & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	37	26	8	48	67	0	0	0	247	225	36
Future Volume (vph)	11	37	26	8	48	67	0	0	0	247	225	36
Peak Hour Factor	0.77	0.77	0.77	0.88	0.88	0.88	0.80	0.80	0.80	0.76	0.76	0.76
Hourly flow rate (vph)	14	48	34	9	55	76	0	0	0	325	296	47

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total (vph)	96	140	473	195
Volume Left (vph)	14	9	325	0
Volume Right (vph)	34	76	0	47
Hadj (s)	-0.01	-0.14	0.51	0.00
Departure Headway (s)	5.7	5.5	5.7	5.2
Degree Utilization, x	0.15	0.21	0.75	0.28
Capacity (veh/h)	588	611	620	682
Control Delay (s)	9.7	10.0	22.4	9.0
Approach Delay (s)	9.7	10.0	18.5	
Approach LOS	A	A	C	

Intersection Summary			
Delay	16.2		
Level of Service	C		
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	93	69	70	52	91	52
Future Volume (vph)	93	69	70	52	91	52
Peak Hour Factor	0.88	0.88	0.94	0.94	0.72	0.72
Hourly flow rate (vph)	106	78	74	55	126	72

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	184	74	55	198
Volume Left (vph)	0	74	0	126
Volume Right (vph)	78	0	0	72
Hadj (s)	-0.08	0.67	0.17	0.08
Departure Headway (s)	4.6	5.9	5.4	4.7
Degree Utilization, x	0.24	0.12	0.08	0.26
Capacity (veh/h)	740	585	640	718
Control Delay (s)	9.0	8.5	7.6	9.4
Approach Delay (s)	9.0	8.1		9.4
Approach LOS	A	A		A

Intersection Summary			
Delay	8.9		
Level of Service	A		
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1: Caliente Avenue & SR-905 WB On-Ramp/SR-905 WB Off-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	40	2	73	114	544	0	0	145	832
Future 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)					1728	1538	1719	4940			4190	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1728	1538	1719	4940			4190	
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	459	0
Lane Group Flow (vph)	0	0	0	0	53	11	123	585	0	0	691	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)					5.5	5.5	5.7	30.6			20.2	
Effective Green, g (s)					5.5	5.5	5.7	30.6			20.2	
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)					205	182	211	3264			1828	
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	19.2	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	21.8	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)	46.3	Sum of lost time (s)	14.9
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Caliente Avenue & SR-905 EB Off-Ramp/SR-905 EB On-Ramp

12/18/2018

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	16	72	121	0
Future 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	0.95	0.95						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	0.94						0.98		1.00	1.00	
Flt Protected	0.95	0.97						1.00		0.95	1.00	
Satd. Flow (prot)	1559	1494						4625		1641	3282	
Flt Permitted	0.95	0.97						1.00		0.95	1.00	
Satd. Flow (perm)	1559	1494						4625		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	39	0	0	0	0	0	16	0	0	0	0
Lane Group Flow (vph)	362	302	0	0	0	0	0	169	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)	15.3	15.3						7.7		2.8	15.2	
Effective Green, g (s)	15.3	15.3						7.7		2.8	15.2	
Actuated g/C Ratio	0.38	0.38						0.19		0.07	0.37	
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)	586	561						875		112	1225	
v/s Ratio Prot								c0.04		c0.05	0.05	
v/s Ratio Perm	c0.23	0.20										
v/c Ratio	0.62	0.54						0.19		0.79	0.12	
Uniform Delay, d1	10.3	9.9						13.9		18.7	8.4	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	1.9	1.0						0.1		27.5	0.0	
Delay (s)	12.3	10.9						14.0		46.2	8.4	
Level of Service	B	B						B		D	A	
Approach Delay (s)		11.6			0.0			14.0			22.5	
Approach LOS		B			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	40.7	Sum of lost time (s)	14.9
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
3: Caliente Avenue & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	134	0	0	0	0	8	2	13	2	5	9	271
Future 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)	107	53	0	12	3	21	5	308
Volume Left (vph)	107	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	0.07	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	674	587	642	607	787
Control Delay (s)	8.9	8.2	7.3	6.8	7.7	7.3	7.5	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		

HCM Unsignalized Intersection Capacity Analysis
4: Innovative Drive & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	309	2	0	510	57	0	0	1	0	0	99
Future 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	973	119	677	912	187
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	617			357			702	973	119	677	912	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)	906			1143			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		

HCM Signalized Intersection Capacity Analysis
5: Heritage Road & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	118	74	22	194	196	140	57	48	186	51	233
Future 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)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
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	0.95	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	1414	3183	4715	1393	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	1414	3183	4715	1393	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	62	0	0	202	0	34	0	0	0	241
Lane Group Flow (vph)	134	134	22	29	255	56	151	79	0	266	73	92
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)	4.7	17.0	17.0	1.5	13.8	13.8	12.5	8.4		16.9	12.8	17.5
Effective Green, g (s)	4.7	17.0	17.0	1.5	13.8	13.8	12.5	8.4		16.9	12.8	17.5
Actuated g/C Ratio	0.07	0.27	0.27	0.02	0.22	0.22	0.20	0.13		0.27	0.20	0.28
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0		2.0	2.0	2.0
Lane Grp Cap (vph)	235	1262	378	75	1024	302	323	210		436	348	712
v/s Ratio Prot	c0.04	c0.03		0.01	c0.05		0.09	c0.05		c0.16	c0.04	0.01
v/s Ratio Perm			0.02			0.04						0.03
v/c Ratio	0.57	0.11	0.06	0.39	0.25	0.19	0.47	0.38		0.61	0.21	0.13
Uniform Delay, d1	28.4	17.5	17.3	30.5	20.6	20.3	22.6	25.2		20.4	21.1	17.3
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	2.1	0.1	0.1	1.2	0.2	0.5	0.4	2.4		1.8	0.1	0.0
Delay (s)	30.5	17.6	17.4	31.8	20.8	20.8	22.9	27.5		22.2	21.2	17.3
Level of Service	C	B	B	C	C	C	C	C		C	C	B
Approach Delay (s)		22.5			21.4			24.9			19.7	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	63.5	Sum of lost time (s)	19.7
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Cactus Road & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	316	37	74	387	10	41	2	87	14	5	8
Future 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)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	4.9
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	4694		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	4694		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	12	0	0	2	0	0	0	87	0	0	17
Lane Group Flow (vph)	2	398	0	88	471	0	47	2	12	33	12	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)	0.7	18.2		5.7	23.2		2.3	6.3	6.3	1.3	5.3	5.3
Effective Green, g (s)	0.7	18.2		5.7	23.2		2.3	6.3	6.3	1.3	5.3	5.3
Actuated g/C Ratio	0.01	0.36		0.11	0.45		0.04	0.12	0.12	0.03	0.10	0.10
Clearance Time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	4.9
Vehicle Extension (s)	2.0	4.4		2.0	4.2		2.0	3.2	3.2	2.0	2.0	2.0
Lane Grp Cap (vph)	22	1645		182	2126		73	212	180	41	178	151
v/s Ratio Prot	0.00	0.09		c0.05	c0.10		c0.03	0.00		0.02	0.01	
v/s Ratio Perm									c0.01			0.00
v/c Ratio	0.09	0.24		0.48	0.22		0.64	0.01	0.07	0.80	0.07	0.01
Uniform Delay, d1	24.9	11.6		21.4	8.5		24.0	19.7	19.9	24.8	20.7	20.6
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	0.7	0.1		0.7	0.1		13.6	0.0	0.2	66.1	0.1	0.0
Delay (s)	25.6	11.8		22.1	8.6		37.7	19.7	20.0	90.9	20.8	20.6
Level of Service	C	B		C	A		D	B	C	F	C	C
Approach Delay (s)		11.8			10.7			25.6			56.9	
Approach LOS		B			B			C			E	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	51.2	Sum of lost time (s)	19.7
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	80	4	3	127	6	1
Future 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)		3				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	101	78			152	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	101	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	99			99	
cM capacity (veh/h)	871	960			1380	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	96	151	12
Volume Left	91	0	10
Volume Right	5	148	0
cSH	918	1700	1380
Volume to Capacity	0.10	0.09	0.01
Queue Length 95th (ft)	9	0	1
Control Delay (s)	9.6	0.0	6.4
Lane LOS	A		A
Approach Delay (s)	9.6	0.0	6.4
Approach LOS	A		

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	19.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	238	179	452	287	184	172
Future Volume (vph)	238	179	452	287	184	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	5.3	4.4	6.0	5.3	5.3
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	69	0	0	0	175
Lane Group Flow (vph)	277	139	579	368	214	25
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	8	1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	11.9	22.2	44.7	61.0	10.3	10.3
Effective Green, g (s)	11.9	22.2	44.7	61.0	10.3	10.3
Actuated g/C Ratio	0.14	0.27	0.54	0.74	0.12	0.12
Clearance Time (s)	6.0	5.3	4.4	6.0	5.3	5.3
Vehicle Extension (s)	4.4	2.0	2.0	4.3	2.0	2.0
Lane Grp Cap (vph)	679	488	888	3482	396	183
v/s Ratio Prot	c0.06	0.04	c0.35	0.08	c0.07	
v/s Ratio Perm		0.06				0.02
v/c Ratio	0.41	0.28	0.65	0.11	0.54	0.14
Uniform Delay, d1	32.1	23.9	13.4	3.1	33.9	32.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1	1.3	0.0	0.8	0.1
Delay (s)	32.8	24.0	14.8	3.1	34.7	32.3
Level of Service	C	C	B	A	C	C
Approach Delay (s)	29.0			10.2	33.6	
Approach LOS	C			B	C	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	82.6	Sum of lost time (s)	15.7
Intersection Capacity Utilization	52.3%	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)	0	0	0	113	1	108	496	234	0	0	229	322
Future 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												
Traffic Volume (vph)	77	1	200	0	0	0	0	653	138	150	192	0
Future 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												
Traffic Volume (vph)	124	25	4	29	18	277	2	342	31	185	146	82
Future 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	0.98
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98			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	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	1692			1676	1447	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)	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	566
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	12.6
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	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	317	42	7	353	47	7
Future 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												
Traffic Volume (vph)	25	152	112	488	279	71	38	79	262	35	153	22
Future 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

HCM Unsignalized Intersection Capacity Analysis
14: La Media Road & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	40	74	27	13	44	207	0	0	0	182	159	31
Future Volume (vph)	40	74	27	13	44	207	0	0	0	182	159	31
Peak Hour Factor	0.78	0.78	0.78	0.87	0.87	0.87	0.79	0.79	0.79	0.84	0.84	0.84
Hourly flow rate (vph)	51	95	35	15	51	238	0	0	0	217	189	37

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total (vph)	181	304	312	132
Volume Left (vph)	51	15	217	0
Volume Right (vph)	35	238	0	37
Hadj (s)	0.11	-0.29	0.52	-0.03
Departure Headway (s)	5.7	5.2	6.3	5.8
Degree Utilization, x	0.29	0.44	0.55	0.21
Capacity (veh/h)	591	664	543	598
Control Delay (s)	11.0	12.1	15.5	9.1
Approach Delay (s)	11.0	12.1	13.6	
Approach LOS	B	B	B	

Intersection Summary			
Delay	12.6		
Level of Service	B		
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	108	131	64	168	85	53
Future 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		

Appendix E
Peak Hour Intersection LOS
– Existing Plus Project (Full Development) Conditions

HCM Signalized Intersection Capacity Analysis
1: Caliente Avenue & SR-905 WB On-Ramp/SR-905 WB Off-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	73	1	40	98	663	0	0	102	296
Future Volume (vph)	0	0	0	73	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			4310	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1724	1538	1719	4940			4310	
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	99	1	54	124	839	0	0	110	318
RTOR Reduction (vph)	0	0	0	0	0	45	0	0	0	0	220	0
Lane Group Flow (vph)	0	0	0	0	100	9	124	839	0	0	208	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)					6.1	6.1	5.6	22.2			11.9	
Effective Green, g (s)					6.1	6.1	5.6	22.2			11.9	
Actuated g/C Ratio					0.16	0.16	0.15	0.58			0.31	
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)					273	243	250	2848			1332	
v/s Ratio Prot							c0.07	c0.17			0.05	
v/s Ratio Perm					0.06	0.01						
v/c Ratio					0.37	0.04	0.50	0.29			0.16	
Uniform Delay, d1					14.5	13.7	15.2	4.2			9.7	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					0.8	0.1	0.6	0.1			0.1	
Delay (s)					15.3	13.8	15.7	4.2			9.7	
Level of Service					B	B	B	A			A	
Approach Delay (s)		0.0			14.8			5.7			9.7	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	38.5	Sum of lost time (s)	14.9
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Caliente Avenue & SR-905 EB Off-Ramp/SR-905 EB On-Ramp

12/18/2018

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	51	78	97	0
Future Volume (vph)	633	1	43	0	0	0	0	128	51	78	97	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	0.95	0.95						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	0.98						0.96		1.00	1.00	
Flt Protected	0.95	0.96						1.00		0.95	1.00	
Satd. Flow (prot)	1559	1542						4484		1641	3282	
Flt Permitted	0.95	0.96						1.00		0.95	1.00	
Satd. Flow (perm)	1559	1542						4484		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	70	118	147	0
RTOR Reduction (vph)	0	6	0	0	0	0	0	59	0	0	0	0
Lane Group Flow (vph)	450	435	0	0	0	0	0	186	0	118	147	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)	23.7	23.7						8.9		7.1	20.7	
Effective Green, g (s)	23.7	23.7						8.9		7.1	20.7	
Actuated g/C Ratio	0.43	0.43						0.16		0.13	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)	676	669						730		213	1244	
v/s Ratio Prot								c0.04		c0.07	0.04	
v/s Ratio Perm	c0.29	0.28										
v/c Ratio	0.67	0.65						0.26		0.55	0.12	
Uniform Delay, d1	12.3	12.2						20.0		22.3	11.0	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	2.5	2.2						0.2		1.8	0.0	
Delay (s)	14.8	14.4						20.1		24.0	11.1	
Level of Service	B	B						C		C	B	
Approach Delay (s)		14.6			0.0			20.1			16.8	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	14.9
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
3: Caliente Avenue & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	159	0	1	1	0	5	0	16	2	5	37	119
Future Volume (vph)	159	0	1	1	0	5	0	16	2	5	37	119
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)	215	0	1	2	0	10	0	32	4	6	46	149

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	143	73	2	10	0	36	6	195
Volume Left (vph)	143	72	2	0	0	0	6	0
Volume Right (vph)	0	1	0	10	0	4	0	149
Hadj (s)	0.58	0.57	0.67	-0.53	0.00	0.02	0.67	-0.43
Departure Headway (s)	5.7	5.7	6.0	4.8	5.3	5.3	5.8	4.7
Degree Utilization, x	0.23	0.11	0.00	0.01	0.00	0.05	0.01	0.26
Capacity (veh/h)	605	608	563	700	656	642	590	731
Control Delay (s)	9.2	8.2	7.8	6.7	7.1	7.4	7.7	8.1
Approach Delay (s)	8.8		6.9		7.4		8.1	
Approach LOS	A		A		A		A	

Intersection Summary			
Delay	8.4		
Level of Service	A		
Intersection Capacity Utilization	28.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Innovative Drive & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	366	1	0	281	54	0	0	1	0	0	40
Future Volume (Veh/h)	0	366	1	0	281	54	0	0	1	0	0	40
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	416	1	0	302	58	0	0	4	0	0	55
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	366			417			572	782	139	451	725	107
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	366			417			572	782	139	451	725	107
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	94
cM capacity (veh/h)	1128			1083			361	308	859	467	333	897

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	166	166	84	101	101	101	58	4	55
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	1	0	0	0	58	4	55
cSH	1700	1700	1700	1700	1700	1700	1700	859	897
Volume to Capacity	0.10	0.10	0.05	0.06	0.06	0.06	0.03	0.00	0.06
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.2	9.3
Lane LOS								A	A
Approach Delay (s)	0.0			0.0				9.2	9.3
Approach LOS								A	A

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	17.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
5: Heritage Road & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	168	127	114	209	93	89	32	49	82	39	37
Future Volume (vph)	80	168	127	114	209	93	89	32	49	82	39	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
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	0.91		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	1468	3183	4715	1468	1641	1570		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	1570		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	191	144	137	252	112	103	37	57	98	46	44
RTOR Reduction (vph)	0	0	109	0	0	82	0	49	0	0	0	35
Lane Group Flow (vph)	91	191	35	137	252	30	103	45	0	98	46	9
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)	4.1	12.7	12.7	5.4	14.0	14.0	7.6	7.0		7.8	7.2	11.3
Effective Green, g (s)	4.1	12.7	12.7	5.4	14.0	14.0	7.6	7.0		7.8	7.2	11.3
Actuated g/C Ratio	0.08	0.24	0.24	0.10	0.27	0.27	0.14	0.13		0.15	0.14	0.21
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0		2.0	2.0	2.0
Lane Grp Cap (vph)	248	1138	354	326	1254	390	237	208		243	236	555
v/s Ratio Prot	0.03	0.04		c0.04	c0.05		c0.06	c0.03		0.06	0.03	0.00
v/s Ratio Perm			0.02			0.02						0.00
v/c Ratio	0.37	0.17	0.10	0.42	0.20	0.08	0.43	0.21		0.40	0.19	0.02
Uniform Delay, d1	23.0	15.8	15.5	22.1	15.0	14.5	20.5	20.3		20.3	20.1	16.3
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	0.3	0.1	0.2	0.3	0.1	0.1	0.5	1.1		0.4	0.1	0.0
Delay (s)	23.4	15.9	15.7	22.5	15.1	14.6	21.0	21.4		20.7	20.3	16.3
Level of Service	C	B	B	C	B	B	C	C		C	C	B
Approach Delay (s)		17.4			17.0			21.2			19.6	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	52.6	Sum of lost time (s)	19.7
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Cactus Road & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	223	43	111	400	39	16	0	76	22	0	0
Future Volume (vph)	6	223	43	111	400	39	16	0	76	22	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0		4.4	6.0		4.4		4.9	4.4		
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	4583		1641	4644		1641		1450	1641		
Flt Permitted	0.95	1.00		0.95	1.00		0.95		1.00	0.95		
Satd. Flow (perm)	1641	4583		1641	4644		1641		1450	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	253	49	129	465	45	26	0	123	29	0	0
RTOR Reduction (vph)	0	25	0	0	8	0	0	0	109	0	0	0
Lane Group Flow (vph)	7	277	0	129	502	0	26	0	14	29	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)	0.7	16.0		7.7	23.0		11.1		5.5	0.7		
Effective Green, g (s)	0.7	16.0		7.7	23.0		11.1		5.5	0.7		
Actuated g/C Ratio	0.01	0.32		0.16	0.46		0.22		0.11	0.01		
Clearance Time (s)	4.4	6.0		4.4	6.0		4.4		4.9	4.4		
Vehicle Extension (s)	2.0	4.4		2.0	4.2		2.0		3.2	2.0		
Lane Grp Cap (vph)	23	1478		254	2153		367		160	23		
v/s Ratio Prot	0.00	0.06		c0.08	c0.11		c0.02			c0.02		
v/s Ratio Perm									0.01			
v/c Ratio	0.30	0.19		0.51	0.23		0.07		0.09	1.26		
Uniform Delay, d1	24.2	12.1		19.2	8.0		15.2		19.8	24.4		
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00	1.00		
Incremental Delay, d2	2.7	0.1		0.6	0.1		0.0		0.2	277.4		
Delay (s)	26.9	12.2		19.8	8.1		15.2		20.0	301.9		
Level of Service	C	B		B	A		B		C	F		
Approach Delay (s)		12.5			10.4			19.2			301.9	
Approach LOS		B			B			B			F	

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	49.6	Sum of lost time (s)	19.7
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Cactus Road & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	330	40	254	156	68	20	1	360	145	0	10
Future Volume (vph)	10	330	40	254	156	68	20	1	360	145	0	10
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
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	1.00		0.97		1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.85		1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1770	3539	1583	3433	3368		3433	1584		3433		1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	1770	3539	1583	3433	3368		3433	1584		3433		1583
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	359	43	302	170	81	22	1	462	210	0	11
RTOR Reduction (vph)	0	0	33	0	46	0	0	314	0	0	0	7
Lane Group Flow (vph)	11	359	10	302	205	0	22	149	0	210	0	4
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot		Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2									8
Actuated Green, G (s)	0.6	17.0	17.0	11.7	28.1		1.3	14.1		9.8		22.6
Effective Green, g (s)	0.6	17.0	17.0	11.7	28.1		1.3	14.1		9.8		22.6
Actuated g/C Ratio	0.01	0.24	0.24	0.17	0.40		0.02	0.20		0.14		0.32
Clearance Time (s)	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
Lane Grp Cap (vph)	15	852	381	568	1340		63	316		476		506
v/s Ratio Prot	0.01	c0.10		c0.09	0.06		0.01	c0.09		c0.06		
v/s Ratio Perm			0.01									0.00
v/c Ratio	0.73	0.42	0.03	0.53	0.15		0.35	0.47		0.44		0.01
Uniform Delay, d1	34.9	22.6	20.5	26.9	13.6		34.2	25.0		27.9		16.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2	103.2	0.3	0.0	1.0	0.1		3.3	1.1		0.7		0.0
Delay (s)	138.2	23.0	20.5	27.9	13.7		37.6	26.1		28.5		16.4
Level of Service	F	C	C	C	B		D	C		C		B
Approach Delay (s)		25.8			21.4			26.6			27.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	70.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	120	198	147	140	401	378
Future Volume (vph)	120	198	147	140	401	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	5.3	4.4	6.0	5.3	5.3
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	218	201	192	446	420
RTOR Reduction (vph)	0	3	0	0	0	313
Lane Group Flow (vph)	132	215	201	192	446	107
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	8	1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	10.0	20.7	5.7	20.1	10.7	10.7
Effective Green, g (s)	10.0	20.7	5.7	20.1	10.7	10.7
Actuated g/C Ratio	0.24	0.49	0.14	0.48	0.25	0.25
Clearance Time (s)	6.0	5.3	4.4	6.0	5.3	5.3
Vehicle Extension (s)	4.4	2.0	2.0	4.3	2.0	2.0
Lane Grp Cap (vph)	1119	906	222	2251	808	373
v/s Ratio Prot	0.03	c0.06	c0.12	0.04	c0.14	
v/s Ratio Perm		0.09				0.07
v/c Ratio	0.12	0.24	0.91	0.09	0.55	0.29
Uniform Delay, d1	12.6	6.2	17.9	6.0	13.6	12.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0	34.9	0.0	0.5	0.2
Delay (s)	12.7	6.2	52.9	6.0	14.1	12.8
Level of Service	B	A	D	A	B	B
Approach Delay (s)	8.6			30.0	13.5	
Approach LOS	A			C	B	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	42.1	Sum of lost time (s)	15.7
Intersection Capacity Utilization	41.2%	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	0	0	201	0	164	407	498	0	0	308	45
Future Volume (vph)	0	0	0	201	0	164	407	498	0	0	308	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			0.98	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1641	1395	1395	3183	4715			4625	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1395	1395	3183	4715			4625	
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	245	0	200	496	607	0	0	328	48
RTOR Reduction (vph)	0	0	0	0	74	74	0	0	0	0	39	0
Lane Group Flow (vph)	0	0	0	245	26	26	496	607	0	0	337	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)				11.8	11.8	11.8	9.4	22.9			8.8	
Effective Green, g (s)				11.8	11.8	11.8	9.4	22.9			8.8	
Actuated g/C Ratio				0.26	0.26	0.26	0.21	0.51			0.20	
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)				431	366	366	666	2404			906	
v/s Ratio Prot					0.02		c0.16	0.13			c0.07	
v/s Ratio Perm				c0.15		0.02						
v/c Ratio				0.57	0.07	0.07	0.74	0.25			0.37	
Uniform Delay, d1				14.3	12.4	12.4	16.6	6.2			15.7	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				1.7	0.1	0.1	4.5	0.1			0.3	
Delay (s)				16.1	12.5	12.5	21.1	6.2			15.9	
Level of Service				B	B	B	C	A			B	
Approach Delay (s)		0.0			14.5			12.9			15.9	
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	0.57		
Actuated Cycle Length (s)	44.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	50.5%	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)	166	3	708	0	0	0	0	747	124	28	481	0
Future Volume (vph)	166	3	708	0	0	0	0	747	124	28	481	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					3212		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1647	2584					3212		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	885	0	0	0	0	922	153	30	512	0
RTOR Reduction (vph)	0	0	422	0	0	0	0	22	0	0	0	0
Lane Group Flow (vph)	0	212	463	0	0	0	0	1053	0	30	512	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)		14.3	14.3					21.5		1.7	27.9	
Effective Green, g (s)		14.3	14.3					21.5		1.7	27.9	
Actuated g/C Ratio		0.27	0.27					0.41		0.03	0.53	
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)		449	705					1317		103	2510	
v/s Ratio Prot								c0.33		0.01	c0.11	
v/s Ratio Perm		0.13	c0.18									
v/c Ratio		0.47	0.66					0.80		0.29	0.20	
Uniform Delay, d1		15.9	16.9					13.6		24.8	6.4	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.8	2.2					3.5		1.6	0.0	
Delay (s)		16.7	19.1					17.1		26.3	6.5	
Level of Service		B	B					B		C	A	
Approach Delay (s)		18.6			0.0			17.1			7.6	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	52.4	Sum of lost time (s)	14.9
Intersection Capacity Utilization	50.5%	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)	581	188	35	24	96	70	16	127	19	288	286	340
Future Volume (vph)	581	188	35	24	96	70	16	127	19	288	286	340
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	0.98			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	1686			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	1686			1710	1449	1641	3208		1641	1727	1468
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)	632	219	41	30	119	86	21	167	25	339	336	370
RTOR Reduction (vph)	0	4	0	0	0	74	0	9	0	0	0	254
Lane Group Flow (vph)	632	256	0	0	149	12	21	183	0	339	336	116
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)	40.9	40.9			15.8	15.8	1.6	16.7		20.7	35.6	35.6
Effective Green, g (s)	40.9	40.9			15.8	15.8	1.6	16.7		20.7	35.6	35.6
Actuated g/C Ratio	0.36	0.36			0.14	0.14	0.01	0.15		0.18	0.31	0.31
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)	589	605			237	201	23	470		298	539	458
v/s Ratio Prot	c0.39	0.15			c0.09		0.01	0.06		c0.21	c0.19	
v/s Ratio Perm						0.01						0.08
v/c Ratio	1.07	0.42			0.63	0.06	0.91	0.39		1.14	0.62	0.25
Uniform Delay, d1	36.5	27.6			46.3	42.6	56.1	44.0		46.6	33.4	29.2
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	58.2	0.2			5.6	0.2	145.7	0.7		94.6	2.5	0.4
Delay (s)	94.7	27.8			51.8	42.8	201.8	44.7		141.2	35.9	29.6
Level of Service	F	C			D	D	F	D		F	D	C
Approach Delay (s)		75.2			48.5			60.2			67.8	
Approach LOS		E			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	68.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	113.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.3%	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)	355	44	3	250	46	4
Future Volume (vph)	355	44	3	250	46	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)	4638		1641	4715	1641	1450
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4638		1641	4715	1641	1450
Peak-hour factor, PHF	0.89	0.89	0.85	0.85	0.73	0.73
Adj. Flow (vph)	399	49	4	294	63	5
RTOR Reduction (vph)	11	0	0	0	0	4
Lane Group Flow (vph)	437	0	4	294	63	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)	23.9		0.9	30.5	5.2	5.2
Effective Green, g (s)	23.9		0.9	30.5	5.2	5.2
Actuated g/C Ratio	0.49		0.02	0.62	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)	2262		30	2934	174	153
v/s Ratio Prot	c0.09		0.00	c0.06	c0.04	
v/s Ratio Perm						0.00
v/c Ratio	0.19		0.13	0.10	0.36	0.00
Uniform Delay, d1	7.1		23.7	3.7	20.4	19.6
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		0.7	0.1	0.5	0.0
Delay (s)	7.2		24.4	3.8	20.8	19.6
Level of Service	A		C	A	C	B
Approach Delay (s)	7.2			4.1	20.7	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	49.0	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			

HCM Signalized Intersection Capacity Analysis
13: La Media Road & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	278	58	321	191	54	30	67	497	32	54	33
Future Volume (vph)	53	278	58	321	191	54	30	67	497	32	54	33
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	0.94	
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	4559		1641	1478		3183	1628	
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	4559		1641	1478		3183	1628	
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)	58	305	64	357	212	60	38	86	637	41	68	42
RTOR Reduction (vph)	0	0	53	0	34	0	0	192	0	0	16	0
Lane Group Flow (vph)	58	305	11	357	238	0	38	531	0	41	94	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)	8.3	23.5	23.5	36.0	51.2		6.8	55.3		5.3	54.7	
Effective Green, g (s)	8.3	23.5	23.5	36.0	51.2		6.8	55.3		5.3	54.7	
Actuated g/C Ratio	0.06	0.17	0.17	0.26	0.37		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)	97	791	241	421	1667		79	583		120	636	
v/s Ratio Prot	0.04	c0.06		c0.22	0.05		c0.02	c0.36		0.01	0.06	
v/s Ratio Perm			0.01									
v/c Ratio	0.60	0.39	0.04	0.85	0.14		0.48	0.91		0.34	0.15	
Uniform Delay, d1	64.2	51.8	48.8	49.4	29.7		64.9	40.0		65.6	27.6	
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	1.4	0.3	14.1	0.2		1.7	18.6		0.6	0.2	
Delay (s)	70.7	53.2	49.2	63.5	29.9		66.6	58.7		66.3	27.8	
Level of Service	E	D	D	E	C		E	E		E	C	
Approach Delay (s)		55.0			49.0			59.1			38.3	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	53.4	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

HCM Unsignalized Intersection Capacity Analysis
14: La Media Road & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	136	51	8	107	67	0	0	0	247	225	36
Future Volume (vph)	11	136	51	8	107	67	0	0	0	247	225	36
Peak Hour Factor	0.77	0.77	0.77	0.88	0.88	0.88	0.80	0.80	0.80	0.76	0.76	0.76
Hourly flow rate (vph)	14	177	66	9	122	76	0	0	0	325	296	47

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total (vph)	257	207	473	195
Volume Left (vph)	14	9	325	0
Volume Right (vph)	66	76	0	47
Hadj (s)	0.03	-0.04	0.51	0.00
Departure Headway (s)	6.1	6.1	6.4	5.9
Degree Utilization, x	0.43	0.35	0.84	0.32
Capacity (veh/h)	565	556	552	597
Control Delay (s)	13.6	12.4	33.7	10.5
Approach Delay (s)	13.6	12.4	26.9	
Approach LOS	B	B	D	

Intersection Summary			
Delay	21.3		
Level of Service	C		
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	101	118	70	158	114	52
Future Volume (vph)	101	118	70	158	114	52
Peak Hour Factor	0.88	0.88	0.94	0.94	0.72	0.72
Hourly flow rate (vph)	115	134	74	168	158	72

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	249	74	168	230
Volume Left (vph)	0	74	0	158
Volume Right (vph)	134	0	0	72
Hadj (s)	-0.15	0.67	0.17	0.12
Departure Headway (s)	4.8	6.1	5.6	5.2
Degree Utilization, x	0.33	0.13	0.26	0.33
Capacity (veh/h)	705	563	616	647
Control Delay (s)	10.2	8.8	9.3	10.8
Approach Delay (s)	10.2	9.2		10.8
Approach LOS	B	A		B

Intersection Summary			
Delay	10.1		
Level of Service	B		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	176	0	0	370
Future Volume (vph)	0	0	176	0	0	370
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	191	0	0	402

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	0	191	0	402
Volume Left (vph)	0	191	0	0
Volume Right (vph)	0	0	0	402
Hadj (s)	0.00	0.53	0.00	-0.57
Departure Headway (s)	5.2	5.9	5.4	3.9
Degree Utilization, x	0.00	0.31	0.00	0.44
Capacity (veh/h)	639	576	643	884
Control Delay (s)	8.2	10.4	7.2	10.0
Approach Delay (s)	0.0	10.4		10.0
Approach LOS	A	B		A

Intersection Summary			
Delay	10.1		
Level of Service	B		
Intersection Capacity Utilization	39.3%	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)	0	134	62	7	11	0
Future Volume (vph)	0	134	62	7	11	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	146	67	8	12	0

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	146	67	8	12
Volume Left (vph)	0	67	0	0
Volume Right (vph)	146	0	0	0
Hadj (s)	-0.57	0.53	0.03	0.03
Departure Headway (s)	3.6	5.3	4.8	4.4
Degree Utilization, x	0.14	0.10	0.01	0.01
Capacity (veh/h)	985	652	716	784
Control Delay (s)	7.2	7.7	6.7	7.5
Approach Delay (s)	7.2	7.6		7.5
Approach LOS	A	A		A

Intersection Summary			
Delay	7.3		
Level of Service	A		
Intersection Capacity Utilization	25.1%	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)	165	0	0	216	216	78
Future Volume (vph)	165	0	0	216	216	78
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	179	0	0	235	235	85

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	179	0	235	157	163
Volume Left (vph)	179	0	0	0	0
Volume Right (vph)	0	0	0	0	85
Hadj (s)	0.23	0.00	0.03	0.03	-0.33
Departure Headway (s)	5.5	5.4	5.4	5.3	5.0
Degree Utilization, x	0.27	0.00	0.35	0.23	0.22
Capacity (veh/h)	612	651	641	649	698
Control Delay (s)	10.5	7.2	10.1	8.7	8.2
Approach Delay (s)	10.5	10.1		8.4	
Approach LOS	B	B		A	

Intersection Summary			
Delay	9.5		
Level of Service	A		
Intersection Capacity Utilization	27.2%	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)	165	0	0	51	138	78
Future Volume (vph)	165	0	0	51	138	78
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	179	0	0	55	150	85

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	179	0	55	100	135
Volume Left (vph)	179	0	0	0	0
Volume Right (vph)	0	0	0	0	85
Hadj (s)	0.23	0.00	0.03	0.03	-0.41
Departure Headway (s)	4.8	5.2	5.2	5.1	4.6
Degree Utilization, x	0.24	0.00	0.08	0.14	0.17
Capacity (veh/h)	709	668	653	681	749
Control Delay (s)	9.3	7.0	7.5	7.7	7.4
Approach Delay (s)	9.3	7.5		7.5	
Approach LOS	A	A		A	

Intersection Summary			
Delay	8.2		
Level of Service	A		
Intersection Capacity Utilization	22.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1: Caliente Avenue & SR-905 WB On-Ramp/SR-905 WB Off-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	81	2	73	114	544	0	0	145	832
Future Volume (vph)	0	0	0	81	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)					1726	1538	1719	4940			4189	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1726	1538	1719	4940			4189	
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	101	2	91	123	585	0	0	171	979
RTOR Reduction (vph)	0	0	0	0	0	78	0	0	0	0	464	0
Lane Group Flow (vph)	0	0	0	0	104	13	123	585	0	0	686	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)					6.7	6.7	5.7	31.0			20.6	
Effective Green, g (s)					6.7	6.7	5.7	31.0			20.6	
Actuated g/C Ratio					0.14	0.14	0.12	0.65			0.43	
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)					241	215	204	3197			1801	
v/s Ratio Prot							c0.07	0.12			c0.16	
v/s Ratio Perm					0.06	0.01						
v/c Ratio					0.43	0.06	0.60	0.18			0.38	
Uniform Delay, d1					18.9	17.9	20.0	3.4			9.3	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					1.2	0.1	3.4	0.0			0.1	
Delay (s)					20.1	18.0	23.4	3.4			9.4	
Level of Service					C	B	C	A			A	
Approach Delay (s)		0.0			19.1			6.9			9.4	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	47.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Caliente Avenue & SR-905 EB Off-Ramp/SR-905 EB On-Ramp

12/18/2018

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	82	72	162	0
Future Volume (vph)	529	2	137	0	0	0	0	130	82	72	162	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	0.95	0.95						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	0.94						0.94		1.00	1.00	
Flt Protected	0.95	0.97						1.00		0.95	1.00	
Satd. Flow (prot)	1559	1494						4393		1641	3282	
Flt Permitted	0.95	0.97						1.00		0.95	1.00	
Satd. Flow (perm)	1559	1494						4393		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	104	88	198	0
RTOR Reduction (vph)	0	39	0	0	0	0	0	84	0	0	0	0
Lane Group Flow (vph)	362	302	0	0	0	0	0	185	0	88	198	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)	15.3	15.3						7.9		2.8	15.4	
Effective Green, g (s)	15.3	15.3						7.9		2.8	15.4	
Actuated g/C Ratio	0.37	0.37						0.19		0.07	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)	583	558						848		112	1235	
v/s Ratio Prot								c0.04		c0.05	0.06	
v/s Ratio Perm	c0.23	0.20										
v/c Ratio	0.62	0.54						0.22		0.79	0.16	
Uniform Delay, d1	10.4	10.0						13.9		18.8	8.5	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	2.1	1.1						0.1		27.5	0.1	
Delay (s)	12.5	11.1						14.0		46.3	8.5	
Level of Service	B	B						B		D	A	
Approach Delay (s)		11.8			0.0			14.0			20.1	
Approach LOS		B			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	40.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
3: Caliente Avenue & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	172	0	0	0	0	8	2	41	2	5	26	295
Future Volume (vph)	172	0	0	0	0	8	2	41	2	5	26	295
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)	205	0	0	0	0	12	3	58	3	5	29	324

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	137	68	0	12	3	61	5	353
Volume Left (vph)	137	68	0	0	3	0	5	0
Volume Right (vph)	0	0	0	12	0	3	0	324
Hadj (s)	0.58	0.58	0.00	-0.53	0.67	0.05	0.67	-0.55
Departure Headway (s)	6.1	6.1	5.8	5.2	6.2	5.5	5.9	4.7
Degree Utilization, x	0.23	0.12	0.00	0.02	0.01	0.09	0.01	0.46
Capacity (veh/h)	558	557	583	621	555	615	584	747
Control Delay (s)	9.7	8.7	7.6	7.1	8.0	7.9	7.7	10.4
Approach Delay (s)	9.4		7.1		7.9		10.3	
Approach LOS	A		A		A		B	

Intersection Summary			
Delay	9.7		
Level of Service	A		
Intersection Capacity Utilization	37.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Innovative Drive & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	375	2	0	551	69	0	0	1	0	0	118
Future Volume (Veh/h)	0	375	2	0	551	69	0	0	1	0	0	118
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	431	2	0	599	75	0	0	4	0	0	190
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	675			433			823	1107	145	748	1033	202
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	675			433			823	1107	145	748	1033	202
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	76
cM capacity (veh/h)	860			1068			191	197	852	285	218	780

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	172	172	88	200	200	200	75	4	190
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	2	0	0	0	75	4	190
cSH	1700	1700	1700	1700	1700	1700	1700	852	780
Volume to Capacity	0.10	0.10	0.05	0.12	0.12	0.12	0.04	0.00	0.24
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	24
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.2	11.1
Lane LOS								A	B
Approach Delay (s)	0.0			0.0				9.2	11.1
Approach LOS								A	B

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
5: Heritage Road & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	203	74	40	247	196	140	57	76	186	51	233
Future Volume (vph)	118	203	74	40	247	196	140	57	76	186	51	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
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	0.91		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	1413	3183	4715	1421	1641	1562		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	1413	3183	4715	1421	1641	1562		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	231	84	53	325	258	151	61	82	266	73	333
RTOR Reduction (vph)	0	0	62	0	0	205	0	40	0	0	0	233
Lane Group Flow (vph)	134	231	22	53	325	53	151	103	0	266	73	100
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)	7.0	18.1	18.1	3.3	14.4	14.4	15.4	13.6		15.9	14.1	21.1
Effective Green, g (s)	7.0	18.1	18.1	3.3	14.4	14.4	15.4	13.6		15.9	14.1	21.1
Actuated g/C Ratio	0.10	0.26	0.26	0.05	0.20	0.20	0.22	0.19		0.23	0.20	0.30
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0		2.0	2.0	2.0
Lane Grp Cap (vph)	315	1208	362	148	961	289	357	300		369	344	772
v/s Ratio Prot	c0.04	c0.05		0.02	c0.07		0.09	c0.07		c0.16	0.04	0.01
v/s Ratio Perm			0.02			0.04						0.03
v/c Ratio	0.43	0.19	0.06	0.36	0.34	0.18	0.42	0.34		0.72	0.21	0.13
Uniform Delay, d1	29.9	20.5	19.8	32.6	24.0	23.2	23.8	24.6		25.3	23.6	18.0
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	0.3	0.1	0.1	0.5	0.3	0.5	0.3	1.4		5.8	0.1	0.0
Delay (s)	30.2	20.6	19.9	33.2	24.4	23.7	24.1	26.1		31.1	23.7	18.1
Level of Service	C	C	B	C	C	C	C	C		C	C	B
Approach Delay (s)		23.4			24.8			25.1			23.8	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	70.6	Sum of lost time (s)	19.7
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Cactus Road & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	430	37	103	457	34	41	2	134	52	5	8
Future Volume (vph)	2	430	37	103	457	34	41	2	134	52	5	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	4.9
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	4653		1641	4658		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	4653		1641	4658		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	500	43	123	544	40	47	2	152	124	12	19
RTOR Reduction (vph)	0	9	0	0	7	0	0	0	131	0	0	15
Lane Group Flow (vph)	2	534	0	123	577	0	47	2	21	124	12	4
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)	0.8	15.9		5.6	20.7		2.7	7.7	7.7	5.6	10.6	10.6
Effective Green, g (s)	0.8	15.9		5.6	20.7		2.7	7.7	7.7	5.6	10.6	10.6
Actuated g/C Ratio	0.01	0.29		0.10	0.38		0.05	0.14	0.14	0.10	0.19	0.19
Clearance Time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	4.9
Vehicle Extension (s)	2.0	4.4		2.0	4.2		2.0	3.2	3.2	2.0	2.0	2.0
Lane Grp Cap (vph)	24	1357		168	1769		81	243	207	168	335	285
v/s Ratio Prot	0.00	c0.11		c0.07	0.12		0.03	0.00		c0.08	c0.01	
v/s Ratio Perm									c0.01			0.00
v/c Ratio	0.08	0.39		0.73	0.33		0.58	0.01	0.10	0.74	0.04	0.01
Uniform Delay, d1	26.5	15.4		23.7	12.0		25.3	20.1	20.4	23.7	17.8	17.7
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	0.5	0.3		13.2	0.2		6.6	0.0	0.2	13.5	0.0	0.0
Delay (s)	27.0	15.8		36.9	12.1		32.0	20.1	20.6	37.3	17.8	17.7
Level of Service	C	B		D	B		C	C	C	D	B	B
Approach Delay (s)		15.8			16.4			23.3			33.4	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	54.5	Sum of lost time (s)	19.7
Intersection Capacity Utilization	37.7%	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)	10	228	30	460	380	144	47	3	367	96	1	10
Future Volume (vph)	10	228	30	460	380	144	47	3	367	96	1	10
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
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	1.00		0.97	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	1.00	0.85	1.00	0.96		1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	3282	1468	3183	3142		3183	1470		3183	1727	1468
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	3282	1468	3183	3142		3183	1470		3183	1727	1468
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)	11	248	33	523	413	164	51	3	427	166	2	11
RTOR Reduction (vph)	0	0	26	0	32	0	0	363	0	0	0	9
Lane Group Flow (vph)	11	248	7	523	545	0	51	67	0	166	2	2
Confl. Peds. (#/hr)				1						1		
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2									8
Actuated Green, G (s)	0.7	14.3	14.3	19.0	32.6		3.2	10.4		7.6	14.8	14.8
Effective Green, g (s)	0.7	14.3	14.3	19.0	32.6		3.2	10.4		7.6	14.8	14.8
Actuated g/C Ratio	0.01	0.21	0.21	0.27	0.47		0.05	0.15		0.11	0.21	0.21
Clearance Time (s)	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
Lane Grp Cap (vph)	16	677	302	872	1478		146	220		349	368	313
v/s Ratio Prot	0.01	0.08		c0.16	c0.17		0.02	c0.05		c0.05	0.00	
v/s Ratio Perm			0.00									c0.00
v/c Ratio	0.69	0.37	0.02	0.60	0.37		0.35	0.30		0.48	0.01	0.01
Uniform Delay, d1	34.2	23.6	21.9	21.8	11.8		32.0	26.2		29.0	21.5	21.5
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	80.1	0.3	0.0	1.1	0.2		1.4	0.8		1.0	0.0	0.0
Delay (s)	114.3	23.9	22.0	23.0	11.9		33.5	27.0		30.0	21.5	21.5
Level of Service	F	C	C	C	B		C	C		C	C	C
Approach Delay (s)		27.1			17.2			27.7			29.4	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	69.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	238	378	575	287	307	248
Future Volume (vph)	238	378	575	287	307	248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	5.3	4.4	6.0	5.3	5.3
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	440	737	368	357	288
RTOR Reduction (vph)	0	36	0	0	0	213
Lane Group Flow (vph)	277	404	737	368	357	75
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	8	1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	12.6	40.4	51.1	68.1	27.8	27.8
Effective Green, g (s)	12.6	40.4	51.1	68.1	27.8	27.8
Actuated g/C Ratio	0.12	0.38	0.48	0.64	0.26	0.26
Clearance Time (s)	6.0	5.3	4.4	6.0	5.3	5.3
Vehicle Extension (s)	4.4	2.0	2.0	4.3	2.0	2.0
Lane Grp Cap (vph)	554	625	782	2995	825	380
v/s Ratio Prot	0.06	c0.17	c0.45	0.08	0.11	
v/s Ratio Perm		0.11				0.05
v/c Ratio	0.50	0.65	0.94	0.12	0.43	0.20
Uniform Delay, d1	44.3	27.5	26.7	7.7	33.1	31.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	1.7	19.3	0.0	0.1	0.1
Delay (s)	45.5	29.2	45.9	7.8	33.3	31.1
Level of Service	D	C	D	A	C	C
Approach Delay (s)	35.5			33.2	32.3	
Approach LOS	D			C	C	

Intersection Summary			
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	107.2	Sum of lost time (s)	15.7
Intersection Capacity Utilization	63.3%	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)	0	0	0	122	1	108	685	433	0	0	550	322
Future Volume (vph)	0	0	0	122	1	108	685	433	0	0	550	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			0.94	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1641	1379	1375	3183	4715			4434	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1379	1375	3183	4715			4434	
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	136	1	120	825	522	0	0	640	374
RTOR Reduction (vph)	0	0	0	0	52	52	0	0	0	0	143	0
Lane Group Flow (vph)	0	0	0	136	9	8	825	522	0	0	871	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)				8.8	8.8	8.8	20.2	45.3			20.4	
Effective Green, g (s)				8.8	8.8	8.8	20.2	45.3			20.4	
Actuated g/C Ratio				0.14	0.14	0.14	0.31	0.70			0.32	
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)				224	188	188	999	3321			1406	
v/s Ratio Prot					0.01		c0.26	0.11			c0.20	
v/s Ratio Perm				c0.08		0.01						
v/c Ratio				0.61	0.05	0.04	0.83	0.16			0.62	
Uniform Delay, d1				26.1	24.1	24.1	20.4	3.2			18.6	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				4.6	0.1	0.1	5.7	0.0			0.8	
Delay (s)				30.7	24.2	24.2	26.1	3.2			19.5	
Level of Service				C	C	C	C	A			B	
Approach Delay (s)		0.0			27.7			17.2			19.5	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	64.3	Sum of lost time (s)	14.9
Intersection Capacity Utilization	56.6%	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)	77	1	502	0	0	0	0	1041	144	150	523	0
Future Volume (vph)	77	1	502	0	0	0	0	1041	144	150	523	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)		1646	2584					3222		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1646	2584					3222		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	577	0	0	0	0	1239	171	163	568	0
RTOR Reduction (vph)	0	0	481	0	0	0	0	15	0	0	0	0
Lane Group Flow (vph)	0	90	96	0	0	0	0	1395	0	163	568	0
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		10.5	10.5					32.2		5.4	42.3	
Effective Green, g (s)		10.5	10.5					32.2		5.4	42.3	
Actuated g/C Ratio		0.17	0.17					0.51		0.09	0.67	
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)		274	430					1646		272	3165	
v/s Ratio Prot								c0.43		c0.05	0.12	
v/s Ratio Perm		0.05	0.04									
v/c Ratio		0.33	0.22					0.85		0.60	0.18	
Uniform Delay, d1		23.1	22.7					13.3		27.8	3.9	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.7	0.3					4.3		3.5	0.0	
Delay (s)		23.8	23.0					17.5		31.3	3.9	
Level of Service		C	C					B		C	A	
Approach Delay (s)		23.1			0.0			17.5			10.0	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	63.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	56.6%	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)	518	154	28	29	226	277	40	342	31	185	146	714
Future Volume (vph)	518	154	28	29	226	277	40	342	31	185	146	714
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	0.98			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	1682			1717	1445	1641	3241		1641	1727	1437
Flt Permitted	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1682			1717	1445	1641	3241		1641	1727	1437
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)	563	173	31	37	286	351	51	433	39	208	164	776
RTOR Reduction (vph)	0	4	0	0	0	192	0	5	0	0	0	507
Lane Group Flow (vph)	563	200	0	0	323	159	51	467	0	208	164	269
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)	48.9	48.9			30.6	30.6	5.6	25.4		18.7	38.3	38.3
Effective Green, g (s)	48.9	48.9			30.6	30.6	5.6	25.4		18.7	38.3	38.3
Actuated g/C Ratio	0.34	0.34			0.21	0.21	0.04	0.18		0.13	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)	559	573			366	308	64	574		213	461	383
v/s Ratio Prot	c0.34	0.12			c0.19		0.03	c0.14		c0.13	0.09	
v/s Ratio Perm						0.11						0.19
v/c Ratio	1.01	0.35			0.88	0.52	0.80	0.81		0.98	0.36	0.70
Uniform Delay, d1	47.2	35.3			54.7	49.9	68.3	56.7		62.1	42.6	47.4
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	39.8	0.1			21.7	1.8	45.6	9.0		54.2	0.6	6.1
Delay (s)	87.1	35.5			76.4	51.7	114.0	65.7		116.4	43.2	53.5
Level of Service	F	D			E	D	F	E		F	D	D
Approach Delay (s)		73.4			63.5			70.4			63.4	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	67.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	143.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	80.3%	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)	352	60	7	410	75	7
Future Volume (vph)	352	60	7	410	75	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)	4612		1641	4715	1641	1468
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4612		1641	4715	1641	1468
Peak-hour factor, PHF	0.93	0.93	0.79	0.79	0.71	0.71
Adj. Flow (vph)	378	65	9	519	106	10
RTOR Reduction (vph)	19	0	0	0	0	8
Lane Group Flow (vph)	424	0	9	519	106	2
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	22.8		0.9	29.4	7.7	7.7
Effective Green, g (s)	22.8		0.9	29.4	7.7	7.7
Actuated g/C Ratio	0.45		0.02	0.58	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)	2086		29	2750	250	224
v/s Ratio Prot	0.09		0.01	c0.11	c0.06	
v/s Ratio Perm						0.00
v/c Ratio	0.20		0.31	0.19	0.42	0.01
Uniform Delay, d1	8.3		24.4	4.9	19.3	18.1
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		2.2	0.1	0.4	0.0
Delay (s)	8.5		26.7	5.0	19.8	18.1
Level of Service	A		C	A	B	B
Approach Delay (s)	8.5			5.4	19.6	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	50.4	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

HCM Signalized Intersection Capacity Analysis
13: La Media Road & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	176	112	488	317	71	38	79	262	35	153	41
Future Volume (vph)	37	176	112	488	317	71	38	79	262	35	153	41
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	0.97	
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	4586		1641	1511		3183	1672	
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	4586		1641	1511		3183	1672	
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)	43	205	130	642	417	93	53	110	364	40	174	47
RTOR Reduction (vph)	0	0	116	0	27	0	0	79	0	0	6	0
Lane Group Flow (vph)	43	205	14	642	483	0	53	395	0	40	215	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)	6.8	14.8	14.8	56.5	64.5		7.9	43.5		5.3	41.8	
Effective Green, g (s)	6.8	14.8	14.8	56.5	64.5		7.9	43.5		5.3	41.8	
Actuated g/C Ratio	0.05	0.11	0.11	0.40	0.46		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)	79	498	152	662	2112		92	469		120	499	
v/s Ratio Prot	0.03	c0.04		c0.39	0.11		c0.03	c0.26		0.01	0.13	
v/s Ratio Perm			0.01									
v/c Ratio	0.54	0.41	0.09	0.97	0.23		0.58	0.84		0.33	0.43	
Uniform Delay, d1	65.1	58.5	56.5	40.9	22.8		64.4	45.0		65.6	39.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.1	2.5	1.2	27.1	0.3		5.3	13.0		0.6	1.4	
Delay (s)	69.1	61.0	57.7	68.0	23.0		69.7	58.0		66.2	40.9	
Level of Service	E	E	E	E	C		E	E		E	D	
Approach Delay (s)		60.8			48.1			59.2			44.8	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	52.3	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

HCM Unsignalized Intersection Capacity Analysis
14: La Media Road & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	40	145	45	13	185	207	0	0	0	182	159	31
Future Volume (vph)	40	145	45	13	185	207	0	0	0	182	159	31
Peak Hour Factor	0.78	0.78	0.78	0.87	0.87	0.87	0.79	0.79	0.79	0.84	0.84	0.84
Hourly flow rate (vph)	51	186	58	15	213	238	0	0	0	217	189	37

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total (vph)	295	466	312	132
Volume Left (vph)	51	15	217	0
Volume Right (vph)	58	238	0	37
Hadj (s)	0.09	-0.13	0.52	-0.03
Departure Headway (s)	6.2	5.7	7.2	6.6
Degree Utilization, x	0.51	0.74	0.62	0.24
Capacity (veh/h)	553	614	479	520
Control Delay (s)	15.4	23.1	20.0	10.5
Approach Delay (s)	15.4	23.1	17.2	
Approach LOS	C	C	C	

Intersection Summary			
Delay	19.0		
Level of Service	C		
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	114	166	64	177	142	53
Future Volume (vph)	114	166	64	177	142	53
Peak Hour Factor	0.81	0.81	0.97	0.97	0.78	0.78
Hourly flow rate (vph)	141	205	66	182	182	68

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	346	66	182	250
Volume Left (vph)	0	66	0	182
Volume Right (vph)	205	0	0	68
Hadj (s)	-0.19	0.67	0.17	0.15
Departure Headway (s)	4.9	6.3	5.8	5.5
Degree Utilization, x	0.48	0.12	0.29	0.38
Capacity (veh/h)	697	542	591	599
Control Delay (s)	12.3	8.9	10.0	12.0
Approach Delay (s)	12.3	9.7		12.0
Approach LOS	B	A		B

Intersection Summary			
Delay	11.5		
Level of Service	B		
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	427	0	0	258
Future Volume (vph)	0	0	427	0	0	258
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	464	0	0	280

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	0	464	0	280
Volume Left (vph)	0	464	0	0
Volume Right (vph)	0	0	0	280
Hadj (s)	0.00	0.53	0.00	-0.57
Departure Headway (s)	5.5	5.8	5.2	4.8
Degree Utilization, x	0.00	0.74	0.00	0.37
Capacity (veh/h)	617	612	684	708
Control Delay (s)	8.5	22.3	7.0	10.6
Approach Delay (s)	0.0	22.3		10.6
Approach LOS	A	C		B

Intersection Summary			
Delay	17.9		
Level of Service	C		
Intersection Capacity Utilization	46.3%	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)	0	90	140	7	7	0
Future Volume (vph)	0	90	140	7	7	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	98	152	8	8	0

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	98	152	8	5	3
Volume Left (vph)	0	152	0	0	0
Volume Right (vph)	98	0	0	0	0
Hadj (s)	-0.57	0.53	0.03	0.03	0.03
Departure Headway (s)	3.8	5.2	4.7	4.9	4.9
Degree Utilization, x	0.10	0.22	0.01	0.01	0.00
Capacity (veh/h)	915	669	736	719	712
Control Delay (s)	7.2	8.5	6.6	6.7	6.7
Approach Delay (s)	7.2	8.4		6.7	
Approach LOS	A	A		A	

Intersection Summary			
Delay	7.9		
Level of Service	A		
Intersection Capacity Utilization	26.7%	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)	120	0	0	297	301	190
Future Volume (vph)	120	0	0	297	301	190
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	130	0	0	323	327	207

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	130	0	323	218	316
Volume Left (vph)	130	0	0	0	0
Volume Right (vph)	0	0	0	0	207
Hadj (s)	0.23	0.00	0.03	0.03	-0.42
Departure Headway (s)	6.0	5.5	5.5	5.3	4.8
Degree Utilization, x	0.22	0.00	0.49	0.32	0.42
Capacity (veh/h)	544	642	636	659	725
Control Delay (s)	10.7	7.3	12.5	9.6	10.1
Approach Delay (s)	10.7	12.5		9.9	
Approach LOS	B	B		A	

Intersection Summary			
Delay	10.9		
Level of Service	B		
Intersection Capacity Utilization	28.9%	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)	120	0	0	177	111	190
Future Volume (vph)	120	0	0	177	111	190
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	130	0	0	192	121	207

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	130	0	192	81	247
Volume Left (vph)	130	0	0	0	0
Volume Right (vph)	0	0	0	0	207
Hadj (s)	0.23	0.00	0.03	0.03	-0.55
Departure Headway (s)	5.3	5.2	5.2	5.1	4.5
Degree Utilization, x	0.19	0.00	0.28	0.11	0.31
Capacity (veh/h)	625	691	667	680	774
Control Delay (s)	9.6	7.0	9.0	7.6	8.3
Approach Delay (s)	9.6	9.0		8.1	
Approach LOS	A	A		A	

Intersection Summary			
Delay	8.7		
Level of Service	A		
Intersection Capacity Utilization	22.6%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix F
Mitigation Measures Worksheets and Triggers
- Existing Plus Project (Full Development) Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	581	188	35	24	96	70	16	127	19	288	286	340
Future Volume (vph)	581	188	35	24	96	70	16	127	19	288	286	340
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	0.97	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	0.98			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)	3183	1686			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)	3183	1686			1710	1449	1641	3208		1641	1727	1468
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)	632	219	41	30	119	86	21	167	25	339	336	370
RTOR Reduction (vph)	0	4	0	0	0	74	0	9	0	0	0	228
Lane Group Flow (vph)	632	256	0	0	149	12	21	183	0	339	336	142
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)	25.8	25.8			14.6	14.6	2.4	14.8		26.7	38.9	38.9
Effective Green, g (s)	25.8	25.8			14.6	14.6	2.4	14.8		26.7	38.9	38.9
Actuated g/C Ratio	0.25	0.25			0.14	0.14	0.02	0.15		0.26	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)	807	427			245	208	38	466		430	660	561
v/s Ratio Prot	c0.20	0.15			c0.09		0.01	0.06		c0.21	c0.19	
v/s Ratio Perm						0.01						0.10
v/c Ratio	0.78	0.60			0.61	0.06	0.55	0.39		0.79	0.51	0.25
Uniform Delay, d1	35.3	33.4			40.9	37.6	49.1	39.4		34.9	24.1	21.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.6	1.5			4.6	0.2	9.5	0.7		8.6	0.8	0.3
Delay (s)	40.0	34.9			45.5	37.8	58.6	40.1		43.5	24.9	21.8
Level of Service	D	C			D	D	E	D		D	C	C
Approach Delay (s)		38.5			42.7			41.9			29.8	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	35.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	101.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.2%	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												
Traffic Volume (vph)	518	154	28	29	226	277	40	342	31	185	146	714
Future Volume (vph)	518	154	28	29	226	277	40	342	31	185	146	714
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	0.97	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	0.98
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98			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)	3183	1682			1717	1446	1641	3241		1641	1727	1437
Flt Permitted	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	1682			1717	1446	1641	3241		1641	1727	1437
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)	563	173	31	37	286	351	51	433	39	208	164	776
RTOR Reduction (vph)	0	6	0	0	0	192	0	5	0	0	0	377
Lane Group Flow (vph)	563	198	0	0	323	159	51	467	0	208	164	399
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)	21.6	21.6			25.2	25.2	3.6	23.9		15.9	36.0	36.0
Effective Green, g (s)	21.6	21.6			25.2	25.2	3.6	23.9		15.9	36.0	36.0
Actuated g/C Ratio	0.20	0.20			0.24	0.24	0.03	0.22		0.15	0.34	0.34
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)	646	341			406	342	55	728		245	584	486
v/s Ratio Prot	c0.18	0.12			c0.19		0.03	0.14		c0.13	0.09	
v/s Ratio Perm						0.11						c0.28
v/c Ratio	0.87	0.58			0.80	0.47	0.93	0.64		0.85	0.28	0.82
Uniform Delay, d1	41.1	38.3			38.2	34.8	51.3	37.4		44.1	25.7	32.2
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.0	1.6			10.7	1.3	93.0	2.1		22.2	0.3	11.1
Delay (s)	53.0	40.0			48.9	36.1	144.3	39.5		66.3	26.1	43.3
Level of Service	D	D			D	D	F	D		E	C	D
Approach Delay (s)		49.6			42.2			49.7			45.0	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	46.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	106.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
11: Britannia Boulevard & Airway Road

12/18/2018

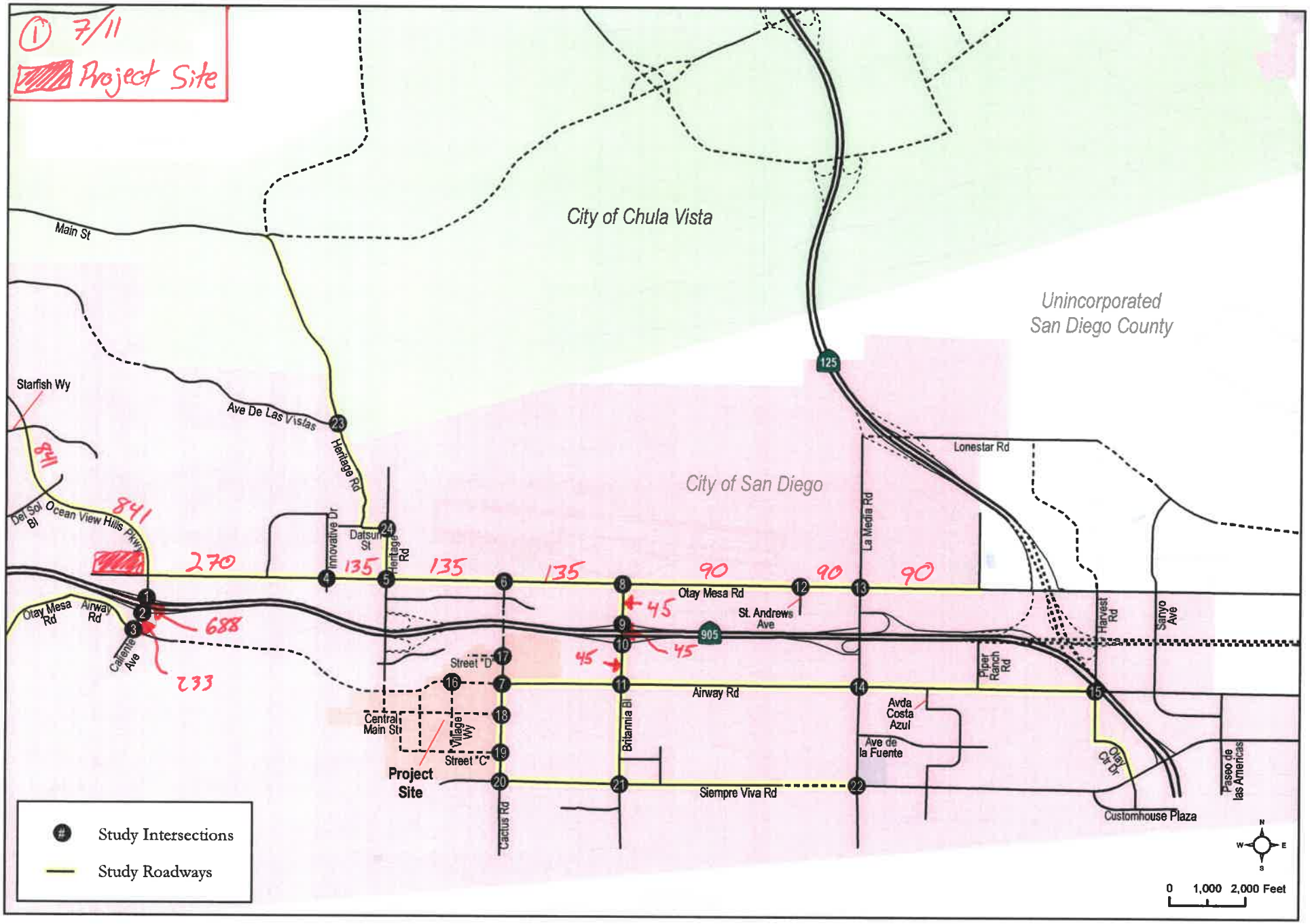
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	204	51	9	29	60	277	10	342	31	185	146	210
Future Volume (vph)	204	51	9	29	60	277	10	342	31	185	146	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost 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	0.98
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98			1.00	0.85	1.00	0.99		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	1683			1699	1447	1641	3241		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	1683			1699	1447	1641	3241		1641	1727	1437
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)	222	57	10	37	76	351	13	433	39	208	164	228
RTOR Reduction (vph)	0	6	0	0	0	180	0	7	0	0	0	149
Lane Group Flow (vph)	222	61	0	0	113	171	13	465	0	208	164	79
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)	14.6	14.6			14.4	14.4	0.6	20.4		6.8	26.4	26.4
Effective Green, g (s)	14.6	14.6			14.4	14.4	0.6	20.4		6.8	26.4	26.4
Actuated g/C Ratio	0.19	0.19			0.19	0.19	0.01	0.27		0.09	0.35	0.35
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)	315	323			321	274	12	869		146	599	499
v/s Ratio Prot	c0.14	0.04			0.07		0.01	c0.14		c0.13	0.09	
v/s Ratio Perm						c0.12						0.06
v/c Ratio	0.70	0.19			0.35	0.62	1.08	0.54		1.42	0.27	0.16
Uniform Delay, d1	28.7	25.7			26.7	28.3	37.7	23.8		34.6	17.9	17.1
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.8	0.1			0.8	4.7	289.8	0.8		226.1	0.3	0.2
Delay (s)	34.4	25.8			27.6	33.1	327.5	24.5		260.7	18.2	17.3
Level of Service	C	C			C	C	F	C		F	B	B
Approach Delay (s)		32.4			31.7			32.6			101.9	
Approach LOS		C			C			C			F	

Intersection Summary			
HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	76.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

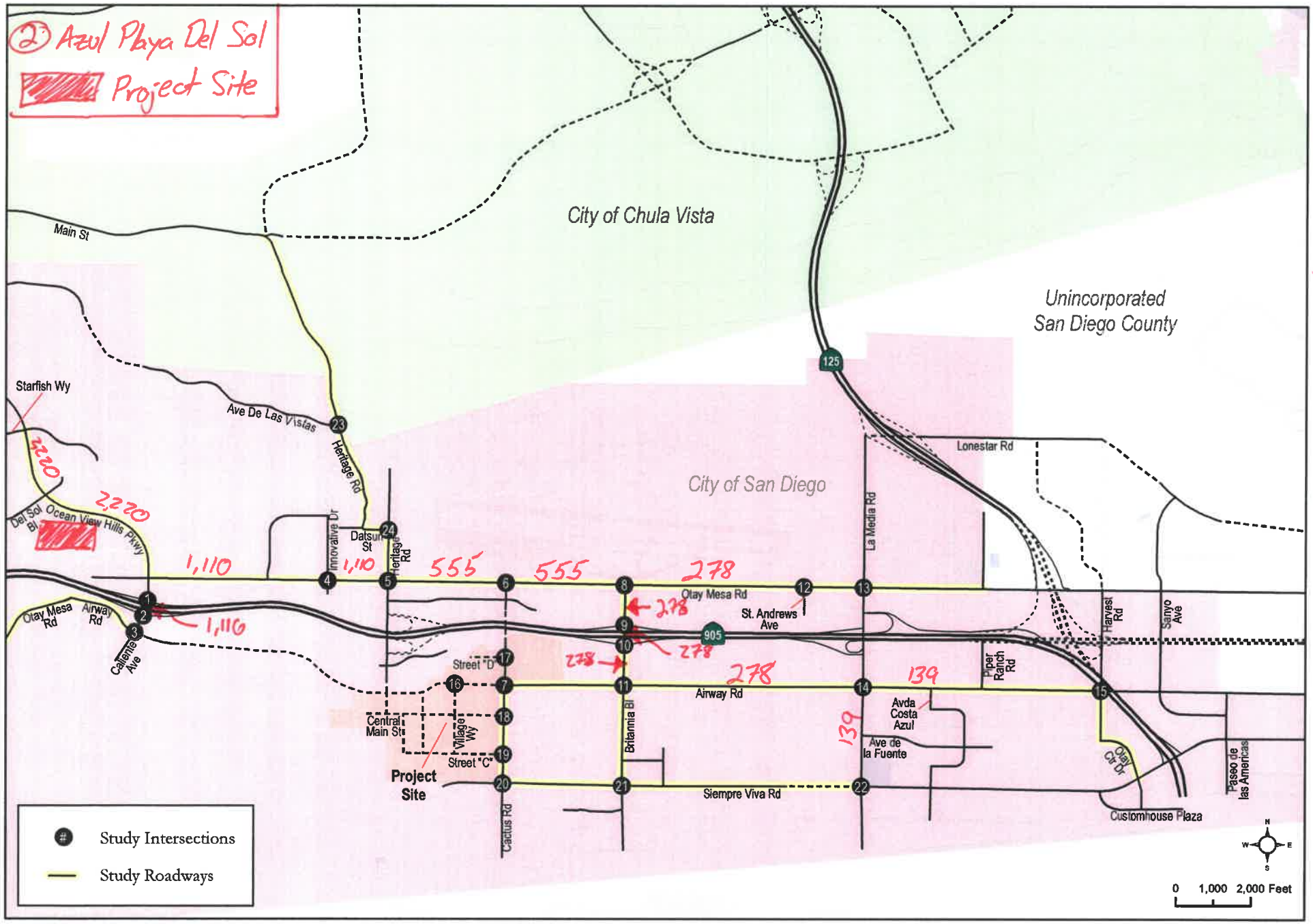
Intersection No.	11	Peak:	PM									
Total ADT	15581											
Project Trip Generation	In	944	Out	588								
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Full with Project Volume	40	342	31	185	146	714	518	154	28	29	226	277
Project Volume	38	0	0	0	0	632	394	129	24	0	208	0
Type of Turning Movement	out								in			
Percentage of Project Volume	6.0%	0.0%	0.0%	0.0%	0.0%	67.0%	42.0%	14.0%	3.0%	0.0%	22.0%	0.0%
Base Volume	2	342	31	185	146	82	124	25	4	29	18	277
PFFP Calculation												
PFFP ADT	7000		Delay	59.8	LOS	E						
Percent Reduction	55.1%											
Trips Assignment	17	0	0	0	0	284	177	58	11	0	93	0
Base + Project	19	342	31	185	146	366	301	83	15	29	111	277
Arrange in EB - WB - NB - SB	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
order	301	83	15	29	111	277	19	342	31	185	146	366
PFFP Calculation												
PFFP ADT	5000		Delay	55.6	LOS	E						
Percent Reduction	67.9%											
Trips Assignment	12	0	0	0	0	203	126	41	8	0	67	0
Base + Project	14	342	31	185	146	285	250	66	12	29	85	277
Arrange in EB - WB - NB - SB	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
order	250	66	12	29	85	277	14	342	31	185	146	285
Change when compare to previous ADT	-51	-17	-3	0	-26	0	-5	0	0	0	0	-81
PFFP Calculation												
PFFP ADT	3145		Delay	55.0	LOS	D						
Percent Reduction	79.8%											
Trips Assignment	8	0	0	0	0	128	80	26	5	0	42	0
Base + Project	10	342	31	185	146	210	204	51	9	29	60	277
Arrange in EB - WB - NB - SB	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
order	204	51	9	29	60	277	10	342	31	185	146	210
Change when compare to previous ADT	-97	-32	-6	0	-51	0	-9	0	0	0	0	-156

Appendix G
Cumulative Project Information



Otay Mesa Lumina
Transportation Impact Study
CHEN RYAN

Figure 1-2
Project Study Area



Otay Mesa Lumina
Transportation Impact Study
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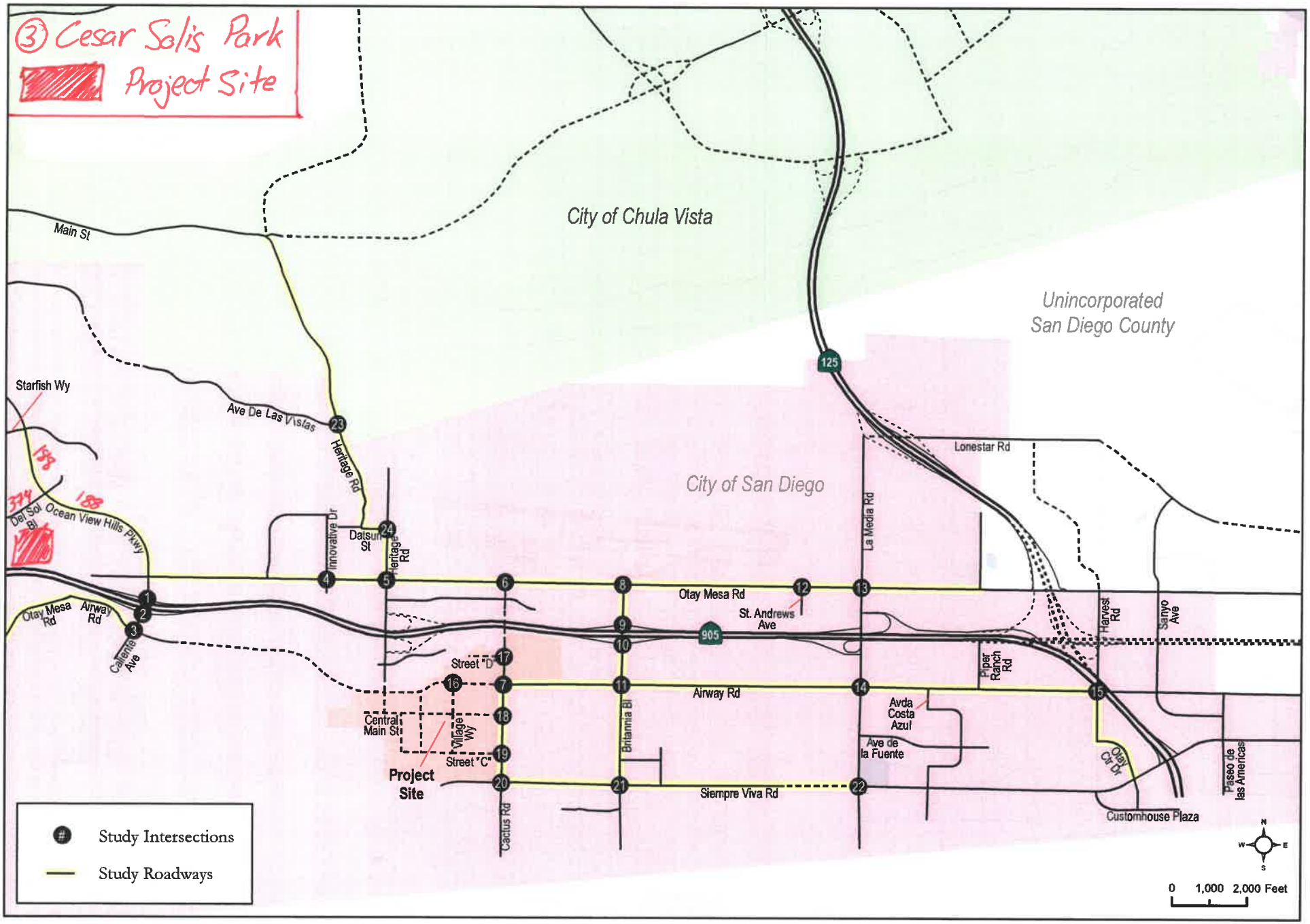
Project Study Area



Otay Mesa Lumina
Transportation Impact Study
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Project Study Area

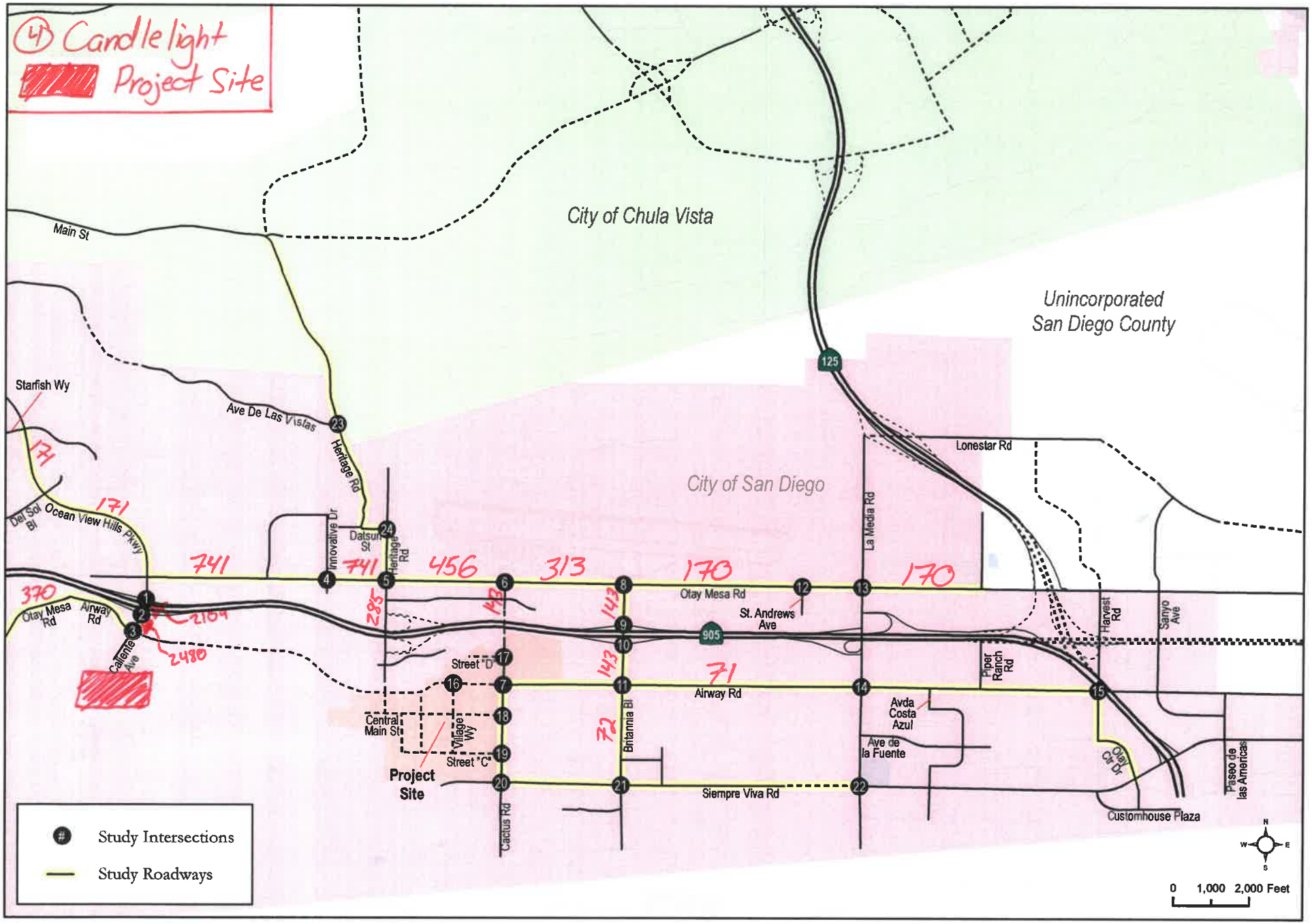

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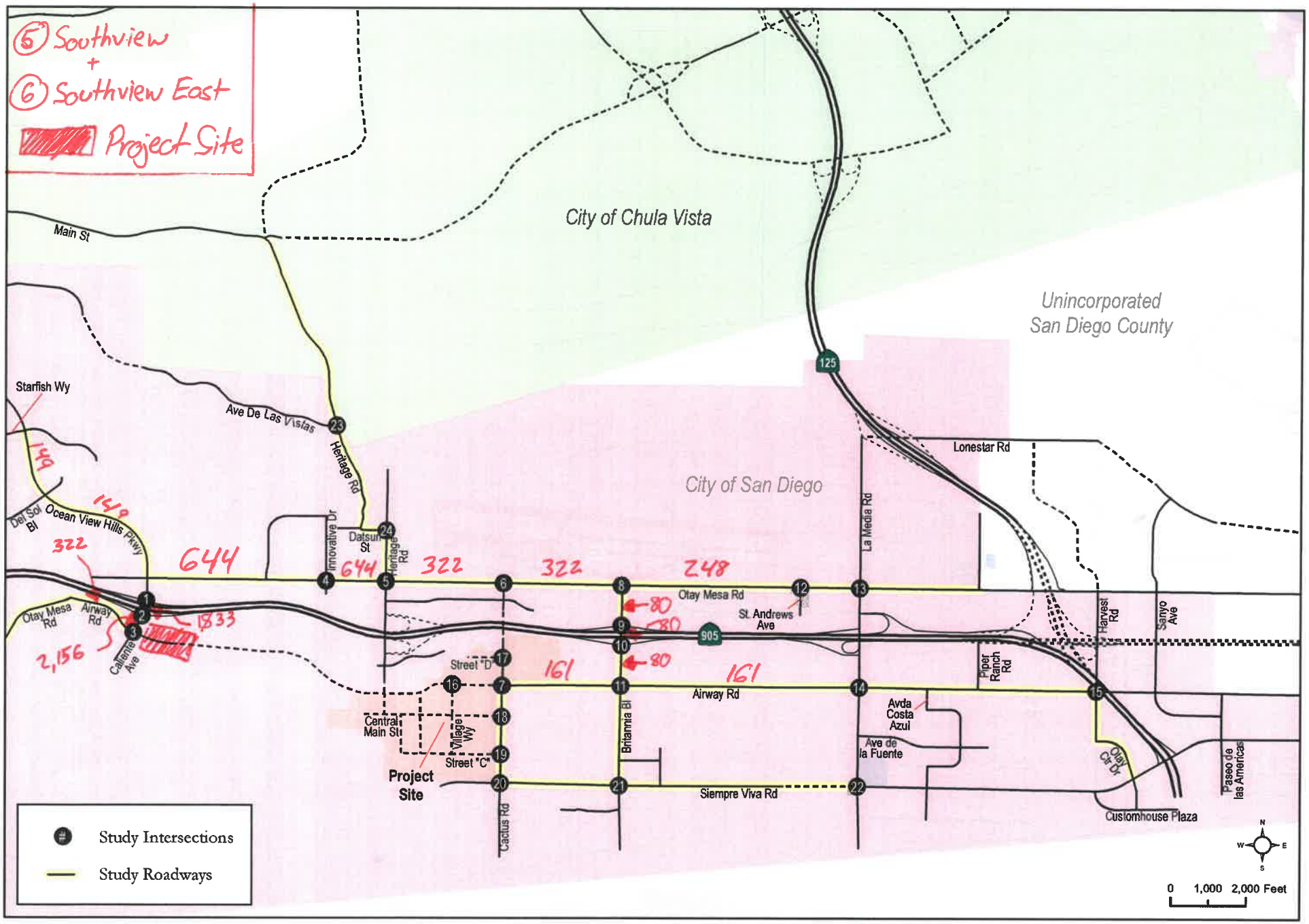
Figure 1-2
Project Study Area



Otay Mesa Lumina
Transportation Impact Study
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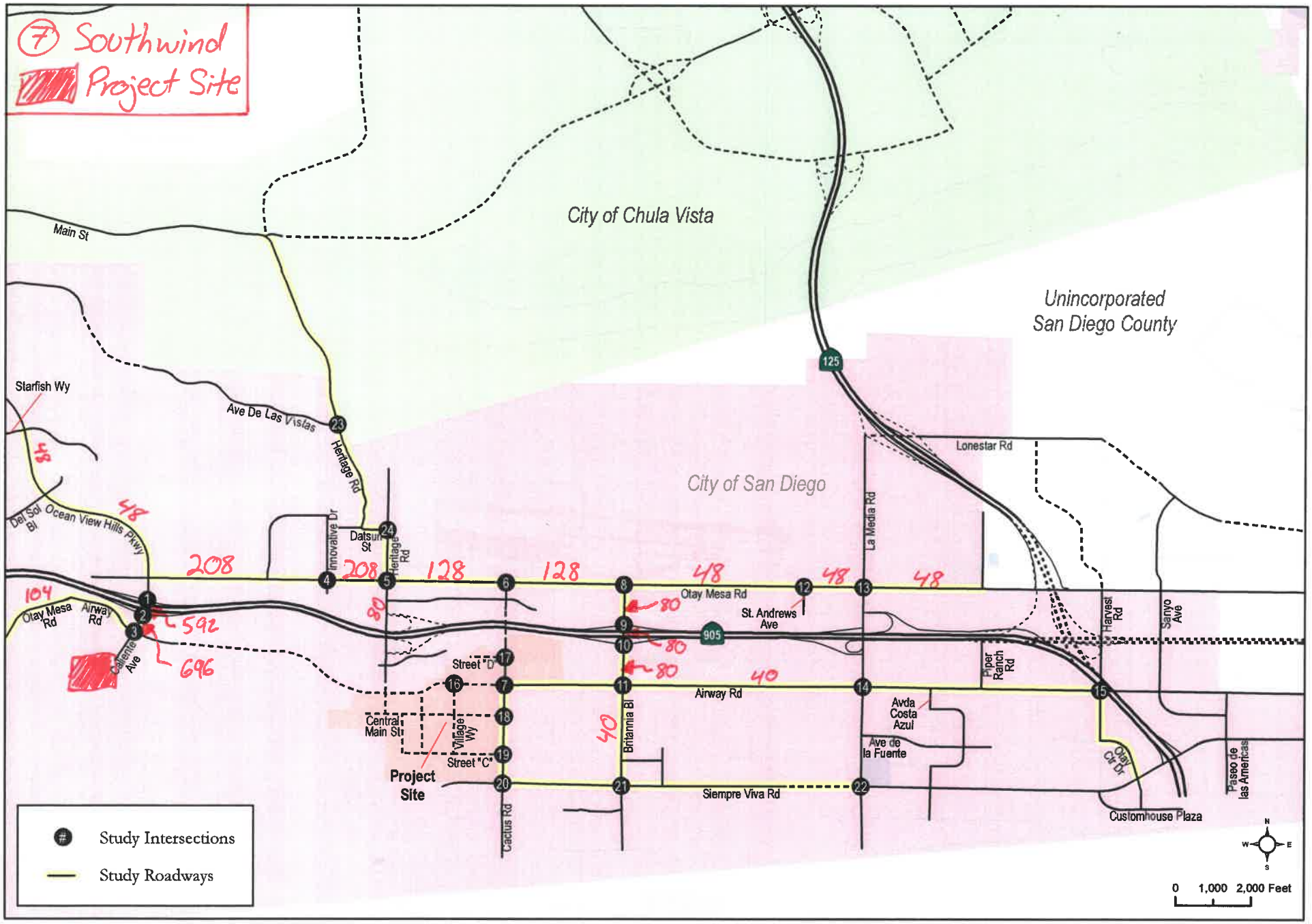
Figure 1-2
Project Study Area



Otay Mesa Lumina
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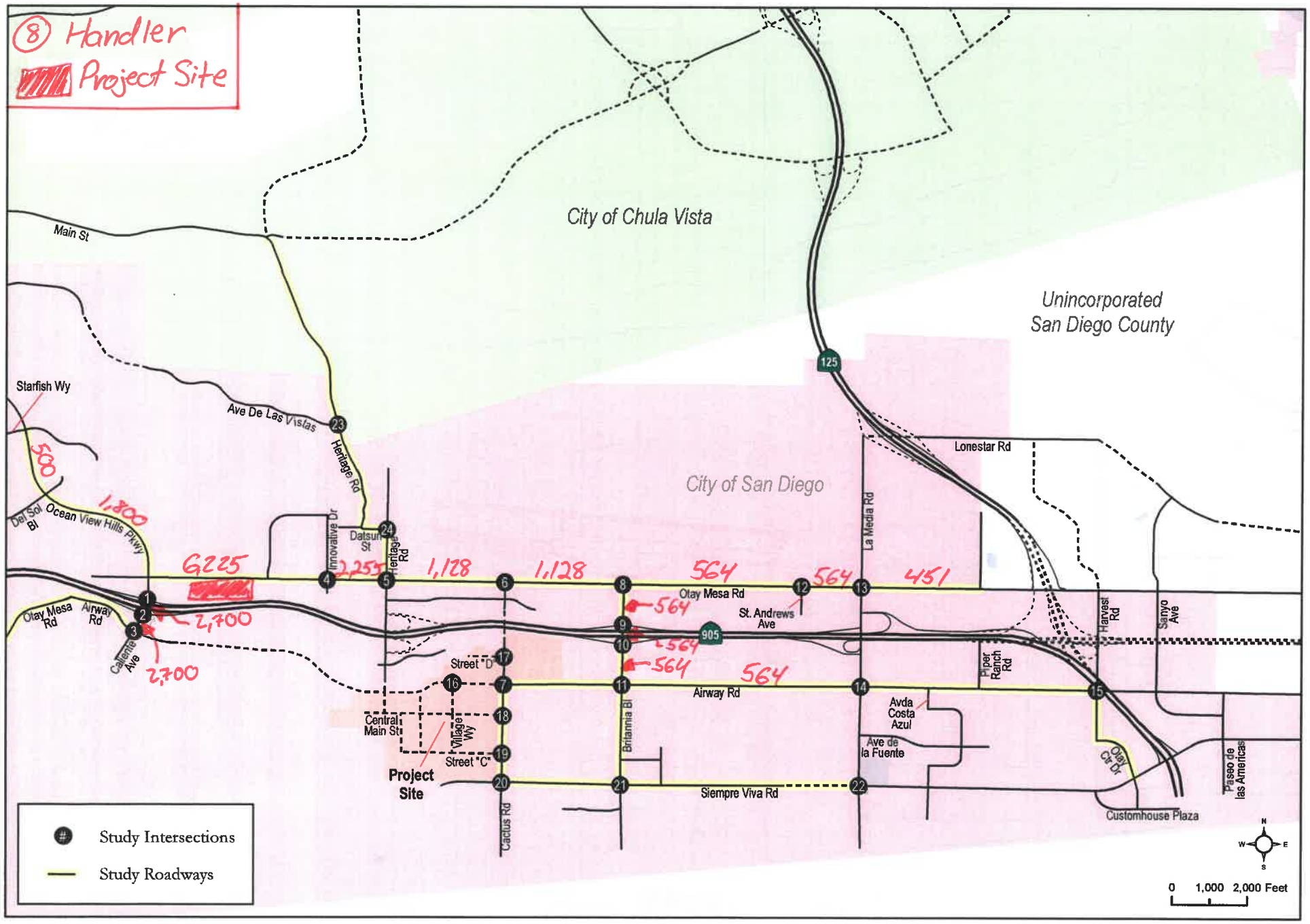
Figure 1-2
Project Study Area



Otay Mesa Lumina
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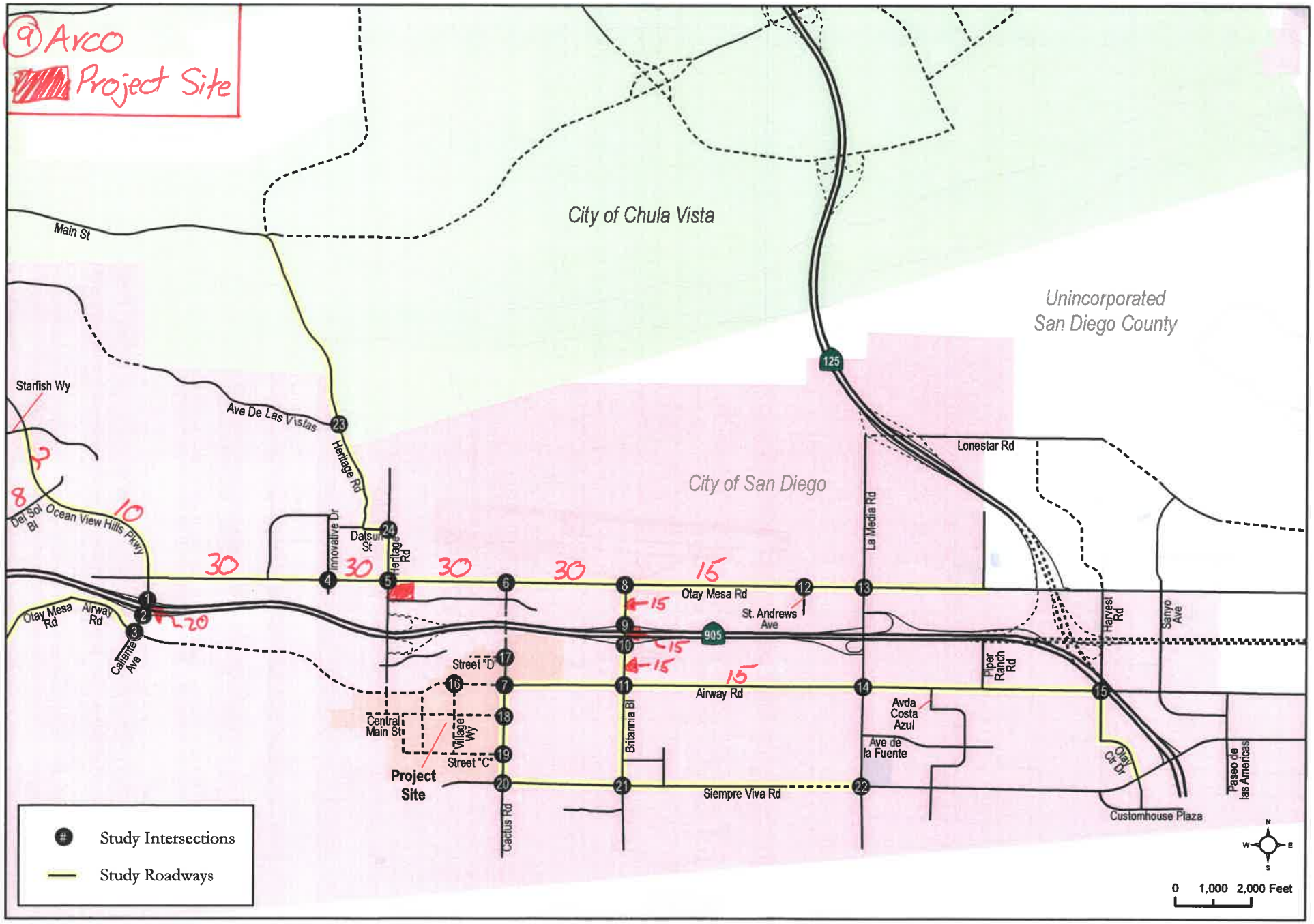
Figure 1-2
Project Study Area



Otay Mesa Lumina
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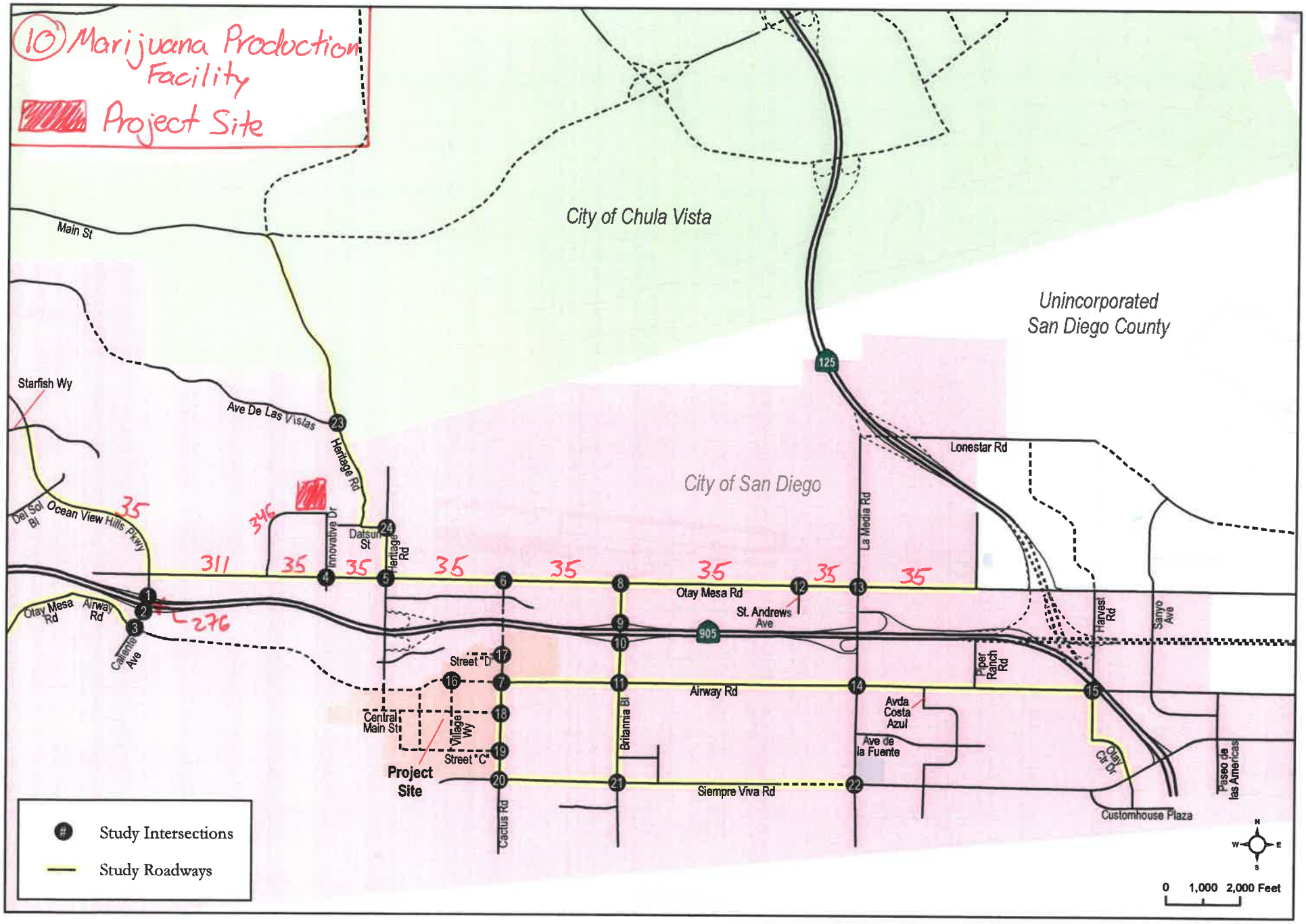
Project Study Area



Otay Mesa Lumina
Transportation Impact Study
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Figure 1-2
Project Study Area

A Series 13, year 2050 SANDAG Select Zone Assignment for the project land uses documented an internal capture rate of 2.8% that was applied to the trip generation. The SANDAG internal capture rate is included in **Appendix L**. The residential density is greater than 20 units per acres (267 du/9.2 acres = 29.0 du/acre).

The project driveway volumes were calculated at 6,816 ADT with 336 AM peak hour trips (152 inbound and 184 outbound) and 717 PM peak hour trips (387 inbound and 330 outbound). The cumulative traffic volumes were calculated at 4,716 ADT with 252 AM peak hour trips (101 inbound and 151 outbound) and 486 PM peak hour trips (271 inbound and 215 outbound) as shown in **Table 9**.

TABLE 9: PROJECT TRIP GENERATION

Land Use	Daily Rate		Size & Units		ADT	%	Split		AM IN	AM OUT	%	Split		PM IN	PM OUT
Driveway Trips															
Neighborhood Shopping Center	120	/KSF	45,000	SF	**5,400**	4%	0.6	0.4	**130**	**86**	11%	0.5	0.5	**297**	**297**
Multi Family (over 20 du/ac)	6	/DU	267	DU	**1,602**	8%	0.2	0.8	**26**	**103**	9%	0.7	0.3	**101**	**43**
Developed Park	50	/Acre	0.19	Acres	**10**	4%	0.5	0.5	**0**	**0**	8%	0.5	0.5	**0**	**0**
SANDAG Traffic Model Internal Capture 2.8%					**-196**				**-4**	**-5**				**-11**	**-10**
External Driveway Trips:					**6,816**				**152**	**184**				**387**	**330**
Cumulative Trips															
Neighborhood Shopping Center	72	/KSF	45,000	SF	**3,240**	4%	0.6	0.4	**78**	**52**	11%	0.5	0.5	**178**	**178**
Multi Family (over 20 du/ac)	6	/DU	267	DU	**1,602**	8%	0.2	0.8	**26**	**103**	9%	0.7	0.3	**101**	**43**
Developed Park	50	/Acre	0.19	Acres	**10**	4%	0.5	0.5	**0**	**0**	8%	0.5	0.5	**0**	**0**
SANDAG Traffic Model Internal Capture 2.8%					**-136**				**-3**	**-4**				**-8**	**-6**
External Cumulative Trips:					**4,716**				**101**	**151**				**271**	**215**

Source: City of San Diego *Trip Generation Manual*, May 2003. SF - Square Feet; ADT-Average Daily Traffic. Totals above ±1 due to Excel rounding.

SF - Square Feet; ADT-Average Daily Traffic; Split-percent inbound and outbound.

If the final project has fewer units, the trip generation will decrease until reaching 183 units at which time the density decreases to less than 20 du/acre (183 du/9.2ac = 19.9 du/acre). At 183 units, the applicable trip generation rate of 8 ADT/du results in 1,464 ADT with 117 AM peak hour trips (23 inbound and 94 outbound) and 146 PM peak hour trips (102 inbound and 44 outbound). When compared to the 183 units at the higher trip rate, 267 units at 6 ADT/du is calculated to generate 1,602 ADT (138 more ADT), 128 AM peak hour trips (11 more peak hour trips), and 144 PM peak hour trips, which is two peak hour trips higher; however, two trips are negligible when compared to the overall reduction of 138 daily trips.

4.3 Project Distribution and Assignment

Project traffic was distributed to the adjacent roadway network based on coordination with City staff, a review of existing traffic patterns, surrounding land uses, existing and future network changes, and a Series 13 Year 2050 SANDAG Select Zone Assignment (Appendix L). The project distribution is shown in **Figure 6**. The project assignment is shown in **Figure 7** to which driveway trips are applied to intersections #6, #10 and #11 to comply with the City of San Diego *Traffic Impact Study Manual*, July 1998 that states on page 13 "All site access points should be evaluated using the higher driveway rates."

Figure 6: Project Distribution

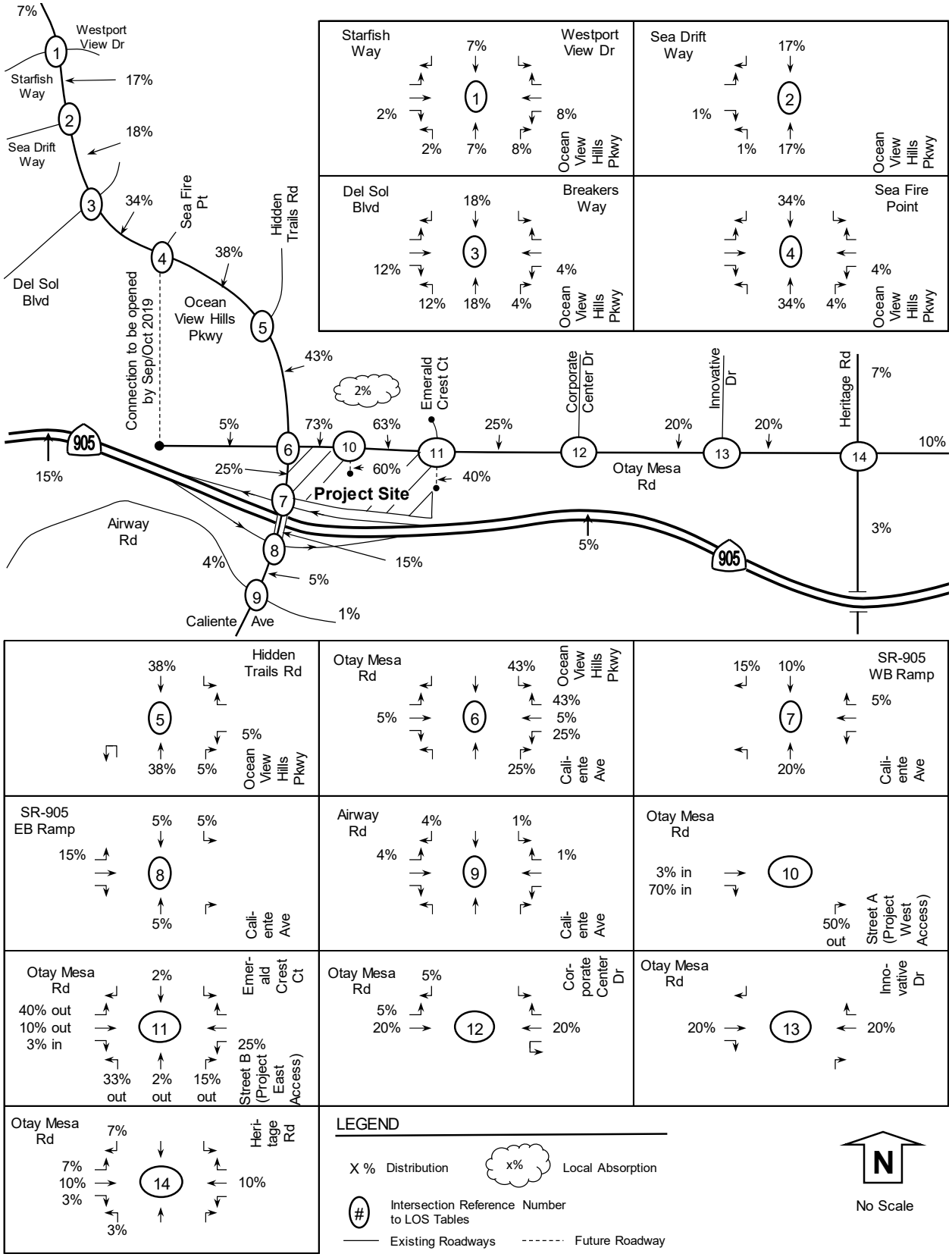
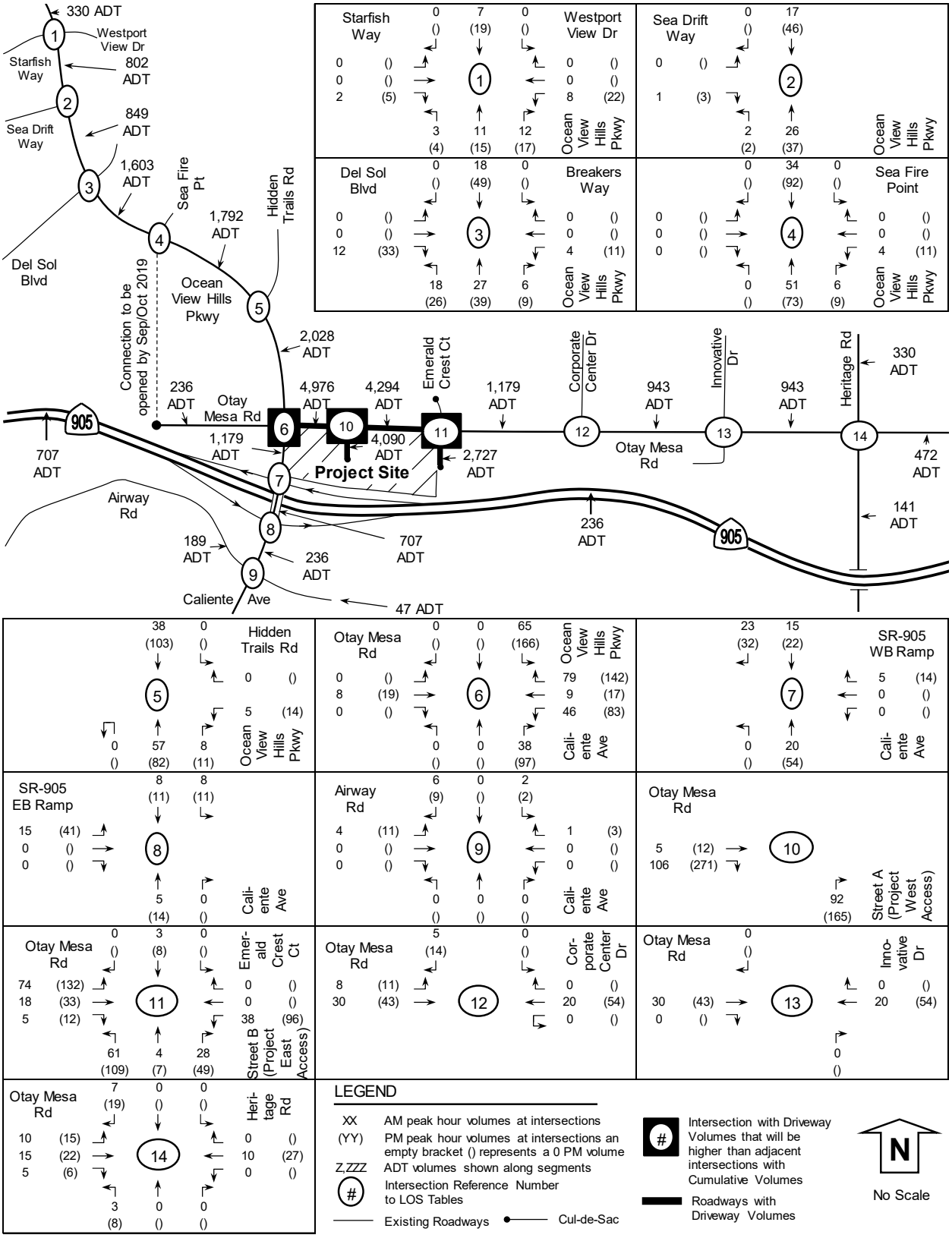


Figure 7: Project Assignment



flows through the CBF. For Phase 1, the CBF building will be an approximately 45,000 sf, two-level facility designed to serve up to approximately 6,838 average daily passengers and 400 peak-hour northbound passengers. For purposes of this analysis, Phase 1 is associated with the Phase 1 condition. There will be no parking structure in Phase 1; instead, there will be 889 surface parking spaces. The CBF is scheduled to open in late 2012.

In Phase 2, the CBF will be expanded by approximately 10,000 sf to a 55,000 sf facility designed to serve up to approximately 13,172 average daily passengers (up to 800 peak-hour northbound airline passengers). A parking structure will be constructed that will provide a total of 1,712 parking spaces on site. For purposes of this analysis, Phase 2 is associated with the Phase 2 condition.

The build out is currently projected for 2026, when the CBF building will reach 95,000 sf, which is designed to serve 17,225 average daily passengers and 1,200 peak-hour airline passengers from Mexico to the United States. For purposes of this analysis, this Horizon Year 2030 phase of the project will be referred to as Build Out Adopted Community Plan condition.

PROJECT TRIP GENERATION

The project is proposed ultimately to develop the 95,000 sf CBF, 402,000 sf of industrial use, 34,000 sf of specialty retail complex, 340 hotel rooms, a 12-pump gas station with a 1,200 sf convenience market and car wash, and a 6,000 sf restaurant by project build out.

As noted previously, the property is currently zoned Otay Mesa Development District (OMDD), which permits uses within the Heavy Industrial (IH-2-1) base zone plus research and development and limited commercial development, and is designated as Industrial in the 1981 Otay Mesa Community Plan. A Community Plan Amendment (CPA) is requested to change the designation of the entire site from Industrial to Institutional and to permit the Cross Border Facility and other non-industrial uses on the site.

The project trip generation for both the commercial and industrial land uses was determined using trip rates from the San Diego Municipal Code Land Development Code, *Trip Generation Manual* (May 2003). The project trip generation is shown in Table B. It should be noted that a rate of 12 trips per 1,000 sf of industrial use was used since the project is still in the early planning stages and will be developing a mixture of various industrial land uses that have a range of trip generation rates (i.e., Large Industrial Park, Small Industrial Park, Industrial/Business Park with some commercial included, Warehousing). The 12 trips per 1,000 sf is a reasonable average rate that captures the range that could occur on site. As shown in the table, the industrial land use is forecast to generate 4,824 ADT, 531 a.m. peak-hour trips, and 579 p.m. peak-hour trips. The commercial land uses (specialty retail, hotel, and gas station with convenience market) are forecast to generate 7,400 ADT, 456 a.m. peak-hour trips, and 623 p.m. peak-hour trips.

As part of the recent San Diego International Airport (SDIA) Master Plan effort, great detail and time was expended in developing the trip generation rate for air travel passengers in the region. Because both SDIA and the CBF are of similar land use types, the 2030 long-range trip generation rates developed for SDIA were used to forecast trips for the CBF. The SDIA trip rates are provided in Appendix C. Furthermore, based on discussion with City staff, these rates have been reviewed and approved for use in this analysis and have been applied to the future forecast passenger data from the

Table B: Project Trip Generation Summary

Land Use	Size	Units	ADT	A.M. Peak Hour			P.M. Peak Hour		
				In	Out	Total	In	Out	Total
Hotel (w/ convention facilities/restaurant)									
Trip Rate[1]		Rooms	10.00	0.36	0.24	0.60	0.48	0.32	0.80
Trip Generation	340	Rooms	3,400	122	82	204	163	109	272
Sit Down Restaurant									
Trip Rate[2]		TSF	130.00	5.20	5.20	10.40	6.24	4.16	10.40
Trip Generation	6.000	TSF	780	31	31	62	37	25	62
Gasoline w/ Food Mart and Car Wash									
Trip Rate[3]		VFS	155.00	6.20	6.20	12.40	6.98	6.98	13.95
Trip Generation	12	VFS	1,860	74	74	149	84	84	167
Specialty Retail									
Trip Rate[1]		TSF	40.00	0.72	0.48	1.20	1.80	1.80	3.60
Trip Generation	34.000	TSF	1,360	24	16	41	61	61	122
Industrial/Business Park (no comm.)									
Trip Rate[1]		TSF	12.00	1.19	0.13	1.32	0.29	1.15	1.44
Trip Generation	402.000	TSF	4,824	478	53	531	116	463	579
Cross Border Facility									
Trip Rate[4]			2.00	0.05	0.03	0.08	0.04	0.04	0.08
Trip Generation (2030)	17,225	Passengers	34,467	775	551	1,326	655	689	1,344
Total Project Trip Generation			**46,691**	**1,505**	**808**	**2,313**	**1,116**	**1,431**	**2,547**

Trip rates referenced from the San Diego Municipal Code Land Development Code, "Trip Generation Manual," May 2003.

[1]Hotel (With Convention Facilities/Restaurant), Specialty Center/Strip Commercial, Industrial/Business Park (No Commercial)

[2]Driveway Vehicle trip rate based on High Turnover (Sit-Down) Restaurant.

[3]Driveway Vehicle trip rate based on Gasoline Station with Food Mart and Car Wash.

[4]Trip Rates based on San Diego International Airport Master Plan EIR, April 2008 (Proposed Airport Land Use Plan, Year 2030).

TSF = Thousand Square Feet

VFS = Vehicle Fueling Space

SH&E study. By 2030 the proposed CBF is anticipated to service approximately 17,225 passengers per day. In that horizon, the facility is forecast to generate 34,467 ADT, 1,326 a.m. peak-hour trips, and 1,344 p.m. peak-hour trips.

The total gross forecast trips generated by the proposed project are approximately 46,691 ADT, 2,313 a.m. peak-hour trips, and 2,547 p.m. peak-hour trips. The City's *Traffic Impact Study Manual* recommends a 4 percent trip reduction from the industrial land use trips to account for potential trip capture between commercial and industrial uses, which has been factored into the trip generation estimates used in the analysis. While LSA understands that additional trip capture will occur between the commercial land uses and the CBF, internal capture rates for these uses are not available and were not factored into this analysis so that it is a conservative, worst-case scenario for the proposed project. With the reduction in trips from internal trip capture, the project is forecast to generate approximately 46,498 ADT, 2,291 a.m. peak-hour trips, and 2,523 p.m. peak-hour trips externally from the site.

TRIP DISTRIBUTION AND ASSIGNMENT

The City of San Diego prepared select zone assignment traffic forecasts for the CBF and non-terminal uses. Project trips were distributed separately to the study area roadway network since the project consists of various land uses. LSA made minor adjustments to the City's forecast plots to reduce internal trip capture to account for an increase of trips along I-5. It should be noted that project traffic was distributed assuming the completion of the SR-905 freeway extension. The trip distribution percentages for the CBF are approximately 83 percent toward the north (via I-5, I-805, Caliente Avenue, Heritage Road, La Media Road, and State Route 125 [SR-125]), percent to the west (via SR-905 and Airway Road), 4 percent to the east (via Airway Road and Siempre Viva Road), 4 percent in the vicinity of the project site, and 5 percent to the United States/Mexico border. The trip distribution percentages for non-terminal uses are approximately 53 percent toward the north (via I-5, I-805, Caliente Avenue, Heritage Road, La Media Road, and SR-125), 8 percent to the west (via SR-905 and Airway Road), 7 percent to the east (via Airway Road and Siempre Viva Road), 25 percent in the vicinity of the project site, and 7 percent to the United States/Mexico border. Figure 3 shows the project trip distribution for the CBF use only for Build Out of Community Plan. Figure 4 shows the project trip distribution for the ancillary uses for Build Out of Community Plan. Trip assignment for the proposed project for each development scenario was developed by multiplying the trip generation for each land use by its specific trip distribution, as illustrated in Figures 5, 6, and 7. Figure 5 illustrates the project trip assignment associated with the Phase 1 condition. Figure 6 illustrates the project trip assignment associated with the Phase 2 condition. Figure 7 illustrates the project trip assignment associated with the Build Out Adopted Community Plan condition.

As previously stated in the project description and market study, a fraction of the CBF traffic along the I-805 and I-5 freeways north of the SR-905 are new trips. The traffic to the Tijuana International Airport now and in the future is already utilizing the I-805 and I-5 freeways. The CBF project will divert trips destined to each port of entry to the project. Therefore, manual adjustments were made to the freeway analysis to include 25 percent of the CBF trips and 100 percent of the non-ancillary uses.

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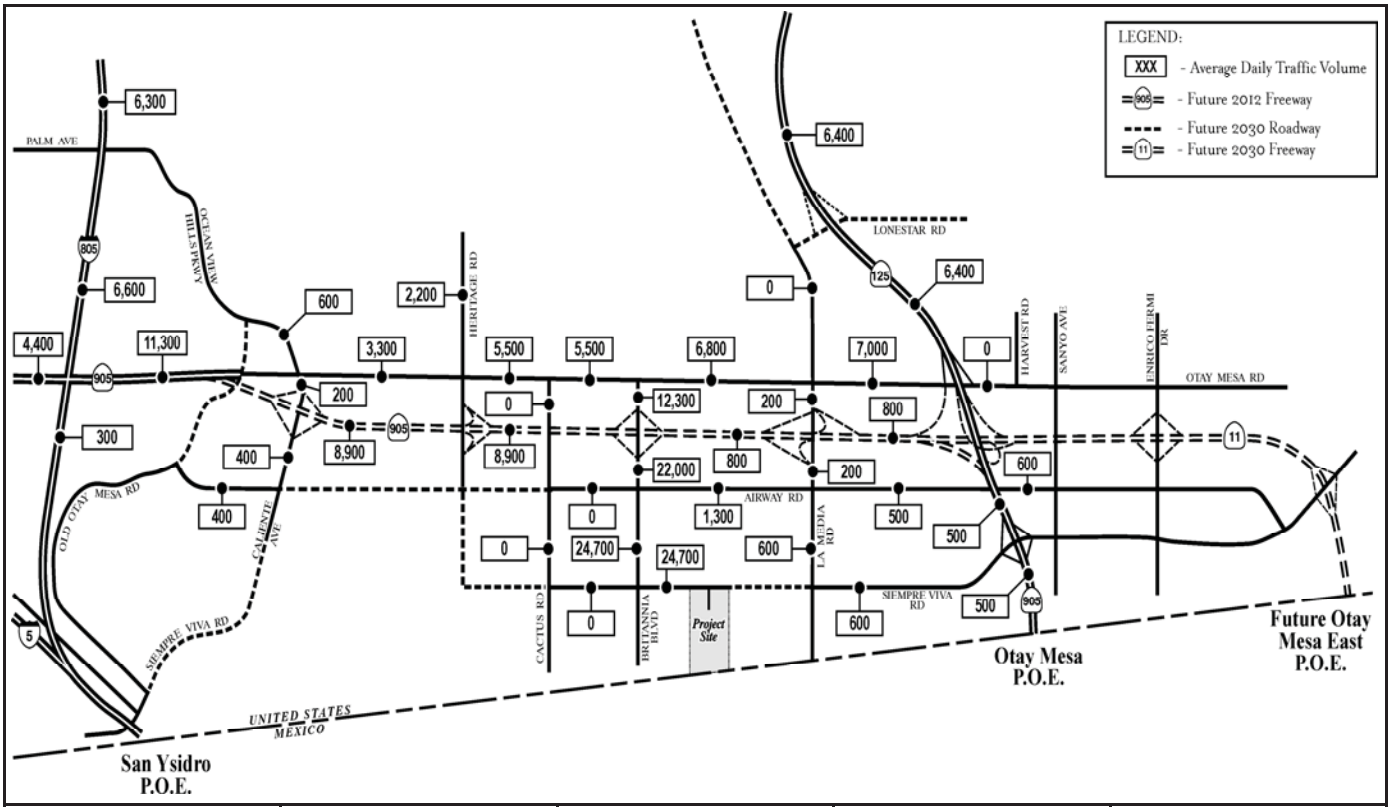

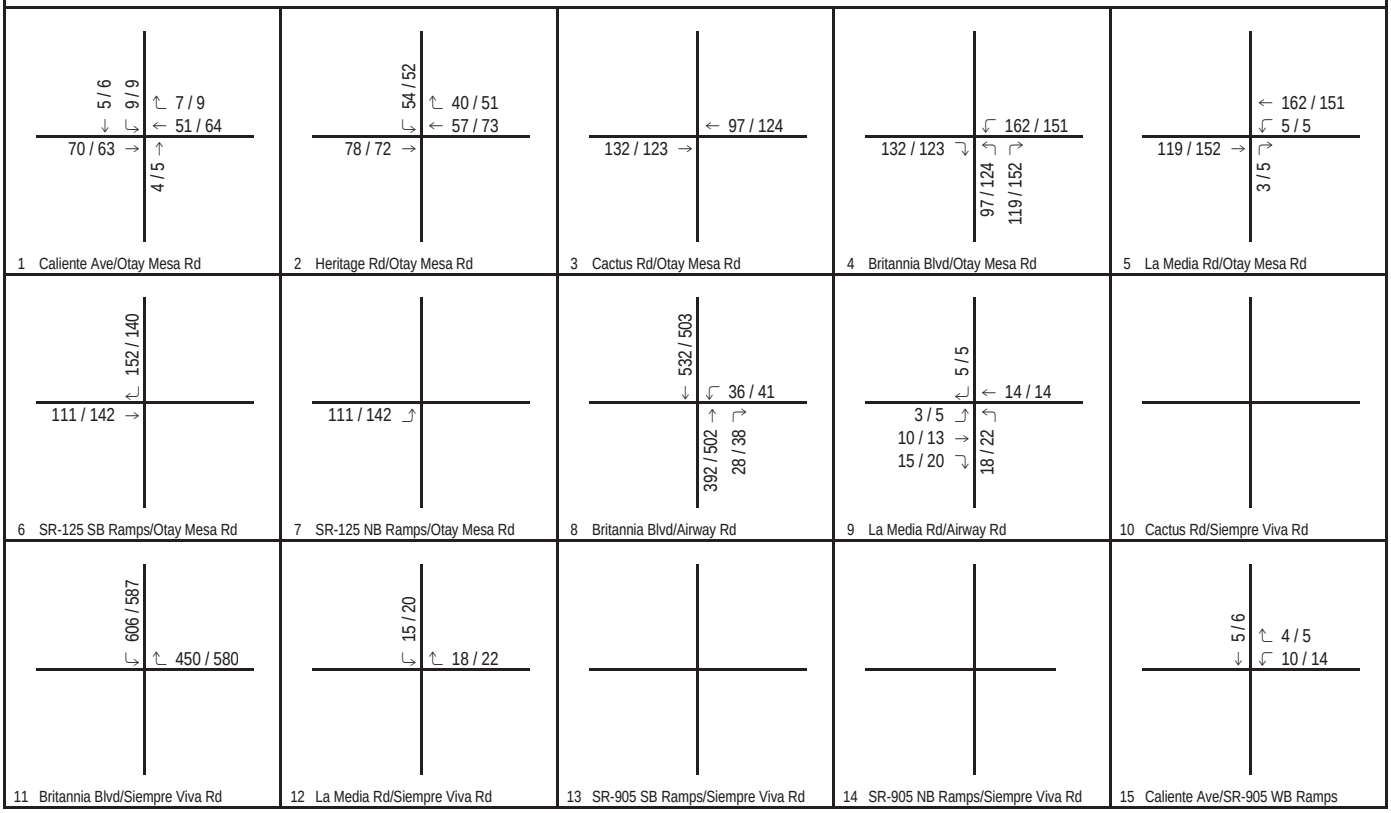

FIGURE 6A

Legend

123 / 456 AM / PM Volume

Otay Cross Border Facility

Project Trip Assignment (Phase 2)

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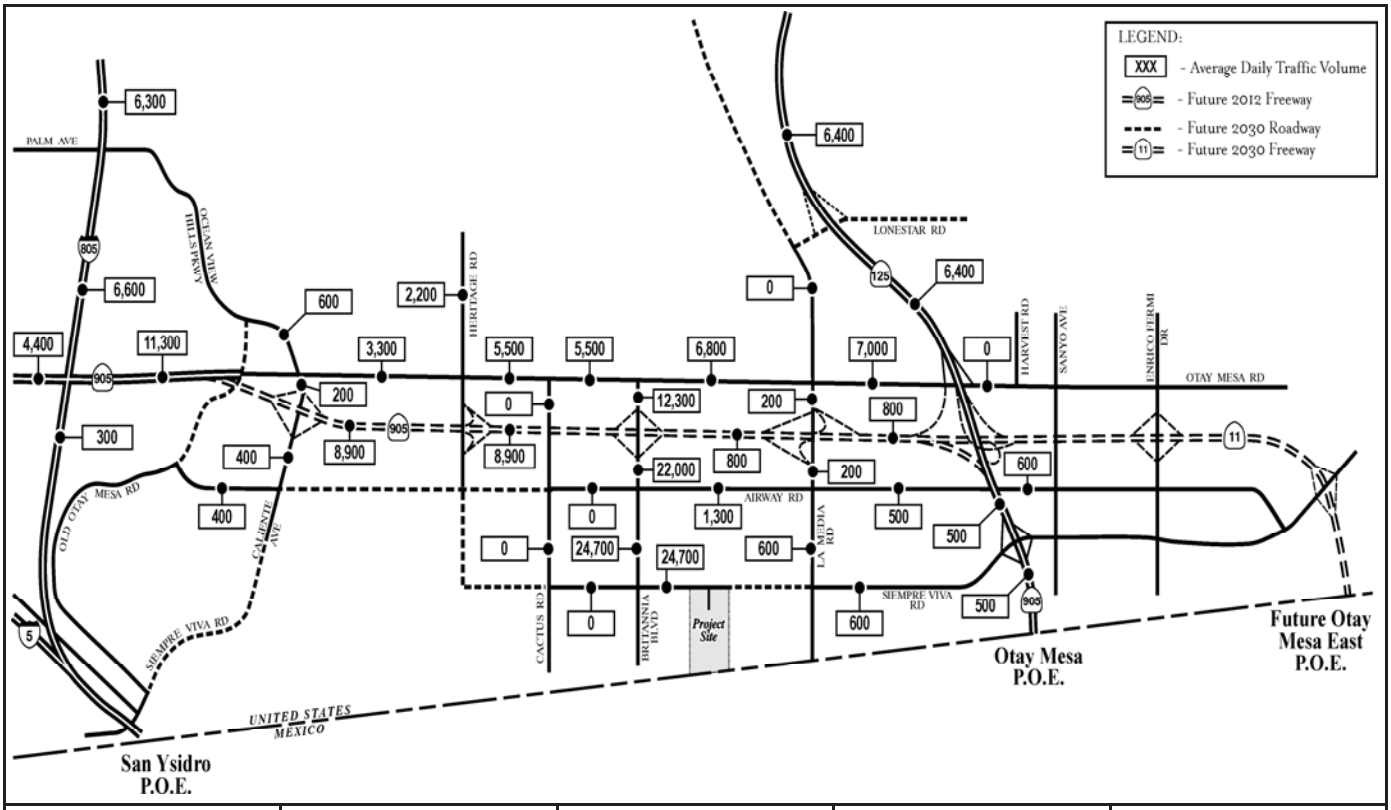

10 / 14 5 / 6 13 / 15 16 Caliente Ave/SR-905 EB Ramps	Future Intersection 17 Heritage Rd/SR-905 WB Ramps	Future Intersection 18 Heritage Rd/SR-905 EB Ramps	295 / 274 20 / 20 161 / 207 216 / 276 19 Britannia Blvd/SR-905 WB Ramps	314 / 294 218 / 209 377 / 483 15 / 19 20 Britannia Blvd/SR-905 EB Ramps
5 / 5 3 / 5 21 La Media Rd/SR-905 WB Ramps	5 / 5 3 / 5 22 La Media Rd/SR-905 EB Ramps	Future Intersection 23 Heritage Rd/Airway Rd	24 Cactus Rd/Airway Rd	10 / 14 13 / 15 25 Caliente Ave/Airway Rd
Future Intersection 26 La Media Rd/Lone Star Rd	Future Intersection 27 SR-125 SB off-ramp/Lone Star Rd	Future Intersection 28 SR-125 NB on-ramp/Lone Star Rd		

FIGURE 6B

Legend

123 / 456 AM / PM Volume

Otay Cross Border Facility

Project Trip Assignment (Phase 2)

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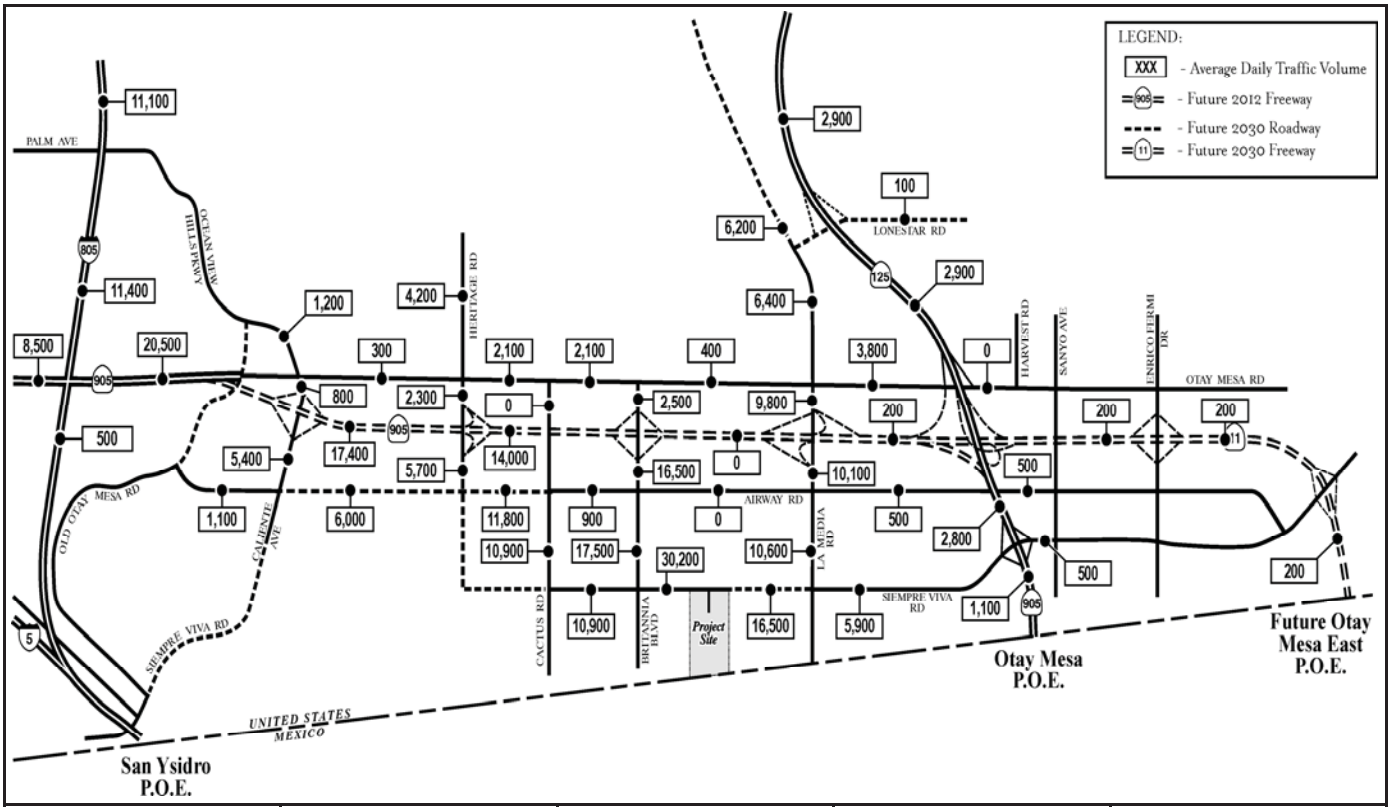

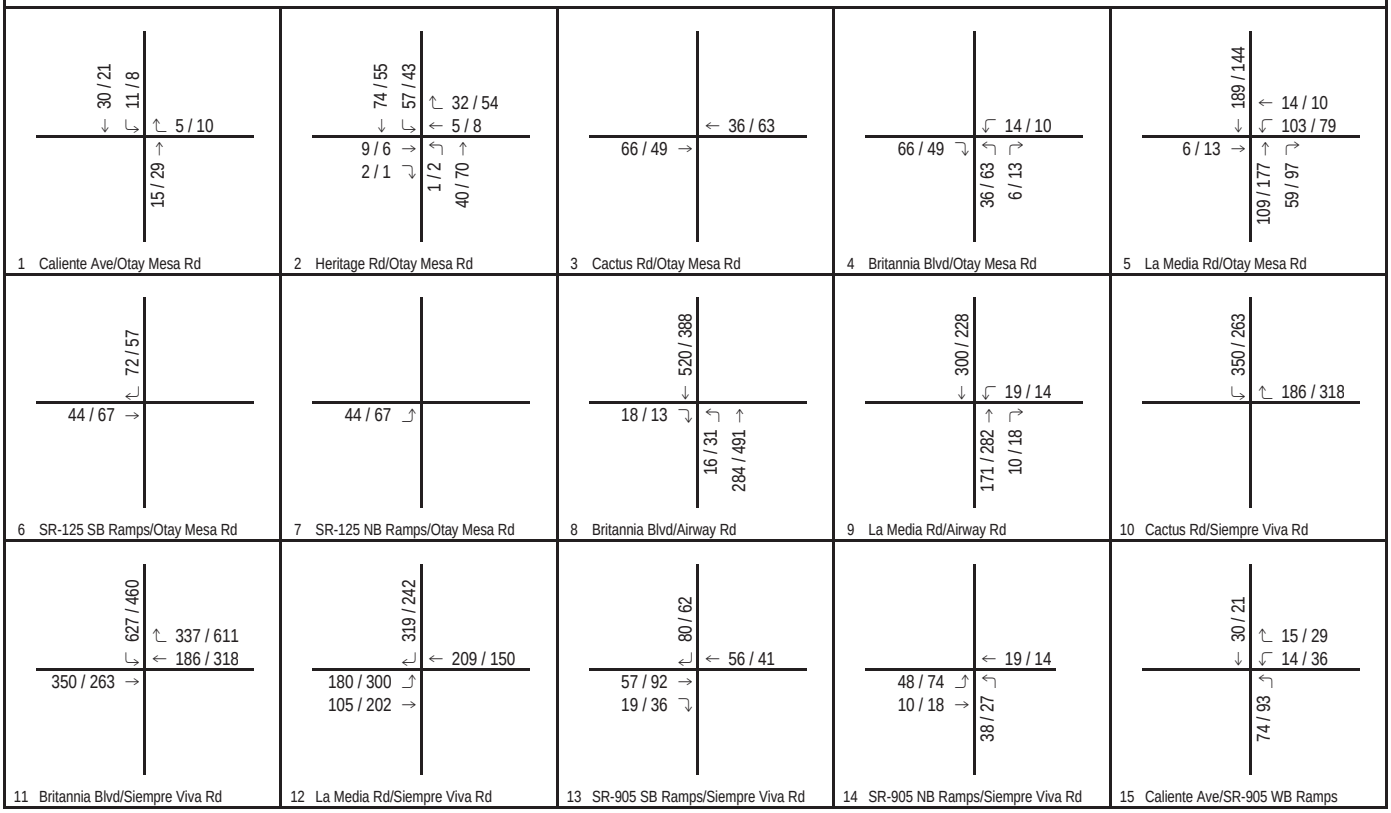

FIGURE 7A

Legend

123 / 456 AM / PM Volume

Otay Cross Border Facility

Project Trip Assignment (Buildout Adopted Community Plan)

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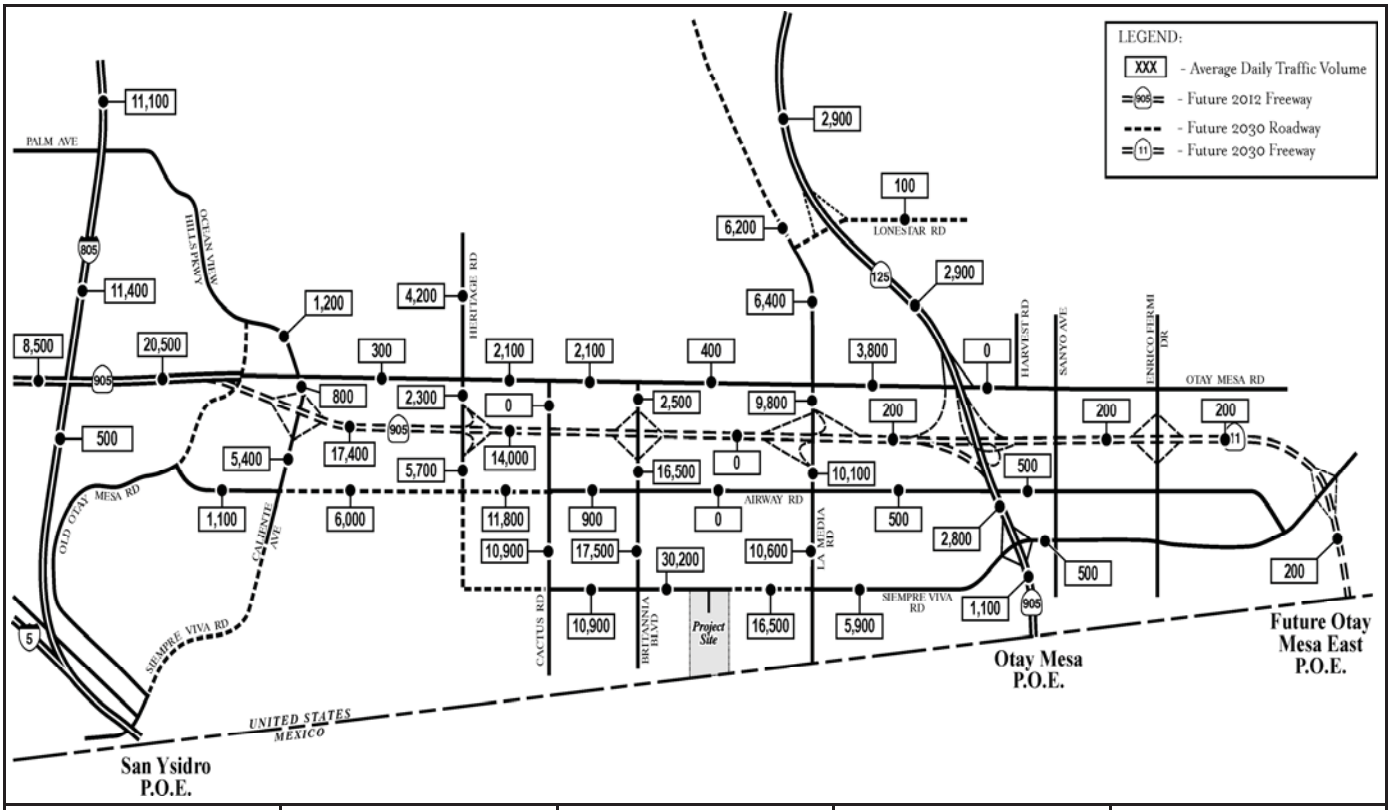

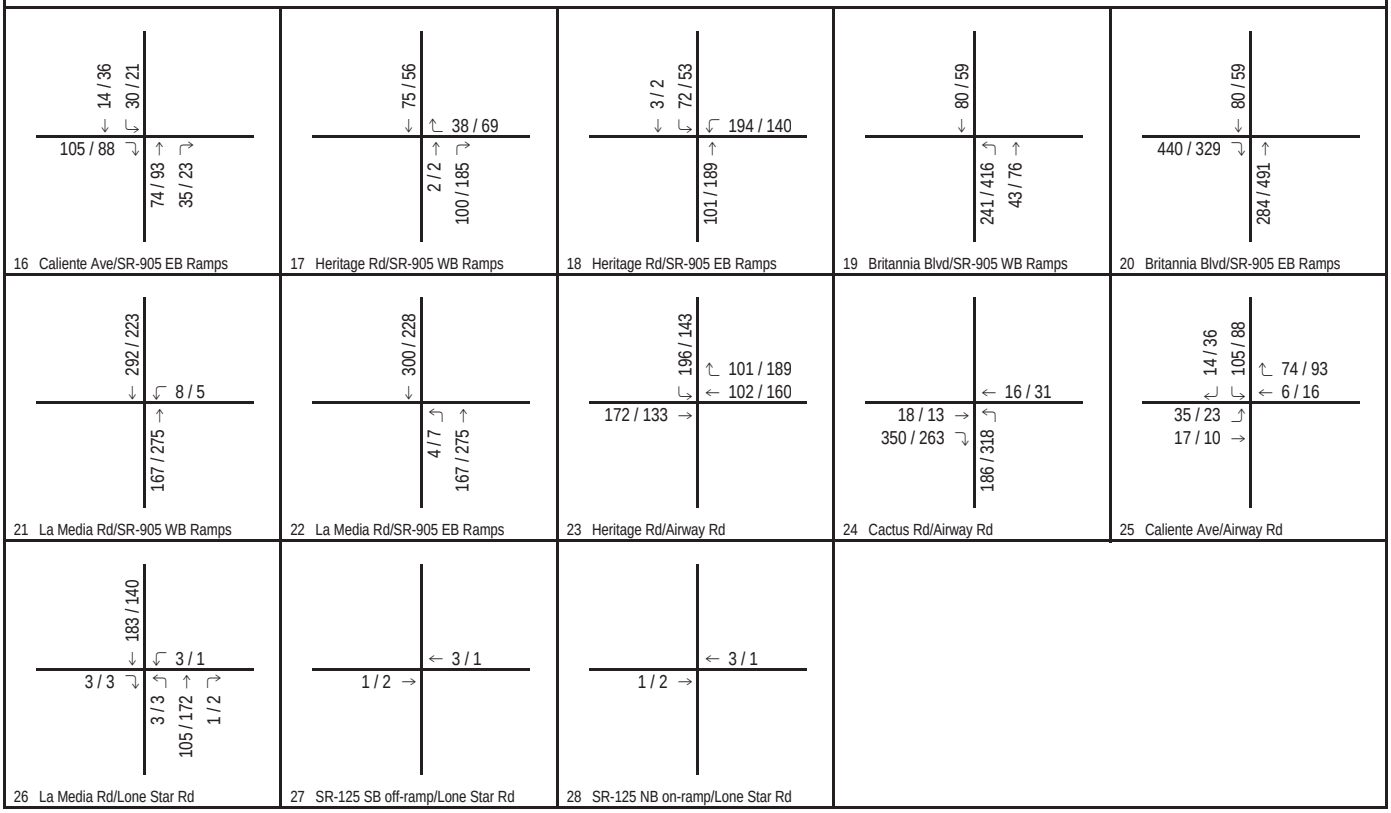

FIGURE 7B

Legend

123 / 456 AM / PM Volume

Otay Cross Border Facility

Project Trip Assignment (Buildout Adopted Community Plan)

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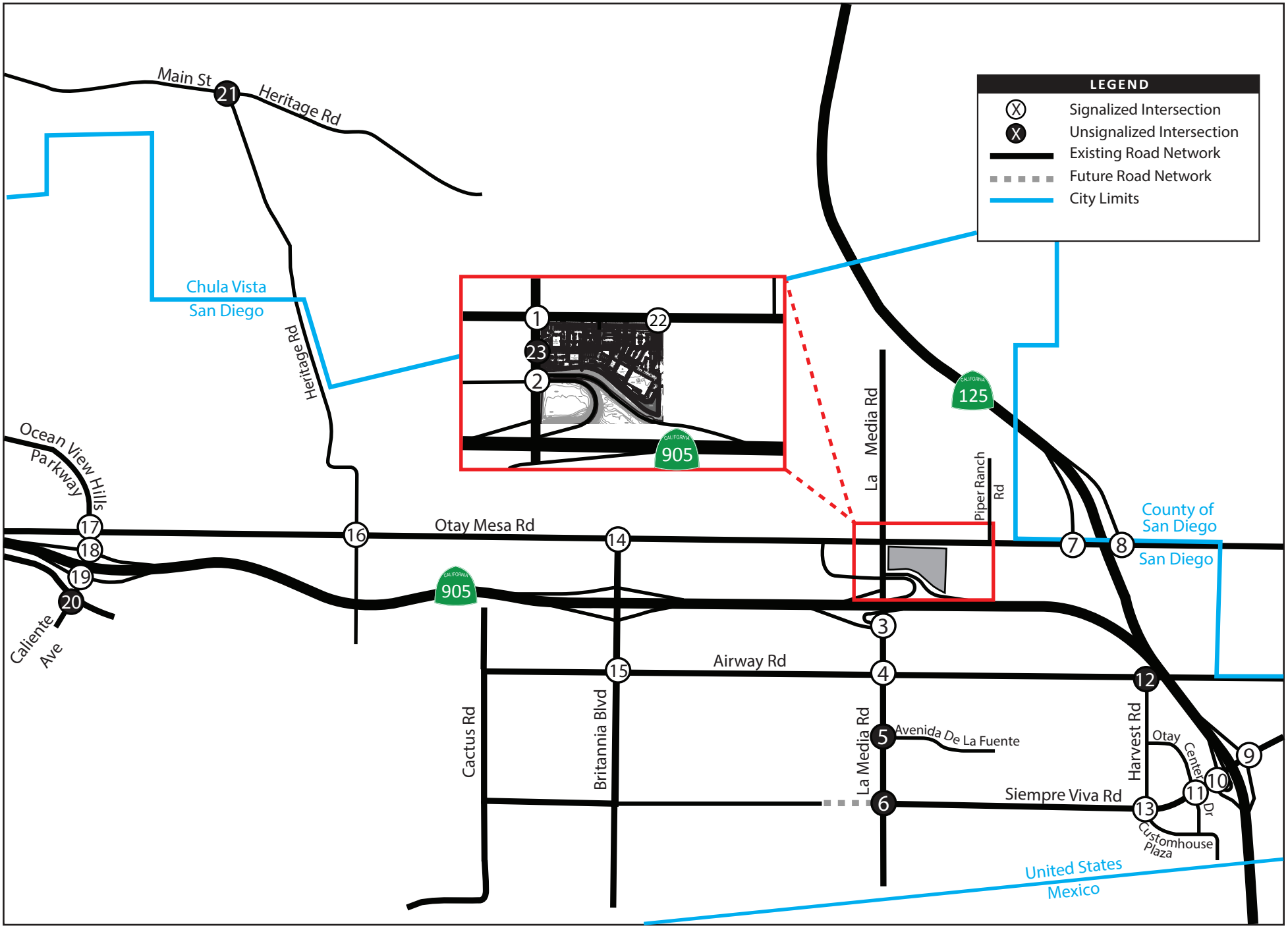

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Figure 1-1
Project Study Area

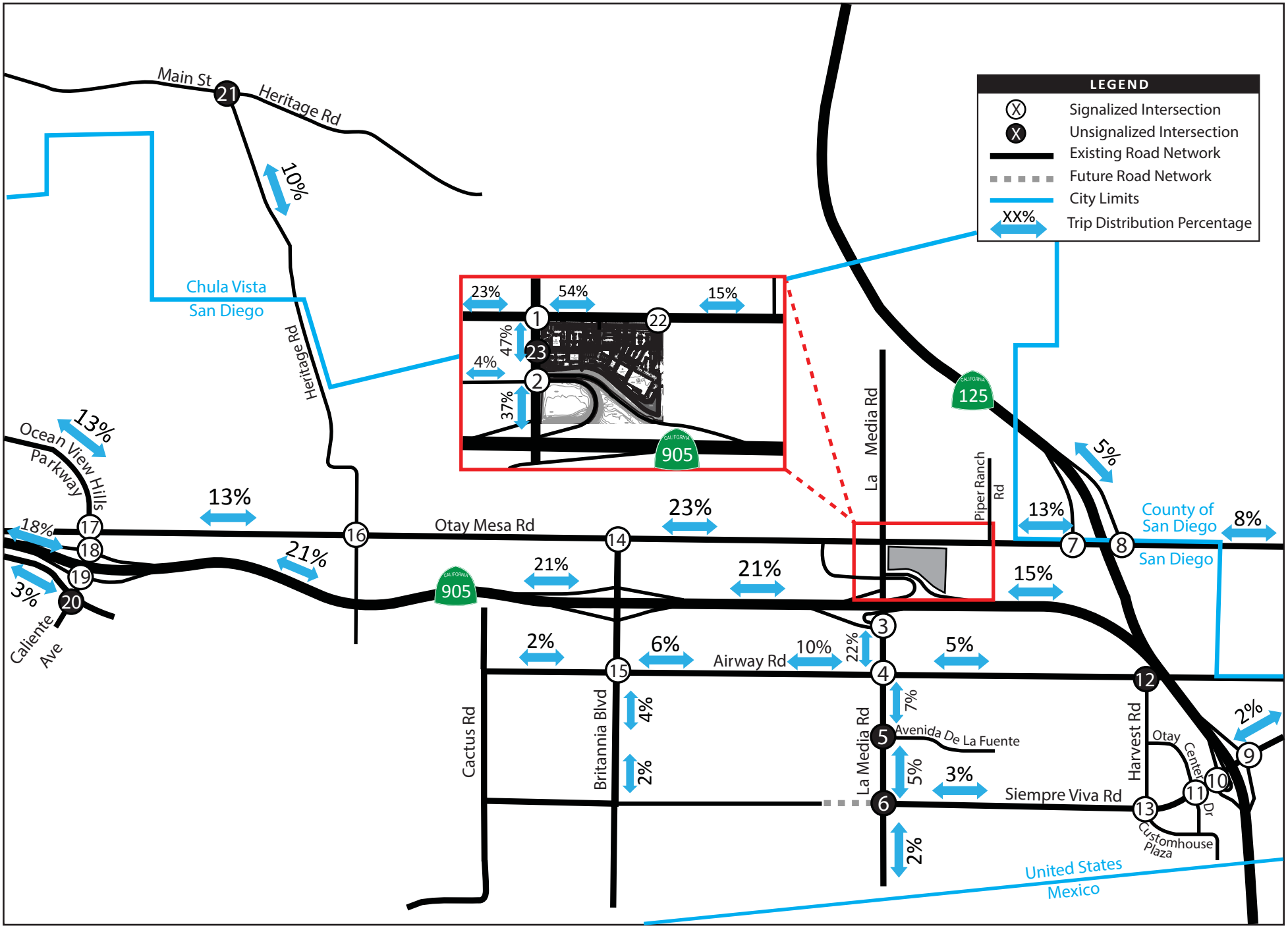

Figure 4-1
Opening Year 2018 Project Trip Distribution

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TABLE 5
REPHASED PROJECT TRIP GENERATION ESTIMATES USING DRIVEWAY TRIP RATES
METROPOLITAN AIRPARK, CITY OF SAN DIEGO

			Daily Trips		AM Peak Hour Trips					PM Peak Hour Trips				
Land Use	*Size*	*Unit*	*Driveway Rate*	*ADT*	*Peak Hour %*	*In/Out Split*	*Inbound*	*Outbound*	*Total*	*Peak Hour %*	*In/Out Split*	*Inbound*	*Outbound*	*Total*
Phase I (2012 thru 2016)														
Airport (General Aviation)[1]	163	Flights	2.0	326	6%	60/40	12	8	20	7%	50/50	11	12	23
Commercial Office[2]	18.88	Ksf	25.37	479	13%	90/10	57	6	63	14%	20/80	13	54	67
High Turnover Restaurant[3]	1.50	Ksf	130.0	195	8%	50/50	8	8	16	8%	60/40	10	6	16
Total Phase I Project Trips				***1,000***			***77***	***22***	***99***			***34***	***72***	***106***
Phase II (2017 thru 2021)														
Airport (General Aviation)[1]	64	Flights	2.0	128	6%	60/40	5	3	8	7%	50/50	4	5	9
Commercial Office[2]	110.482	Ksf	14.2	1,572	13%	90/10	183	21	204	14%	20/80	44	176	220
High Turnover Restaurant[3]	2.5	Ksf	130.0	325	8%	50/50	13	13	26	8%	60/40	15	11	26
Transit Transfer Station[4]	0.74	acre	600.0	444	14%	70/30	44	18	62	15%	30/70	20	47	67
Hotel[5]	150.00	rooms	10.0	1,500	6%	60/40	54	36	90	8%	60/40	72	48	120
Industrial[6]	647.60	Ksf	8.0	5,181	11%	90/10	513	57	570	12%	20/80	125	497	622
Industrial[7]	707.40	Ksf	16.0	11,318	12%	80/20	1,088	271	1,359	12%	20/80	271	1,088	1,359
Gasoline Station w/ Mini Mart[8]	3.225	Ksf	1020.0	3,290	8.4%	50/50	138	138	276	7.6%	50/50	125	125	250
Solar Field[13]	66.50	acre	-	2	-	-	1	0	1	-	-	0	1	1
Total Phase II Project Trips				***23,760***			***2,039***	***557***	***2,596***			***676***	***1,998***	***2,674***
Total (Phase I + Phase II) Project Trips				**24,760**			**2,116**	**579**	**2,695**			**710**	**2,070**	**2,780**
Phase III (2022 thru 2026)														
Airport (General Aviation)[1]	45	Flights	2.0	90	6%	60/40	3	2	5	7%	50/50	3	3	6
High Turnover Restaurant[3]	4.80	Ksf	130.0	624	8%	50/50	25	25	50	8%	60/40	30	20	50
Hotel[5]	120.00	rooms	10.0	1,200	6%	60/40	43	29	72	8%	60/40	58	38	96
Fast Food Restaurant[9]	14.250	Ksf	700.0	9,975	4%	60/40	240	159	399	8%	50/50	399	399	798
Airport Related Commercial[10]	182.65	Ksf	70.0	12,786	3%	60/40	230	154	384	10%	50/50	639	640	1,279
Total Phase III Project Trips				***24,675***			***541***	***369***	***910***			***1,129***	***1,100***	***2,229***
Total (Phase I + II + III) Project Trips				**49,435**			**2,657**	**948**	**3,605**			**1,839**	**3,170**	**5,009**
Phase IV (2027 thru 2031)														
Airport (General Aviation)[1]	43	Flights	2.0	86	6%	60/40	3	2	5	7%	50/50	3	3	6
Commercial Office[2]	31.460	Ksf	22.44	706	13%	90/10	83	9	92	14%	20/80	20	79	99
Total Phase IV Project Trips				***792***			***86***	***11***	***97***			***23***	***82***	***105***
Total (Phase I + II + III+ IV) Project Trips				**50,227**			**2,743**	**959**	**3,702**			**1,862**	**3,252**	**5,114**

Note:

Trip rates are trips per flight or trips per 1,000 square feet (Ksf) or trips per room; ADT=Average Daily Traffic

[1]Airport: Trip generation rates for "General Aviation" were used per City of San Diego Trip Generation Manual. The number of flights for each phase was determined based on the difference between the project and no project scenarios for the "Average Day of Peak Month" Aircraft and Operational Forecasts. Source: "Brown Field Airport Master Plan Update", "Working Paper No. 2, Summary of Aviation Activity Forecasts" prepared by Mead and Hunt; Peak hour percentages and in/out splits for "Commercial Airport" land use were used to derive the peak hour trips for the proposed Aviation facility

[2]Commercial Office: Trip generation rates for "Commercial Office" were based on the natural logarithmic equation per City of San Diego Trip Generation Manual

[3]High Turnover Restaurant: Trip generation rates for "High Turnover (sit down)" land use were used per City of San Diego Trip Generation Manual

[4]Transit Transfer Station: The most conservative trip generation rate of 600 trips/acre from the "Transportation Facilities" category was used per City of San Diego Trip Generation Manual, since detailed information about the tranist transfer station (number of bays, routes, frequency, etc.) is not available at this planning stage of the project

[5]Hotel: Trip generation rates for "Hotel" were used per City of San Diego Trip Generation Manual; The proposed hotel will have conventional facilities or restaurants

[6]Industrial: Trip generation rates for "Large Industrial Park" were used per City of San Diego Trip Generation Manual

[7]Industrial: Trip generation rates for "Industrial/Business Park" were used per City of San Diego Trip Generation Manual

[8]Gasoline Station with Mini Mart: Trip generation rates for "Gasoline Station with Mini Mart" with 12 vehicle fueling stations and remaining space occupied by a convenience market were provided by City of San Diego staff

[9]Fast Food Restaurant: Trip generation rates for "Fast Food Restaurant" were used per City of San Diego Trip Generation Manual

[10]Airport Related Commercial: Trip generation rates for "Community Shopping Center" were used per City of San Diego Trip Generation Manual; This will include uses such as grocery and/or drug store, beauty shops, stationery, recreational facilities, custom shops, etc.

[11]Solar Field: Two daily trips were assumed for maintenance/operation

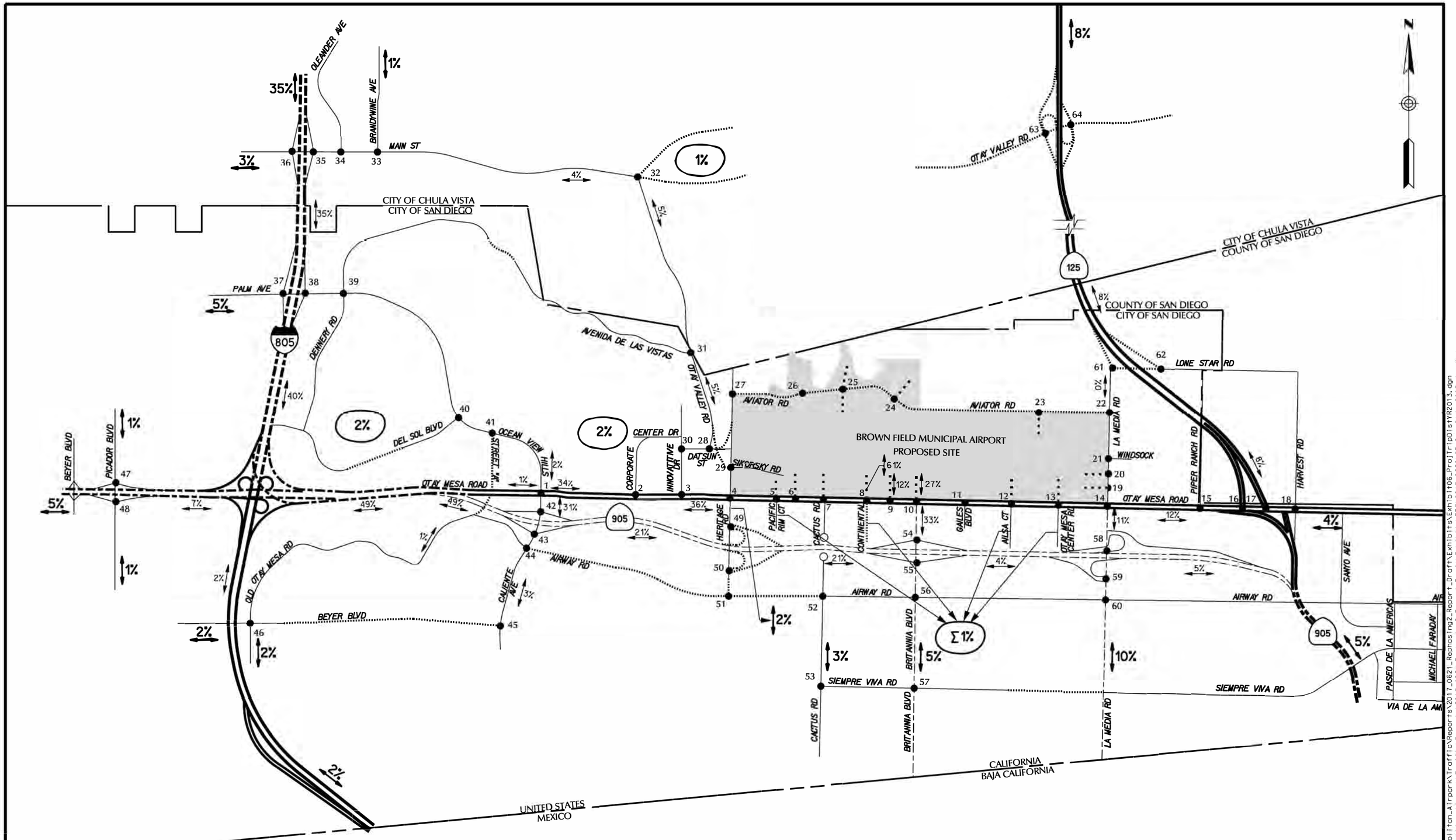

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EXHIBIT 6

PHASE 1 TRIP DISTRIBUTION FOR YEAR 2013 (PHASE 1 OPENING YEAR) SCENARIO

METROPOLITAN AIRPARK TRAFFIC IMPACT ANALYSIS

LEGEND

- ● = STUDY INTERSECTION
- - - - = PROJECT ACCESS
- ..... = FUTURE ROAD
- — - = TRUCK ROUTE
- XX% = MACRO TRIP DISTRIBUTION ASSIGNMENT
- XX% = MICRO TRIP DISTRIBUTION ASSIGNMENT

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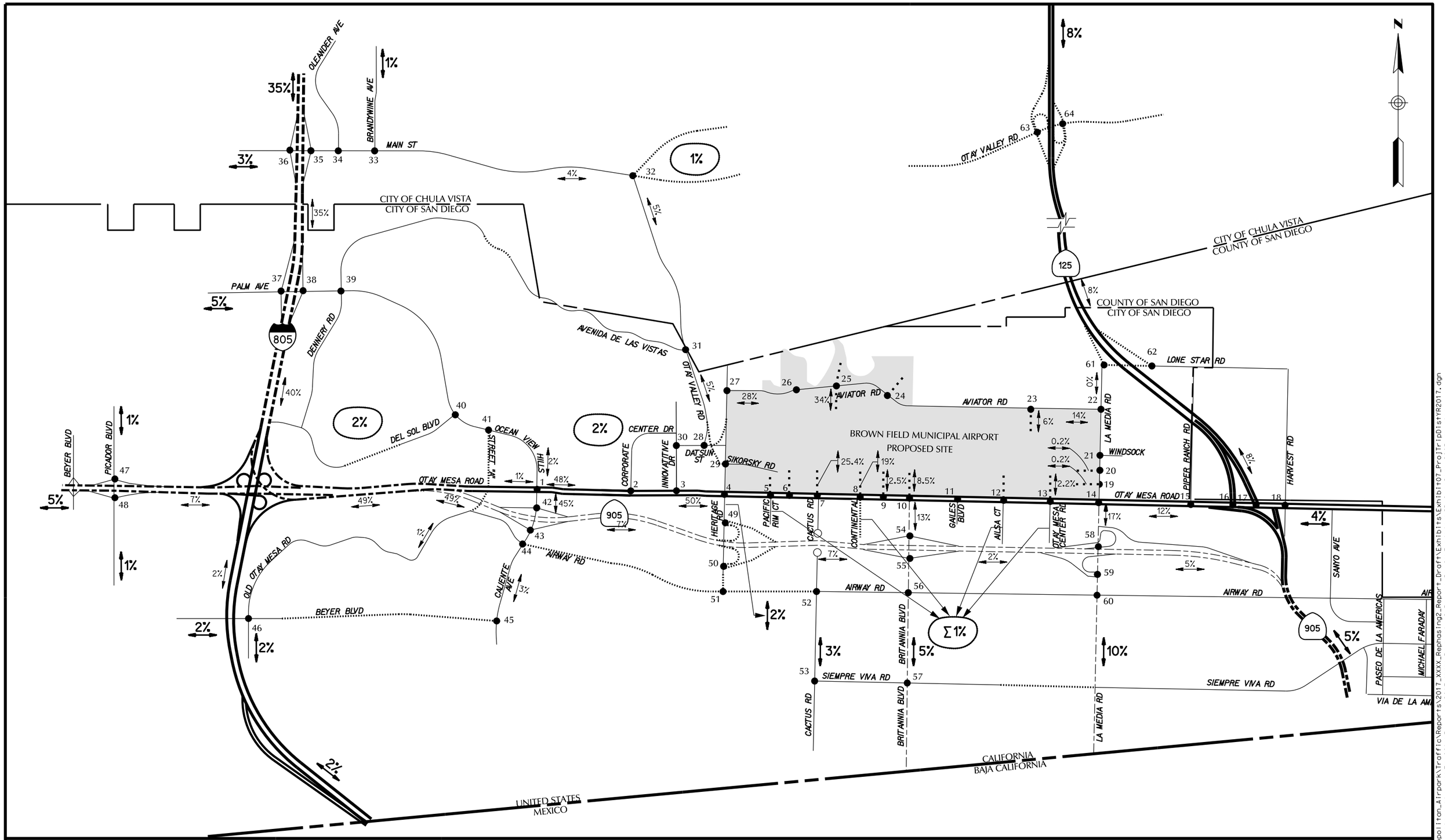

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EXHIBIT 7

PHASE 1+2 TRIP DISTRIBUTION FOR YEAR 2017 (PHASE 2 OPENING YEAR) SCENARIO

METROPOLITAN AIRPARK TRAFFIC IMPACT ANALYSIS

LEGEND

● = STUDY INTERSECTION
- - - - = PROJECT ACCESS
..... = FUTURE ROAD
— · — = TRUCK ROUTE
XX% = MACRO TRIP DISTRIBUTION ASSIGNMENT
XX% = MICRO TRIP DISTRIBUTION ASSIGNMENT

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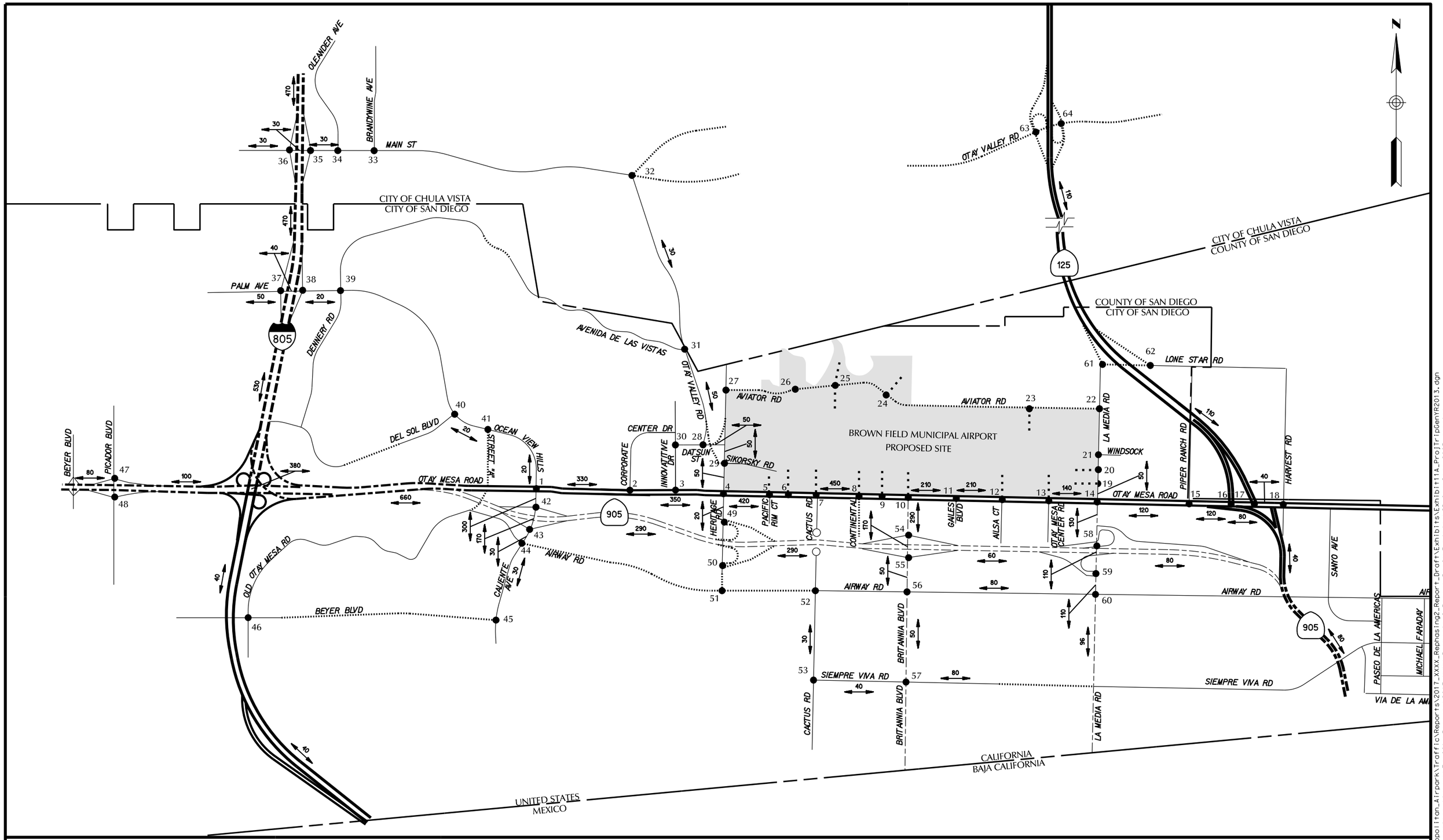

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EXHIBIT 11A

PHASE 1 TRIP ASSIGNMENT FOR YEAR 2013 (PHASE 1 OPENING YEAR) SCENARIO

METROPOLITAN AIRPARK TRAFFIC IMPACT ANALYSIS

LEGEND

● = STUDY INTERSECTION

= PROJECT ACCESS

= FUTURE ROAD

= TRUCK ROUTE

XX,XXX = ADT

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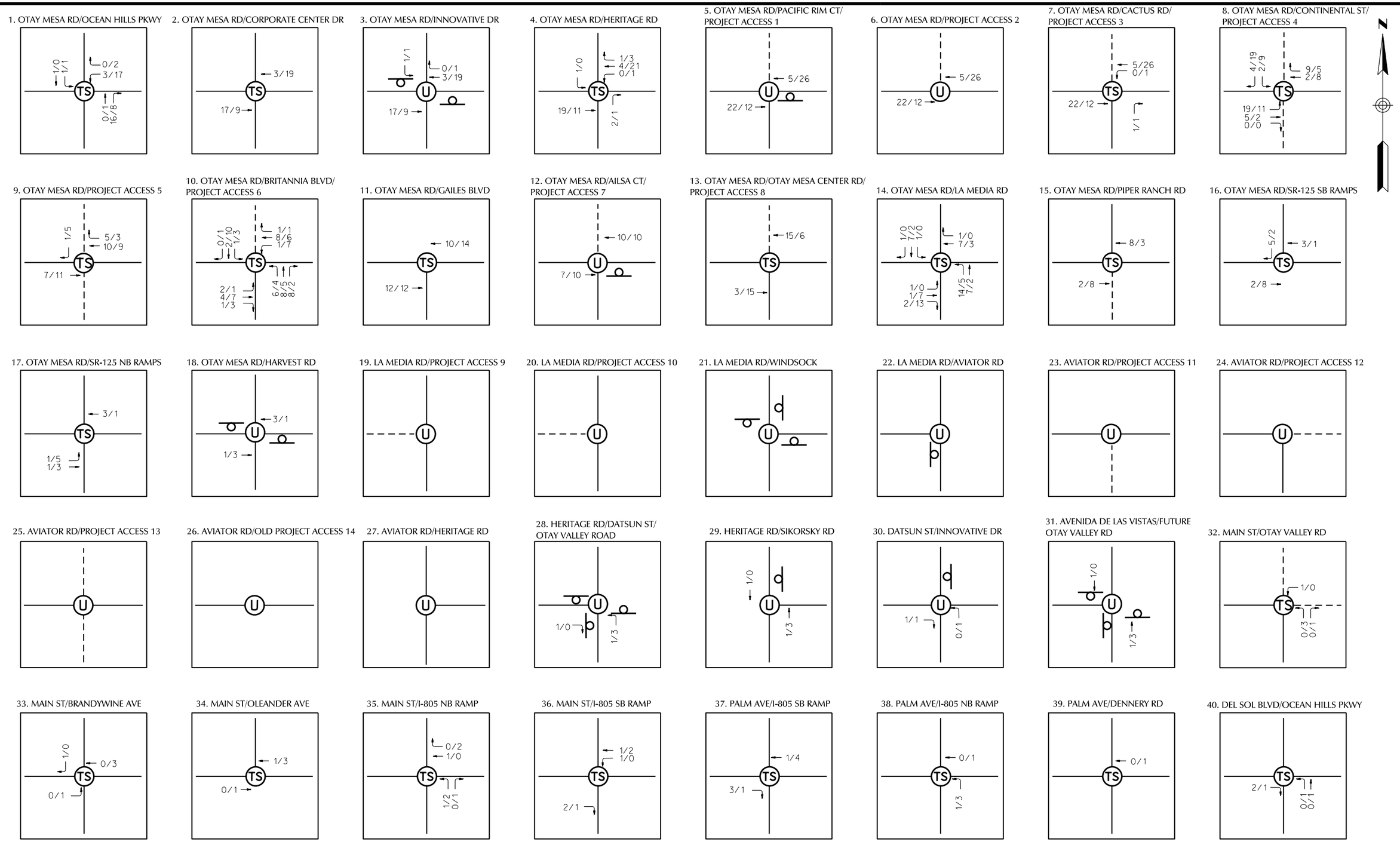

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EXHIBIT 11B

PHASE 1 TRIP ASSIGNMENT FOR YEAR 2013 (PHASE 1 OPENING YEAR) SCENARIO

METROPOLITAN AIRPARK TRAFFIC IMPACT ANALYSIS

LEGEND

= STOP-CONTROLLED

(TS) = TRAFFIC SIGNAL

(U) = UNSIGNALIZED INTERSECTION

XXX/XXX = AM/PM PEAK HOUR VOLUMES

– – – = FUTURE STREET/ PROJECT ACCESS

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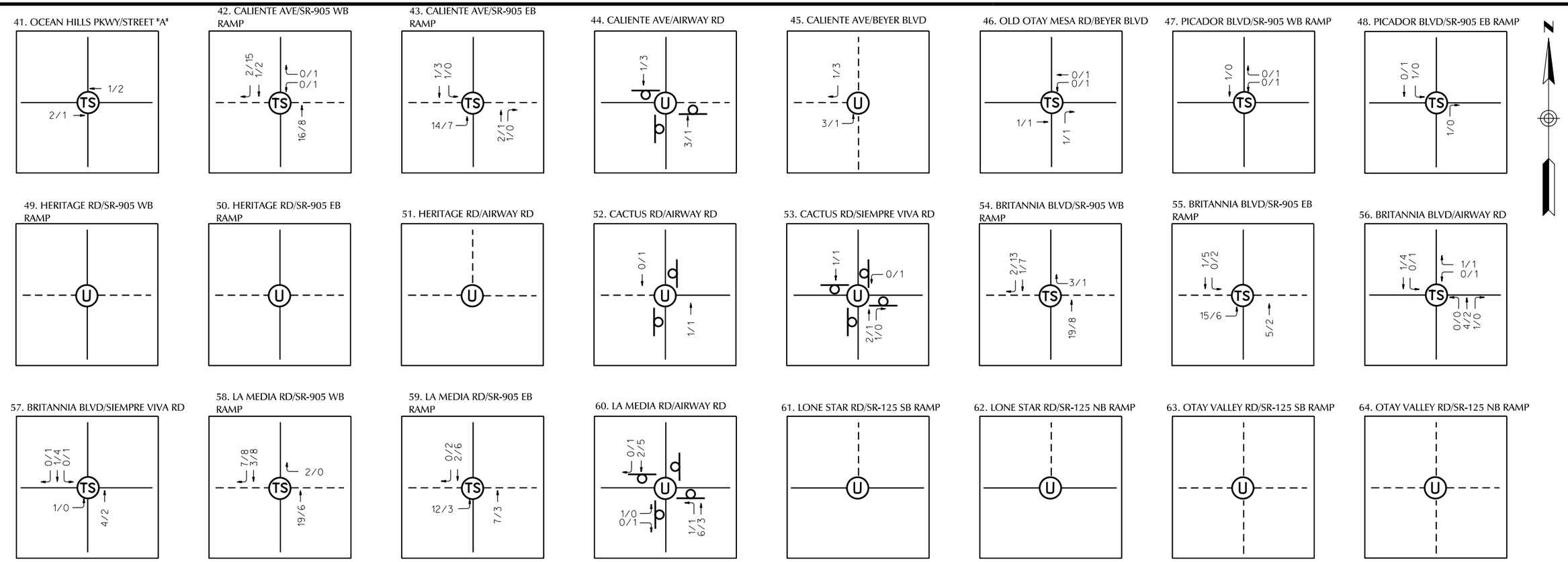

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EXHIBIT 11C

PHASE 1 TRIP ASSIGNMENT FOR YEAR 2013 (PHASE 1 OPENING YEAR) SCENARIO

METROPOLITAN AIRPARK TRAFFIC IMPACT ANALYSIS

LEGEND

- = STOP-CONTROLLED
- TS = TRAFFIC SIGNAL
- U = UNSIGNALIZED INTERSECTION
- XXX/XXX = AM/PM PEAK HOUR VOLUMES
- --- = FUTURE STREET/ PROJECT ACCESS

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EXHIBIT 12A

PHASE 1 + 2 TRIP ASSIGNMENT FOR YEAR 2017 (PHASE 2 OPENING YEAR) SCENARIO

METROPOLITAN AIRPARK TRAFFIC IMPACT ANALYSIS

LEGEND

● = STUDY INTERSECTION

- - - - = PROJECT ACCESS

..... = FUTURE ROAD

— · — = TRUCK ROUTE

XX,XXX ⟷ = ADT

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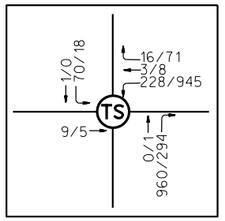

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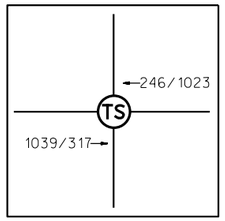

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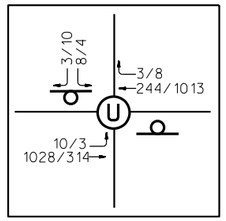

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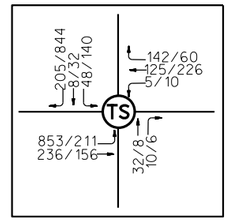

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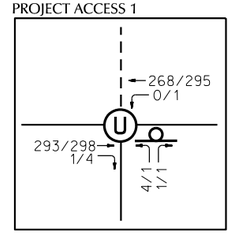

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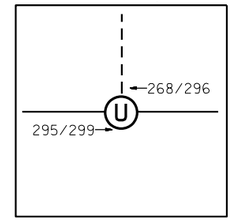

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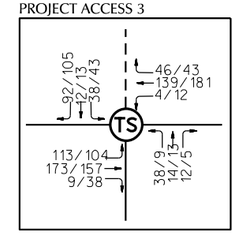
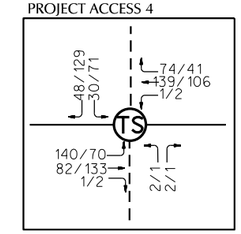
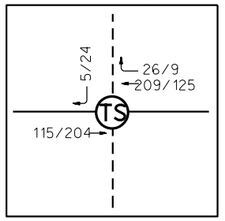


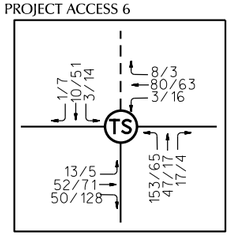
8. OTAY MESA RD/CONTINENTAL ST/ PROJECT ACCESS 4



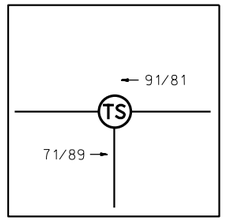
9. OTAY MESA RD/PROJECT ACCESS 5



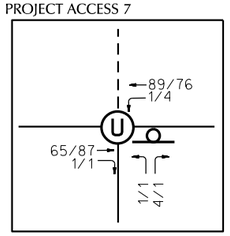
10. OTAY MESA RD/BRITANNIA BLVD/ PROJECT ACCESS 6



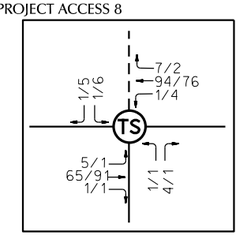
11. OTAY MESA RD/GAILES BLVD



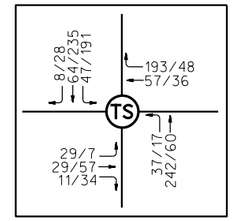
12. OTAY MESA RD/AILSA CT/ PROJECT ACCESS 7



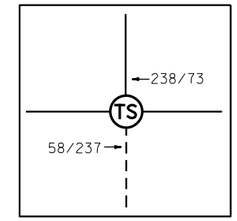
13. OTAY MESA RD/OTAY MESA CENTER RD/ PROJECT ACCESS 8



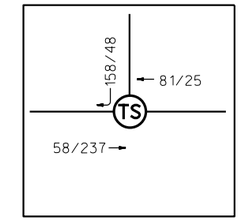
14. OTAY MESA RD/LA MEDIA RD



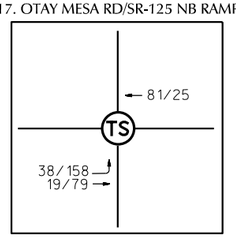
15. OTAY MESA RD/PIPER RANCH RD



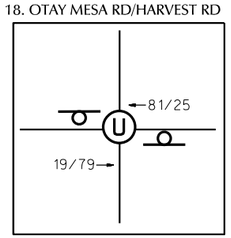
16. OTAY MESA RD/SR-125 SB RAMPS



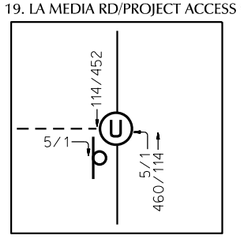
17. OTAY MESA RD/SR-125 NB RAMPS



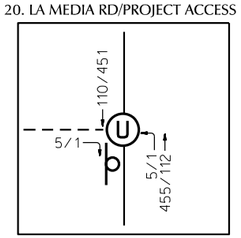
18. OTAY MESA RD/HARVEST RD



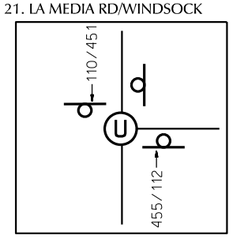
19. LA MEDIA RD/PROJECT ACCESS 9



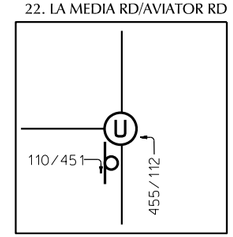
20. LA MEDIA RD/PROJECT ACCESS 10



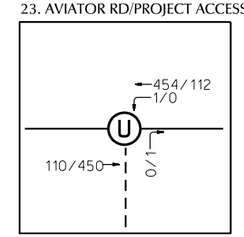
21. LA MEDIA RD/WINDSOCK



22. LA MEDIA RD/AVIATOR RD



23. AVIATOR RD/PROJECT ACCESS 11



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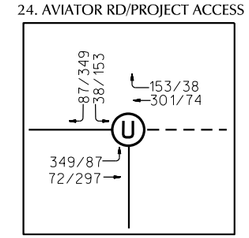
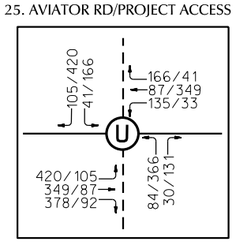
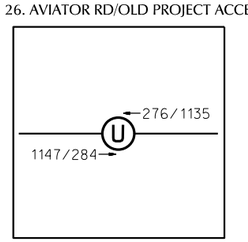


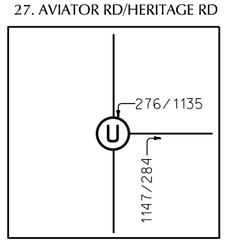
25. AVIATOR RD/PROJECT ACCESS 13



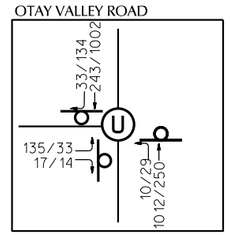
26. AVIATOR RD/OLD PROJECT ACCESS 14



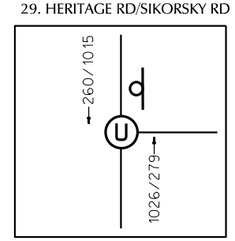
27. AVIATOR RD/HERITAGE RD



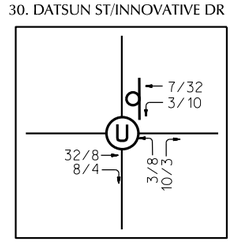
28. HERITAGE RD/DATSUN ST/ OTAY VALLEY ROAD



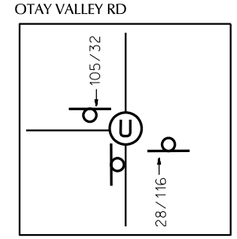
29. HERITAGE RD/SIKORSKY RD



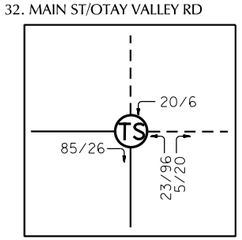
30. DATSUN ST/INNOVATIVE DR



31. AVENIDA DE LAS VISTAS/FUTURE OTAY VALLEY RD



32. MAIN ST/OTAY VALLEY RD



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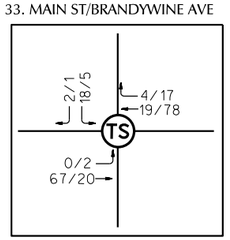
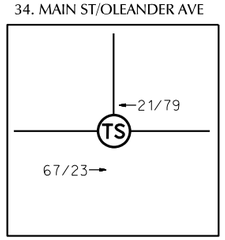
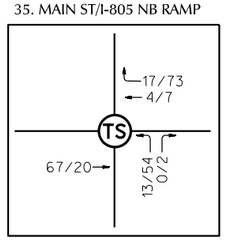


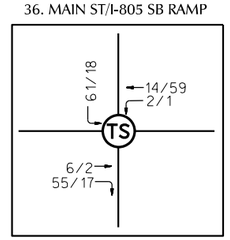
34. MAIN ST/OLEANDER AVE



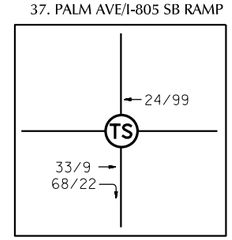
35. MAIN ST/I-805 NB RAMP



36. MAIN ST/I-805 SB RAMP



37. PALM AVE/I-805 SB RAMP



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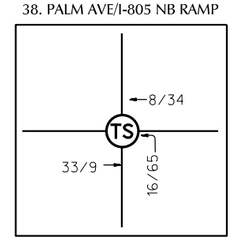
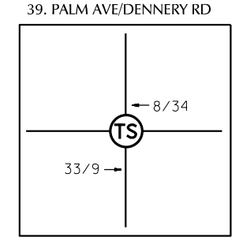


39. PALM AVE/DENNERY RD



40. DEL SOL BLVD/OCEAN HILLS PKWY

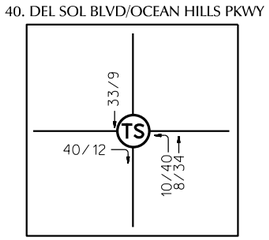


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EXHIBIT 12B

PHASE 1 + 2 TRIP ASSIGNMENT FOR YEAR 2017 (PHASE 2 OPENING YEAR) SCENARIO

METROPOLITAN AIRPARK TRAFFIC IMPACT ANALYSIS

LEGEND

= STOP-CONTROLLED

TS = TRAFFIC SIGNAL

U = UNSIGNALIZED INTERSECTION

XXX/XXX = AM/PM PEAK HOUR VOLUMES

– – – = FUTURE STREET/ PROJECT ACCESS

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R:\15818B_Metropolitan_Airpark\Traffic\Reports\2015_0630_Rephasing_Report_1st_Submittal\Exhibits\Exhibit12B_ProjTripGenYR2017.dgn
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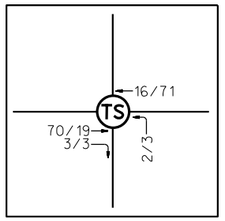
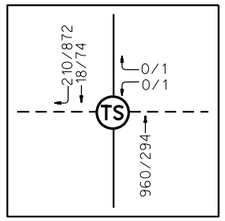
24-JUN-2015 17:46

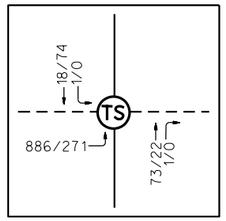
41. OCEAN HILLS PKWY/STREET "A"



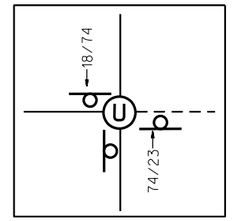
42. CALIENTE AVE/SR-905 WB RAMP



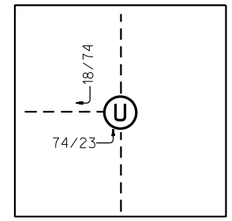
43. CALIENTE AVE/SR-905 EB RAMP



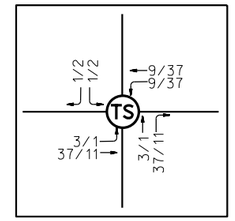
44. CALIENTE AVE/AIRWAY RD



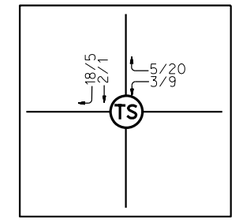
45. CALIENTE AVE/BEYER BLVD



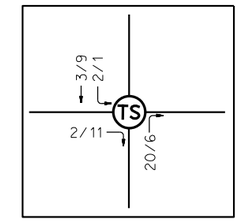
46. OLD OTAY MESA RD/BEYER BLVD



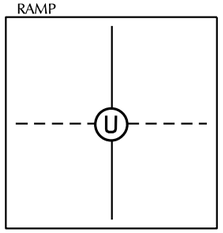
47. PICADOR BLVD/SR-905 WB RAMP



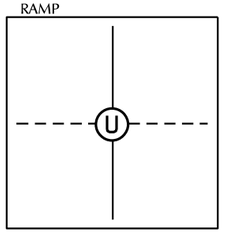
48. PICADOR BLVD/SR-905 EB RAMP



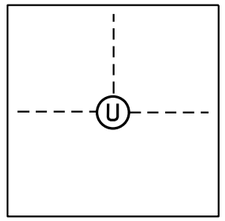
49. HERITAGE RD/SR-905 WB RAMP



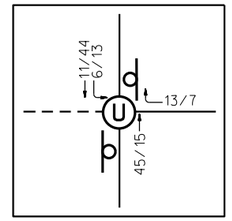
50. HERITAGE RD/SR-905 EB RAMP



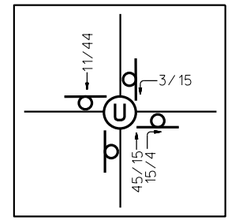
51. HERITAGE RD/AIRWAY RD



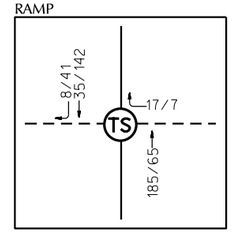
52. CACTUS RD/AIRWAY RD



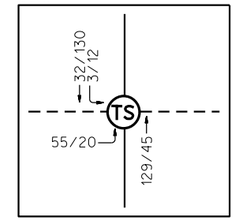
53. CACTUS RD/SIEMPRE VIVA RD



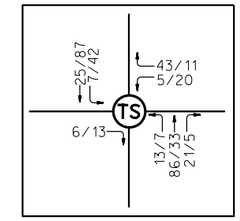
54. BRITANNIA BLVD/SR-905 WB RAMP



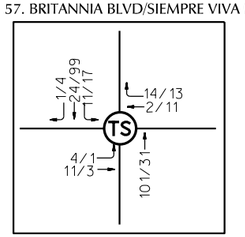
55. BRITANNIA BLVD/SR-905 EB RAMP



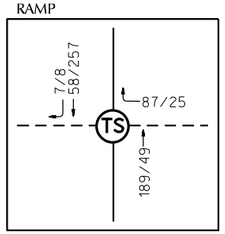
56. BRITANNIA BLVD/AIRWAY RD



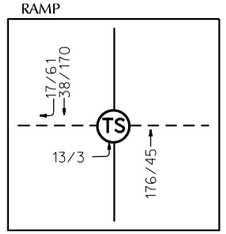
57. BRITANNIA BLVD/SIEMPRE VIVA RD



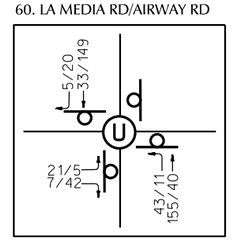
58. LA MEDIA RD/SR-905 WB RAMP



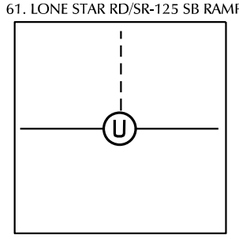
59. LA MEDIA RD/SR-905 EB RAMP



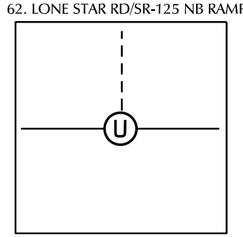
60. LA MEDIA RD/AIRWAY RD



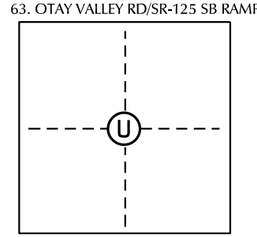
61. LONE STAR RD/SR-125 SB RAMP



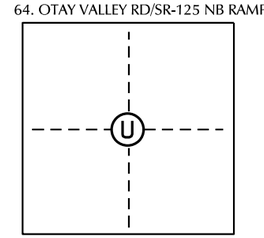
62. LONE STAR RD/SR-125 NB RAMP



63. OTAY VALLEY RD/SR-125 SB RAMP



64. OTAY VALLEY RD/SR-125 NB RAMP



RICK ENGINEERING COMPANY
5620 FRIARS ROAD
SAN DIEGO, CA 92110
619.291.0707
(FAX)619.291.4165

EXHIBIT 12C

PHASE 1 + 2 TRIP ASSIGNMENT FOR YEAR 2017 (PHASE 2 OPENING YEAR) SCENARIO

METROPOLITAN AIRPARK TRAFFIC IMPACT ANALYSIS

LEGEND

= STOP-CONTROLLED

TS = TRAFFIC SIGNAL

U = UNSIGNALIZED INTERSECTION

XXX/XXX = AM/PM PEAK HOUR VOLUMES

--- = FUTURE STREET/ PROJECT ACCESS

© 2015 Rick Engineering Company

R:\15818B_Metropolitan_Airpark\Traffic\Reports\2015_0630_Rephasing_Report_1st_Submittal\Exhibits\Exhibit12C_ProjTripGenYR2017.dgn
R:\15818B_Metropolitan_Airpark\Traffic\Reports\2015_0630_Rephasing_Report_1st_Submittal\Exhibits\SD CorpStds 2005.dscript
24-JUN-2015 17:47

Plaza La Media Trip Generation

TRIP GENERATION RATES						
	Dwy	Cum		AM PEAK		PM PEAK	
Land Use	Rate	Rate		% of ADT	In:Out Ratio	% of ADT	In:Out Ratio
Community Retail	70 /	49	trips / ksf	3%	0.60 : 0.40	10%	0.50 : 0.50
Fast Food w/Drive Thru	700 /	420	trips / ksf	4%	0.60 : 0.40	8%	0.50 : 0.50
Drugstore	90 /	40	trips / ksf	4%	0.60 : 0.40	10%	0.50 : 0.50
Gas Station w/Food Mart & Carwash	155 /	31	trips / vfs	8%	0.50 : 0.50	9%	0.50 : 0.50

TRIP GENERATION CALCULATIONS									
				AM PEAK			PM PEAK		
Land Use	Amount		ADT	In	Out	Total	In	Out	Total
Community Retail	106.7	ksf	7,469	134	90	224	374	373	747
Drugstore	13.5	ksf	1,215	29	20	49	61	61	122
Fast Food w/Drive Thru	6.0	ksf	4,200	101	67	168	168	168	336
Gas Station w/Food Mart & Carwash	12	vfs	1,860	75	74	149	84	83	167
Driveway Trips Total			*14,744*	*339*	*251*	*590*	*687*	*685*	*1,372*
Cumulative Trips Total (a)			8,660	183	127	310	407	405	812

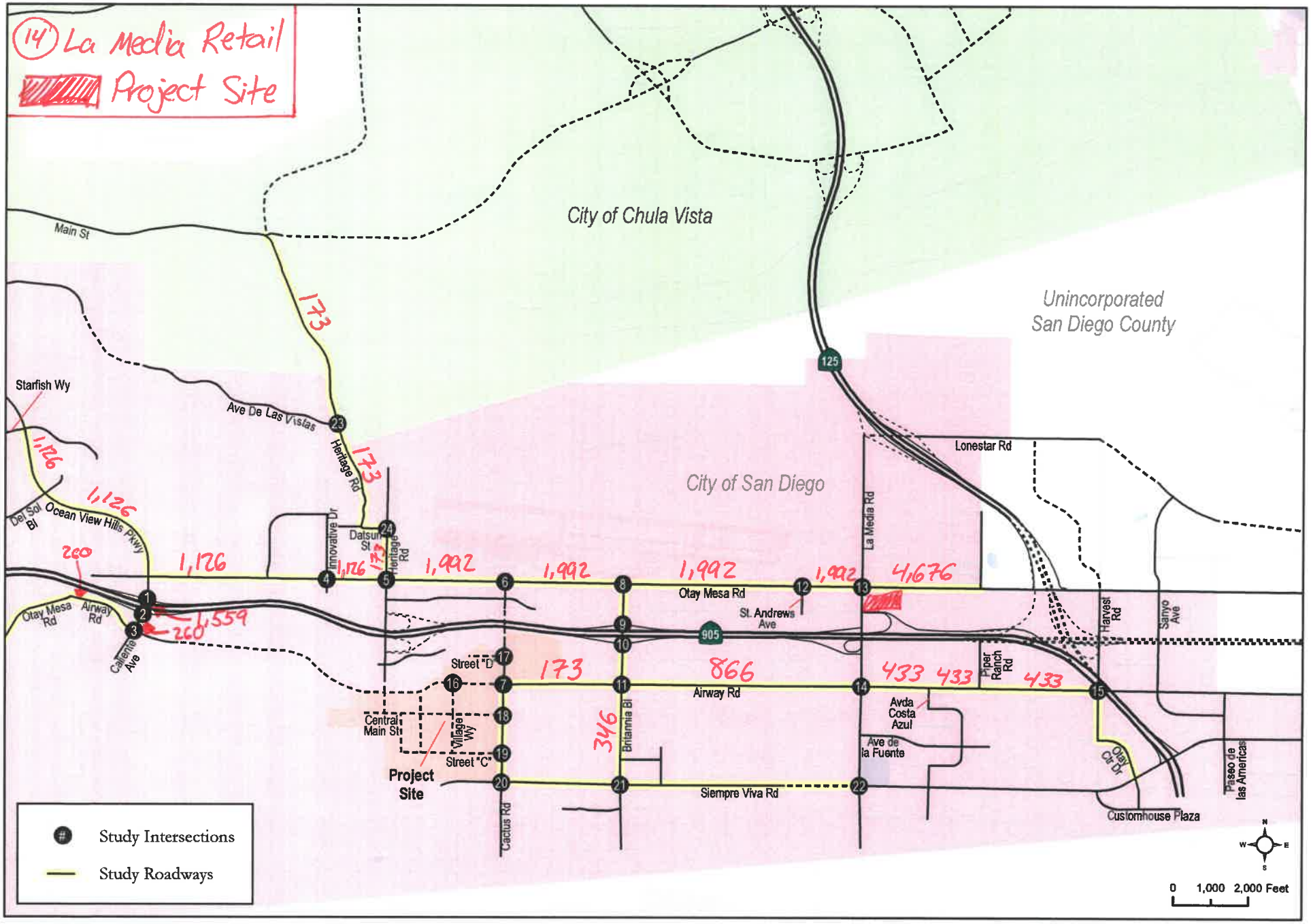
Notes:

ksf: 1,000 square feet, vfs: vehicle fueling space

The trip rates for the proposed uses are based on *the City of San Diego's Trip Generation Manual, May 2003* .

Dwy = Driveway; Cum = Cumulative

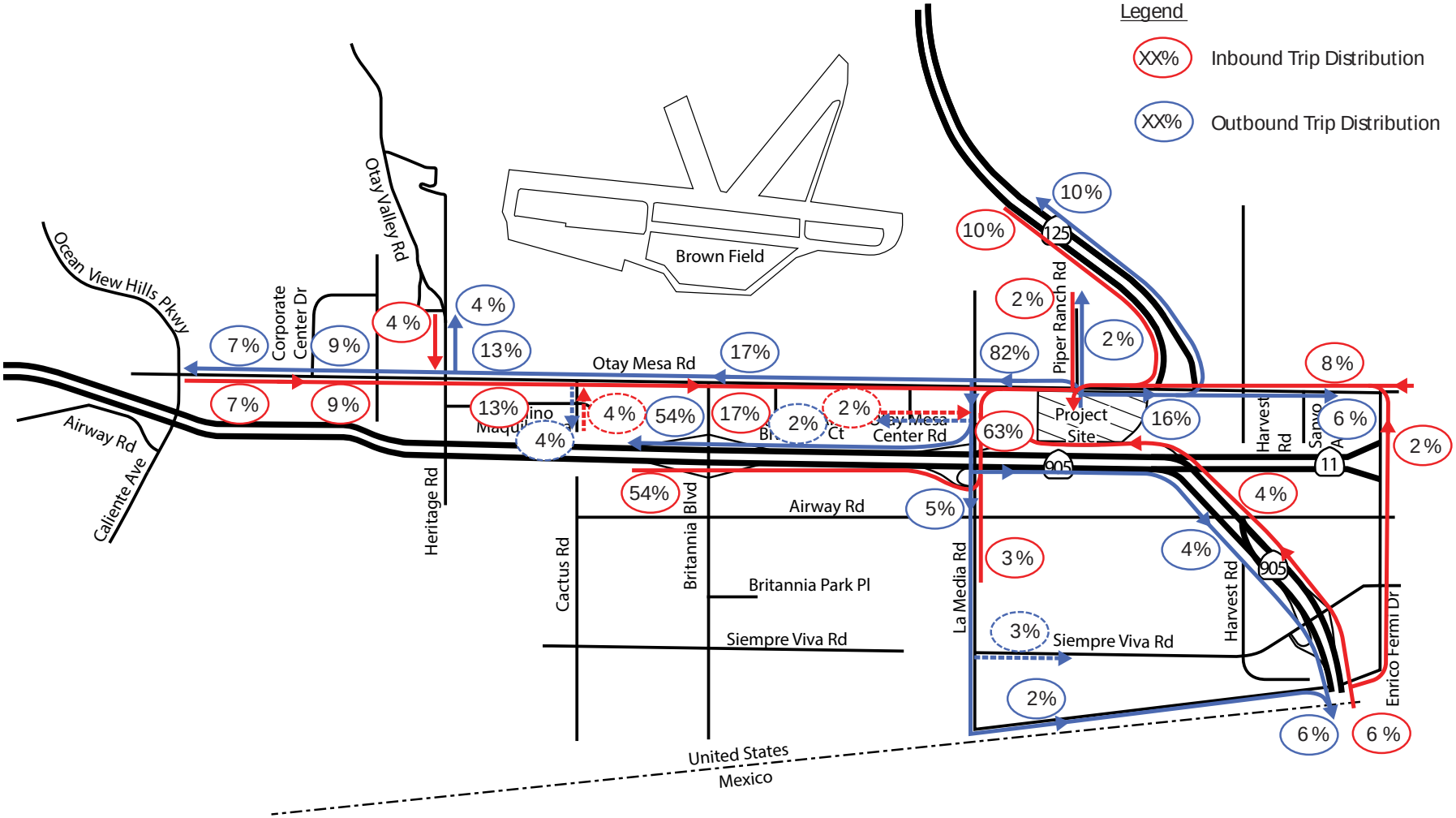
(a) Cumulative trips are based off of the cumulative trip rate and take into account pass by and diverted link trips.



Otay Mesa Lumina
Transportation Impact Study
CHEN RYAN

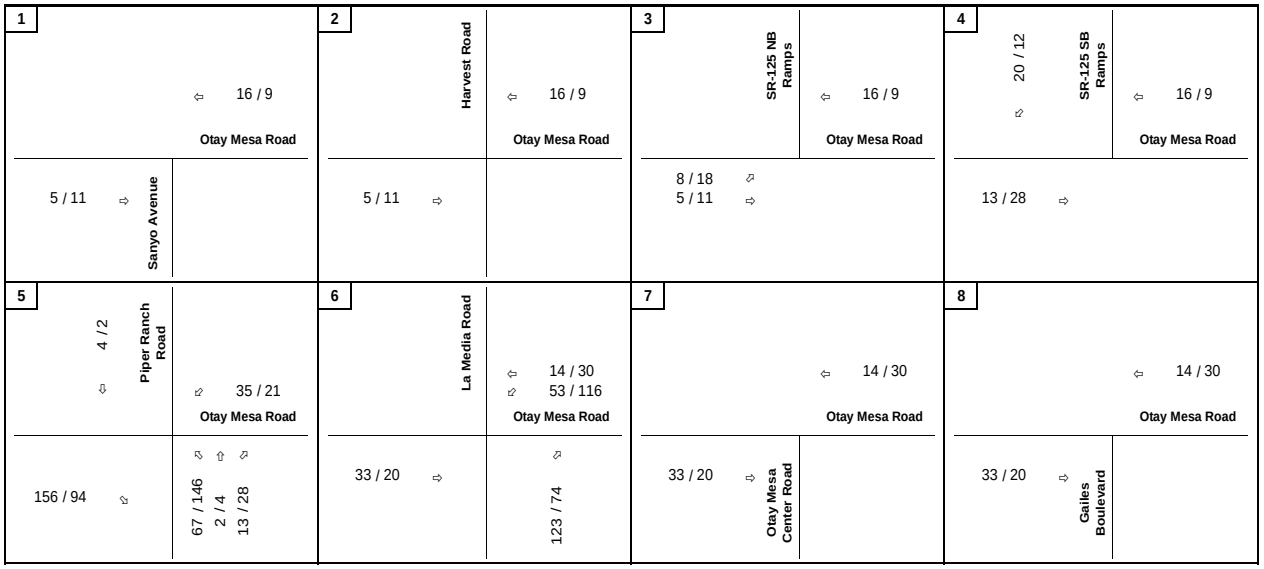
Figure 1-2
Project Study Area

FIGURE 4-1



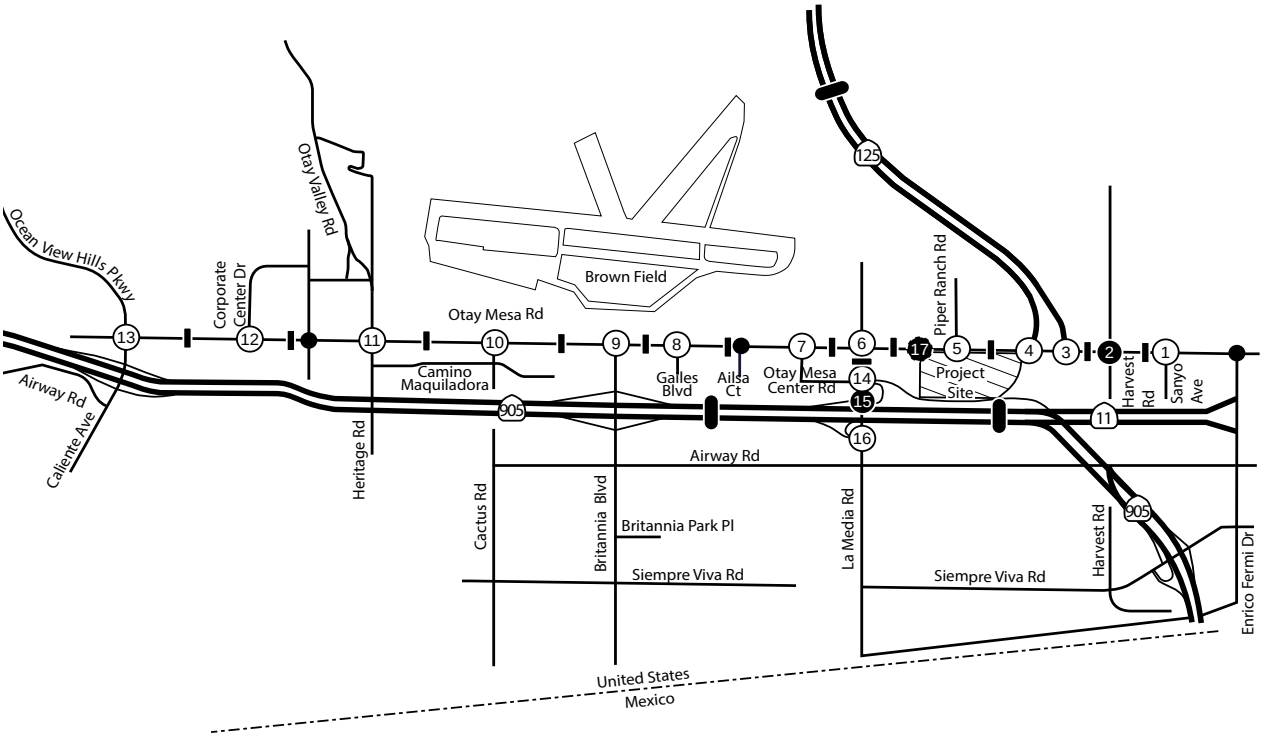
General Trip Distribution
Existing & Near Term Conditions

FIGURE 4-11



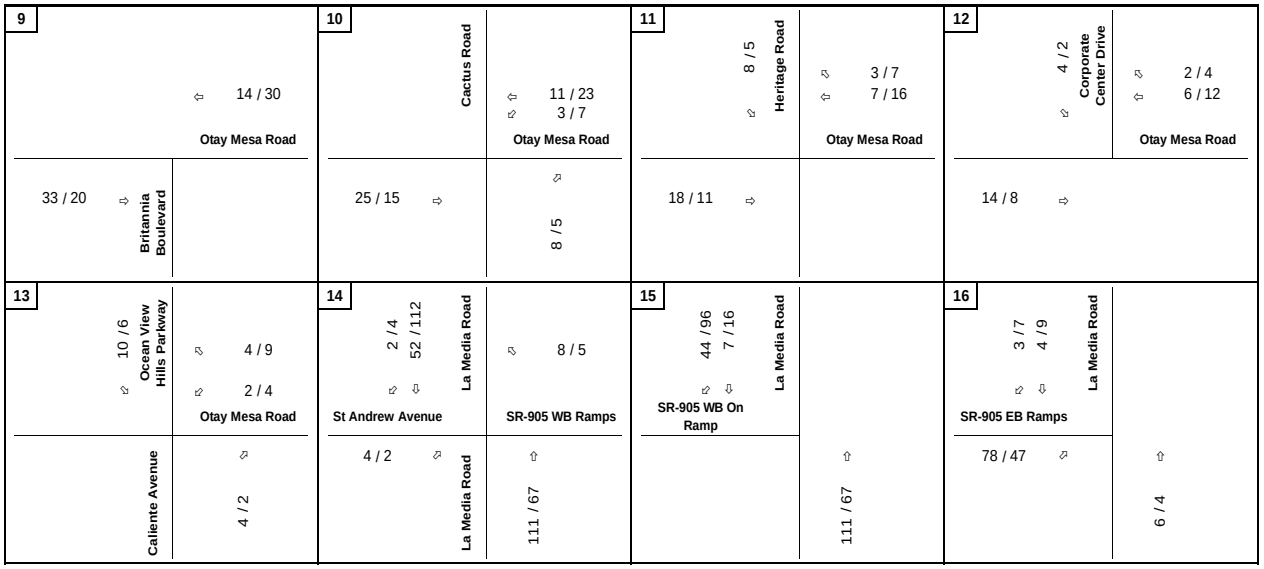
LEGEND

X/Y	AM/PM Peak Hour Traffic Volumes



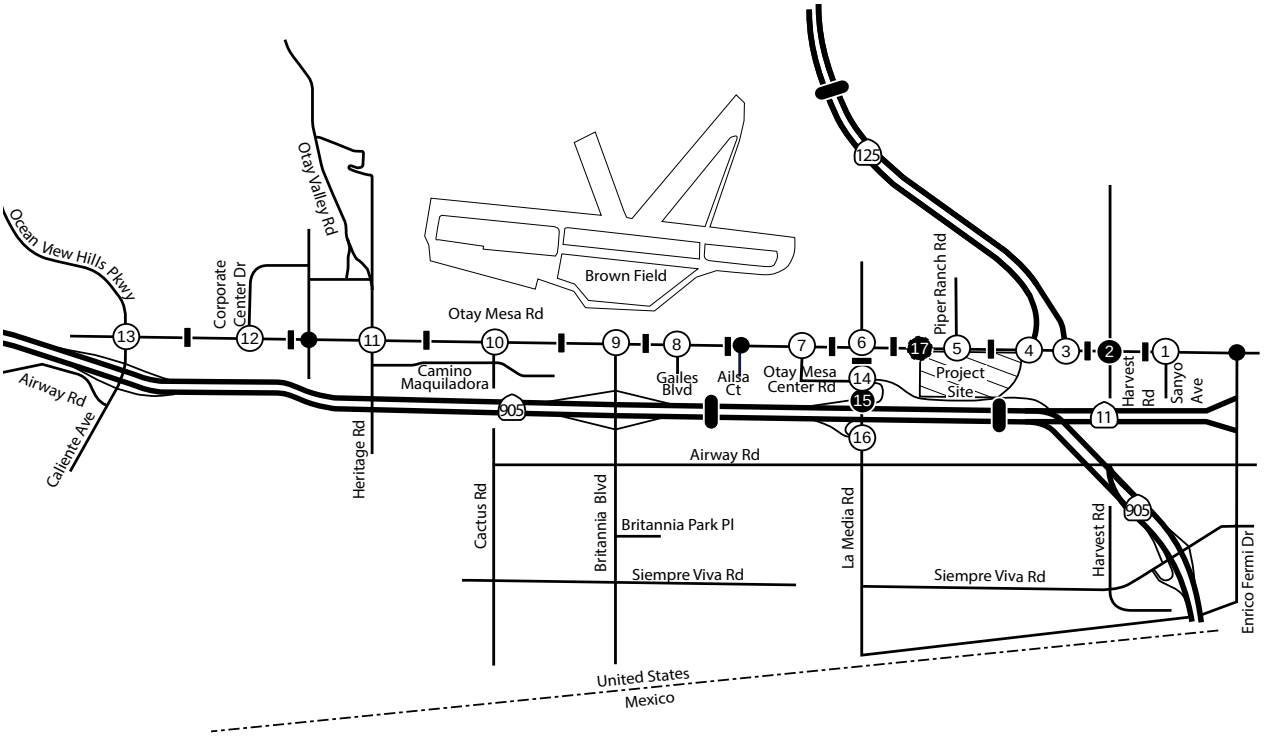
Trip Assignment For Phase 1
Existing & Near Term Conditions

FIGURE 4-12



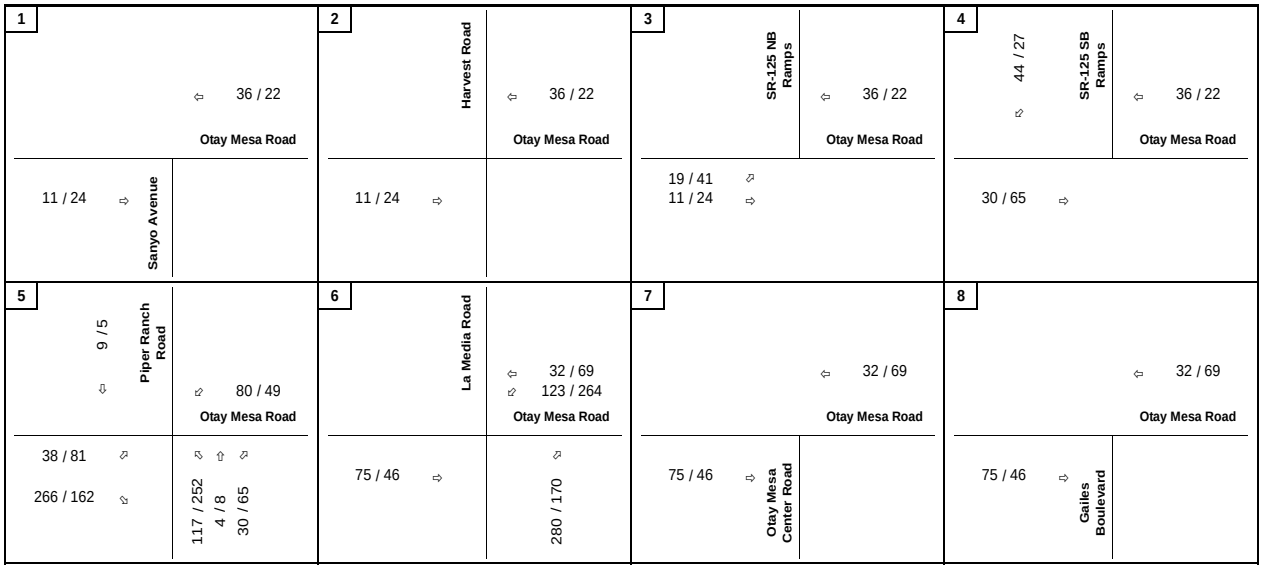
LEGEND

X/Y	AM/PM Peak Hour Traffic Volumes



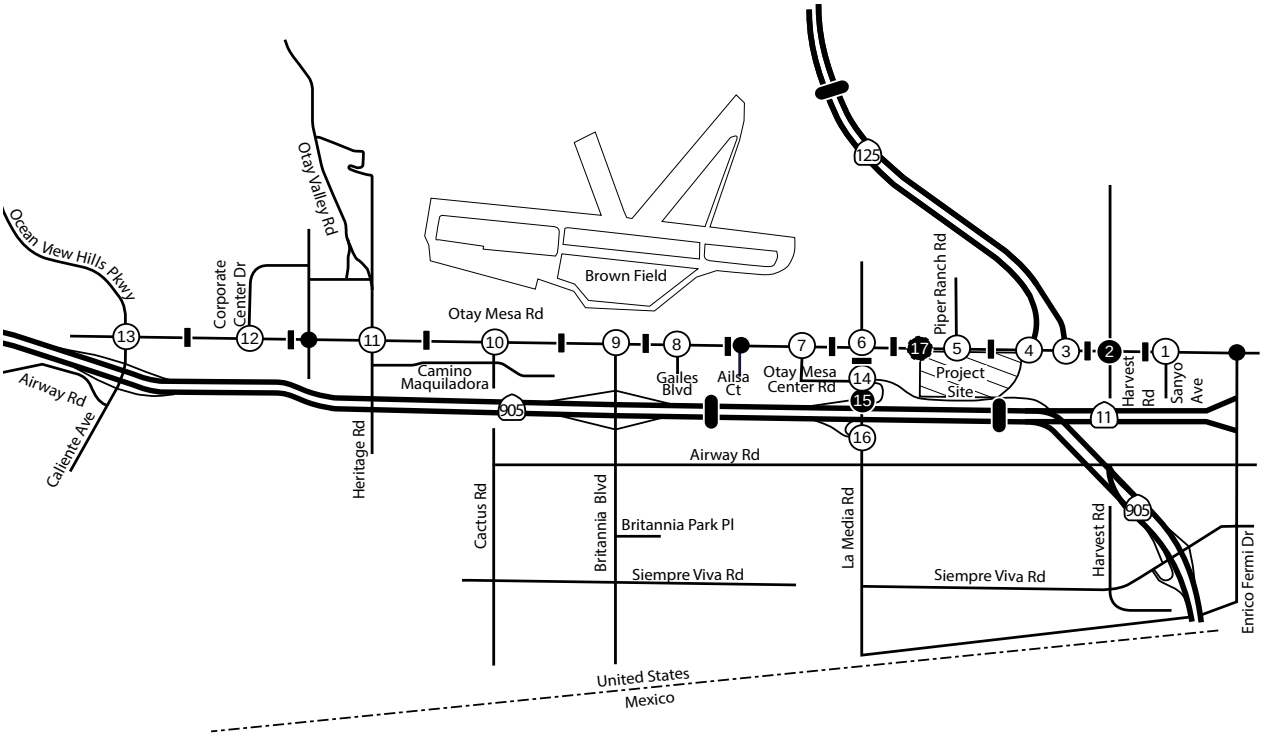
Trip Assignment For Phase 1
Existing & Near Term Conditions (cont.)

FIGURE 4-13



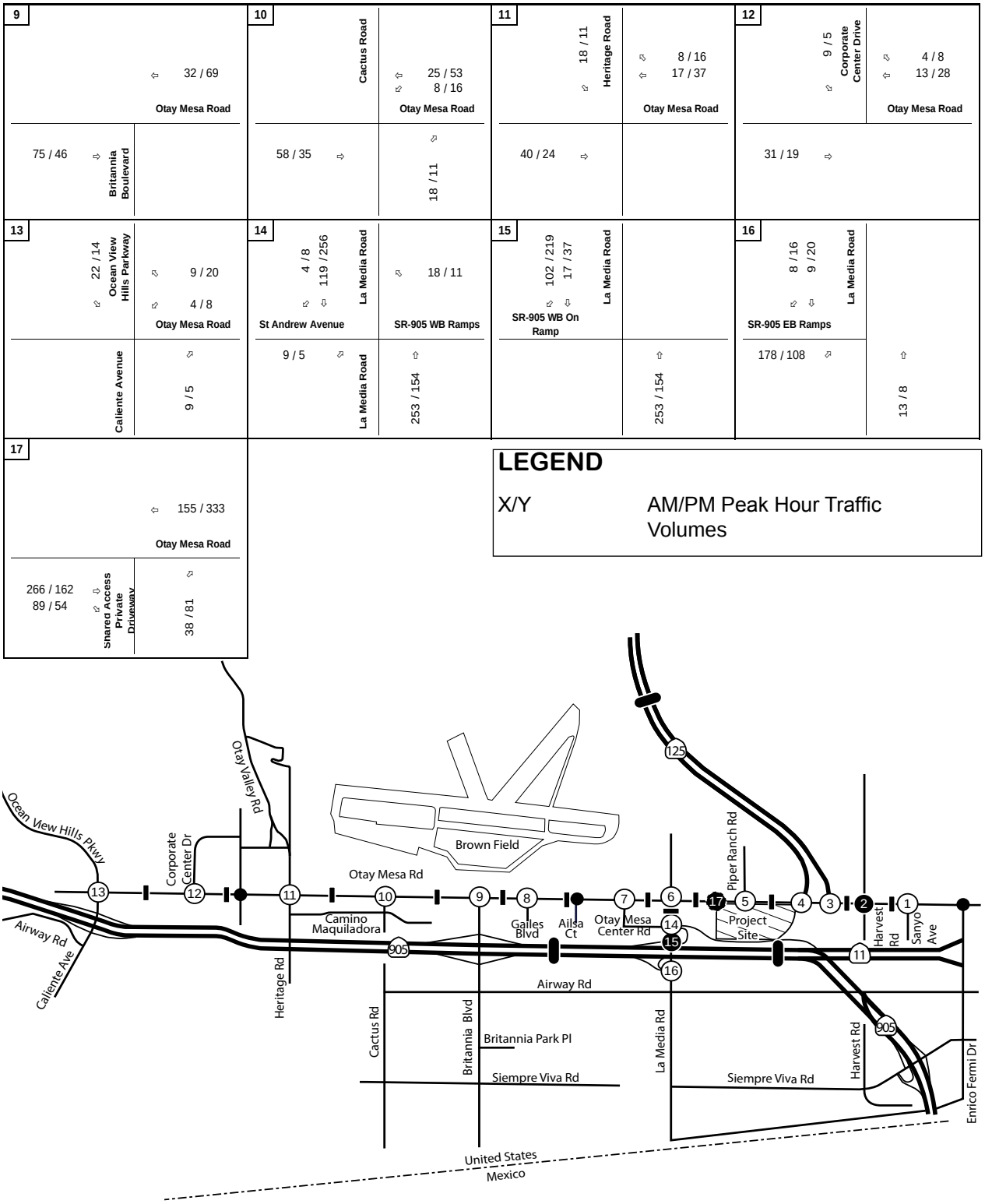
LEGEND

X/Y	AM/PM Peak Hour Traffic Volumes



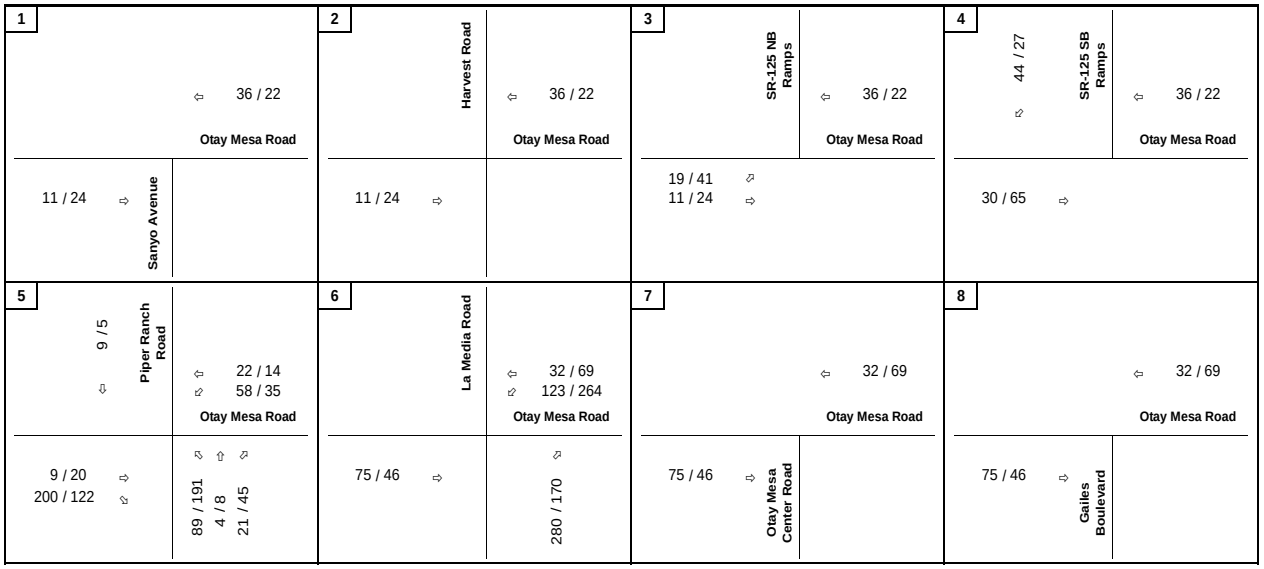
Trip Assignment For Phase 1 & 2
Existing Condition

FIGURE 4-14



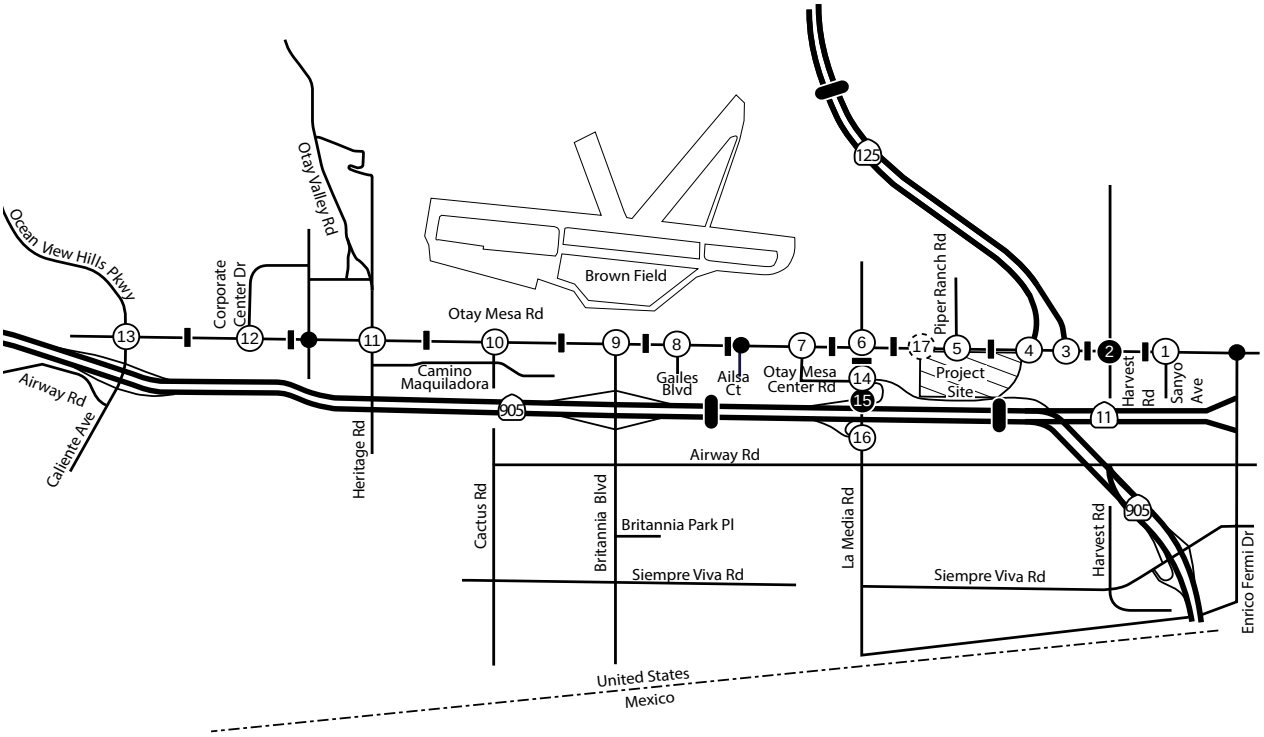
Trip Assignment For Phase 1 & 2 Existing Condition (cont.)

FIGURE 4-15



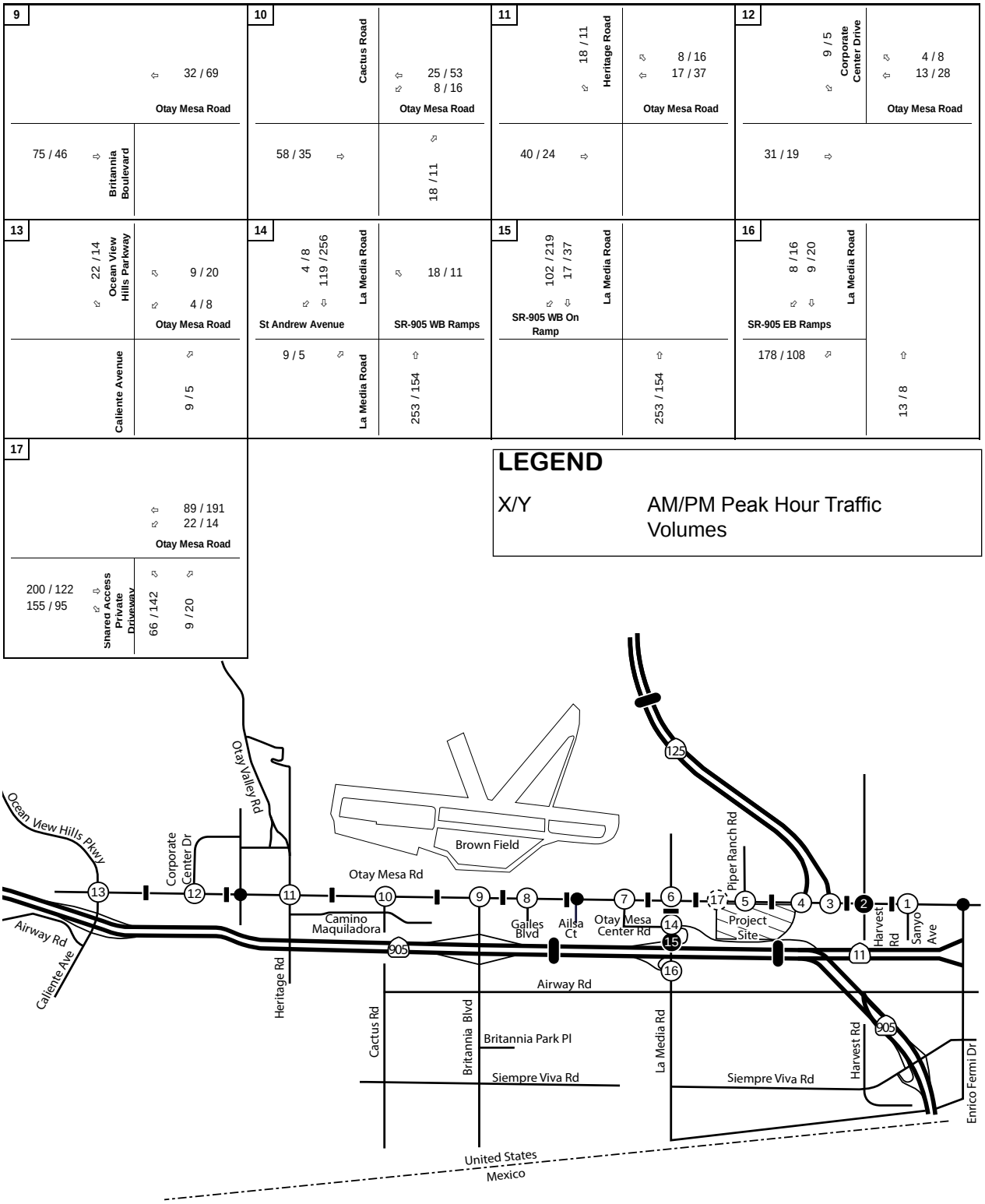
LEGEND

X/Y	AM/PM Peak Hour Traffic Volumes



Trip Assignment For Phase 1 & 2
Near Term (2020) Condition

FIGURE 4-16



Trip Assignment For Phase 1 & 2
Near Term (2020) Condition (cont.)

Table 4-1 Trip Generation Summary

Land Use	d Use as listed in SanD	Units[1]	Trip Rate[2]	Daily Trips	AM Peak-Hour % of ADT[2]	AM Peak-Hour In:Out Ratio[2]	AM Peak-Hour In	AM Peak-Hour Out	AM Peak-Hour Total	PM Peak-Hour % of ADT[2]	PM Peak-Hour In:Out Ratio[2]	PM Peak-Hour In	PM Peak-Hour Out	PM Peak-Hour Total
Cumulative Trips [3]														
Proposed														
Phase 1														
Building 3	Warehousing	216.3 ksf	5 / ksf	1,082	15%	7.00 : 3.00	114	48	162	16%	4.00 : 6.00	69	104	173
Building 4	Warehousing	153.5 ksf	5 / ksf	768	15%	7.00 : 3.00	81	34	115	16%	4.00 : 6.00	49	74	123
Phase Total				**1,849**			**195**	**82**	**277**			**118**	**178**	**296**
Phase 2														
Building 1	Warehousing	234.7 ksf	5 / ksf	1,173	15%	7.00 : 3.00	123	53	176	16%	4.00 : 6.00	75	113	188
Building 2	Warehousing	240.6 ksf	5 / ksf	1,203	15%	7.00 : 3.00	126	54	180	16%	4.00 : 6.00	77	115	192
Phase Total				**2,376**			**249**	**107**	**356**			**152**	**228**	**380**
Proposed Total				**4,225**			**444**	**189**	**633**			**270**	**406**	**676**
GENERATION =				**4,225**			**444**	**189**	**633**			**270**	**406**	**676**

Note:

1. ksf = Thousand Square Feet
2. Daily and peak-hour trip generation rates referenced from the City of San Diego Land Development Code - Trip Generation Manual, May 2003.
3. Cumulative trips are the total trips generated by the site exclusive of pass-by trips already on the roadway.

K:\SND_LDEV\095128024 - Sunroad Otay\Traffic\ANALYSIS\EXCEL\[095128024_TG01.xlsm]Summary

Appendix H
Cumulative Traffic Conditions Network Mitigation Measures - Identified Capital Improvement Projects

Jonathan Sanchez

From: Monique Chen
Sent: Tuesday, December 04, 2018 7:23 AM
To: Alberto, Eddmond
Cc: Lowe, Elyse; Hopkins, Gregory; McPherson, Anna; Gonsalves, Ann; FitzGerald, PJ; Tomlinson, Tom; Godwin, Paul; Ghossain, George; Rita Mahoney - ColRich; Jason Shepard; Jer Harding; Emilie Colwell; John Ponder; mescobareck@atlantissd.com; Hansen, Mike; Kathi Riser; Jonathan Sanchez
Subject: Re: Lumina - La Media CIP

Great - thank you! 🙃

Sent from my iPhone

On Dec 4, 2018, at 7:10 AM, Alberto, Eddmond <AlbertoE@sandiego.gov> wrote:

> Hi Monique,
>
> I believe you captured the planned phasing of the La Media CIP in your summary. You may also proceed with the assumptions as noted in the TIA.
>
> Thanks,
>
> Edd

Edd Alberto, TE
Program Manager
City of San Diego
Engineering Division, Development Services Department
(619) 446-5416
sandiego.gov

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From: Monique Chen [mailto:mchen@chenryanmobility.com]
Sent: Monday, December 03, 2018 7:01 PM
To: Lowe, Elyse <ELowe@sandiego.gov>; Hopkins, Gregory <GHopkins@sandiego.gov>; McPherson, Anna <AMcPherson@sandiego.gov>; Gonsalves, Ann <AGonsalves@sandiego.gov>; FitzGerald, PJ <PFitzgerald@sandiego.gov>; Tomlinson, Tom <TomlinsonT@sandiego.gov>; Godwin, Paul <PGodwin@sandiego.gov>; Ghossain, George <GGhossain@sandiego.gov>; Alberto, Eddmond <AlbertoE@sandiego.gov>
Cc: Rita Mahoney - ColRich <ritam@colrich.com>; Jason Shepard <jshepard@colrich.com>; Jer Harding <jharding@tbplanning.com>; Emilie Colwell <ecolwell@tbplanning.com>; John Ponder

<JPonder@sheppardmullin.com>; mescobareck@atlantissd.com; Hansen, Mike <MHansen@sandiego.gov>; Kathi Riser <kriser@atlantissd.com>; Jonathan Sanchez <jsanchez@chenryanmobility.com>
Subject: Lumina - La Media CIP
Importance: High

Hi all,

Hope this message finds you well! ☺ I, along with Rita, Jason and Jer attended the *La Media Road Improvements & Otay Truck Route Project Progress Meeting* today – the meeting provided some very useful information on the funding and schedule status of this important CIP project. In fact, both Councilmember David Alvarez and Councilmember Elect Vivian Moreno were present.

Based on what was shared at this meeting, the entire La Media Road CIP is anticipated to be completed by the winter of 2022. Please see attached for references – the blue (interim) and yellow (ultimate) highlighted roads in "IMG_9150.jpg" represent the La Media CIP, and the other attachment indicates the project schedule. I asked James Nagelvoort specifically about the construction schedule and he said that the entire CIP will be completed by Winter 2022 if the project is constructed as one phase, and at the next meeting (June/July 2019), we will be talking about potential phased construction. He also confirmed that in any case, drainage for the entire project will be completed as the first step to this CIP. I believe this provides substantial evidence that Airway Road will be improved by no later that Winter 2022 and that we should be able to assume this in our phase 1 (2023) baseline network. In fact, we could assume that the entire CIP is in by 2023 – but to be conservative, we will proceed with what we have originally planned on by assuming the rest of this CIP will be in by our phase 2 (2027).

Tom and Ed, since you both were also at this meeting, please chime in and correct or add on to what I summarized above…

I hope that with this email, we can close the loop on network assumptions for the Lumina TIS – below is a recap:

- Phase 1 (Yr 2023) – Airway Road improvements completed as per CIP
- Phase 2 (full development of Lumina, Yr 2027) – both Airway Road and La Media Road improvements completed as per CIP

Thanks!

Monique Chen, PE
Chen Ryan Associates
3900 Fifth Avenue, Suite 310 | San Diego, CA 92103
O: (619) 795-6086 | M: (619) 318-4664
www.ChenRyanMobility.com

Schedule:

Phase	Estimated Completion Dates
Procurement of Design Consultant	Spring 2019
Design*	Fall 2019
Environmental*	Winter 2020
Right of Way*	Winter 2020
Final PS&E*	Winter 2020
Advertise and Award	Summer 2020
Construction	Winter 2022

*Work runs parallel

Includes the following assumptions:

- Schedule for 905 to Siempre Viva
- Design for full buildout
- CEQA clearance
- Permits for full buildout

LA MEDIA ROAD SOUTH (SIEMPRE VIVA TO TRUCK ROUTE) COST – 12/3/18

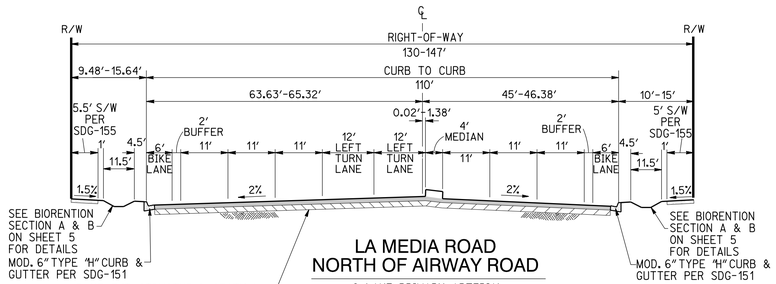
Cost Estimate (Complete Project):

	Total
La Media Road South (Siempre Viva to Truck Route)	$4,000,000

Schedule:

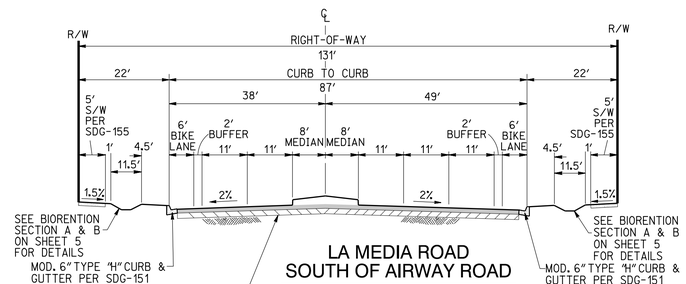
To be determined

PRELIMINARY



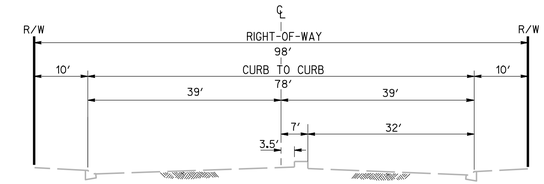
LA MEDIA ROAD
NORTH OF AIRWAY ROAD

6 LANE PRIMARY ARTERIAL
STA. 20+34.24 TO 22+52.87
NOT TO SCALE



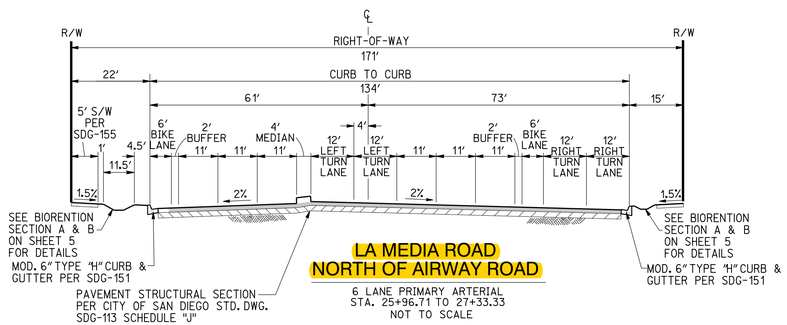
LA MEDIA ROAD
SOUTH OF AIRWAY ROAD

5 LANE MAJOR
STA. 41+71.61 TO 49+39.85
NOT TO SCALE



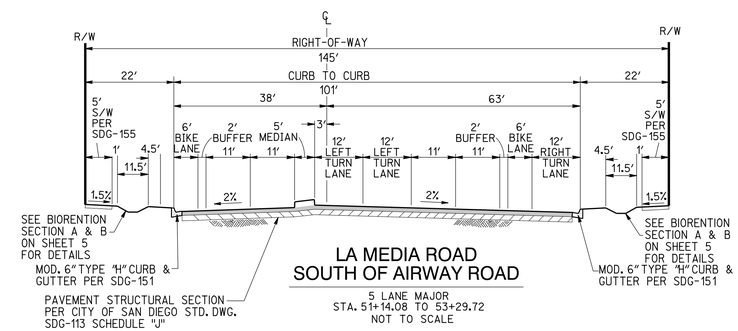
AVENIDA DE LA FUENTE

STA. 10+64.75 TO 12+06.75
NOT TO SCALE



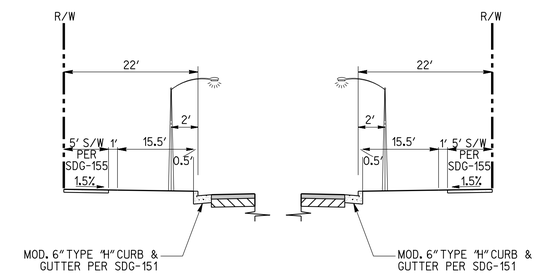
LA MEDIA ROAD
NORTH OF AIRWAY ROAD

6 LANE PRIMARY ARTERIAL
STA. 25+96.71 TO 27+33.33
NOT TO SCALE



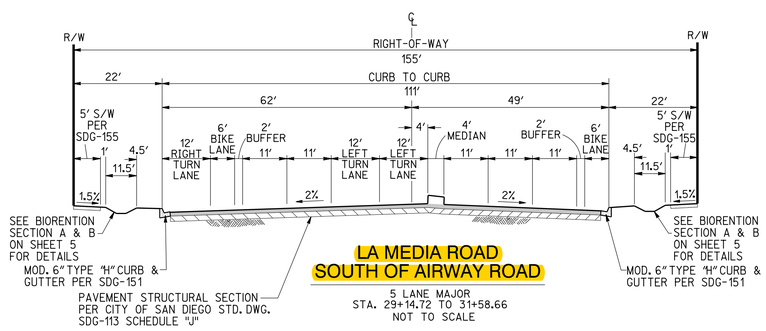
LA MEDIA ROAD
SOUTH OF AIRWAY ROAD

5 LANE MAJOR
STA. 51+14.08 TO 53+29.72
NOT TO SCALE



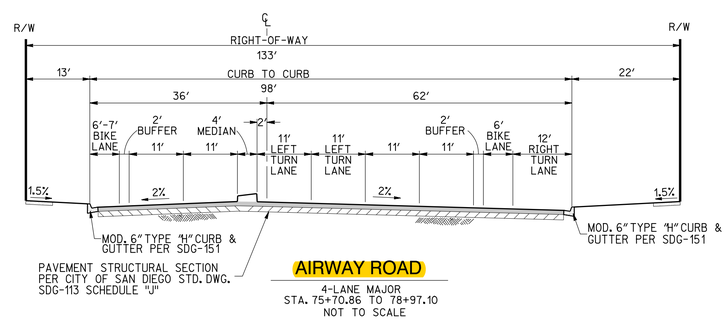
TYPICAL STREET LIGHT LOCATIONS

NOT TO SCALE



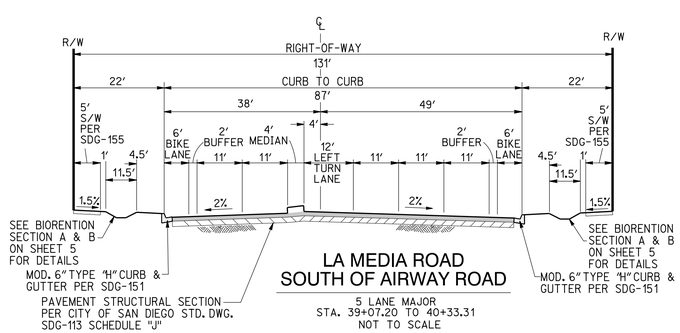
LA MEDIA ROAD
SOUTH OF AIRWAY ROAD

5 LANE MAJOR
STA. 29+14.72 TO 31+58.66
NOT TO SCALE



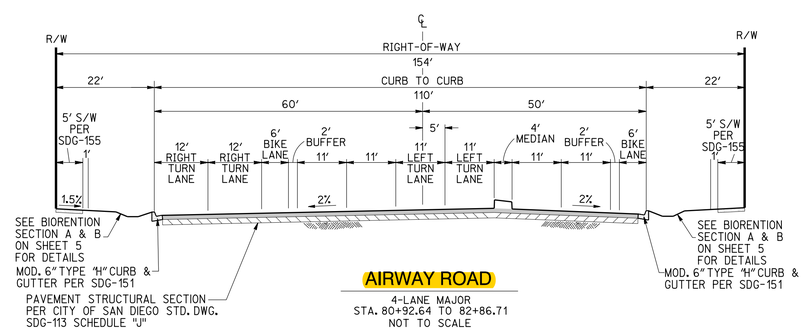
AIRWAY ROAD

4-LANE MAJOR
STA. 75+70.86 TO 78+97.10
NOT TO SCALE



LA MEDIA ROAD
SOUTH OF AIRWAY ROAD

5 LANE MAJOR
STA. 39+07.20 TO 40+33.31
NOT TO SCALE



AIRWAY ROAD

4-LANE MAJOR
STA. 80+92.64 TO 82+86.71
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ENGINEER OF WORK

JOHN D. GODDARD, JR. R.C.E. 33037 DATE

PRIVATE CONTRACT

REGISTERED PROFESSIONAL ENGINEER JOHN D. GODDARD JR. NO. 33037 CIVIL STATE OF CALIFORNIA

STREET CROSS SECTIONS FOR:

LA MEDIA ROAD & AIRWAY ROAD

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 19 OF 59 SHEETS

FOR CITY ENGINEER DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	REC			
AS-BUILTS				

CONTRACTOR DATE STARTED
INSPECTOR DATE COMPLETED

L.O. NO. 23431277
P.T.S NO. 435752
V.T.M. / E.I.R. 208889

1780-6339
NAD83 COORDINATES
140-1779
LAMBERT COORDINATES

38936- 19 -D

PRELIMINARY
NOT FOR CONSTRUCTION

RICK ENGINEERING COMPANY
5620 FRIARS ROAD
SAN DIEGO, CA 92110
619.291.0707
(FAX)619.291.4165
rickengineering.com
San Diego Riverside - Orange - San Luis Obispo - Bakersfield - Sacramento - Phoenix - Tucson

J-15818-B

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22-FEB-2018 11:45

Jonathan Sanchez

From: Monique Chen
Sent: Monday, December 10, 2018 5:18 PM
To: Alberto, Eddmond
Cc: Gonsalves, Ann; Jonathan Sanchez
Subject: RE: Caliente Avenue / Airway Road Intersection

Awesome – thank you so much! 😊

From: Alberto, Eddmond <AlbertoE@sandiego.gov>
Sent: Monday, December 10, 2018 5:14 PM
To: Chen Ryan Associates Inc <Mchen@chenryanmobility.com>
Cc: Gonsalves, Ann <AGonsalves@sandiego.gov>; Jonathan Sanchez <jsanchez@chenryanmobility.com>
Subject: Re: Caliente Avenue / Airway Road Intersection

Confirmed.

Get Outlook for iOS

From: Monique Chen <mchen@chenryanmobility.com>
Sent: Monday, December 10, 2018 4:16:13 PM
To: Alberto, Eddmond
Cc: Gonsalves, Ann; Jonathan Sanchez
Subject: Caliente Avenue / Airway Road Intersection

Hi Ed,

I just talked with Ann and she indicated that you were okay with us assuming the above referenced intersection to be signalized under the Year 2023 (Phase I) baseline conditions – could you please send me a quick confirmation?

Thanks!

Monique Chen, PE
Chen Ryan Associates
3900 Fifth Avenue, Suite 310 | San Diego, CA 92103
O: (619) 795-6086 | M: (619) 318-4664
www.ChenRyanMobility.com

Appendix I
Peak Hour Intersection LOS
– Near-Term Year 2023 Conditions

HCM Signalized Intersection Capacity Analysis
1: Caliente Avenue & SR-905 WB On-Ramp/SR-905 WB Off-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	38	1	62	261	992	0	0	272	393
Future Volume (vph)	0	0	0	38	1	62	261	992	0	0	272	393
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	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			0.91	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1725	1538	1719	4940			4437	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1725	1538	1719	4940			4437	
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	41	1	67	284	1078	0	0	296	427
RTOR Reduction (vph)	0	0	0	0	0	59	0	0	0	0	291	0
Lane Group Flow (vph)	0	0	0	0	42	8	284	1078	0	0	432	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)					3.8	3.8	12.0	29.5			12.8	
Effective Green, g (s)					4.9	4.9	12.7	30.6			13.9	
Actuated g/C Ratio					0.11	0.11	0.29	0.70			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)					194	173	501	3475			1417	
v/s Ratio Prot							c0.17	c0.22			0.10	
v/s Ratio Perm					0.02	0.00						
v/c Ratio					0.22	0.04	0.57	0.31			0.31	
Uniform Delay, d1					17.6	17.2	13.1	2.4			11.2	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					0.6	0.1	0.9	0.1			0.1	
Delay (s)					18.1	17.3	13.9	2.5			11.3	
Level of Service					B	B	B	A			B	
Approach Delay (s)		0.0			17.6			4.9			11.3	
Approach LOS		A			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	43.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Caliente Avenue & SR-905 EB Off-Ramp/SR-905 EB On-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	735	1	84	0	0	0	0	518	90	115	196	0
Future Volume (vph)	735	1	84	0	0	0	0	518	90	115	196	0
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	0.95	0.95						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	0.97						0.98		1.00	1.00	
Flt Protected	0.95	0.96						1.00		0.95	1.00	
Satd. Flow (prot)	1559	1530						4595		1641	3282	
Flt Permitted	0.95	0.96						1.00		0.95	1.00	
Satd. Flow (perm)	1559	1530						4595		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)	799	1	91	0	0	0	0	563	98	125	213	0
RTOR Reduction (vph)	0	13	0	0	0	0	0	42	0	0	0	0
Lane Group Flow (vph)	447	431	0	0	0	0	0	619	0	125	213	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)	19.6	19.6						13.9		4.6	23.2	
Effective Green, g (s)	20.7	20.7						15.0		5.3	24.3	
Actuated g/C Ratio	0.39	0.39						0.28		0.10	0.46	
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)	608	597						1300		164	1504	
v/s Ratio Prot								c0.13		c0.08	0.06	
v/s Ratio Perm	c0.29	0.28										
v/c Ratio	0.74	0.72						0.48		0.76	0.14	
Uniform Delay, d1	13.8	13.7						15.7		23.2	8.3	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	4.6	4.3						0.3		17.0	0.0	
Delay (s)	18.4	18.0						16.0		40.2	8.4	
Level of Service	B	B						B		D	A	
Approach Delay (s)		18.2			0.0			16.0			20.1	
Approach LOS		B			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	53.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Caliente Avenue & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	5	9	1	21	143	31	305	2	42	157	110
Future Volume (vph)	171	5	9	1	21	143	31	305	2	42	157	110
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	
Lane Util. Factor	0.95	0.95		0.97	1.00	1.00	1.00	0.91		1.00	0.95	
Frpb, ped/bikes	1.00	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	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00		1.00	0.94	
Flt Protected	0.95	0.96		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1633	1624		3183	1810	1447	1719	4711		1641	3102	
Flt Permitted	0.95	0.96		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1633	1624		3183	1810	1447	1719	4711		1641	3102	
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)	186	5	10	1	23	155	34	332	2	46	171	120
RTOR Reduction (vph)	0	6	0	0	0	136	0	1	0	0	82	0
Lane Group Flow (vph)	100	95	0	1	23	19	34	333	0	46	209	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	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	6.6	6.6		5.3	5.3	5.3	1.5	13.4		1.8	13.7	
Effective Green, g (s)	6.6	6.6		5.3	5.3	5.3	1.5	13.4		1.8	13.7	
Actuated g/C Ratio	0.15	0.15		0.12	0.12	0.12	0.03	0.31		0.04	0.32	
Clearance Time (s)	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	
Lane Grp Cap (vph)	250	248		391	222	177	59	1464		68	986	
v/s Ratio Prot	c0.06	0.06		0.00	0.01		0.02	c0.07		c0.03	0.07	
v/s Ratio Perm						c0.01						
v/c Ratio	0.40	0.38		0.00	0.10	0.11	0.58	0.23		0.68	0.21	
Uniform Delay, d1	16.5	16.4		16.6	16.8	16.8	20.5	11.0		20.4	10.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	1.0		0.0	0.2	0.3	12.9	0.1		23.5	0.1	
Delay (s)	17.5	17.4		16.6	17.0	17.1	33.4	11.1		43.8	10.9	
Level of Service	B	B		B	B	B	C	B		D	B	
Approach Delay (s)		17.5			17.1			13.2			15.4	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	43.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
4: Innovative Drive & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	683	1	0	407	38	0	0	1	0	0	33
Future Volume (Veh/h)	0	683	1	0	407	38	0	0	1	0	0	33
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	742	1	0	442	41	0	0	1	0	0	36
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	489			743			926	1232	248	696	1191	153
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	489			743			926	1232	248	696	1191	153
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	96
cM capacity (veh/h)	1011			809			202	164	728	310	174	836

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	297	297	149	147	147	147	41	1	36
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	1	0	0	0	41	1	36
cSH	1700	1700	1700	1700	1700	1700	1700	728	836
Volume to Capacity	0.17	0.17	0.09	0.09	0.09	0.09	0.02	0.00	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.9	9.5
Lane LOS								A	A
Approach Delay (s)	0.0			0.0				9.9	9.5
Approach LOS								A	A

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	23.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
5: Heritage Road & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	465	248	91	328	167	148	32	41	189	39	44
Future Volume (vph)	91	465	248	91	328	167	148	32	41	189	39	44
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
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	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	1468	3183	4715	1468	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)	99	505	270	99	357	182	161	35	45	205	42	48
RTOR Reduction (vph)	0	0	198	0	0	133	0	38	0	0	0	40
Lane Group Flow (vph)	99	505	72	99	357	49	161	42	0	205	42	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)	5.0	13.8	13.8	5.0	13.8	13.8	16.1	7.9		12.5	4.3	9.3
Effective Green, g (s)	5.4	15.8	15.8	5.4	15.8	15.8	16.5	8.8		12.9	5.2	10.1
Actuated g/C Ratio	0.09	0.27	0.27	0.09	0.27	0.27	0.28	0.15		0.22	0.09	0.17
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0		2.0	2.0	2.0
Lane Grp Cap (vph)	291	1264	393	291	1264	393	459	236		359	152	443
v/s Ratio Prot	c0.03	c0.11		0.03	0.08		0.10	c0.03		c0.12	c0.02	0.00
v/s Ratio Perm			0.05			0.03						0.00
v/c Ratio	0.34	0.40	0.18	0.34	0.28	0.12	0.35	0.18		0.57	0.28	0.02
Uniform Delay, d1	25.1	17.7	16.6	25.1	17.1	16.3	16.9	21.9		20.5	25.1	20.3
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	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.8		1.4	0.4	0.0
Delay (s)	25.3	18.0	16.9	25.3	17.3	16.5	17.1	22.6		21.9	25.5	20.3
Level of Service	C	B	B	C	B	B	B	C		C	C	C
Approach Delay (s)		18.5			18.3			18.9			22.1	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	58.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Cactus Road & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	610	52	78	568	6	18	0	75	6	0	0
Future Volume (vph)	6	610	52	78	568	6	18	0	75	6	0	0
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		
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	0.99		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	4651		1641	4706		1641		1450	1641		
Flt Permitted	0.95	1.00		0.95	1.00		0.95		1.00	0.95		
Satd. Flow (perm)	1641	4651		1641	4706		1641		1450	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)	7	663	57	85	617	7	20	0	82	7	0	0
RTOR Reduction (vph)	0	7	0	0	1	0	0	0	75	0	0	0
Lane Group Flow (vph)	7	713	0	85	623	0	20	0	7	7	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)	0.6	20.6		5.7	25.7		9.2		3.7	0.6		
Effective Green, g (s)	1.0	22.6		6.1	27.7		9.6		4.6	1.0		
Actuated g/C Ratio	0.02	0.45		0.12	0.55		0.19		0.09	0.02		
Clearance Time (s)	4.4	6.0		4.4	6.0		4.4		4.9	4.4		
Vehicle Extension (s)	2.0	4.4		2.0	4.2		2.0		3.2	2.0		
Lane Grp Cap (vph)	32	2089		199	2591		313		132	32		
v/s Ratio Prot	0.00	c0.15		c0.05	0.13		c0.01			c0.00		
v/s Ratio Perm									0.01			
v/c Ratio	0.22	0.34		0.43	0.24		0.06		0.06	0.22		
Uniform Delay, d1	24.3	9.0		20.5	5.9		16.7		20.9	24.3		
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00	1.00		
Incremental Delay, d2	1.3	0.2		0.5	0.1		0.0		0.2	1.3		
Delay (s)	25.5	9.2		21.0	5.9		16.7		21.1	25.5		
Level of Service	C	A		C	A		B		C	C		
Approach Delay (s)		9.3			7.7			20.2			25.5	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	50.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	98	6	2	30	11	0
Future Volume (Veh/h)	98	6	2	30	11	0
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)	107	7	2	33	12	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		3				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	42	18			35	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	42	18			35	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.3	
p0 queue free %	89	99			99	
cM capacity (veh/h)	941	1037			1526	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	114	35	12
Volume Left	107	0	12
Volume Right	7	33	0
cSH	1003	1700	1526
Volume to Capacity	0.11	0.02	0.01
Queue Length 95th (ft)	10	0	1
Control Delay (s)	9.3	0.0	7.4
Lane LOS	A		A
Approach Delay (s)	9.3	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	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	373	298	259	288	362	398
Future Volume (vph)	373	298	259	288	362	398
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	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)	405	324	282	313	393	433
RTOR Reduction (vph)	0	38	0	0	0	329
Lane Group Flow (vph)	405	286	282	313	393	104
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	8	1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	12.5	24.6	15.7	32.6	12.1	12.1
Effective Green, g (s)	14.5	27.2	16.1	34.6	13.4	13.4
Actuated g/C Ratio	0.26	0.49	0.29	0.62	0.24	0.24
Clearance Time (s)	6.0	5.3	4.4	6.0	5.3	5.3
Vehicle Extension (s)	4.4	2.0	2.0	4.3	2.0	2.0
Lane Grp Cap (vph)	1220	817	471	2913	761	351
v/s Ratio Prot	0.09	c0.08	c0.17	0.07	c0.12	
v/s Ratio Perm		0.11				0.07
v/c Ratio	0.33	0.35	0.60	0.11	0.52	0.30
Uniform Delay, d1	16.8	8.9	17.2	4.4	18.5	17.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	1.4	0.0	0.2	0.2
Delay (s)	17.1	9.0	18.5	4.4	18.7	17.6
Level of Service	B	A	B	A	B	B
Approach Delay (s)	13.5			11.1	18.1	
Approach LOS	B			B	B	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	56.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	43.0%	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)	0	0	0	217	0	167	304	484	0	0	521	47
Future Volume (vph)	0	0	0	217	0	167	304	484	0	0	521	47
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	
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			4657	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1395	1395	3183	4715			4657	
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	236	0	182	330	526	0	0	566	51
RTOR Reduction (vph)	0	0	0	0	74	56	0	0	0	0	21	0
Lane Group Flow (vph)	0	0	0	236	30	22	330	526	0	0	596	0
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				11.4	11.4	11.4	5.1	21.9			12.1	
Effective Green, g (s)				12.5	12.5	12.5	5.8	23.0			13.2	
Actuated g/C Ratio				0.29	0.29	0.29	0.13	0.53			0.30	
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)				471	400	400	424	2492			1413	
v/s Ratio Prot					0.02		c0.10	0.11			c0.13	
v/s Ratio Perm				c0.14		0.02						
v/c Ratio				0.50	0.07	0.06	0.78	0.21			0.42	
Uniform Delay, d1				12.9	11.3	11.2	18.2	5.4			12.1	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				0.8	0.1	0.1	8.7	0.0			0.2	
Delay (s)				13.7	11.4	11.3	27.0	5.5			12.3	
Level of Service				B	B	B	C	A			B	
Approach Delay (s)		0.0			12.7			13.8			12.3	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	43.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: Britannia Boulevard & SR-905 EB Ramps

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	181	3	801	0	0	0	0	616	131	28	709	0
Future Volume (vph)	181	3	801	0	0	0	0	616	131	28	709	0
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	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					0.97		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	0.92	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)	197	3	871	0	0	0	0	670	142	30	771	0
RTOR Reduction (vph)	0	0	225	0	0	0	0	32	0	0	0	0
Lane Group Flow (vph)	0	200	646	0	0	0	0	780	0	30	771	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)		15.8	15.8					18.1		1.7	24.5	
Effective Green, g (s)		16.9	16.9					19.2		2.4	25.6	
Actuated g/C Ratio		0.33	0.33					0.38		0.05	0.51	
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)		550	864					1215		151	2390	
v/s Ratio Prot								c0.24		0.01	c0.16	
v/s Ratio Perm		0.12	c0.25									
v/c Ratio		0.36	0.75					0.64		0.20	0.32	
Uniform Delay, d1		12.7	14.9					12.8		23.1	7.3	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.4	3.6					1.2		0.6	0.1	
Delay (s)		13.1	18.5					14.0		23.8	7.4	
Level of Service		B	B					B		C	A	
Approach Delay (s)		17.5			0.0			14.0			8.0	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	50.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
11: Britannia Boulevard & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	14	2	70	15	100	0	525	62	329	827	79
Future Volume (vph)	29	14	2	70	15	100	0	525	62	329	827	79
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
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	0.98			1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.96	1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1697			1659	1449		3222		1641	1727	1468
Flt Permitted	0.95	1.00			0.96	1.00		1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1697			1659	1449		3222		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)	32	15	2	76	16	109	0	571	67	358	899	86
RTOR Reduction (vph)	0	2	0	0	0	95	0	5	0	0	0	26
Lane Group Flow (vph)	32	15	0	0	92	14	0	633	0	358	899	60
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)	4.4	4.4			12.0	12.0		41.0		27.0	72.2	72.2
Effective Green, g (s)	5.7	5.7			13.2	13.2		41.9		27.4	73.3	73.3
Actuated g/C Ratio	0.05	0.05			0.13	0.13		0.40		0.26	0.70	0.70
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)	89	92			210	183		1295		431	1214	1032
v/s Ratio Prot	c0.02	0.01			c0.06			0.20		c0.22	c0.52	
v/s Ratio Perm						0.01						0.04
v/c Ratio	0.36	0.16			0.44	0.08		0.49		0.83	0.74	0.06
Uniform Delay, d1	47.5	47.0			42.1	40.1		23.2		36.2	9.6	4.8
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	0.3			1.8	0.2		0.4		12.2	2.6	0.0
Delay (s)	48.4	47.3			43.9	40.3		23.6		48.5	12.2	4.8
Level of Service	D	D			D	D		C		D	B	A
Approach Delay (s)		48.0			42.0			23.6			21.4	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	68.7%	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)	516	33	3	358	44	4
Future Volume (vph)	516	33	3	358	44	4
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	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)	4673		1641	4715	1641	1450
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4673		1641	4715	1641	1450
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	561	36	3	389	48	4
RTOR Reduction (vph)	5	0	0	0	0	3
Lane Group Flow (vph)	592	0	3	389	48	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)	27.2		0.8	33.7	5.1	5.1
Effective Green, g (s)	30.4		2.5	36.9	7.2	7.2
Actuated g/C Ratio	0.58		0.05	0.71	0.14	0.14
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)	2726		78	3339	226	200
v/s Ratio Prot	c0.13		0.00	c0.08	c0.03	
v/s Ratio Perm						0.00
v/c Ratio	0.22		0.04	0.12	0.21	0.00
Uniform Delay, d1	5.2		23.7	2.4	19.9	19.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		0.1	0.1	0.2	0.0
Delay (s)	5.3		23.7	2.5	20.1	19.4
Level of Service	A		C	A	C	B
Approach Delay (s)	5.3			2.6	20.0	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	5.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	52.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	27.6%	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)	41	473	156	632	404	55	96	74	892	33	61	30
Future Volume (vph)	41	473	156	632	404	55	96	74	892	33	61	30
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	
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	0.86		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	4630		1641	1466		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	4630		1641	1466		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)	45	514	170	687	439	60	104	80	970	36	66	33
RTOR Reduction (vph)	0	0	140	0	14	0	0	260	0	0	13	0
Lane Group Flow (vph)	45	514	30	687	485	0	104	790	0	36	86	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)	6.1	21.6	21.6	28.0	43.5		16.7	65.4		5.1	54.7	
Effective Green, g (s)	6.1	24.3	24.3	28.0	46.2		16.7	66.6		5.1	55.0	
Actuated g/C Ratio	0.04	0.17	0.17	0.20	0.33		0.12	0.48		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)	71	818	250	328	1527		195	697		115	644	
v/s Ratio Prot	0.03	c0.11		c0.42	0.10		c0.06	c0.54		0.01	0.05	
v/s Ratio Perm			0.02									
v/c Ratio	0.63	0.63	0.12	2.09	0.32		0.53	1.13		0.31	0.13	
Uniform Delay, d1	65.9	53.7	48.8	56.0	35.1		58.0	36.7		65.7	27.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.8	3.6	1.0	502.8	0.5		1.4	77.1		0.6	0.2	
Delay (s)	78.6	57.3	49.8	558.8	35.6		59.4	113.8		66.3	27.5	
Level of Service	E	E	D	F	D		E	F		E	C	
Approach Delay (s)		56.9			338.7			108.9			37.8	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	179.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	125.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: La Media Road & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	47	41	8	63	94	0	0	0	269	254	66
Future Volume (vph)	49	47	41	8	63	94	0	0	0	269	254	66
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	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	0.88					0.95	
Frpb, ped/bikes	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	
Frt	1.00	1.00	0.85	1.00	1.00	0.85					0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00					0.98	
Satd. Flow (prot)	3183	3282	1448	3183	3282	2584					3154	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00					0.98	
Satd. Flow (perm)	3183	3282	1448	3183	3282	2584					3154	
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)	53	51	45	9	68	102	0	0	0	292	276	72
RTOR Reduction (vph)	0	0	34	0	0	80	0	0	0	0	19	0
Lane Group Flow (vph)	53	51	11	9	68	22	0	0	0	0	621	0
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA	Perm	Prot	NA	Perm				Perm	NA	
Protected Phases	5	2		1	6						4	
Permitted Phases			2			6				4		
Actuated Green, G (s)	1.2	7.7	7.7	0.6	7.1	7.1					12.0	
Effective Green, g (s)	1.2	7.7	7.7	0.6	7.1	7.1					12.0	
Actuated g/C Ratio	0.04	0.24	0.24	0.02	0.22	0.22					0.37	
Clearance Time (s)	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	
Lane Grp Cap (vph)	118	782	345	59	721	568					1171	
v/s Ratio Prot	c0.02	0.02		0.00	c0.02							
v/s Ratio Perm			0.01			0.01					0.20	
v/c Ratio	0.45	0.07	0.03	0.15	0.09	0.04					0.53	
Uniform Delay, d1	15.2	9.5	9.4	15.6	10.0	9.9					7.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00					1.00	
Incremental Delay, d2	2.7	0.0	0.0	1.2	0.1	0.0					0.5	
Delay (s)	17.9	9.6	9.5	16.8	10.1	9.9					8.4	
Level of Service	B	A	A	B	B	A					A	
Approach Delay (s)		12.5			10.3			0.0			8.4	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	32.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	33.6%	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)	102	69	70	105	91	52
Future Volume (vph)	102	69	70	105	91	52
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	111	75	76	114	99	57

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	186	76	114	156
Volume Left (vph)	0	76	0	99
Volume Right (vph)	75	0	0	57
Hadj (s)	-0.07	0.67	0.17	0.08
Departure Headway (s)	4.6	5.8	5.2	4.9
Degree Utilization, x	0.24	0.12	0.17	0.21
Capacity (veh/h)	757	601	660	693
Control Delay (s)	9.0	8.3	8.1	9.2
Approach Delay (s)	9.0	8.2		9.2
Approach LOS	A	A		A

Intersection Summary			
Delay	8.8		
Level of Service	A		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1: Caliente Avenue & SR-905 WB On-Ramp/SR-905 WB Off-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	105	2	116	308	956	0	0	434	956
Future Volume (vph)	0	0	0	105	2	116	308	956	0	0	434	956
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			4352	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1725	1538	1719	4940			4352	
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	114	2	126	335	1039	0	0	472	1039
RTOR Reduction (vph)	0	0	0	0	0	106	0	0	0	0	388	0
Lane Group Flow (vph)	0	0	0	0	116	20	335	1039	0	0	1123	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)					7.7	7.7	14.5	42.5			23.3	
Effective Green, g (s)					7.7	7.7	14.5	42.5			23.3	
Actuated g/C Ratio					0.13	0.13	0.24	0.70			0.39	
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)					219	196	412	3475			1678	
v/s Ratio Prot							c0.19	0.21			c0.26	
v/s Ratio Perm					0.07	0.01						
v/c Ratio					0.53	0.10	0.81	0.30			1.06dr	
Uniform Delay, d1					24.7	23.3	21.7	3.4			15.4	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					2.3	0.2	11.1	0.0			1.0	
Delay (s)					27.0	23.5	32.7	3.4			16.4	
Level of Service					C	C	C	A			B	
Approach Delay (s)		0.0			25.2			10.6			16.4	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	60.4	Sum of lost time (s)	14.9
Intersection Capacity Utilization	65.6%	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

HCM Signalized Intersection Capacity Analysis
2: Caliente Avenue & SR-905 EB Off-Ramp/SR-905 EB On-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	653	2	303	0	0	0	0	612	91	104	443	0
Future Volume (vph)	653	2	303	0	0	0	0	612	91	104	443	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	0.95	0.95						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	0.90						0.98		1.00	1.00	
Flt Protected	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (prot)	1559	1455						4610		1641	3282	
Flt Permitted	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (perm)	1559	1455						4610		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)	710	2	329	0	0	0	0	665	99	113	482	0
RTOR Reduction (vph)	0	90	0	0	0	0	0	27	0	0	0	0
Lane Group Flow (vph)	540	411	0	0	0	0	0	737	0	113	482	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)	27.3	27.3						17.5		5.3	27.5	
Effective Green, g (s)	27.3	27.3						17.5		5.3	27.5	
Actuated g/C Ratio	0.42	0.42						0.27		0.08	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)	654	611						1241		133	1388	
v/s Ratio Prot								c0.16		c0.07	0.15	
v/s Ratio Perm	c0.35	0.28										
v/c Ratio	0.83	0.67						0.59		0.85	0.35	
Uniform Delay, d1	16.7	15.2						20.7		29.5	12.7	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	8.4	2.9						0.8		35.7	0.2	
Delay (s)	25.1	18.1						21.4		65.1	12.8	
Level of Service	C	B						C		E	B	
Approach Delay (s)		21.8			0.0			21.4			22.8	
Approach LOS		C			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Caliente Avenue & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	181	20	30	0	47	327	15	225	2	142	337	315
Future Volume (vph)	181	20	30	0	47	327	15	225	2	142	337	315
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	
Lane Util. Factor	0.95	0.95			1.00	1.00	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	0.96			1.00	0.85	1.00	1.00		1.00	0.93	
Flt Protected	0.95	0.97			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1633	1606			1810	1447	1713	4709		1641	3068	
Flt Permitted	0.95	0.97			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1633	1606			1810	1447	1713	4709		1641	3068	
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)	197	22	33	0	51	355	16	245	2	154	366	342
RTOR Reduction (vph)	0	20	0	0	0	296	0	2	0	0	206	0
Lane Group Flow (vph)	128	104	0	0	51	59	16	245	0	154	502	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	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	7.6	7.6			8.5	8.5	0.6	12.8		6.5	18.7	
Effective Green, g (s)	7.6	7.6			8.5	8.5	0.6	12.8		6.5	18.7	
Actuated g/C Ratio	0.15	0.15			0.17	0.17	0.01	0.25		0.13	0.36	
Clearance Time (s)	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	
Lane Grp Cap (vph)	241	237			299	239	19	1172		207	1116	
v/s Ratio Prot	c0.08	0.06			0.03		0.01	0.05		c0.09	c0.16	
v/s Ratio Perm						c0.04						
v/c Ratio	0.53	0.44			0.17	0.25	0.84	0.21		0.74	0.45	
Uniform Delay, d1	20.3	20.0			18.4	18.7	25.4	15.3		21.6	12.4	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	1.3			0.3	0.5	131.7	0.1		13.5	0.3	
Delay (s)	22.5	21.2			18.7	19.2	157.1	15.4		35.1	12.7	
Level of Service	C	C			B	B	F	B		D	B	
Approach Delay (s)		21.9			19.1			24.0			16.7	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	51.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
4: Innovative Drive & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	706	2	0	948	58	0	0	1	0	0	100
Future Volume (Veh/h)	0	706	2	0	948	58	0	0	1	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	767	2	0	1030	63	0	0	1	0	0	109
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	1099			769			1220	1867	257	1293	1805	349
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1099			769			1220	1867	257	1293	1805	349
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	82
cM capacity (veh/h)	583			791			105	65	719	111	72	621

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	307	307	155	343	343	343	63	1	109
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	2	0	0	0	63	1	109
cSH	1700	1700	1700	1700	1700	1700	1700	719	621
Volume to Capacity	0.18	0.18	0.09	0.20	0.20	0.20	0.04	0.00	0.18
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	16
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	12.0
Lane LOS								B	B
Approach Delay (s)	0.0			0.0				10.0	12.0
Approach LOS								B	B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
5: Heritage Road & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	473	199	25	589	335	276	57	51	319	51	252
Future Volume (vph)	133	473	199	25	589	335	276	57	51	319	51	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
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	0.93		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	1468	3183	4715	1468	1641	1605		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	1605		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)	145	514	216	27	640	364	300	62	55	347	55	274
RTOR Reduction (vph)	0	0	152	0	0	274	0	31	0	0	0	205
Lane Group Flow (vph)	145	514	64	27	640	90	300	86	0	347	55	69
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)	5.6	25.0	25.0	1.5	20.9	20.9	24.6	12.8		25.8	14.0	19.6
Effective Green, g (s)	5.6	25.0	25.0	1.5	20.9	20.9	24.6	12.8		25.8	14.0	19.6
Actuated g/C Ratio	0.07	0.29	0.29	0.02	0.25	0.25	0.29	0.15		0.30	0.17	0.23
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0		2.0	2.0	2.0
Lane Grp Cap (vph)	210	1390	432	56	1162	361	476	242		499	285	597
v/s Ratio Prot	c0.05	c0.11		0.01	c0.14		0.18	c0.05		c0.21	0.03	0.01
v/s Ratio Perm			0.04			0.06						0.02
v/c Ratio	0.69	0.37	0.15	0.48	0.55	0.25	0.63	0.36		0.70	0.19	0.12
Uniform Delay, d1	38.8	23.7	22.0	41.3	27.9	25.6	26.1	32.3		26.0	30.5	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	7.6	0.3	0.3	2.4	0.8	0.6	2.0	1.9		3.4	0.1	0.0
Delay (s)	46.4	23.9	22.3	43.6	28.7	26.2	28.1	34.2		29.4	30.6	25.8
Level of Service	D	C	C	D	C	C	C	C		C	C	C
Approach Delay (s)		27.2			28.2			29.8			28.1	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	84.8	Sum of lost time (s)	19.7
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Cactus Road & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	801	41	91	916	10	50	2	99	14	5	8
Future Volume (vph)	2	801	41	91	916	10	50	2	99	14	5	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	4.9
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	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
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	4675		1641	4707		1641	1727	1450	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	4675		1641	4707		1641	1727	1450	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)	2	871	45	99	996	11	54	2	108	15	5	9
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	96	0	0	9
Lane Group Flow (vph)	2	912	0	99	1007	0	54	2	12	15	5	0
Confl. Peds. (#/hr)			4			2			1			
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)	0.6	23.3		7.7	30.4		4.6	6.4	6.4	0.6	2.4	2.4
Effective Green, g (s)	0.6	23.3		7.7	30.4		4.6	6.4	6.4	0.6	2.4	2.4
Actuated g/C Ratio	0.01	0.40		0.13	0.53		0.08	0.11	0.11	0.01	0.04	0.04
Clearance Time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	4.9
Vehicle Extension (s)	2.0	4.4		2.0	4.2		2.0	3.2	3.2	2.0	2.0	2.0
Lane Grp Cap (vph)	17	1887		218	2479		130	191	160	17	71	61
v/s Ratio Prot	0.00	c0.20		c0.06	0.21		c0.03	0.00		0.01	0.00	
v/s Ratio Perm									c0.01			0.00
v/c Ratio	0.12	0.48		0.45	0.41		0.42	0.01	0.07	0.88	0.07	0.01
Uniform Delay, d1	28.3	12.7		23.1	8.2		25.3	22.8	23.0	28.5	26.6	26.5
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	1.1	0.3		0.5	0.2		0.8	0.0	0.2	157.0	0.2	0.0
Delay (s)	29.4	13.1		23.6	8.4		26.1	22.9	23.2	185.5	26.7	26.5
Level of Service	C	B		C	A		C	C	C	F	C	C
Approach Delay (s)		13.1			9.7			24.1			108.8	
Approach LOS		B			A			C			F	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	57.7	Sum of lost time (s)	19.7
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	80	4	4	127	6	2
Future Volume (Veh/h)	80	4	4	127	6	2
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)	87	4	4	138	7	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		3				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	89	73			142	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	89	73			142	
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)	888	967			1393	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	91	142	9
Volume Left	87	0	7
Volume Right	4	138	0
cSH	929	1700	1393
Volume to Capacity	0.10	0.08	0.01
Queue Length 95th (ft)	8	0	0
Control Delay (s)	9.5	0.0	5.9
Lane LOS	A		A
Approach Delay (s)	9.5	0.0	5.9
Approach LOS	A		

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	19.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	551	359	610	627	374	326
Future Volume (vph)	551	359	610	627	374	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	5.3	4.4	6.0	5.3	5.3
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)	599	390	663	682	407	354
RTOR Reduction (vph)	0	38	0	0	0	280
Lane Group Flow (vph)	599	352	663	682	407	74
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	8	1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	21.6	43.8	46.1	72.1	22.2	22.2
Effective Green, g (s)	21.6	43.8	46.1	72.1	22.2	22.2
Actuated g/C Ratio	0.20	0.41	0.44	0.68	0.21	0.21
Clearance Time (s)	6.0	5.3	4.4	6.0	5.3	5.3
Vehicle Extension (s)	4.4	2.0	2.0	4.3	2.0	2.0
Lane Grp Cap (vph)	964	682	716	3219	669	308
v/s Ratio Prot	c0.13	0.11	c0.40	0.14	c0.13	
v/s Ratio Perm		0.13				0.05
v/c Ratio	0.62	0.52	0.93	0.21	0.61	0.24
Uniform Delay, d1	38.3	23.0	28.1	6.2	37.8	34.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.3	17.6	0.1	1.1	0.1
Delay (s)	39.8	23.3	45.7	6.3	38.8	34.8
Level of Service	D	C	D	A	D	C
Approach Delay (s)	33.3			25.7	37.0	
Approach LOS	C			C	D	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	105.6	Sum of lost time (s)	15.7
Intersection Capacity Utilization	68.2%	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	0	0	133	1	109	703	580	0	0	564	335
Future Volume (vph)	0	0	0	133	1	109	703	580	0	0	564	335
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			0.94	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1641	1399	1395	3183	4715			4452	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1399	1395	3183	4715			4452	
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	145	1	118	764	630	0	0	613	364
RTOR Reduction (vph)	0	0	0	0	51	51	0	0	0	0	146	0
Lane Group Flow (vph)	0	0	0	145	9	8	764	630	0	0	831	0
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				8.8	8.8	8.8	18.7	43.3			19.9	
Effective Green, g (s)				8.8	8.8	8.8	18.7	43.3			19.9	
Actuated g/C Ratio				0.14	0.14	0.14	0.30	0.70			0.32	
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)				231	197	197	955	3277			1422	
v/s Ratio Prot					0.01		c0.24	0.13			c0.19	
v/s Ratio Perm				c0.09		0.01						
v/c Ratio				0.63	0.05	0.04	0.80	0.19			0.58	
Uniform Delay, d1				25.2	23.1	23.1	20.1	3.3			17.7	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				5.2	0.1	0.1	4.9	0.0			0.6	
Delay (s)				30.5	23.2	23.2	24.9	3.4			18.4	
Level of Service				C	C	C	C	A			B	
Approach Delay (s)		0.0			27.2			15.2			18.4	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	62.3	Sum of lost time (s)	14.9
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: Britannia Boulevard & SR-905 EB Ramps

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	1	409	0	0	0	0	1200	157	152	545	0
Future Volume (vph)	83	1	409	0	0	0	0	1200	157	152	545	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)		1646	2584					3225		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1646	2584					3225		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)	90	1	445	0	0	0	0	1304	171	165	592	0
RTOR Reduction (vph)	0	0	377	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	0	91	68	0	0	0	0	1462	0	165	592	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)		10.1	10.1					36.1		5.4	46.2	
Effective Green, g (s)		10.1	10.1					36.1		5.4	46.2	
Actuated g/C Ratio		0.15	0.15					0.54		0.08	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)		249	392					1750		258	3275	
v/s Ratio Prot								c0.45		c0.05	0.13	
v/s Ratio Perm		0.06	0.03									
v/c Ratio		0.37	0.17					0.84		0.64	0.18	
Uniform Delay, d1		25.3	24.6					12.7		29.6	3.5	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.9	0.2					3.6		5.1	0.0	
Delay (s)		26.2	24.8					16.3		34.7	3.6	
Level of Service		C	C					B		C	A	
Approach Delay (s)		25.0			0.0			16.3			10.4	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	14.9
Intersection Capacity Utilization	59.6%	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)	124	39	4	98	32	332	2	854	96	237	656	82
Future Volume (vph)	124	39	4	98	32	332	2	854	96	237	656	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	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	0.99			1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	1705			1665	1449	1641	3228		1641	1727	1468
Flt Permitted	0.95	1.00			0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1705			1665	1449	1641	3228		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)	135	42	4	107	35	361	2	928	104	258	713	89
RTOR Reduction (vph)	0	3	0	0	0	284	0	5	0	0	0	38
Lane Group Flow (vph)	135	43	0	0	142	77	2	1027	0	258	713	51
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)	13.1	13.1			15.8	15.8	0.7	46.0		21.5	66.6	66.6
Effective Green, g (s)	13.1	13.1			15.8	15.8	0.7	46.0		21.5	66.6	66.6
Actuated g/C Ratio	0.11	0.11			0.14	0.14	0.01	0.40		0.19	0.57	0.57
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)	185	192			226	197	9	1277		303	989	841
v/s Ratio Prot	c0.08	0.03			c0.09		0.00	c0.32		c0.16	0.41	
v/s Ratio Perm						0.05						0.03
v/c Ratio	0.73	0.23			0.63	0.39	0.22	0.80		0.85	0.72	0.06
Uniform Delay, d1	49.8	46.9			47.4	45.8	57.5	31.1		45.8	18.0	11.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	11.5	0.2			5.8	1.6	4.5	3.9		19.3	2.8	0.0
Delay (s)	61.4	47.2			53.2	47.4	62.0	35.0		65.1	20.8	11.0
Level of Service	E	D			D	D	E	D		E	C	B
Approach Delay (s)		57.7			49.0			35.1			30.8	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	37.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	116.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	67.3%	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)	583	69	7	583	74	7
Future Volume (vph)	583	69	7	583	74	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
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)	4641		1641	4715	1641	1450
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4641		1641	4715	1641	1450
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	634	75	8	634	80	8
RTOR Reduction (vph)	11	0	0	0	0	7
Lane Group Flow (vph)	698	0	8	634	80	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)	25.4		0.9	32.0	7.6	7.6
Effective Green, g (s)	25.4		0.9	32.0	7.6	7.6
Actuated g/C Ratio	0.48		0.02	0.60	0.14	0.14
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)	2228		27	2852	235	208
v/s Ratio Prot	c0.15		0.00	c0.13	c0.05	
v/s Ratio Perm						0.00
v/c Ratio	0.31		0.30	0.22	0.34	0.01
Uniform Delay, d1	8.4		25.7	4.8	20.4	19.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3		2.2	0.1	0.3	0.0
Delay (s)	8.7		27.9	4.9	20.7	19.4
Level of Service	A		C	A	C	B
Approach Delay (s)	8.7			5.2	20.6	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	52.9	Sum of lost time (s)	19.0
Intersection Capacity Utilization	34.1%	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)	30	391	291	1128	540	71	155	81	663	35	155	27
Future Volume (vph)	30	391	291	1128	540	71	155	81	663	35	155	27
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	0.87		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	1441	1641	4633		1641	1475		3183	1689	
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	4633		1641	1475		3183	1689	
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)	33	425	316	1226	587	77	168	88	721	38	168	29
RTOR Reduction (vph)	0	0	273	0	13	0	0	189	0	0	4	0
Lane Group Flow (vph)	33	425	43	1226	651	0	168	620	0	38	193	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)	4.6	18.9	18.9	31.6	45.9		18.6	64.4		5.2	51.9	
Effective Green, g (s)	4.6	18.9	18.9	31.6	45.9		18.6	64.4		5.2	51.9	
Actuated g/C Ratio	0.03	0.13	0.13	0.23	0.33		0.13	0.46		0.04	0.37	
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)	53	636	194	370	1518		218	678		118	626	
v/s Ratio Prot	0.02	c0.09		c0.75	0.14		c0.10	c0.42		0.01	0.11	
v/s Ratio Perm			0.03									
v/c Ratio	0.62	0.67	0.22	3.31	0.43		0.77	0.91		0.32	0.31	
Uniform Delay, d1	66.8	57.6	54.0	54.2	36.8		58.6	35.2		65.7	31.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.2	5.5	2.6	1048.0	0.9		14.2	17.0		0.6	0.6	
Delay (s)	82.1	63.1	56.6	1102.2	37.7		72.8	52.2		66.3	31.9	
Level of Service	F	E	E	F	D		E	D		E	C	
Approach Delay (s)		61.2			728.2			55.8			37.5	
Approach LOS		E			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	383.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.51		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	148.7%	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)	114	87	48	13	59	260	0	0	0	220	216	106
Future Volume (vph)	114	87	48	13	59	260	0	0	0	220	216	106
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	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	0.88					0.95	
Frpb, ped/bikes	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	
Frt	1.00	1.00	0.85	1.00	1.00	0.85					0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00					0.98	
Satd. Flow (prot)	3183	3282	1448	3183	3282	2584					3122	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00					0.98	
Satd. Flow (perm)	3183	3282	1448	3183	3282	2584					3122	
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)	124	95	52	14	64	283	0	0	0	239	235	115
RTOR Reduction (vph)	0	0	37	0	0	215	0	0	0	0	41	0
Lane Group Flow (vph)	124	95	15	14	64	68	0	0	0	0	548	0
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA	Perm	Prot	NA	Perm				Perm	NA	
Protected Phases	5	2		1	6						4	
Permitted Phases			2			6				4		
Actuated Green, G (s)	2.5	10.2	10.2	0.6	8.3	8.3					11.9	
Effective Green, g (s)	2.5	10.2	10.2	0.6	8.3	8.3					11.9	
Actuated g/C Ratio	0.07	0.29	0.29	0.02	0.24	0.24					0.34	
Clearance Time (s)	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	
Lane Grp Cap (vph)	229	964	425	55	785	618					1070	
v/s Ratio Prot	c0.04	c0.03		0.00	0.02							
v/s Ratio Perm			0.01			0.03					0.18	
v/c Ratio	0.54	0.10	0.04	0.25	0.08	0.11					0.51	
Uniform Delay, d1	15.5	8.9	8.7	16.8	10.2	10.3					9.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00					1.00	
Incremental Delay, d2	2.6	0.0	0.0	2.4	0.0	0.1					0.4	
Delay (s)	18.1	9.0	8.8	19.3	10.3	10.4					9.5	
Level of Service	B	A	A	B	B	B					A	
Approach Delay (s)		13.1			10.7			0.0			9.5	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	34.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	32.4%	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	131	64	176	85	53
Future Volume (vph)	112	131	64	176	85	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	122	142	70	191	92	58

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	264	70	191	150
Volume Left (vph)	0	70	0	92
Volume Right (vph)	142	0	0	58
Hadj (s)	-0.15	0.67	0.17	0.06
Departure Headway (s)	4.6	5.8	5.3	5.2
Degree Utilization, x	0.34	0.11	0.28	0.22
Capacity (veh/h)	747	594	652	641
Control Delay (s)	9.9	8.4	9.2	9.6
Approach Delay (s)	9.9	9.0		9.6
Approach LOS	A	A		A

Intersection Summary			
Delay	9.5		
Level of Service	A		
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix J
Traffic Signal Warrants

	Intersection	CONDITION A - Minimum Vehicular Volume	CONDITION B - Interruption of Continuous Traffc	Combination of CONDITIONS A+B
Near-Term 2023 + Project				
7	Cactus Road / Airway Road	Yes	No	Yes
Near-Term 2027 + Project				
16	Village Way / Airway Road	No	No	No
17	Cactus Road / Street D	No	No	No
18	Cactus Road / Central Main Street	No	No	No
19	Cactus Road / Street C	No	No	No
Buildout of Otay Mesa Central Village				
16	Village Way / Airway Road	Yes	Yes	Yes
17	Cactus Road / Street D	Yes	Yes	Yes
18	Cactus Road / Central Main Street	Yes	Yes	Yes
19	Cactus Road / Street C	No	Yes	No

TRAFFIC SIGNAL WARRANTS AT NEAR-TERM YEAR 2023 + PROJECT (PHASE 1 - LUMINA)

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

		COUNT DATE	Near-Term 2023 + P
Major St:	Airway Road	# of Lanes:	2 or more
Minor St:	Cactus Road	# of Lanes:	2 or more

Speed limit or critical speed on major street traffic > 64 km/h (40 mph) ….. or **RURAL (R)**

In built up area of isolated community of < 10,000 population…… **URBAN (U)**

Major St ADT (Total):	13000	Roadway Type:	Urban
Minor Street ADT (Highest Direction):	3290		

(Based on Estimated Average Daily Traffic - See Note)

CONDITION A - Minimum Vehicular Volume			Minimum Requirements EADT			
Satisfied	X	Not Satisfied	Vehicles 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			Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied		Not Satisfied X				
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			2 CONDITIONS 80%		2 CONDITIONS 80%	
Satisfied	X	Not Satisfied				
No one condition satisfied, but following conditions fulfilled 80% or More	103% A	90% B				

Note: **To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count**

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

TRAFFIC SIGNAL WARRANTS AT NEAR-TERM YEAR 2027 + PROJECT (FULL BUILDOUT OF LUMINA)

TABLE 13.1
OTAY MESA LUMINA LOS ANALYSIS

Internal Roadway	Segment	Estimated ADT	Recommended Classification	Capacity Threshold LOS E	LOS
Street "D"	from Western terminus to Cactus Road	2,300	2-lane Collector w/ Raised Median & Turn Pocket	<15,000	B
Central Main Street	from Street "A" to Village Way	3,100	2-lane Collector w/ Raised Median & Turn Pocket	<15,000	A
	from Village Way to Cactus Road	3,100	2-lane Collector w/ Raised Median & Turn Pocket	<15,000	C
Street "C"	from Village Way to Cactus Road	3,100	2-lane Collector (multi-family)	<8,000	B
Village Way	from Airway Road to Central Main Street	7,000	2-lane Collector w/ Raised Median & Turn Pocket	<15,000	C
	from Central Main Street to Street "C"	7,000	2-lane Collector (multi-family)	<8,000	B

Source: Chen Ryan Associates; January 2019

As shown in Table 13.1, all of the internal roadways would operate at acceptable LOS C or better at Project buildout.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

		COUNT DATE	Buildout + Project
Major St:	Airway Road	# of Lanes:	2 or more
Minor St:	Village Way	# of Lanes:	1

Speed limit or critical speed on major street traffic > 64 km/h (40 mph) ..... or } **RURAL (R)**

In built up area of isolated community of < 10,000 population..... **URBAN (U)**

Major St ADT (Total):	7020	Roadway Type:	Urban
Minor Street ADT (Highest Direction):	3500		

(Based on Estimated Average Daily Traffic - See Note)

CONDITION A - Minimum Vehicular Volume			Minimum Requirements EADT			
Satisfied	Not Satisfied	X	Vehicles 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			Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied	X				
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			2 CONDITIONS 80%		2 CONDITIONS 80%	
Satisfied	Not Satisfied	X				
No one condition satisfied, but following conditions fulfilled 80% or More	73%	49%				
	A	B				

Note: **To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count**

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	Buildout + Project
Major St:	Cactus Road	# of Lanes:	2 or more
Minor St:	Street D	# of Lanes:	1

Speed limit or critical speed on major street traffic > 64 km/h (40 mph) ..... or **RURAL (R)**

In built up area of isolated community of < 10,000 population..... **URBAN (U)**

Major St ADT (Total):	4420	Roadway Type:	Urban
Minor Street ADT (Highest Direction):	1150		

(Based on Estimated Average Daily Traffic - See Note)

CONDITION A - Minimum Vehicular Volume			Minimum Requirements EADT			
Satisfied	Not Satisfied	X	Vehicles 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			Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied	X				
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			2 CONDITIONS 80%		2 CONDITIONS 80%	
Satisfied	Not Satisfied	X				
No one condition satisfied, but following conditions fulfilled 80% or More	46%	31%				
	A	B				

Note: **To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count**

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	Buildout + Project
Major St:	Cactus Road	# of Lanes:	2 or more
Minor St:	Central Main Street	# of Lanes:	1

Speed limit or critical speed on major street traffic > 64 km/h (40 mph) ..... or **RURAL (R)**

In built up area of isolated community of < 10,000 population..... **URBAN (U)**

Major St ADT (Total):	8320	Roadway Type:	Urban
Minor Street ADT (Highest Direction):	1550		

(Based on Estimated Average Daily Traffic - See Note)

CONDITION A - Minimum Vehicular Volume			Minimum Requirements EADT			
Satisfied	Not Satisfied	X	Vehicles 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			Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied	X				
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			2 CONDITIONS 80%		2 CONDITIONS 80%	
Satisfied	Not Satisfied	X				
No one condition satisfied, but following conditions fulfilled 80% or More	65%	58%				
	A	B				

Note: **To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count**

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	Buildout + Project
Major St:	Cactus Road	# of Lanes:	2 or more
Minor St:	Street C	# of Lanes:	1

Speed limit or critical speed on major street traffic > 64 km/h (40 mph) ..... or **RURAL (R)**

In built up area of isolated community of < 10,000 population..... **URBAN (U)**

Major St ADT (Total):	5200	Roadway Type:	Urban
Minor Street ADT (Highest Direction):	1550		

(Based on Estimated Average Daily Traffic - See Note)

CONDITION A - Minimum Vehicular Volume			Minimum Requirements EADT			
Satisfied	Not Satisfied	X	Vehicles 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			Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied	X				
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			2 CONDITIONS 80%		2 CONDITIONS 80%	
Satisfied	Not Satisfied	X				
No one condition satisfied, but following conditions fulfilled 80% or More	54% A	36% B				

Note: **To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count**

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

TRAFFIC SIGNAL WARRANTS AT BUILDOUT OF 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.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

		COUNT DATE	Buildout + Project
Major St:	Airway Road	# of Lanes:	2 or more
Minor St:	Village Way	# of Lanes:	1

Speed limit or critical speed on major street traffic > 64 km/h (40 mph) ..... or } **RURAL (R)**

In built up area of isolated community of < 10,000 population..... **URBAN (U)**

Major St ADT (Total):	50640	Roadway Type:	Urban
Minor Street ADT (Highest Direction):	4200		

(Based on Estimated Average Daily Traffic - See Note)

CONDITION A - Minimum Vehicular Volume	Minimum Requirements EADT	
Satisfied X Not Satisfied	Vehicles 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	Vehicles Per Day on Major Street (Total of Both Approaches)	Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)
Satisfied 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	175% A	350% B		

Note: **To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count**

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	Buildout + Project
Major St:	Cactus Road	# of Lanes:	2 or more
Minor St:	Street D	# of Lanes:	1

Speed limit or critical speed on major street traffic > 64 km/h (40 mph) ..... or } **RURAL (R)**

In built up area of isolated community of < 10,000 population..... **URBAN (U)**

Major St ADT (Total):	39340	Roadway Type:	Urban
Minor Street ADT (Highest Direction):	2550		

(Based on Estimated Average Daily Traffic - See Note)

CONDITION A - Minimum Vehicular Volume			Minimum Requirements EADT			
Satisfied	X	Not Satisfied	Vehicles 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			Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	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		106% A	213% B			

Note: **To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count**

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	Buildout + Project
Major St:	Cactus Road	# of Lanes:	2 or more
Minor St:	Central Main Street	# of Lanes:	1

Speed limit or critical speed on major street traffic > 64 km/h (40 mph) ..... or **RURAL (R)**

In built up area of isolated community of < 10,000 population..... **URBAN (U)**

Major St ADT (Total):	36310	Roadway Type:	Urban
Minor Street ADT (Highest Direction):	3750		

(Based on Estimated Average Daily Traffic - See Note)

CONDITION A - Minimum Vehicular Volume			Minimum Requirements EADT			
Satisfied	X	Not Satisfied	Vehicles 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			Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	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		156% A	252% B			

Note: **To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count**

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	Buildout + Project
Major St:	Cactus Road	# of Lanes:	2 or more
Minor St:	Street C	# of Lanes:	1

Speed limit or critical speed on major street traffic > 64 km/h (40 mph) ..... or **RURAL (R)**

In built up area of isolated community of < 10,000 population..... **URBAN (U)**

Major St ADT (Total):	36930	Roadway Type:	Urban
Minor Street ADT (Highest Direction):	1450		

(Based on Estimated Average Daily Traffic - See Note)

CONDITION A - Minimum Vehicular Volume			Minimum Requirements EADT			
Satisfied	Not Satisfied	X	Vehicles 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			Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	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			2 CONDITIONS 80%		2 CONDITIONS 80%	
Satisfied	Not Satisfied	X				
No one condition satisfied, but following conditions fulfilled 80% or More	60% A	121% B				

Note: **To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count**

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Appendix K
Peak Hour Intersection LOS
- Near-Term Year 2023 Plus Project (Phase 1) Conditions

HCM Signalized Intersection Capacity Analysis
1: Caliente Avenue & SR-905 WB On-Ramp/SR-905 WB Off-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	72	1	62	261	992	0	0	272	393
Future Volume (vph)	0	0	0	72	1	62	261	992	0	0	272	393
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			0.99	
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.91	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1724	1538	1719	4940			4436	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1724	1538	1719	4940			4436	
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	78	1	67	284	1078	0	0	296	427
RTOR Reduction (vph)	0	0	0	0	0	58	0	0	0	0	307	0
Lane Group Flow (vph)	0	0	0	0	79	9	284	1078	0	0	416	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)					6.1	6.1	12.0	29.6			12.9	
Effective Green, g (s)					6.1	6.1	12.0	29.6			12.9	
Actuated g/C Ratio					0.13	0.13	0.26	0.64			0.28	
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)					229	204	449	3185			1246	
v/s Ratio Prot							c0.17	c0.22			0.09	
v/s Ratio Perm					0.05	0.01						
v/c Ratio					0.34	0.04	0.63	0.34			0.33	
Uniform Delay, d1					18.1	17.4	15.0	3.7			13.1	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					0.9	0.1	2.1	0.1			0.2	
Delay (s)					19.0	17.4	17.1	3.8			13.3	
Level of Service					B	B	B	A			B	
Approach Delay (s)		0.0			18.3			6.6			13.3	
Approach LOS		A			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	45.9	Sum of lost time (s)	14.9
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Caliente Avenue & SR-905 EB Off-Ramp/SR-905 EB On-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	735	1	84	0	0	0	0	518	103	115	230	0
Future Volume (vph)	735	1	84	0	0	0	0	518	103	115	230	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	0.95	0.95						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	0.97						0.98		1.00	1.00	
Flt Protected	0.95	0.96						1.00		0.95	1.00	
Satd. Flow (prot)	1559	1530						4581		1641	3282	
Flt Permitted	0.95	0.96						1.00		0.95	1.00	
Satd. Flow (perm)	1559	1530						4581		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)	799	1	91	0	0	0	0	563	112	125	250	0
RTOR Reduction (vph)	0	13	0	0	0	0	0	46	0	0	0	0
Lane Group Flow (vph)	447	431	0	0	0	0	0	629	0	125	250	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)	21.6	21.6						14.8		5.9	25.4	
Effective Green, g (s)	21.6	21.6						14.8		5.9	25.4	
Actuated g/C Ratio	0.38	0.38						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)	588	577						1185		169	1457	
v/s Ratio Prot								c0.14		c0.08	0.08	
v/s Ratio Perm	c0.29	0.28										
v/c Ratio	0.76	0.75						0.53		0.74	0.17	
Uniform Delay, d1	15.5	15.4						18.2		24.9	9.6	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	5.7	5.2						0.5		13.6	0.1	
Delay (s)	21.3	20.7						18.7		38.5	9.6	
Level of Service	C	C						B		D	A	
Approach Delay (s)		21.0			0.0			18.7			19.2	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	57.2	Sum of lost time (s)	14.9
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Caliente Avenue & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	5	9	1	21	143	31	311	2	42	172	129
Future Volume (vph)	178	5	9	1	21	143	31	311	2	42	172	129
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	
Lane Util. Factor	0.95	0.95		0.97	1.00	1.00	1.00	0.91		1.00	0.95	
Frpb, ped/bikes	1.00	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	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00		1.00	0.94	
Flt Protected	0.95	0.96		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1633	1625		3183	1810	1447	1641	4934		1641	3095	
Flt Permitted	0.95	0.96		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1633	1625		3183	1810	1447	1641	4934		1641	3095	
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	5	10	1	23	155	34	338	2	46	187	140
RTOR Reduction (vph)	0	6	0	0	0	136	0	1	0	0	96	0
Lane Group Flow (vph)	104	98	0	1	23	19	34	339	0	46	231	0
Confl. Peds. (#/hr)	1					1	6		1	1		6
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	10%	5%	10%	10%	5%	10%	10%	10%	5%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	6.7	6.7		5.3	5.3	5.3	1.5	13.4		1.8	13.7	
Effective Green, g (s)	6.7	6.7		5.3	5.3	5.3	1.5	13.4		1.8	13.7	
Actuated g/C Ratio	0.16	0.16		0.12	0.12	0.12	0.03	0.31		0.04	0.32	
Clearance Time (s)	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	
Lane Grp Cap (vph)	253	252		390	222	177	56	1530		68	981	
v/s Ratio Prot	c0.06	0.06		0.00	0.01		0.02	0.07		c0.03	c0.07	
v/s Ratio Perm						c0.01						
v/c Ratio	0.41	0.39		0.00	0.10	0.11	0.61	0.22		0.68	0.24	
Uniform Delay, d1	16.5	16.4		16.6	16.8	16.8	20.6	11.0		20.4	10.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	1.0		0.0	0.2	0.3	17.2	0.1		23.5	0.1	
Delay (s)	17.6	17.4		16.6	17.0	17.1	37.8	11.1		43.9	11.0	
Level of Service	B	B		B	B	B	D	B		D	B	
Approach Delay (s)		17.5			17.1			13.5			15.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	43.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
4: Innovative Drive & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	696	1	0	441	48	0	0	1	0	0	37
Future Volume (Veh/h)	0	696	1	0	441	48	0	0	1	0	0	37
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	757	1	0	479	52	0	0	1	0	0	40
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	537			758			957	1294	253	738	1243	166
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	537			758			957	1294	253	738	1243	166
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)	969			799			190	150	723	289	162	821

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	303	303	152	160	160	160	52	1	40
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	1	0	0	0	52	1	40
cSH	1700	1700	1700	1700	1700	1700	1700	723	821
Volume to Capacity	0.18	0.18	0.09	0.09	0.09	0.09	0.03	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	10.0	9.6
Lane LOS								A	A
Approach Delay (s)	0.0			0.0				10.0	9.6
Approach LOS								A	A

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	23.5%	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 (vph)	91	482	248	106	372	167	148	32	47	189	39	44
Future Volume (vph)	91	482	248	106	372	167	148	32	47	189	39	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
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	0.91		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	1468	3183	4715	1468	1641	1574		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	1574		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)	99	524	270	115	404	182	161	35	51	205	42	48
RTOR Reduction (vph)	0	0	205	0	0	133	0	44	0	0	0	40
Lane Group Flow (vph)	99	524	65	115	404	49	161	42	0	205	42	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)	5.2	15.2	15.2	7.0	17.0	17.0	16.4	8.2		12.9	4.7	9.9
Effective Green, g (s)	5.2	15.2	15.2	7.0	17.0	17.0	16.4	8.2		12.9	4.7	9.9
Actuated g/C Ratio	0.08	0.24	0.24	0.11	0.27	0.27	0.26	0.13		0.20	0.07	0.16
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0		2.0	2.0	2.0
Lane Grp Cap (vph)	262	1137	354	353	1272	396	427	204		336	128	406
v/s Ratio Prot	0.03	c0.11		c0.04	0.09		0.10	c0.03		c0.12	c0.02	0.00
v/s Ratio Perm			0.04			0.03						0.00
v/c Ratio	0.38	0.46	0.18	0.33	0.32	0.12	0.38	0.20		0.61	0.33	0.02
Uniform Delay, d1	27.4	20.4	19.0	25.8	18.4	17.4	19.1	24.5		22.8	27.7	22.4
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	0.3	0.5	0.4	0.2	0.2	0.2	0.2	1.0		2.3	0.5	0.0
Delay (s)	27.7	20.9	19.4	26.0	18.6	17.6	19.3	25.5		25.1	28.2	22.5
Level of Service	C	C	B	C	B	B	B	C		C	C	C
Approach Delay (s)		21.2			19.6			21.5			25.1	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	63.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	42.5%	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)	6	632	52	102	627	25	18	0	84	13	0	0
Future Volume (vph)	6	632	52	102	627	25	18	0	84	13	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0		4.4	6.0		4.4		4.9	4.4		
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	0.99		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	4653		1641	4684		1641		1450	1641		
Flt Permitted	0.95	1.00		0.95	1.00		0.95		1.00	0.95		
Satd. Flow (perm)	1641	4653		1641	4684		1641		1450	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)	7	687	57	111	682	27	20	0	91	14	0	0
RTOR Reduction (vph)	0	7	0	0	3	0	0	0	82	0	0	0
Lane Group Flow (vph)	7	737	0	111	706	0	20	0	9	14	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)	0.7	20.6		8.2	28.1		11.2		5.6	0.7		
Effective Green, g (s)	0.7	20.6		8.2	28.1		11.2		5.6	0.7		
Actuated g/C Ratio	0.01	0.38		0.15	0.51		0.20		0.10	0.01		
Clearance Time (s)	4.4	6.0		4.4	6.0		4.4		4.9	4.4		
Vehicle Extension (s)	2.0	4.4		2.0	4.2		2.0		3.2	2.0		
Lane Grp Cap (vph)	20	1749		245	2401		335		148	20		
v/s Ratio Prot	0.00	c0.16		c0.07	0.15		c0.01			c0.01		
v/s Ratio Perm									0.01			
v/c Ratio	0.35	0.42		0.45	0.29		0.06		0.06	0.70		
Uniform Delay, d1	26.8	12.7		21.3	7.7		17.6		22.2	26.9		
Progression Factor	1.00	1.00		1.00	1.00		1.00		1.00	1.00		
Incremental Delay, d2	3.8	0.3		0.5	0.1		0.0		0.2	61.0		
Delay (s)	30.7	13.0		21.7	7.8		17.6		22.4	88.0		
Level of Service	C	B		C	A		B		C	F		
Approach Delay (s)		13.1			9.7			21.6			88.0	
Approach LOS		B			A			C			F	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	54.8	Sum of lost time (s)	19.7
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Cactus Road & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	204	10	184	74	36	9	2	169	89	0	10
Future Volume (vph)	10	204	10	184	74	36	9	2	169	89	0	10
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
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	1.00		0.97		1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.85		1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1770	3539	1583	3433	3365		3433	1586		3433		1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	1770	3539	1583	3433	3365		3433	1586		3433		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	222	11	200	80	39	10	2	184	97	0	11
RTOR Reduction (vph)	0	0	8	0	26	0	0	147	0	0	0	8
Lane Group Flow (vph)	11	222	3	200	93	0	10	39	0	97	0	3
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot		Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2									8
Actuated Green, G (s)	0.7	11.6	11.6	5.5	16.4		0.7	10.0		4.0		13.3
Effective Green, g (s)	0.7	11.6	11.6	5.5	16.4		0.7	10.0		4.0		13.3
Actuated g/C Ratio	0.01	0.24	0.24	0.11	0.33		0.01	0.20		0.08		0.27
Clearance Time (s)	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
Lane Grp Cap (vph)	25	836	373	384	1123		48	323		279		428
v/s Ratio Prot	0.01	c0.06		c0.06	0.03		0.00	c0.02		c0.03		
v/s Ratio Perm			0.00									c0.00
v/c Ratio	0.44	0.27	0.01	0.52	0.08		0.21	0.12		0.35		0.01
Uniform Delay, d1	24.0	15.3	14.3	20.6	11.2		23.9	16.0		21.3		13.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2	11.9	0.2	0.0	1.3	0.0		2.2	0.2		0.8		0.0
Delay (s)	35.9	15.4	14.4	21.8	11.2		26.1	16.1		22.1		13.1
Level of Service	D	B	B	C	B		C	B		C		B
Approach Delay (s)		16.3			17.9			16.6			21.2	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	49.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	39.8%	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)	373	337	283	288	465	461
Future Volume (vph)	373	337	283	288	465	461
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	5.3	4.4	6.0	5.3	5.3
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)	405	366	308	313	505	501
RTOR Reduction (vph)	0	27	0	0	0	350
Lane Group Flow (vph)	405	339	308	313	505	151
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	8	1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	12.9	27.9	15.8	33.1	15.0	15.0
Effective Green, g (s)	12.9	27.9	15.8	33.1	15.0	15.0
Actuated g/C Ratio	0.22	0.47	0.27	0.56	0.25	0.25
Clearance Time (s)	6.0	5.3	4.4	6.0	5.3	5.3
Vehicle Extension (s)	4.4	2.0	2.0	4.3	2.0	2.0
Lane Grp Cap (vph)	1023	820	436	2627	803	370
v/s Ratio Prot	0.09	c0.10	c0.19	0.07	c0.16	
v/s Ratio Perm		0.13				0.10
v/c Ratio	0.40	0.41	0.71	0.12	0.63	0.41
Uniform Delay, d1	19.9	10.4	19.7	6.2	19.7	18.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	4.2	0.0	1.1	0.3
Delay (s)	20.3	10.5	23.9	6.3	20.8	18.8
Level of Service	C	B	C	A	C	B
Approach Delay (s)	15.7			15.0	19.8	
Approach LOS	B			B	B	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	15.7
Intersection Capacity Utilization	50.4%	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)	0	0	0	219	0	167	459	650	0	0	584	47
Future Volume (vph)	0	0	0	219	0	167	459	650	0	0	584	47
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			4663	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1395	1395	3183	4715			4663	
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	238	0	182	499	707	0	0	635	51
RTOR Reduction (vph)	0	0	0	0	69	69	0	0	0	0	17	0
Lane Group Flow (vph)	0	0	0	238	22	22	499	707	0	0	669	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)				12.3	12.3	12.3	9.9	28.8			14.2	
Effective Green, g (s)				12.3	12.3	12.3	9.9	28.8			14.2	
Actuated g/C Ratio				0.24	0.24	0.24	0.19	0.56			0.28	
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)				393	334	334	614	2647			1290	
v/s Ratio Prot					0.02		c0.16	0.15			c0.14	
v/s Ratio Perm				c0.15		0.02						
v/c Ratio				0.61	0.07	0.07	0.81	0.27			0.52	
Uniform Delay, d1				17.3	15.1	15.1	19.8	5.8			15.7	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				2.6	0.1	0.1	8.1	0.1			0.4	
Delay (s)				20.0	15.1	15.1	27.9	5.9			16.0	
Level of Service				B	B	B	C	A			B	
Approach Delay (s)		0.0			17.9			15.0			16.0	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	51.3	Sum of lost time (s)	14.9
Intersection Capacity Utilization	57.0%	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)	181	3	861	0	0	0	0	937	136	28	774	0
Future Volume (vph)	181	3	861	0	0	0	0	937	136	28	774	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)		1646	2584					3219		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1646	2584					3219		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)	197	3	936	0	0	0	0	1018	148	30	841	0
RTOR Reduction (vph)	0	0	234	0	0	0	0	15	0	0	0	0
Lane Group Flow (vph)	0	200	702	0	0	0	0	1151	0	30	841	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)		18.4	18.4					27.7		2.3	34.7	
Effective Green, g (s)		18.4	18.4					27.7		2.3	34.7	
Actuated g/C Ratio		0.29	0.29					0.44		0.04	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)		478	751					1408		115	2584	
v/s Ratio Prot								c0.36		0.01	c0.18	
v/s Ratio Perm		0.12	c0.27									
v/c Ratio		0.42	0.93					0.82		0.26	0.33	
Uniform Delay, d1		18.1	21.9					15.6		29.7	7.9	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.6	18.6					3.8		1.2	0.1	
Delay (s)		18.7	40.5					19.4		30.9	7.9	
Level of Service		B	D					B		C	A	
Approach Delay (s)		36.7			0.0			19.4			8.7	
Approach LOS		D			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	14.9
Intersection Capacity Utilization	57.0%	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)	355	121	21	70	56	100	7	525	62	329	827	204
Future Volume (vph)	355	121	21	70	56	100	7	525	62	329	827	204
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	0.98			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	1689			1681	1449	1641	3222		1641	1727	1468
Flt Permitted	0.95	1.00			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1689			1681	1449	1641	3222		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)	386	132	23	76	61	109	8	571	67	358	899	222
RTOR Reduction (vph)	0	4	0	0	0	95	0	6	0	0	0	58
Lane Group Flow (vph)	386	151	0	0	137	14	8	632	0	358	899	164
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)	27.8	27.8			16.1	16.1	0.7	33.4		30.1	62.6	62.6
Effective Green, g (s)	27.8	27.8			16.1	16.1	0.7	33.4		30.1	62.6	62.6
Actuated g/C Ratio	0.22	0.22			0.13	0.13	0.01	0.26		0.24	0.49	0.49
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)	358	369			212	183	9	846		388	849	722
v/s Ratio Prot	c0.24	0.09			c0.08		0.00	0.20		c0.22	c0.52	
v/s Ratio Perm						0.01						0.11
v/c Ratio	1.08	0.41			0.65	0.08	0.89	0.75		0.92	1.06	0.23
Uniform Delay, d1	49.7	42.7			52.8	49.0	63.2	43.0		47.4	32.3	18.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	70.0	0.3			7.1	0.2	226.7	3.8		26.8	47.7	0.2
Delay (s)	119.7	42.9			59.9	49.2	289.9	46.8		74.2	80.0	18.7
Level of Service	F	D			E	D	F	D		E	E	B
Approach Delay (s)		97.7			55.2			49.9			69.4	
Approach LOS		F			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	69.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	127.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	90.7%	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)	545	48	3	369	50	4
Future Volume (vph)	545	48	3	369	50	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)	4658		1641	4715	1641	1450
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4658		1641	4715	1641	1450
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	592	52	3	401	54	4
RTOR Reduction (vph)	7	0	0	0	0	4
Lane Group Flow (vph)	637	0	3	401	54	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)	27.2		0.8	33.7	5.1	5.1
Effective Green, g (s)	27.2		0.8	33.7	5.1	5.1
Actuated g/C Ratio	0.52		0.02	0.65	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)	2431		25	3049	160	141
v/s Ratio Prot	c0.14		0.00	c0.09	c0.03	
v/s Ratio Perm						0.00
v/c Ratio	0.26		0.12	0.13	0.34	0.00
Uniform Delay, d1	6.9		25.3	3.6	21.9	21.2
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		0.8	0.1	0.5	0.0
Delay (s)	7.1		26.1	3.6	22.4	21.2
Level of Service	A		C	A	C	C
Approach Delay (s)	7.1			3.8	22.3	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	52.1	Sum of lost time (s)	19.0
Intersection Capacity Utilization	32.9%	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)	51	492	156	632	411	55	96	74	892	33	61	34
Future Volume (vph)	51	492	156	632	411	55	96	74	892	33	61	34
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	0.86		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	4632		1641	1466		3183	1634	
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	4632		1641	1466		3183	1634	
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)	55	535	170	687	447	60	104	80	970	36	66	37
RTOR Reduction (vph)	0	0	143	0	14	0	0	269	0	0	14	0
Lane Group Flow (vph)	55	535	27	687	493	0	104	781	0	36	89	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)	6.3	22.1	22.1	29.0	44.8		15.4	63.9		5.1	54.5	
Effective Green, g (s)	6.3	22.1	22.1	29.0	44.8		15.4	63.9		5.1	54.5	
Actuated g/C Ratio	0.04	0.16	0.16	0.21	0.32		0.11	0.46		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)	73	744	227	339	1482		180	669		115	636	
v/s Ratio Prot	0.03	c0.11		c0.42	0.11		c0.06	c0.53		0.01	0.05	
v/s Ratio Perm			0.02									
v/c Ratio	0.75	0.72	0.12	2.03	0.33		0.58	1.17		0.31	0.14	
Uniform Delay, d1	66.1	56.0	50.6	55.5	36.2		59.2	38.0		65.7	27.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	31.7	5.9	1.1	472.2	0.6		2.8	91.2		0.6	0.2	
Delay (s)	97.7	61.9	51.6	527.7	36.8		62.0	129.2		66.3	27.8	
Level of Service	F	E	D	F	D		E	F		E	C	
Approach Delay (s)		62.2			319.3			123.2			37.8	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	177.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	128.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: La Media Road & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	105	56	8	85	94	0	0	0	269	254	66
Future Volume (vph)	49	105	56	8	85	94	0	0	0	269	254	66
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	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	0.88					0.95	
Frpb, ped/bikes	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	
Frt	1.00	1.00	0.85	1.00	1.00	0.85					0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00					0.98	
Satd. Flow (prot)	3183	3282	1448	3183	3282	2584					3154	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00					0.98	
Satd. Flow (perm)	3183	3282	1448	3183	3282	2584					3154	
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)	53	114	61	9	92	102	0	0	0	292	276	72
RTOR Reduction (vph)	0	0	46	0	0	79	0	0	0	0	19	0
Lane Group Flow (vph)	53	114	15	9	92	23	0	0	0	0	621	0
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA	Perm	Prot	NA	Perm				Perm	NA	
Protected Phases	5	2		1	6						4	
Permitted Phases			2			6				4		
Actuated Green, G (s)	1.2	8.1	8.1	0.6	7.5	7.5					12.1	
Effective Green, g (s)	1.2	8.1	8.1	0.6	7.5	7.5					12.1	
Actuated g/C Ratio	0.04	0.25	0.25	0.02	0.23	0.23					0.37	
Clearance Time (s)	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	
Lane Grp Cap (vph)	116	810	357	58	750	590					1163	
v/s Ratio Prot	c0.02	c0.03		0.00	0.03							
v/s Ratio Perm			0.01			0.01					0.20	
v/c Ratio	0.46	0.14	0.04	0.16	0.12	0.04					0.53	
Uniform Delay, d1	15.5	9.6	9.4	15.9	10.0	9.8					8.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00					1.00	
Incremental Delay, d2	2.8	0.1	0.0	1.2	0.1	0.0					0.5	
Delay (s)	18.3	9.7	9.4	17.1	10.1	9.9					8.6	
Level of Service	B	A	A	B	B	A					A	
Approach Delay (s)		11.6			10.3			0.0			8.6	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	32.8	Sum of lost time (s)	12.0
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)	107	98	70	158	102	52
Future Volume (vph)	107	98	70	158	102	52
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	116	107	76	172	111	57

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	223	76	172	168
Volume Left (vph)	0	76	0	111
Volume Right (vph)	107	0	0	57
Hadj (s)	-0.12	0.67	0.17	0.10
Departure Headway (s)	4.7	5.8	5.3	5.1
Degree Utilization, x	0.29	0.12	0.26	0.24
Capacity (veh/h)	733	591	649	656
Control Delay (s)	9.6	8.5	9.0	9.7
Approach Delay (s)	9.6	8.8		9.7
Approach LOS	A	A		A

Intersection Summary			
Delay	9.3		
Level of Service	A		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	83	0	0	214
Future Volume (vph)	0	0	83	0	0	214
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	90	0	0	233

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	0	90	0	233
Volume Left (vph)	0	90	0	0
Volume Right (vph)	0	0	0	233
Hadj (s)	0.00	0.53	0.00	-0.57
Departure Headway (s)	4.6	5.5	5.0	3.6
Degree Utilization, x	0.00	0.14	0.00	0.23
Capacity (veh/h)	753	623	711	972
Control Delay (s)	7.6	8.2	6.8	7.7
Approach Delay (s)	0.0	8.2		7.7
Approach LOS	A	A		A

Intersection Summary			
Delay	7.8		
Level of Service	A		
Intersection Capacity Utilization	24.5%	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)	0	78	30	65	28	0
Future Volume (vph)	0	78	30	65	28	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	85	33	71	30	0

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	85	33	71	30
Volume Left (vph)	0	33	0	0
Volume Right (vph)	85	0	0	0
Hadj (s)	-0.57	0.53	0.03	0.03
Departure Headway (s)	3.7	5.2	4.7	4.3
Degree Utilization, x	0.09	0.05	0.09	0.04
Capacity (veh/h)	950	670	740	812
Control Delay (s)	7.0	7.3	7.0	7.5
Approach Delay (s)	7.0	7.1		7.5
Approach LOS	A	A		A

Intersection Summary			
Delay	7.1		
Level of Service	A		
Intersection Capacity Utilization	19.8%	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)	194	0	0	127	168	74
Future Volume (vph)	194	0	0	127	168	74
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	211	0	0	138	183	80

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	211	0	138	122	141
Volume Left (vph)	211	0	0	0	0
Volume Right (vph)	0	0	0	0	80
Hadj (s)	0.23	0.00	0.03	0.03	-0.36
Departure Headway (s)	5.1	5.4	5.4	5.3	4.9
Degree Utilization, x	0.30	0.00	0.21	0.18	0.19
Capacity (veh/h)	664	646	633	651	706
Control Delay (s)	10.3	7.2	8.6	8.2	7.8
Approach Delay (s)	10.3	8.6		8.0	
Approach LOS	B	A		A	

Intersection Summary			
Delay	8.9		
Level of Service	A		
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1: Caliente Avenue & SR-905 WB On-Ramp/SR-905 WB Off-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	133	2	116	308	956	0	0	434	956
Future Volume (vph)	0	0	0	133	2	116	308	956	0	0	434	956
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)					1724	1538	1719	4940			4320	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1724	1538	1719	4940			4320	
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	145	2	126	335	1039	0	0	472	1039
RTOR Reduction (vph)	0	0	0	0	0	101	0	0	0	0	397	0
Lane Group Flow (vph)	0	0	0	0	147	25	335	1039	0	0	1114	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)					10.8	10.8	14.1	42.3			23.5	
Effective Green, g (s)					10.8	10.8	14.1	42.3			23.5	
Actuated g/C Ratio					0.17	0.17	0.22	0.67			0.37	
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)					294	262	382	3301			1603	
v/s Ratio Prot							c0.19	0.21			c0.26	
v/s Ratio Perm					0.09	0.02						
v/c Ratio					0.50	0.09	0.88	0.31			1.08dr	
Uniform Delay, d1					23.8	22.1	23.8	4.4			16.9	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					1.3	0.2	19.1	0.1			1.3	
Delay (s)					25.1	22.3	42.9	4.5			18.2	
Level of Service					C	C	D	A			B	
Approach Delay (s)		0.0			23.8			13.8			18.2	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	14.9
Intersection Capacity Utilization	67.5%	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)	653	2	303	0	0	0	0	612	136	104	471	0
Future Volume (vph)	653	2	303	0	0	0	0	612	136	104	471	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	0.95	0.95						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	0.90						0.97		1.00	1.00	
Flt Protected	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (prot)	1559	1455						4564		1641	3282	
Flt Permitted	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (perm)	1559	1455						4564		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)	710	2	329	0	0	0	0	665	148	113	512	0
RTOR Reduction (vph)	0	90	0	0	0	0	0	49	0	0	0	0
Lane Group Flow (vph)	540	411	0	0	0	0	0	764	0	113	512	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)	27.4	27.4						18.2		5.9	28.8	
Effective Green, g (s)	27.4	27.4						18.2		5.9	28.8	
Actuated g/C Ratio	0.41	0.41						0.27		0.09	0.43	
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)	643	600						1250		145	1423	
v/s Ratio Prot								c0.17		c0.07	0.16	
v/s Ratio Perm	c0.35	0.28										
v/c Ratio	0.84	0.69						0.61		0.78	0.36	
Uniform Delay, d1	17.5	16.0						21.0		29.6	12.6	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	9.4	3.2						0.9		21.0	0.2	
Delay (s)	27.0	19.2						21.9		50.6	12.8	
Level of Service	C	B						C		D	B	
Approach Delay (s)		23.2			0.0			21.9			19.6	
Approach LOS		C			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	66.4	Sum of lost time (s)	14.9
Intersection Capacity Utilization	67.5%	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)	207	20	30	0	47	327	15	244	2	142	349	331
Future Volume (vph)	207	20	30	0	47	327	15	244	2	142	349	331
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	
Lane Util. Factor	0.95	0.95			1.00	1.00	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	0.96			1.00	0.85	1.00	1.00		1.00	0.93	
Flt Protected	0.95	0.97			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1633	1609			1810	1449	1639	4932		1641	3076	
Flt Permitted	0.95	0.97			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1633	1609			1810	1449	1639	4932		1641	3076	
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)	225	22	33	0	51	355	16	265	2	154	379	360
RTOR Reduction (vph)	0	18	0	0	0	297	0	1	0	0	212	0
Lane Group Flow (vph)	142	120	0	0	51	58	16	266	0	154	527	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	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	8.0	8.0			8.5	8.5	0.5	12.8		6.5	18.8	
Effective Green, g (s)	8.0	8.0			8.5	8.5	0.5	12.8		6.5	18.8	
Actuated g/C Ratio	0.15	0.15			0.16	0.16	0.01	0.25		0.13	0.36	
Clearance Time (s)	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	
Lane Grp Cap (vph)	252	248			297	237	15	1218		205	1116	
v/s Ratio Prot	c0.09	0.07			0.03		0.01	0.05		c0.09	c0.17	
v/s Ratio Perm						c0.04						
v/c Ratio	0.56	0.48			0.17	0.25	1.07	0.22		0.75	0.47	
Uniform Delay, d1	20.3	20.0			18.6	18.9	25.6	15.5		21.9	12.7	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.9	1.5			0.3	0.5	255.5	0.1		14.3	0.3	
Delay (s)	23.2	21.5			18.9	19.4	281.1	15.6		36.2	13.0	
Level of Service	C	C			B	B	F	B		D	B	
Approach Delay (s)		22.3			19.3			30.6			17.0	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	51.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
4: Innovative Drive & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	751	2	0	976	66	0	0	1	0	0	113
Future Volume (Veh/h)	0	751	2	0	976	66	0	0	1	0	0	113
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	816	2	0	1061	72	0	0	1	0	0	123
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	1134			818			1295	1951	273	1335	1880	356
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1134			818			1295	1951	273	1335	1880	356
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)	567			756			89	58	701	104	64	617

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	326	326	165	354	354	354	72	1	123
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	2	0	0	0	72	1	123
cSH	1700	1700	1700	1700	1700	1700	1700	701	617
Volume to Capacity	0.19	0.19	0.10	0.21	0.21	0.21	0.04	0.00	0.20
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	18
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.1	12.3
Lane LOS								B	B
Approach Delay (s)	0.0			0.0				10.1	12.3
Approach LOS								B	B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	531	199	37	625	335	276	57	70	319	51	252
Future Volume (vph)	133	531	199	37	625	335	276	57	70	319	51	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
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	0.92		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	1415	3183	4715	1422	1641	1567		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	1415	3183	4715	1422	1641	1567		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)	145	577	216	40	679	364	300	62	76	347	55	274
RTOR Reduction (vph)	0	0	157	0	0	275	0	42	0	0	0	195
Lane Group Flow (vph)	145	577	59	40	679	89	300	96	0	347	55	79
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)	5.6	23.5	23.5	3.0	20.9	20.9	24.9	13.4		25.8	14.3	19.9
Effective Green, g (s)	5.6	23.5	23.5	3.0	20.9	20.9	24.9	13.4		25.8	14.3	19.9
Actuated g/C Ratio	0.07	0.28	0.28	0.04	0.24	0.24	0.29	0.16		0.30	0.17	0.23
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0		2.0	2.0	2.0
Lane Grp Cap (vph)	208	1297	389	111	1153	348	478	245		495	289	602
v/s Ratio Prot	c0.05	c0.12		0.01	c0.14		0.18	c0.06		c0.21	0.03	0.01
v/s Ratio Perm			0.04			0.06						0.02
v/c Ratio	0.70	0.44	0.15	0.36	0.59	0.26	0.63	0.39		0.70	0.19	0.13
Uniform Delay, d1	39.1	25.6	23.4	40.3	28.5	26.0	26.2	32.3		26.4	30.6	25.9
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	7.9	0.4	0.3	0.7	1.0	0.6	1.9	2.2		3.7	0.1	0.0
Delay (s)	47.0	25.9	23.7	41.0	29.5	26.6	28.1	34.5		30.0	30.7	25.9
Level of Service	D	C	C	D	C	C	C	C		C	C	C
Approach Delay (s)		28.7			29.0			30.1			28.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	85.4	Sum of lost time (s)	19.7
Intersection Capacity Utilization	63.9%	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												
Traffic Volume (vph)	2	878	41	111	964	26	50	2	131	40	5	8
Future Volume (vph)	2	878	41	111	964	26	50	2	131	40	5	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	4.9
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	4678		1641	4694		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	4678		1641	4694		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)	2	954	45	121	1048	28	54	2	142	43	5	9
RTOR Reduction (vph)	0	4	0	0	2	0	0	0	124	0	0	9
Lane Group Flow (vph)	2	995	0	121	1074	0	54	2	18	43	5	0
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)	0.7	23.3		8.3	30.9		7.9	8.1	8.1	3.2	3.4	3.4
Effective Green, g (s)	0.7	23.3		8.3	30.9		7.9	8.1	8.1	3.2	3.4	3.4
Actuated g/C Ratio	0.01	0.37		0.13	0.49		0.13	0.13	0.13	0.05	0.05	0.05
Clearance Time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	4.9
Vehicle Extension (s)	2.0	4.4		2.0	4.2		2.0	3.2	3.2	2.0	2.0	2.0
Lane Grp Cap (vph)	18	1741		217	2317		207	223	189	83	93	79
v/s Ratio Prot	0.00	c0.21		c0.07	0.23		c0.03	0.00		c0.03	0.00	
v/s Ratio Perm									c0.01			0.00
v/c Ratio	0.11	0.57		0.56	0.46		0.26	0.01	0.10	0.52	0.05	0.01
Uniform Delay, d1	30.6	15.7		25.4	10.4		24.7	23.8	24.0	28.9	28.1	28.0
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	1.0	0.6		1.8	0.2		0.2	0.0	0.2	2.3	0.1	0.0
Delay (s)	31.6	16.3		27.2	10.6		25.0	23.8	24.3	31.2	28.2	28.0
Level of Service	C	B		C	B		C	C	C	C	C	C
Approach Delay (s)		16.3			12.3			24.5			30.4	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	62.6	Sum of lost time (s)	19.7
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												
Traffic Volume (vph)	10	158	20	338	253	107	32	4	252	64	2	10
Future Volume (vph)	10	158	20	338	253	107	32	4	252	64	2	10
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
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	1.00		0.97	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	1.00	0.85	1.00	0.96		1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	3282	1468	3183	3136		3183	1472		3183	1727	1468
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	3282	1468	3183	3136		3183	1472		3183	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)	11	172	22	367	275	116	35	4	274	70	2	11
RTOR Reduction (vph)	0	0	16	0	43	0	0	223	0	0	0	9
Lane Group Flow (vph)	11	172	6	367	348	0	35	55	0	70	2	2
Confl. Peds. (#/hr)				1						1		
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2									8
Actuated Green, G (s)	0.6	12.1	12.1	5.7	17.2		0.6	8.6		2.1	10.1	10.1
Effective Green, g (s)	0.6	12.1	12.1	5.7	17.2		0.6	8.6		2.1	10.1	10.1
Actuated g/C Ratio	0.01	0.26	0.26	0.12	0.37		0.01	0.18		0.05	0.22	0.22
Clearance Time (s)	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
Lane Grp Cap (vph)	21	854	381	390	1159		41	272		143	375	318
v/s Ratio Prot	0.01	0.05		c0.12	c0.11		0.01	c0.04		c0.02	0.00	
v/s Ratio Perm			0.00									0.00
v/c Ratio	0.52	0.20	0.02	0.94	0.30		0.85	0.20		0.49	0.01	0.01
Uniform Delay, d1	22.8	13.4	12.8	20.2	10.4		22.9	16.0		21.7	14.3	14.3
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	21.6	0.1	0.0	30.8	0.1		85.0	0.4		2.6	0.0	0.0
Delay (s)	44.4	13.5	12.8	51.0	10.5		107.9	16.4		24.3	14.3	14.3
Level of Service	D	B	B	D	B		F	B		C	B	B
Approach Delay (s)		15.1			30.1			26.6			22.7	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	46.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	48.2%	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)	551	494	694	627	459	378
Future Volume (vph)	551	494	694	627	459	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	5.3	4.4	6.0	5.3	5.3
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)	599	537	754	682	499	411
RTOR Reduction (vph)	0	22	0	0	0	294
Lane Group Flow (vph)	599	515	754	682	499	117
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	8	1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	22.7	56.5	46.1	73.2	33.8	33.8
Effective Green, g (s)	22.7	56.5	46.1	73.2	33.8	33.8
Actuated g/C Ratio	0.19	0.48	0.39	0.62	0.29	0.29
Clearance Time (s)	6.0	5.3	4.4	6.0	5.3	5.3
Vehicle Extension (s)	4.4	2.0	2.0	4.3	2.0	2.0
Lane Grp Cap (vph)	904	766	639	2917	909	419
v/s Ratio Prot	0.13	c0.19	c0.46	0.14	0.16	
v/s Ratio Perm		0.16				0.08
v/c Ratio	0.66	0.67	1.18	0.23	0.55	0.28
Uniform Delay, d1	44.3	23.8	36.1	10.1	35.8	32.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	1.8	96.5	0.1	0.4	0.1
Delay (s)	46.4	25.6	132.6	10.1	36.2	32.9
Level of Service	D	C	F	B	D	C
Approach Delay (s)	36.6			74.4	34.7	
Approach LOS	D			E	C	

Intersection Summary			
HCM 2000 Control Delay	51.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	118.3	Sum of lost time (s)	15.7
Intersection Capacity Utilization	77.1%	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	139	1	109	831	717	0	0	783	335
Future Volume (vph)	0	0	0	139	1	109	831	717	0	0	783	335
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			0.96	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1641	1380	1375	3183	4715			4486	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1380	1375	3183	4715			4486	
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	151	1	118	903	779	0	0	851	364
RTOR Reduction (vph)	0	0	0	0	50	50	0	0	0	0	95	0
Lane Group Flow (vph)	0	0	0	151	10	9	903	779	0	0	1120	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)				11.8	11.8	11.8	23.5	52.1			23.9	
Effective Green, g (s)				11.8	11.8	11.8	23.5	52.1			23.9	
Actuated g/C Ratio				0.16	0.16	0.16	0.32	0.70			0.32	
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)				261	219	218	1009	3315			1446	
v/s Ratio Prot					0.01		c0.28	0.17			c0.25	
v/s Ratio Perm				c0.09		0.01						
v/c Ratio				0.58	0.05	0.04	0.89	0.23			0.77	
Uniform Delay, d1				28.8	26.4	26.4	24.1	3.9			22.7	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				3.1	0.1	0.1	10.3	0.0			2.7	
Delay (s)				31.9	26.5	26.5	34.4	3.9			25.3	
Level of Service				C	C	C	C	A			C	
Approach Delay (s)		0.0			29.5			20.3			25.3	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	74.1	Sum of lost time (s)	14.9
Intersection Capacity Utilization	67.0%	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)	83	1	616	0	0	0	0	1465	161	152	771	0
Future Volume (vph)	83	1	616	0	0	0	0	1465	161	152	771	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					3233		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1646	2584					3233		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)	90	1	670	0	0	0	0	1592	175	165	838	0
RTOR Reduction (vph)	0	0	332	0	0	0	0	9	0	0	0	0
Lane Group Flow (vph)	0	91	338	0	0	0	0	1758	0	165	838	0
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		14.9	14.9					50.9		6.3	61.9	
Effective Green, g (s)		14.9	14.9					50.9		6.3	61.9	
Actuated g/C Ratio		0.17	0.17					0.59		0.07	0.71	
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)		281	442					1891		230	3354	
v/s Ratio Prot								c0.54		c0.05	0.18	
v/s Ratio Perm		0.06	c0.13									
v/c Ratio		0.32	0.76					0.93		0.72	0.25	
Uniform Delay, d1		31.6	34.4					16.4		39.5	4.4	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.7	7.7					8.6		10.2	0.0	
Delay (s)		32.3	42.0					25.0		49.7	4.4	
Level of Service		C	D					C		D	A	
Approach Delay (s)		40.9			0.0			25.0			11.9	
Approach LOS		D			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	87.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	67.0%	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)	393	127	20	98	174	332	28	854	96	237	656	515
Future Volume (vph)	393	127	20	98	174	332	28	854	96	237	656	515
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	0.98			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	1687			1697	1445	1641	3232		1641	1727	1438
Flt Permitted	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1687			1697	1445	1641	3232		1641	1727	1438
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)	427	138	22	107	189	361	30	928	104	258	713	560
RTOR Reduction (vph)	0	4	0	0	0	180	0	6	0	0	0	200
Lane Group Flow (vph)	427	156	0	0	296	181	30	1026	0	258	713	360
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)	31.7	31.7			29.6	29.6	3.2	44.9		20.6	62.1	62.1
Effective Green, g (s)	31.7	31.7			29.6	29.6	3.2	44.9		20.6	62.1	62.1
Actuated g/C Ratio	0.22	0.22			0.20	0.20	0.02	0.31		0.14	0.42	0.42
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)	354	364			342	291	35	989		230	731	609
v/s Ratio Prot	c0.26	0.09			c0.17		0.02	c0.32		c0.16	0.41	
v/s Ratio Perm						0.13						0.25
v/c Ratio	1.21	0.43			0.87	0.62	0.86	1.04		1.12	0.98	0.59
Uniform Delay, d1	57.4	49.6			56.6	53.4	71.5	50.8		63.0	41.5	32.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	116.5	0.3			20.3	4.5	92.4	38.9		96.0	27.1	1.7
Delay (s)	173.9	49.9			76.8	57.9	163.9	89.7		159.0	68.6	34.2
Level of Service	F	D			E	E	F	F		F	E	C
Approach Delay (s)		140.1			66.4			91.8			71.3	
Approach LOS		F			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	86.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	146.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	607	81	7	622	93	7
Future Volume (vph)	607	81	7	622	93	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)	4632		1641	4715	1641	1468
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4632		1641	4715	1641	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	660	88	8	676	101	8
RTOR Reduction (vph)	13	0	0	0	0	7
Lane Group Flow (vph)	736	0	8	676	101	1
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	27.7		0.9	34.3	7.8	7.8
Effective Green, g (s)	27.7		0.9	34.3	7.8	7.8
Actuated g/C Ratio	0.50		0.02	0.62	0.14	0.14
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)	2316		26	2919	231	206
v/s Ratio Prot	c0.16		0.00	c0.14	c0.06	
v/s Ratio Perm						0.00
v/c Ratio	0.32		0.31	0.23	0.44	0.01
Uniform Delay, d1	8.2		26.9	4.7	21.8	20.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3		2.4	0.1	0.5	0.0
Delay (s)	8.5		29.4	4.8	22.3	20.5
Level of Service	A		C	A	C	C
Approach Delay (s)	8.5			5.1	22.1	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	55.4	Sum of lost time (s)	19.0
Intersection Capacity Utilization	32.9%	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)	38	407	291	1128	566	71	155	81	663	35	155	40
Future Volume (vph)	38	407	291	1128	566	71	155	81	663	35	155	40
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	0.87		1.00	0.97	
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	4637		1641	1478		3183	1674	
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	4637		1641	1478		3183	1674	
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)	41	442	316	1226	615	77	168	88	721	38	168	43
RTOR Reduction (vph)	0	0	272	0	12	0	0	191	0	0	6	0
Lane Group Flow (vph)	41	442	44	1226	680	0	168	618	0	38	205	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)	6.5	19.6	19.6	31.6	44.7		11.9	63.7		5.2	57.9	
Effective Green, g (s)	6.5	19.6	19.6	31.6	44.7		11.9	63.7		5.2	57.9	
Actuated g/C Ratio	0.05	0.14	0.14	0.23	0.32		0.09	0.46		0.04	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)	76	660	202	370	1480		139	672		118	692	
v/s Ratio Prot	0.02	c0.09		c0.75	0.15		c0.10	c0.42		0.01	0.12	
v/s Ratio Perm			0.03									
v/c Ratio	0.54	0.67	0.22	3.31	0.46		1.21	0.92		0.32	0.30	
Uniform Delay, d1	65.3	57.1	53.4	54.2	38.0		64.0	35.8		65.7	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	3.7	5.3	2.5	1048.0	1.0		143.1	18.0		0.6	0.6	
Delay (s)	68.9	62.5	55.9	1102.2	39.0		207.2	53.8		66.3	28.0	
Level of Service	E	E	E	F	D		F	D		E	C	
Approach Delay (s)		60.2			718.6			80.2			33.8	
Approach LOS		E			F			F			C	

Intersection Summary			
HCM 2000 Control Delay	383.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.55		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	136.0%	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)	114	135	60	13	137	260	0	0	0	220	216	106
Future Volume (vph)	114	135	60	13	137	260	0	0	0	220	216	106
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	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	0.88					0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98					1.00	
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	0.85					0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00					0.98	
Satd. Flow (prot)	3183	3282	1450	3183	3282	2521					3115	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00					0.98	
Satd. Flow (perm)	3183	3282	1450	3183	3282	2521					3115	
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)	124	147	65	14	149	283	0	0	0	239	235	115
RTOR Reduction (vph)	0	0	45	0	0	210	0	0	0	0	41	0
Lane Group Flow (vph)	124	147	20	14	149	73	0	0	0	0	548	0
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			1			3						
Turn Type	Prot	NA	Perm	Prot	NA	Perm				Perm	NA	
Protected Phases	5	2		1	6						4	
Permitted Phases			2			6				4		
Actuated Green, G (s)	2.5	11.1	11.1	0.6	9.2	9.2					12.2	
Effective Green, g (s)	2.5	11.1	11.1	0.6	9.2	9.2					12.2	
Actuated g/C Ratio	0.07	0.31	0.31	0.02	0.26	0.26					0.34	
Clearance Time (s)	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	
Lane Grp Cap (vph)	221	1014	448	53	841	646					1058	
v/s Ratio Prot	c0.04	0.04		0.00	c0.05							
v/s Ratio Perm			0.01			0.03					0.18	
v/c Ratio	0.56	0.14	0.04	0.26	0.18	0.11					0.52	
Uniform Delay, d1	16.2	9.0	8.7	17.4	10.4	10.2					9.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00					1.00	
Incremental Delay, d2	3.2	0.1	0.0	2.7	0.1	0.1					0.4	
Delay (s)	19.4	9.0	8.7	20.1	10.5	10.3					9.9	
Level of Service	B	A	A	C	B	B					A	
Approach Delay (s)		12.8			10.7			0.0			9.9	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	35.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	32.9%	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)	116	155	64	266	124	53
Future Volume (vph)	116	155	64	266	124	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	126	168	70	289	135	58

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	294	70	289	193
Volume Left (vph)	0	70	0	135
Volume Right (vph)	168	0	0	58
Hadj (s)	-0.17	0.67	0.17	0.13
Departure Headway (s)	4.9	6.1	5.6	5.6
Degree Utilization, x	0.40	0.12	0.45	0.30
Capacity (veh/h)	701	571	627	585
Control Delay (s)	11.1	8.7	11.7	11.0
Approach Delay (s)	11.1	11.1		11.0
Approach LOS	B	B		B

Intersection Summary			
Delay	11.1		
Level of Service	B		
Intersection Capacity Utilization	39.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	285	0	0	178
Future Volume (vph)	0	0	285	0	0	178
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	310	0	0	193

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	0	310	0	193
Volume Left (vph)	0	310	0	0
Volume Right (vph)	0	0	0	193
Hadj (s)	0.00	0.53	0.00	-0.57
Departure Headway (s)	4.9	5.5	4.9	4.2
Degree Utilization, x	0.00	0.47	0.00	0.23
Capacity (veh/h)	702	637	725	796
Control Delay (s)	7.9	12.1	6.7	8.5
Approach Delay (s)	0.0	12.1		8.5
Approach LOS	A	B		A

Intersection Summary			
Delay	10.7		
Level of Service	B		
Intersection Capacity Utilization	33.5%	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)	0	64	103	29	57	0
Future Volume (vph)	0	64	103	29	57	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	70	112	32	62	0

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	70	112	32	62
Volume Left (vph)	0	112	0	0
Volume Right (vph)	70	0	0	0
Hadj (s)	-0.57	0.53	0.03	0.03
Departure Headway (s)	3.8	5.2	4.7	4.3
Degree Utilization, x	0.07	0.16	0.04	0.07
Capacity (veh/h)	892	673	741	809
Control Delay (s)	7.1	8.0	6.7	7.7
Approach Delay (s)	7.1	7.7		7.7
Approach LOS	A	A		A

Intersection Summary			
Delay	7.6		
Level of Service	A		
Intersection Capacity Utilization	23.0%	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)	160	0	0	222	273	258
Future Volume (vph)	160	0	0	222	273	258
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	174	0	0	241	297	280

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	174	0	241	198	379
Volume Left (vph)	174	0	0	0	0
Volume Right (vph)	0	0	0	0	280
Hadj (s)	0.23	0.00	0.03	0.03	-0.48
Departure Headway (s)	5.9	5.7	5.7	5.4	4.8
Degree Utilization, x	0.29	0.00	0.38	0.30	0.51
Capacity (veh/h)	561	614	606	648	723
Control Delay (s)	11.3	7.5	11.0	9.4	11.6
Approach Delay (s)	11.3	11.0		10.8	
Approach LOS	B	B		B	

Intersection Summary			
Delay	10.9		
Level of Service	B		
Intersection Capacity Utilization	31.4%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix L
Mitigation Worksheets & Trigger Calculations
- Near-Term Year 2023 Plus Project (Phase 1) Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	355	121	21	70	56	100	7	525	62	329	827	204
Future Volume (vph)	355	121	21	70	56	100	7	525	62	329	827	204
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	5.3
Lane Util. Factor	0.97	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	0.98			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)	3183	1689			1681	1449	1641	3222		1641	1727	1468
Flt Permitted	0.95	1.00			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	1689			1681	1449	1641	3222		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)	386	132	23	76	61	109	8	571	67	358	899	222
RTOR Reduction (vph)	0	4	0	0	0	95	0	5	0	0	0	54
Lane Group Flow (vph)	386	151	0	0	137	14	8	633	0	358	899	168
Confl. Peds. (#/hr)	1					1			2			
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	7		8	8		5	2		1	6	7
Permitted Phases						8						6
Actuated Green, G (s)	16.9	16.9			15.9	15.9	0.7	41.8		30.3	71.2	88.1
Effective Green, g (s)	16.9	16.9			15.9	15.9	0.7	41.8		30.3	71.2	88.1
Actuated g/C Ratio	0.14	0.14			0.13	0.13	0.01	0.34		0.24	0.57	0.71
Clearance Time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.3
Vehicle Extension (s)	2.0	2.0			3.7	3.7	2.0	3.8		2.0	3.8	2.0
Lane Grp Cap (vph)	431	228			214	184	9	1080		398	986	1037
v/s Ratio Prot	c0.12	0.09			c0.08		0.00	0.20		c0.22	c0.52	0.02
v/s Ratio Perm						0.01						0.09
v/c Ratio	0.90	0.66			0.64	0.08	0.89	0.59		0.90	0.91	0.16
Uniform Delay, d1	53.0	51.2			51.7	47.9	62.0	34.3		45.7	23.9	6.1
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	20.1	5.5			6.8	0.2	226.7	0.9		21.9	12.5	0.0
Delay (s)	73.1	56.6			58.5	48.1	288.6	35.2		67.6	36.5	6.1
Level of Service	E	E			E	D	F	D		E	D	A
Approach Delay (s)		68.4			53.9			38.4			39.4	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	45.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	124.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	81.2%	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												
Traffic Volume (vph)	393	127	20	98	174	332	28	854	96	237	656	515
Future Volume (vph)	393	127	20	98	174	332	28	854	96	237	656	515
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	5.3
Lane Util. Factor	0.97	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	0.98			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)	3183	1686			1697	1446	1641	3232		1641	1727	1445
Flt Permitted	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	1686			1697	1446	1641	3232		1641	1727	1445
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)	427	138	22	107	189	361	30	928	104	258	713	560
RTOR Reduction (vph)	0	4	0	0	0	194	0	6	0	0	0	143
Lane Group Flow (vph)	427	156	0	0	296	167	30	1026	0	258	713	417
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						1
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	7		8	8		5	2		1	6	7
Permitted Phases						8						6
Actuated Green, G (s)	20.0	20.0			27.8	27.8	3.2	46.5		21.7	64.8	84.8
Effective Green, g (s)	20.0	20.0			27.8	27.8	3.2	46.5		21.7	64.8	84.8
Actuated g/C Ratio	0.15	0.15			0.20	0.20	0.02	0.34		0.16	0.48	0.62
Clearance Time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.3
Vehicle Extension (s)	2.0	2.0			3.7	3.7	2.0	3.8		2.0	3.8	2.0
Lane Grp Cap (vph)	468	248			347	296	38	1106		262	824	902
v/s Ratio Prot	c0.13	0.09			c0.17		0.02	c0.32		c0.16	0.41	0.07
v/s Ratio Perm						0.12						0.22
v/c Ratio	0.91	0.63			0.85	0.56	0.79	0.93		0.98	0.87	0.46
Uniform Delay, d1	57.0	54.4			52.0	48.6	66.0	43.0		56.9	31.6	13.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	21.7	3.6			18.5	2.8	63.7	13.2		50.8	9.7	0.1
Delay (s)	78.7	58.0			70.5	51.3	129.7	56.2		107.7	41.3	13.6
Level of Service	E	E			E	D	F	E		F	D	B
Approach Delay (s)		73.0			60.0			58.3			42.4	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	54.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	135.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection No.	11	Peak:	PM									
Total ADT	11151											
Project Trip Generation	In	646	Out	402								
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Full with Project Volume	28	854	96	237	656	515	393	127	20	98	174	332
Project Volume	26	0	0	0	0	433	269	88	16	0	142	0
Type of Turning Movement	in					in	out	out	out		in	
Percentage of Project Volume	4.0%	0.0%	0.0%	0.0%	0.0%	67.0%	67.0%	22.0%	4.0%	0.0%	22.0%	0.0%
Base Volume	2	854	96	237	656	82	124	39	4	98	32	332
PFFP Calculation												
PFFP ADT	4912		Delay	55	LOS	D						
Percent Reduction	56.0%											
Trips Assignment	11	0	0	0	0	191	118	39	7	0	63	0
Base + Project	13	854	96	237	656	273	242	78	11	98	95	332
Arrange in EB - WB - NB - SB order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
	242	78	11	98	95	332	13	854	96	237	656	273
PFFP Calculation												
PFFP ADT	5000		Delay	55.7	LOS	E						
Percent Reduction	55.2%											
Trips Assignment	12	0	0	0	0	194	121	39	7	0	64	0
Base + Project	14	854	96	237	656	276	245	78	11	98	96	332
Arrange in EB - WB - NB - SB order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
	245	78	11	98	96	332	14	854	96	237	656	276
Change when compare to previous ADT	3	0	0	0	1	0	1	0	0	0	0	3

Appendix M
Peak Hour Intersection LOS
- Near-Term Year 2027 Conditions

HCM Signalized Intersection Capacity Analysis
1: Caliente Avenue & SR-905 WB On-Ramp/SR-905 WB Off-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	42	1	73	335	1936	0	0	314	601
Future Volume (vph)	0	0	0	42	1	73	335	1936	0	0	314	601
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			4378	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1725	1538	1719	4940			4378	
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	46	1	79	364	2104	0	0	341	653
RTOR Reduction (vph)	0	0	0	0	0	72	0	0	0	0	367	0
Lane Group Flow (vph)	0	0	0	0	47	7	364	2104	0	0	627	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)					5.6	5.6	16.8	43.9			22.4	
Effective Green, g (s)					5.6	5.6	16.8	43.9			22.4	
Actuated g/C Ratio					0.09	0.09	0.28	0.74			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)					161	144	483	3632			1642	
v/s Ratio Prot							c0.21	c0.43			0.14	
v/s Ratio Perm					0.03	0.00						
v/c Ratio					0.29	0.05	0.75	0.58			0.38	
Uniform Delay, d1					25.2	24.6	19.6	3.6			13.6	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					1.0	0.1	5.8	0.2			0.1	
Delay (s)					26.2	24.8	25.4	3.9			13.8	
Level of Service					C	C	C	A			B	
Approach Delay (s)		0.0			25.3			7.0			13.8	
Approach LOS		A			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	59.7	Sum of lost time (s)	14.9
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												
Traffic Volume (vph)	1607	1	189	0	0	0	0	663	112	140	217	0
Future Volume (vph)	1607	1	189	0	0	0	0	663	112	140	217	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	0.95	0.95						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	0.97						0.98		1.00	1.00	
Flt Protected	0.95	0.96						1.00		0.95	1.00	
Satd. Flow (prot)	1559	1528						4595		1641	3282	
Flt Permitted	0.95	0.96						1.00		0.95	1.00	
Satd. Flow (perm)	1559	1528						4595		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)	1747	1	205	0	0	0	0	721	122	152	236	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	16	0	0	0	0
Lane Group Flow (vph)	996	950	0	0	0	0	0	827	0	152	236	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)	86.3	86.3						24.5		14.1	43.3	
Effective Green, g (s)	86.3	86.3						24.5		14.1	43.3	
Actuated g/C Ratio	0.62	0.62						0.18		0.10	0.31	
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)	962	943						805		165	1016	
v/s Ratio Prot								c0.18		c0.09	0.07	
v/s Ratio Perm	c0.64	0.62										
v/c Ratio	1.04	1.01						1.03		0.92	0.23	
Uniform Delay, d1	26.8	26.8						57.7		62.3	35.9	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	38.5	31.2						38.7		47.0	0.1	
Delay (s)	65.3	57.9						96.4		109.3	36.0	
Level of Service	E	E						F		F	D	
Approach Delay (s)		61.7			0.0			96.4			64.7	
Approach LOS		E			A			F			E	

Intersection Summary			
HCM 2000 Control Delay	71.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	139.8	Sum of lost time (s)	14.9
Intersection Capacity Utilization	98.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Caliente Avenue & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	22	9	1	27	217	31	376	2	147	174	114
Future Volume (vph)	193	22	9	1	27	217	31	376	2	147	174	114
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	
Lane Util. Factor	0.95	0.95		0.97	1.00	1.00	1.00	0.91		1.00	0.95	
Frpb, ped/bikes	1.00	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	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00		1.00	0.94	
Flt Protected	0.95	0.97		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1633	1639		3183	1810	1447	1719	4712		1641	3107	
Flt Permitted	0.95	0.97		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1633	1639		3183	1810	1447	1719	4712		1641	3107	
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)	210	24	10	1	29	236	34	409	2	160	189	124
RTOR Reduction (vph)	0	5	0	0	0	201	0	1	0	0	81	0
Lane Group Flow (vph)	122	117	0	1	29	35	34	410	0	160	232	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	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	7.4	7.4		7.5	7.5	7.5	1.7	12.9		6.4	17.6	
Effective Green, g (s)	7.4	7.4		7.5	7.5	7.5	1.7	12.9		6.4	17.6	
Actuated g/C Ratio	0.15	0.15		0.15	0.15	0.15	0.03	0.26		0.13	0.35	
Clearance Time (s)	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	
Lane Grp Cap (vph)	240	241		475	270	216	58	1210		209	1089	
v/s Ratio Prot	c0.07	0.07		0.00	0.02		0.02	c0.09		c0.10	0.07	
v/s Ratio Perm						c0.02						
v/c Ratio	0.51	0.48		0.00	0.11	0.16	0.59	0.34		0.77	0.21	
Uniform Delay, d1	19.7	19.7		18.2	18.5	18.6	23.9	15.2		21.2	11.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	1.5		0.0	0.2	0.4	14.2	0.2		15.3	0.1	
Delay (s)	21.4	21.2		18.2	18.6	19.0	38.1	15.3		36.5	11.5	
Level of Service	C	C		B	B	B	D	B		D	B	
Approach Delay (s)		21.3			18.9			17.1			20.0	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
4: Innovative Drive & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1694	1	0	648	41	0	0	1	0	0	35
Future Volume (Veh/h)	0	1694	1	0	648	41	0	0	1	0	0	35
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	1841	1	0	704	45	0	0	1	0	0	38
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	755			1842			2114	2596	614	1325	2552	241
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	755			1842			2114	2596	614	1325	2552	241
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)	797			295			25	22	416	105	23	733

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	736	736	369	235	235	235	45	1	38
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	1	0	0	0	45	1	38
cSH	1700	1700	1700	1700	1700	1700	1700	416	733
Volume to Capacity	0.43	0.43	0.22	0.14	0.14	0.14	0.03	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	13.7	10.2
Lane LOS								B	B
Approach Delay (s)	0.0			0.0				13.7	10.2
Approach LOS								B	B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	944	613	250	96	397	300	149	104	49	239	121	249
Future Volume (vph)	944	613	250	96	397	300	149	104	49	239	121	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
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	0.95		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	1645		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	1645		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)	1026	666	272	104	432	326	162	113	53	260	132	271
RTOR Reduction (vph)	0	0	168	0	0	272	0	14	0	0	0	142
Lane Group Flow (vph)	1026	666	104	104	432	54	162	152	0	260	132	129
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)	27.8	35.9	35.9	7.4	15.5	15.5	13.8	16.1		14.7	17.0	44.8
Effective Green, g (s)	27.8	35.9	35.9	7.4	15.5	15.5	13.8	16.1		14.7	17.0	44.8
Actuated g/C Ratio	0.30	0.38	0.38	0.08	0.17	0.17	0.15	0.17		0.16	0.18	0.48
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0		2.0	2.0	2.0
Lane Grp Cap (vph)	943	1804	561	251	779	242	241	282		257	312	1234
v/s Ratio Prot	c0.32	0.14		0.03	c0.09		0.10	c0.09		c0.16	0.08	0.03
v/s Ratio Perm			0.07			0.04						0.02
v/c Ratio	1.09	0.37	0.19	0.41	0.55	0.22	0.67	0.54		1.01	0.42	0.10
Uniform Delay, d1	33.0	20.8	19.2	41.1	36.0	33.9	37.9	35.5		39.5	34.1	13.5
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	56.2	0.2	0.3	0.4	1.2	0.8	5.7	3.6		59.2	0.3	0.0
Delay (s)	89.2	21.0	19.5	41.5	37.2	34.7	43.6	39.1		98.7	34.4	13.5
Level of Service	F	C	B	D	D	C	D	D		F	C	B
Approach Delay (s)		56.4			36.8			41.3			51.1	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	93.8	Sum of lost time (s)	19.7
Intersection Capacity Utilization	73.4%	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												
Traffic Volume (vph)	119	695	61	82	641	52	56	14	86	44	12	92
Future Volume (vph)	119	695	61	82	641	52	56	14	86	44	12	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	4.9
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	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
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	4650		1641	4654		1641	1727	1450	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	4650		1641	4654		1641	1727	1450	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)	129	755	66	89	697	57	61	15	93	48	13	100
RTOR Reduction (vph)	0	8	0	0	7	0	0	0	81	0	0	88
Lane Group Flow (vph)	129	813	0	89	747	0	61	15	12	48	13	12
Confl. Peds. (#/hr)			4			2			1			
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)	7.6	22.7		5.4	20.5		4.2	7.7	7.7	3.3	6.8	6.8
Effective Green, g (s)	7.6	22.7		5.4	20.5		4.2	7.7	7.7	3.3	6.8	6.8
Actuated g/C Ratio	0.13	0.39		0.09	0.35		0.07	0.13	0.13	0.06	0.12	0.12
Clearance Time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	4.9
Vehicle Extension (s)	2.0	4.4		2.0	4.2		2.0	3.2	3.2	2.0	2.0	2.0
Lane Grp Cap (vph)	212	1795		150	1622		117	226	189	92	199	169
v/s Ratio Prot	c0.08	c0.17		0.05	0.16		c0.04	c0.01		0.03	0.01	
v/s Ratio Perm									0.01			0.01
v/c Ratio	0.61	0.45		0.59	0.46		0.52	0.07	0.06	0.52	0.07	0.07
Uniform Delay, d1	24.2	13.4		25.6	14.9		26.3	22.4	22.4	27.0	23.2	23.2
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	3.4	0.3		4.1	0.3		1.9	0.1	0.2	2.4	0.1	0.1
Delay (s)	27.6	13.7		29.8	15.2		28.3	22.5	22.5	29.4	23.2	23.2
Level of Service	C	B		C	B		C	C	C	C	C	C
Approach Delay (s)		15.6			16.7			24.6			25.1	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	58.8	Sum of lost time (s)	19.7
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	98	19	46	30	17	11
Future Volume (Veh/h)	98	19	46	30	17	11
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)	107	21	50	33	18	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		4				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	114	66			83	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	114	66			83	
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	98			99	
cM capacity (veh/h)	852	975			1465	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	128	83	30
Volume Left	107	0	18
Volume Right	21	33	0
cSH	1020	1700	1465
Volume to Capacity	0.13	0.05	0.01
Queue Length 95th (ft)	11	0	1
Control Delay (s)	9.7	0.0	4.5
Lane LOS	A		A
Approach Delay (s)	9.7	0.0	4.5
Approach LOS	A		

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	20.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	421	281	113	360	448	294
Future Volume (vph)	421	281	113	360	448	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	5.3	4.4	6.0	5.3	5.3
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)	458	305	123	391	487	320
RTOR Reduction (vph)	0	22	0	0	0	236
Lane Group Flow (vph)	458	283	123	391	487	84
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	8	1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	12.9	25.2	5.7	23.0	12.3	12.3
Effective Green, g (s)	12.9	25.2	5.7	23.0	12.3	12.3
Actuated g/C Ratio	0.28	0.54	0.12	0.49	0.26	0.26
Clearance Time (s)	6.0	5.3	4.4	6.0	5.3	5.3
Vehicle Extension (s)	4.4	2.0	2.0	4.3	2.0	2.0
Lane Grp Cap (vph)	1305	960	200	2327	840	387
v/s Ratio Prot	0.10	c0.08	c0.07	0.08	c0.15	
v/s Ratio Perm		0.12				0.06
v/c Ratio	0.35	0.29	0.61	0.17	0.58	0.22
Uniform Delay, d1	13.5	5.8	19.4	6.5	14.9	13.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	3.9	0.1	0.6	0.1
Delay (s)	13.8	5.9	23.3	6.6	15.5	13.5
Level of Service	B	A	C	A	B	B
Approach Delay (s)	10.6			10.6	14.7	
Approach LOS	B			B	B	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	46.6	Sum of lost time (s)	15.7
Intersection Capacity Utilization	40.5%	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)	0	0	0	197	0	181	384	477	0	0	340	53
Future Volume (vph)	0	0	0	197	0	181	384	477	0	0	340	53
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			0.98	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1641	1395	1395	3183	4715			4620	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1395	1395	3183	4715			4620	
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	214	0	197	417	518	0	0	370	58
RTOR Reduction (vph)	0	0	0	0	74	74	0	0	0	0	41	0
Lane Group Flow (vph)	0	0	0	214	25	24	417	518	0	0	387	0
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				11.2	11.2	11.2	9.6	23.8			9.5	
Effective Green, g (s)				11.2	11.2	11.2	9.6	23.8			9.5	
Actuated g/C Ratio				0.25	0.25	0.25	0.21	0.53			0.21	
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)				406	345	345	676	2482			971	
v/s Ratio Prot					0.02		c0.13	0.11			c0.08	
v/s Ratio Perm				c0.13		0.02						
v/c Ratio				0.53	0.07	0.07	0.62	0.21			0.40	
Uniform Delay, d1				14.7	13.0	13.0	16.1	5.7			15.4	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				1.2	0.1	0.1	1.7	0.0			0.3	
Delay (s)				15.9	13.1	13.1	17.8	5.7			15.7	
Level of Service				B	B	B	B	A			B	
Approach Delay (s)		0.0			14.6			11.1			15.7	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	45.2	Sum of lost time (s)	14.9
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: Britannia Boulevard & SR-905 EB Ramps

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	221	3	1023	0	0	0	0	647	116	31	506	0
Future Volume (vph)	221	3	1023	0	0	0	0	647	116	31	506	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)		1646	2584					3207		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1646	2584					3207		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)	240	3	1112	0	0	0	0	703	126	34	550	0
RTOR Reduction (vph)	0	0	262	0	0	0	0	21	0	0	0	0
Lane Group Flow (vph)	0	243	850	0	0	0	0	808	0	34	550	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)		24.6	24.6					20.2		1.7	26.6	
Effective Green, g (s)		24.6	24.6					20.2		1.7	26.6	
Actuated g/C Ratio		0.40	0.40					0.33		0.03	0.43	
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)		659	1035					1055		88	2042	
v/s Ratio Prot								c0.25		0.01	c0.12	
v/s Ratio Perm		0.15	c0.33									
v/c Ratio		0.37	0.82					0.77		0.39	0.27	
Uniform Delay, d1		12.9	16.4					18.5		29.3	11.2	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.4	5.3					3.4		2.8	0.1	
Delay (s)		13.3	21.8					21.8		32.1	11.2	
Level of Service		B	C					C		C	B	
Approach Delay (s)		20.3			0.0			21.8			12.5	
Approach LOS		C			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	61.4	Sum of lost time (s)	14.9
Intersection Capacity Utilization	54.1%	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)	29	14	26	39	15	142	29	499	54	336	839	79
Future Volume (vph)	29	14	26	39	15	142	29	499	54	336	839	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	4.4	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	0.90			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	1559			1667	1449	1641	3226		1641	1727	1468
Flt Permitted	0.95	1.00			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1559			1667	1449	1641	3226		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)	32	15	28	42	16	154	32	542	59	365	912	86
RTOR Reduction (vph)	0	27	0	0	0	140	0	5	0	0	0	30
Lane Group Flow (vph)	32	16	0	0	58	14	32	596	0	365	912	56
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)	5.6	5.6			9.9	9.9	3.1	47.2		27.9	71.8	71.8
Effective Green, g (s)	5.6	5.6			9.9	9.9	3.1	47.2		27.9	71.8	71.8
Actuated g/C Ratio	0.05	0.05			0.09	0.09	0.03	0.43		0.25	0.65	0.65
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)	83	79			149	129	46	1379		414	1123	954
v/s Ratio Prot	c0.02	0.01			c0.03		0.02	0.18		c0.22	c0.53	
v/s Ratio Perm						0.01						0.04
v/c Ratio	0.39	0.21			0.39	0.11	0.70	0.43		0.88	0.81	0.06
Uniform Delay, d1	50.7	50.3			47.4	46.2	53.2	22.2		39.7	14.3	7.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.1	0.5			2.1	0.5	30.8	0.3		18.8	4.8	0.0
Delay (s)	51.8	50.7			49.5	46.6	84.0	22.5		58.4	19.1	7.0
Level of Service	D	D			D	D	F	C		E	B	A
Approach Delay (s)		51.2			47.4			25.6			28.9	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	110.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	70.0%	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)	578	34	4	437	45	8
Future Volume (vph)	578	34	4	437	45	8
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)	4676		1641	4715	1641	1450
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4676		1641	4715	1641	1450
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	628	37	4	475	49	9
RTOR Reduction (vph)	4	0	0	0	0	8
Lane Group Flow (vph)	661	0	4	475	49	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)	27.3		0.9	33.9	5.2	5.2
Effective Green, g (s)	27.3		0.9	33.9	5.2	5.2
Actuated g/C Ratio	0.52		0.02	0.65	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)	2436		28	3050	162	143
v/s Ratio Prot	c0.14		0.00	c0.10	c0.03	
v/s Ratio Perm						0.00
v/c Ratio	0.27		0.14	0.16	0.30	0.01
Uniform Delay, d1	7.0		25.4	3.6	21.9	21.3
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		0.9	0.1	0.4	0.0
Delay (s)	7.2		26.2	3.7	22.3	21.3
Level of Service	A		C	A	C	C
Approach Delay (s)	7.2			3.9	22.1	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	52.4	Sum of lost time (s)	19.0
Intersection Capacity Utilization	33.2%	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)	69	388	165	730	306	247	119	418	948	79	307	37
Future Volume (vph)	69	388	165	730	306	247	119	418	948	79	307	37
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	0.93		1.00	0.90		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	1441	1641	4400		1641	1530		3183	1700	
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	4400		1641	1530		3183	1700	
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)	75	422	179	793	333	268	129	454	1030	86	334	40
RTOR Reduction (vph)	0	0	154	0	120	0	0	53	0	0	3	0
Lane Group Flow (vph)	75	422	25	793	481	0	129	1431	0	86	371	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)	7.9	19.7	19.7	28.0	39.8		19.6	63.2		9.2	53.7	
Effective Green, g (s)	7.9	19.7	19.7	28.0	39.8		19.6	63.2		9.2	53.7	
Actuated g/C Ratio	0.06	0.14	0.14	0.20	0.28		0.14	0.45		0.07	0.38	
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)	92	663	202	328	1250		229	690		209	652	
v/s Ratio Prot	0.05	c0.09		c0.48	0.11		c0.08	c0.93		0.03	0.22	
v/s Ratio Perm			0.02									
v/c Ratio	0.82	0.64	0.12	2.42	0.39		0.56	2.07		0.41	0.57	
Uniform Delay, d1	65.3	56.8	52.6	56.0	40.3		56.2	38.4		62.8	34.0	
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	4.6	1.3	647.2	0.9		1.9	488.1		0.5	2.0	
Delay (s)	104.1	61.4	53.9	703.2	41.2		58.1	526.5		63.3	36.0	
Level of Service	F	E	D	F	D		E	F		E	D	
Approach Delay (s)		64.1			417.8			489.0			41.1	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	346.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.81		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	161.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: La Media Road & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	37	33	27	48	86	43	328	10	269	585	66
Future Volume (vph)	66	37	33	27	48	86	43	328	10	269	585	66
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	0.95	1.00	0.97	0.95	0.88	0.97	0.95	1.00	0.97	0.91	0.88
Frpb, ped/bikes	1.00	1.00	0.99	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	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	3282	1447	3183	3282	2584	3183	3282	1468	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	3282	1447	3183	3282	2584	3183	3282	1468	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)	72	40	36	29	52	93	47	357	11	292	636	72
RTOR Reduction (vph)	0	0	29	0	0	77	0	0	8	0	0	42
Lane Group Flow (vph)	72	40	7	29	52	16	47	357	3	292	636	30
Confl. Bikes (#/hr)			2									
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)	2.1	9.2	9.2	0.7	7.8	7.8	1.4	12.8	12.8	7.9	19.3	19.3
Effective Green, g (s)	2.1	9.2	9.2	0.7	7.8	7.8	1.4	12.8	12.8	7.9	19.3	19.3
Actuated g/C Ratio	0.05	0.20	0.20	0.02	0.17	0.17	0.03	0.27	0.27	0.17	0.41	0.41
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)	143	647	285	47	549	432	95	901	403	539	1952	1070
v/s Ratio Prot	c0.02	0.01		0.01	c0.02		0.01	c0.11		c0.09	0.13	
v/s Ratio Perm			0.00			0.01			0.00			0.01
v/c Ratio	0.50	0.06	0.02	0.62	0.09	0.04	0.49	0.40	0.01	0.54	0.33	0.03
Uniform Delay, d1	21.7	15.2	15.1	22.8	16.4	16.3	22.3	13.8	12.3	17.7	9.2	8.1
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	2.8	0.0	0.0	21.7	0.1	0.0	4.0	0.3	0.0	1.1	0.1	0.0
Delay (s)	24.5	15.2	15.1	44.5	16.5	16.3	26.3	14.0	12.3	18.8	9.3	8.1
Level of Service	C	B	B	D	B	B	C	B	B	B	A	A
Approach Delay (s)		19.7			21.1			15.4			12.0	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	46.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	35.3%	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)	102	69	70	105	91	52
Future Volume (vph)	102	69	70	105	91	52
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	111	75	76	114	99	57

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	186	76	114	156
Volume Left (vph)	0	76	0	99
Volume Right (vph)	75	0	0	57
Hadj (s)	-0.07	0.67	0.17	0.08
Departure Headway (s)	4.6	5.8	5.2	4.9
Degree Utilization, x	0.24	0.12	0.17	0.21
Capacity (veh/h)	757	601	660	693
Control Delay (s)	9.0	8.3	8.1	9.2
Approach Delay (s)	9.0	8.2		9.2
Approach LOS	A	A		A

Intersection Summary			
Delay	8.8		
Level of Service	A		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1: Caliente Avenue & SR-905 WB On-Ramp/SR-905 WB Off-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	127	2	140	401	1242	0	0	521	1813
Future Volume (vph)	0	0	0	127	2	140	401	1242	0	0	521	1813
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)					1725	1538	1719	4940			4255	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1725	1538	1719	4940			4255	
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	138	2	152	436	1350	0	0	566	1971
RTOR Reduction (vph)	0	0	0	0	0	112	0	0	0	0	183	0
Lane Group Flow (vph)	0	0	0	0	140	40	436	1350	0	0	2354	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)					15.1	15.1	38.4	123.5			80.4	
Effective Green, g (s)					15.1	15.1	38.4	123.5			80.4	
Actuated g/C Ratio					0.10	0.10	0.26	0.83			0.54	
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)					175	156	443	4100			2299	
v/s Ratio Prot							c0.25	0.27			c0.55	
v/s Ratio Perm					0.08	0.03						
v/c Ratio					0.80	0.25	0.98	0.33			1.96dr	
Uniform Delay, d1					65.4	61.7	54.9	3.0			34.2	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					22.4	0.9	38.2	0.0			25.1	
Delay (s)					87.8	62.5	93.1	3.0			59.3	
Level of Service					F	E	F	A			E	
Approach Delay (s)		0.0			74.6			25.0			59.3	
Approach LOS		A			E			C			E	

Intersection Summary			
HCM 2000 Control Delay	47.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	148.8	Sum of lost time (s)	14.9
Intersection Capacity Utilization	93.2%	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

HCM Signalized Intersection Capacity Analysis
2: Caliente Avenue & SR-905 EB Off-Ramp/SR-905 EB On-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	917	2	391	0	0	0	0	726	99	119	536	0
Future Volume (vph)	917	2	391	0	0	0	0	726	99	119	536	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	0.95	0.95						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	0.91						0.98		1.00	1.00	
Flt Protected	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (prot)	1559	1461						4617		1641	3282	
Flt Permitted	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (perm)	1559	1461						4617		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)	997	2	425	0	0	0	0	789	108	129	583	0
RTOR Reduction (vph)	0	65	0	0	0	0	0	20	0	0	0	0
Lane Group Flow (vph)	738	621	0	0	0	0	0	877	0	129	583	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)	43.9	43.9						21.2		8.2	34.1	
Effective Green, g (s)	43.9	43.9						21.2		8.2	34.1	
Actuated g/C Ratio	0.50	0.50						0.24		0.09	0.39	
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)	775	727						1109		152	1268	
v/s Ratio Prot								c0.19		c0.08	0.18	
v/s Ratio Perm	c0.47	0.42										
v/c Ratio	0.95	0.85						0.79		0.85	0.46	
Uniform Delay, d1	21.1	19.3						31.4		39.4	20.2	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	21.4	9.6						3.9		32.1	0.3	
Delay (s)	42.5	28.9						35.4		71.5	20.4	
Level of Service	D	C						D		E	C	
Approach Delay (s)		36.0			0.0			35.4			29.7	
Approach LOS		D			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	88.2	Sum of lost time (s)	14.9
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Caliente Avenue & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	189	20	40	0	63	420	15	247	2	230	408	337
Future Volume (vph)	189	20	40	0	63	420	15	247	2	230	408	337
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	
Lane Util. Factor	0.95	0.95			1.00	1.00	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	0.95			1.00	0.85	1.00	1.00		1.00	0.93	
Flt Protected	0.95	0.98			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1633	1595			1810	1447	1713	4709		1641	3079	
Flt Permitted	0.95	0.98			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1633	1595			1810	1447	1713	4709		1641	3079	
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)	205	22	43	0	68	457	16	268	2	250	443	366
RTOR Reduction (vph)	0	24	0	0	0	342	0	1	0	0	175	0
Lane Group Flow (vph)	137	109	0	0	68	115	16	269	0	250	634	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	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	10.3	10.3			10.1	10.1	0.6	13.0		11.4	23.8	
Effective Green, g (s)	10.3	10.3			10.1	10.1	0.6	13.0		11.4	23.8	
Actuated g/C Ratio	0.17	0.17			0.17	0.17	0.01	0.21		0.19	0.39	
Clearance Time (s)	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	
Lane Grp Cap (vph)	276	270			300	240	16	1006		307	1205	
v/s Ratio Prot	c0.08	0.07			0.04		0.01	0.06		c0.15	c0.21	
v/s Ratio Perm						c0.08						
v/c Ratio	0.50	0.40			0.23	0.48	1.00	0.27		0.81	0.53	
Uniform Delay, d1	22.9	22.5			22.0	23.0	30.1	19.9		23.7	14.2	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	1.0			0.4	1.5	225.0	0.1		15.2	0.4	
Delay (s)	24.3	23.5			22.4	24.5	255.1	20.1		38.8	14.6	
Level of Service	C	C			C	C	F	C		D	B	
Approach Delay (s)		23.9			24.2			33.2			20.3	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
4: Innovative Drive & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1011	2	0	1942	65	0	0	1	0	0	109
Future Volume (Veh/h)	0	1011	2	0	1942	65	0	0	1	0	0	109
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	1099	2	0	2111	71	0	0	1	0	0	118
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	2188			1101			1922	3288	367	2484	3218	710
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2188			1101			1922	3288	367	2484	3218	710
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	67
cM capacity (veh/h)	212			585			25	7	607	13	8	357

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	440	440	222	704	704	704	71	1	118
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	2	0	0	0	71	1	118
cSH	1700	1700	1700	1700	1700	1700	1700	607	357
Volume to Capacity	0.26	0.26	0.13	0.41	0.41	0.41	0.04	0.00	0.33
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	35
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.9	20.0
Lane LOS								B	C
Approach Delay (s)	0.0			0.0				10.9	20.0
Approach LOS								B	C

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
5: Heritage Road & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	344	552	200	34	729	395	278	135	56	449	138	1096
Future Volume (vph)	344	552	200	34	729	395	278	135	56	449	138	1096
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
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	0.96		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	1651		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	1651		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)	374	600	217	37	792	429	302	147	61	488	150	1191
RTOR Reduction (vph)	0	0	142	0	0	322	0	12	0	0	0	158
Lane Group Flow (vph)	374	600	75	37	792	107	302	196	0	488	150	1033
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)	12.7	37.3	37.3	2.5	27.1	27.1	24.2	20.2		28.9	24.9	37.6
Effective Green, g (s)	12.7	37.3	37.3	2.5	27.1	27.1	24.2	20.2		28.9	24.9	37.6
Actuated g/C Ratio	0.12	0.34	0.34	0.02	0.25	0.25	0.22	0.19		0.27	0.23	0.35
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0		2.0	2.0	2.0
Lane Grp Cap (vph)	372	1619	504	73	1176	366	365	307		436	395	894
v/s Ratio Prot	0.12	0.13		0.01	c0.17		0.18	0.12		c0.30	0.09	c0.14
v/s Ratio Perm			0.05			0.07						0.26
v/c Ratio	1.01	0.37	0.15	0.51	0.67	0.29	0.83	0.64		1.12	0.38	1.16
Uniform Delay, d1	47.9	26.8	24.7	52.4	36.8	33.0	40.2	40.8		39.9	35.3	35.5
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	48.0	0.2	0.2	2.0	1.8	0.7	13.6	5.9		79.7	0.2	82.5
Delay (s)	96.0	27.0	24.9	54.4	38.6	33.7	53.8	46.8		119.6	35.6	118.0
Level of Service	F	C	C	D	D	C	D	D		F	D	F
Approach Delay (s)		48.3			37.4			50.9			111.7	
Approach LOS		D			D			D			F	

Intersection Summary			
HCM 2000 Control Delay	69.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	108.6	Sum of lost time (s)	19.7
Intersection Capacity Utilization	80.2%	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												
Traffic Volume (vph)	106	872	79	102	1010	53	59	15	103	57	18	113
Future Volume (vph)	106	872	79	102	1010	53	59	15	103	57	18	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	4.9
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	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
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	4647		1641	4674		1641	1727	1450	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	4647		1641	4674		1641	1727	1450	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)	115	948	86	111	1098	58	64	16	112	62	20	123
RTOR Reduction (vph)	0	9	0	0	4	0	0	0	99	0	0	110
Lane Group Flow (vph)	115	1025	0	111	1152	0	64	16	13	62	20	13
Confl. Peds. (#/hr)			4			2			1			
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)	8.8	23.8		7.9	22.9		5.8	7.6	7.6	4.8	6.6	6.6
Effective Green, g (s)	8.8	23.8		7.9	22.9		5.8	7.6	7.6	4.8	6.6	6.6
Actuated g/C Ratio	0.14	0.37		0.12	0.36		0.09	0.12	0.12	0.08	0.10	0.10
Clearance Time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	4.9
Vehicle Extension (s)	2.0	4.4		2.0	4.2		2.0	3.2	3.2	2.0	2.0	2.0
Lane Grp Cap (vph)	226	1733		203	1677		149	205	172	123	178	151
v/s Ratio Prot	c0.07	0.22		0.07	c0.25		c0.04	0.01		0.04	c0.01	
v/s Ratio Perm									0.01			0.01
v/c Ratio	0.51	0.59		0.55	0.69		0.43	0.08	0.08	0.50	0.11	0.08
Uniform Delay, d1	25.5	16.1		26.3	17.4		27.4	25.0	25.0	28.4	25.9	25.9
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	0.7	0.7		1.6	1.3		0.7	0.2	0.2	1.2	0.1	0.1
Delay (s)	26.2	16.8		27.9	18.7		28.2	25.2	25.2	29.5	26.0	26.0
Level of Service	C	B		C	B		C	C	C	C	C	C
Approach Delay (s)		17.7			19.5			26.2			27.0	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	63.8	Sum of lost time (s)	19.7
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	80	11	18	127	19	45
Future Volume (Veh/h)	80	11	18	127	19	45
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)	87	12	20	138	21	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		3				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	180	89			158	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	180	89			158	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.3	
p0 queue free %	89	99			98	
cM capacity (veh/h)	779	947			1374	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	99	158	70
Volume Left	87	0	21
Volume Right	12	138	0
cSH	887	1700	1374
Volume to Capacity	0.11	0.09	0.02
Queue Length 95th (ft)	9	0	1
Control Delay (s)	10.0	0.0	2.4
Lane LOS	B		A
Approach Delay (s)	10.0	0.0	2.4
Approach LOS	B		

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	26.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	615	410	478	684	374	189
Future Volume (vph)	615	410	478	684	374	189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	5.3	4.4	6.0	5.3	5.3
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)	668	446	520	743	407	205
RTOR Reduction (vph)	0	69	0	0	0	162
Lane Group Flow (vph)	668	377	520	743	407	43
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	8	1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	24.1	46.2	43.8	72.3	22.1	22.1
Effective Green, g (s)	24.1	46.2	43.8	72.3	22.1	22.1
Actuated g/C Ratio	0.23	0.44	0.41	0.68	0.21	0.21
Clearance Time (s)	6.0	5.3	4.4	6.0	5.3	5.3
Vehicle Extension (s)	4.4	2.0	2.0	4.3	2.0	2.0
Lane Grp Cap (vph)	1075	715	679	3225	665	306
v/s Ratio Prot	c0.14	0.11	c0.32	0.16	c0.13	
v/s Ratio Perm		0.15				0.03
v/c Ratio	0.62	0.53	0.77	0.23	0.61	0.14
Uniform Delay, d1	36.7	21.8	26.6	6.3	37.9	34.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.3	4.6	0.1	1.2	0.1
Delay (s)	38.1	22.1	31.2	6.3	39.1	34.1
Level of Service	D	C	C	A	D	C
Approach Delay (s)	31.7			16.6	37.4	
Approach LOS	C			B	D	

Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	105.7	Sum of lost time (s)	15.7
Intersection Capacity Utilization	62.1%	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)	0	0	0	113	1	115	912	437	0	0	484	363
Future Volume (vph)	0	0	0	113	1	115	912	437	0	0	484	363
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			0.94	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1641	1399	1395	3183	4715			4412	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1399	1395	3183	4715			4412	
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	123	1	125	991	475	0	0	526	395
RTOR Reduction (vph)	0	0	0	0	55	54	0	0	0	0	176	0
Lane Group Flow (vph)	0	0	0	123	9	8	991	475	0	0	745	0
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				8.8	8.8	8.8	25.5	49.2			19.0	
Effective Green, g (s)				8.8	8.8	8.8	25.5	49.2			19.0	
Actuated g/C Ratio				0.13	0.13	0.13	0.37	0.72			0.28	
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)				211	180	180	1190	3401			1229	
v/s Ratio Prot					0.01		c0.31	0.10			c0.17	
v/s Ratio Perm				c0.07		0.01						
v/c Ratio				0.58	0.05	0.04	0.83	0.14			0.61	
Uniform Delay, d1				28.0	26.0	26.0	19.4	2.9			21.4	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				4.1	0.1	0.1	5.1	0.0			0.9	
Delay (s)				32.0	26.2	26.1	24.5	3.0			22.2	
Level of Service				C	C	C	C	A			C	
Approach Delay (s)		0.0			29.0			17.6			22.2	
Approach LOS		A			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	68.2	Sum of lost time (s)	14.9
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: Britannia Boulevard & SR-905 EB Ramps

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	1	529	0	0	0	0	1251	138	162	435	0
Future Volume (vph)	97	1	529	0	0	0	0	1251	138	162	435	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)		1646	2584					3233		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1646	2584					3233		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)	105	1	575	0	0	0	0	1360	150	176	473	0
RTOR Reduction (vph)	0	0	481	0	0	0	0	11	0	0	0	0
Lane Group Flow (vph)	0	106	94	0	0	0	0	1499	0	176	473	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)		11.2	11.2					36.7		5.5	46.9	
Effective Green, g (s)		11.2	11.2					36.7		5.5	46.9	
Actuated g/C Ratio		0.16	0.16					0.54		0.08	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)		269	423					1737		256	3237	
v/s Ratio Prot								c0.46		c0.06	0.10	
v/s Ratio Perm		0.06	0.04									
v/c Ratio		0.39	0.22					0.86		0.69	0.15	
Uniform Delay, d1		25.5	24.8					13.6		30.6	3.7	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		1.0	0.3					4.7		7.5	0.0	
Delay (s)		26.5	25.0					18.3		38.0	3.7	
Level of Service		C	C					B		D	A	
Approach Delay (s)		25.3			0.0			18.3			13.0	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	68.3	Sum of lost time (s)	14.9
Intersection Capacity Utilization	62.2%	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												
Traffic Volume (vph)	124	39	30	76	32	342	40	874	63	278	624	82
Future Volume (vph)	124	39	30	76	32	342	40	874	63	278	624	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	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	0.93			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	1613			1669	1449	1641	3244		1641	1727	1468
Flt Permitted	0.95	1.00			0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	1613			1669	1449	1641	3244		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)	135	42	33	83	35	372	43	950	68	302	678	89
RTOR Reduction (vph)	0	21	0	0	0	307	0	4	0	0	0	40
Lane Group Flow (vph)	135	54	0	0	118	65	43	1014	0	302	678	49
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)	13.1	13.1			14.4	14.4	3.6	41.3		25.1	62.6	62.6
Effective Green, g (s)	13.1	13.1			14.4	14.4	3.6	41.3		25.1	62.6	62.6
Actuated g/C Ratio	0.12	0.12			0.13	0.13	0.03	0.36		0.22	0.55	0.55
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)	189	185			211	183	51	1178		362	950	808
v/s Ratio Prot	c0.08	0.03			c0.07		0.03	c0.31		c0.18	0.39	
v/s Ratio Perm						0.04						0.03
v/c Ratio	0.71	0.29			0.56	0.35	0.84	0.86		0.83	0.71	0.06
Uniform Delay, d1	48.5	46.0			46.7	45.4	54.8	33.5		42.3	18.9	11.9
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.2	0.3			3.7	1.5	68.5	6.8		14.5	2.7	0.0
Delay (s)	58.6	46.4			50.3	46.9	123.3	40.4		56.8	21.6	11.9
Level of Service	E	D			D	D	F	D		E	C	B
Approach Delay (s)		54.3			47.7			43.7			30.8	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	40.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	113.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	67.4%	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)	659	70	11	653	75	8
Future Volume (vph)	659	70	11	653	75	8
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)	4648		1641	4715	1641	1450
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4648		1641	4715	1641	1450
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	716	76	12	710	82	9
RTOR Reduction (vph)	9	0	0	0	0	8
Lane Group Flow (vph)	783	0	12	710	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)	26.2		0.9	32.8	7.7	7.7
Effective Green, g (s)	26.2		0.9	32.8	7.7	7.7
Actuated g/C Ratio	0.49		0.02	0.61	0.14	0.14
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)	2263		27	2874	234	207
v/s Ratio Prot	c0.17		0.01	c0.15	c0.05	
v/s Ratio Perm						0.00
v/c Ratio	0.35		0.44	0.25	0.35	0.01
Uniform Delay, d1	8.5		26.2	4.8	20.8	19.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3		4.2	0.2	0.3	0.0
Delay (s)	8.8		30.4	5.0	21.1	19.8
Level of Service	A		C	A	C	B
Approach Delay (s)	8.8			5.4	21.0	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	53.8	Sum of lost time (s)	19.0
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												
Traffic Volume (vph)	37	302	312	1202	432	119	167	316	755	226	532	55
Future Volume (vph)	37	302	312	1202	432	119	167	316	755	226	532	55
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	0.89		1.00	0.99	
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	4563		1641	1527		3183	1703	
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	4563		1641	1527		3183	1703	
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)	40	328	339	1307	470	129	182	343	821	246	578	60
RTOR Reduction (vph)	0	0	134	0	37	0	0	61	0	0	2	0
Lane Group Flow (vph)	40	328	205	1307	562	0	182	1103	0	246	636	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)	6.0	24.6	24.6	29.0	47.6		13.7	55.8		10.7	53.7	
Effective Green, g (s)	6.0	24.6	24.6	29.0	47.6		13.7	55.8		10.7	53.7	
Actuated g/C Ratio	0.04	0.18	0.18	0.21	0.34		0.10	0.40		0.08	0.38	
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)	70	828	253	339	1551		160	608		243	653	
v/s Ratio Prot	0.02	0.07		c0.80	0.12		c0.11	c0.72		0.08	0.37	
v/s Ratio Perm			c0.14									
v/c Ratio	0.57	0.40	0.81	3.86	0.36		1.14	1.81		1.01	0.97	
Uniform Delay, d1	65.7	51.1	55.5	55.5	34.8		63.1	42.1		64.7	42.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.8	1.4	24.0	1292.1	0.7		112.9	372.6		60.9	28.8	
Delay (s)	72.6	52.5	79.4	1347.6	35.4		176.0	414.7		125.6	71.2	
Level of Service	E	D	E	F	D		F	F		F	E	
Approach Delay (s)		66.6			935.2			382.4			86.4	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	499.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	173.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: La Media Road & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	74	69	27	44	249	11	330	18	220	588	120
Future Volume (vph)	114	74	69	27	44	249	11	330	18	220	588	120
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	0.95	1.00	0.97	0.95	0.88	0.97	0.95	1.00	0.97	0.91	0.88
Frpb, ped/bikes	1.00	1.00	0.99	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	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	3282	1448	3183	3282	2584	3183	3282	1468	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	3282	1448	3183	3282	2584	3183	3282	1468	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)	124	80	75	29	48	271	12	359	20	239	639	130
RTOR Reduction (vph)	0	0	57	0	0	221	0	0	14	0	0	76
Lane Group Flow (vph)	124	80	18	29	48	50	12	359	6	239	639	54
Confl. Bikes (#/hr)			2									
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)	3.0	11.5	11.5	0.6	9.1	9.1	0.6	14.0	14.0	7.0	20.4	20.4
Effective Green, g (s)	3.0	11.5	11.5	0.6	9.1	9.1	0.6	14.0	14.0	7.0	20.4	20.4
Actuated g/C Ratio	0.06	0.23	0.23	0.01	0.19	0.19	0.01	0.29	0.29	0.14	0.42	0.42
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)	194	768	339	38	608	478	38	935	418	453	1958	1073
v/s Ratio Prot	c0.04	c0.02		0.01	0.01		0.00	0.11		c0.08	c0.14	
v/s Ratio Perm			0.01			0.02			0.00			0.02
v/c Ratio	0.64	0.10	0.05	0.76	0.08	0.11	0.32	0.38	0.01	0.53	0.33	0.05
Uniform Delay, d1	22.5	14.8	14.6	24.2	16.5	16.6	24.0	14.1	12.6	19.5	9.7	8.6
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	6.8	0.1	0.1	60.7	0.1	0.1	4.7	0.3	0.0	1.1	0.1	0.0
Delay (s)	29.3	14.8	14.6	84.9	16.6	16.7	28.8	14.4	12.6	20.6	9.8	8.6
Level of Service	C	B	B	F	B	B	C	B	B	C	A	A
Approach Delay (s)		21.2			22.4			14.7			12.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	49.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	35.3%	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	131	64	176	85	53
Future Volume (vph)	112	131	64	176	85	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	122	142	70	191	92	58

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	264	70	191	150
Volume Left (vph)	0	70	0	92
Volume Right (vph)	142	0	0	58
Hadj (s)	-0.15	0.67	0.17	0.06
Departure Headway (s)	4.6	5.8	5.3	5.2
Degree Utilization, x	0.34	0.11	0.28	0.22
Capacity (veh/h)	747	594	652	641
Control Delay (s)	9.9	8.4	9.2	9.6
Approach Delay (s)	9.9	9.0		9.6
Approach LOS	A	A		A

Intersection Summary			
Delay	9.5		
Level of Service	A		
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix N
Peak Hour Intersection LOS
- Near-Term Year 2027 Plus Project (Full Development) Conditions

HCM Signalized Intersection Capacity Analysis
1: Caliente Avenue & SR-905 WB On-Ramp/SR-905 WB Off-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	100	1	73	335	1936	0	0	314	601
Future Volume (vph)	0	0	0	100	1	73	335	1936	0	0	314	601
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)					1724	1538	1719	4940			4378	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1724	1538	1719	4940			4378	
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	109	1	79	364	2104	0	0	341	653
RTOR Reduction (vph)	0	0	0	0	0	69	0	0	0	0	372	0
Lane Group Flow (vph)	0	0	0	0	110	10	364	2104	0	0	622	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)					7.6	7.6	16.9	44.3			22.7	
Effective Green, g (s)					7.6	7.6	16.9	44.3			22.7	
Actuated g/C Ratio					0.12	0.12	0.27	0.71			0.37	
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)					210	188	467	3524			1600	
v/s Ratio Prot							c0.21	c0.43			0.14	
v/s Ratio Perm					0.06	0.01						
v/c Ratio					0.52	0.05	0.78	0.60			0.39	
Uniform Delay, d1					25.6	24.1	20.9	4.4			14.6	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					2.4	0.1	7.4	0.3			0.2	
Delay (s)					27.9	24.2	28.2	4.7			14.7	
Level of Service					C	C	C	A			B	
Approach Delay (s)		0.0			26.3			8.2			14.7	
Approach LOS		A			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	62.1	Sum of lost time (s)	14.9
Intersection Capacity Utilization	99.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Caliente Avenue & SR-905 EB Off-Ramp/SR-905 EB On-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1607	1	189	0	0	0	0	663	139	140	275	0
Future Volume (vph)	1607	1	189	0	0	0	0	663	139	140	275	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	0.95	0.95						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	0.97						0.97		1.00	1.00	
Flt Protected	0.95	0.96						1.00		0.95	1.00	
Satd. Flow (prot)	1559	1528						4572		1641	3282	
Flt Permitted	0.95	0.96						1.00		0.95	1.00	
Satd. Flow (perm)	1559	1528						4572		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)	1747	1	205	0	0	0	0	721	151	152	299	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	23	0	0	0	0
Lane Group Flow (vph)	996	950	0	0	0	0	0	849	0	152	299	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)	85.9	85.9						25.9		13.3	43.9	
Effective Green, g (s)	85.9	85.9						25.9		13.3	43.9	
Actuated g/C Ratio	0.61	0.61						0.18		0.10	0.31	
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)	956	937						845		155	1029	
v/s Ratio Prot								c0.19		c0.09	0.09	
v/s Ratio Perm	c0.64	0.62										
v/c Ratio	1.04	1.01						1.00		0.98	0.29	
Uniform Delay, d1	27.0	27.0						57.0		63.2	36.3	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	40.6	32.9						32.2		66.1	0.2	
Delay (s)	67.6	60.0						89.2		129.3	36.4	
Level of Service	E	E						F		F	D	
Approach Delay (s)		63.9			0.0			89.2			67.7	
Approach LOS		E			A			F			E	

Intersection Summary			
HCM 2000 Control Delay	71.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	99.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Caliente Avenue & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	208	22	9	1	27	217	31	388	2	147	199	147
Future Volume (vph)	208	22	9	1	27	217	31	388	2	147	199	147
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	
Lane Util. Factor	0.95	0.95		1.00	1.00	1.00	1.00	0.91		1.00	0.95	
Frpb, ped/bikes	1.00	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	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00		1.00	0.94	
Flt Protected	0.95	0.96		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1633	1639		1641	1810	1447	1641	4935		1641	3094	
Flt Permitted	0.95	0.96		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1633	1639		1641	1810	1447	1641	4935		1641	3094	
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)	226	24	10	1	29	236	34	422	2	160	216	160
RTOR Reduction (vph)	0	5	0	0	0	201	0	1	0	0	104	0
Lane Group Flow (vph)	131	124	0	1	29	35	34	423	0	160	272	0
Confl. Peds. (#/hr)	1					1	6		1	1		6
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	10%	5%	10%	10%	5%	10%	10%	10%	5%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	7.8	7.8		7.5	7.5	7.5	1.7	13.1		6.4	17.8	
Effective Green, g (s)	7.8	7.8		7.5	7.5	7.5	1.7	13.1		6.4	17.8	
Actuated g/C Ratio	0.15	0.15		0.15	0.15	0.15	0.03	0.26		0.13	0.35	
Clearance Time (s)	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	
Lane Grp Cap (vph)	250	251		242	267	213	54	1272		206	1084	
v/s Ratio Prot	c0.08	0.08		0.00	0.02		0.02	c0.09		c0.10	0.09	
v/s Ratio Perm						c0.02						
v/c Ratio	0.52	0.49		0.00	0.11	0.16	0.63	0.33		0.78	0.25	
Uniform Delay, d1	19.8	19.7		18.5	18.8	18.9	24.2	15.3		21.5	11.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	1.5		0.0	0.2	0.4	20.8	0.2		16.6	0.1	
Delay (s)	21.8	21.2		18.5	18.9	19.3	45.0	15.5		38.1	11.9	
Level of Service	C	C		B	B	B	D	B		D	B	
Approach Delay (s)		21.5			19.2			17.7			19.7	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
4: Innovative Drive & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1721	1	0	706	57	0	0	1	0	0	43
Future Volume (Veh/h)	0	1721	1	0	706	57	0	0	1	0	0	43
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	1871	1	0	767	62	0	0	1	0	0	47
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	835			1872			2174	2706	624	1398	2645	262
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	835			1872			2174	2706	624	1398	2645	262
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	93
cM capacity (veh/h)	741			287			22	18	409	92	20	710

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	748	748	375	256	256	256	62	1	47
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	1	0	0	0	62	1	47
cSH	1700	1700	1700	1700	1700	1700	1700	409	710
Volume to Capacity	0.44	0.44	0.22	0.15	0.15	0.15	0.04	0.00	0.07
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.8	10.4
Lane LOS								B	B
Approach Delay (s)	0.0			0.0				13.8	10.4
Approach LOS								B	B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	43.3%	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)	944	648	250	121	471	300	149	104	61	239	121	249
Future Volume (vph)	944	648	250	121	471	300	149	104	61	239	121	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
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	0.94		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	1632		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	1632		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)	1026	704	272	132	512	326	162	113	66	260	132	271
RTOR Reduction (vph)	0	0	168	0	0	267	0	16	0	0	0	145
Lane Group Flow (vph)	1026	704	104	132	512	59	162	163	0	260	132	126
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)	27.8	36.7	36.7	8.5	17.4	17.4	14.0	17.0		13.7	16.7	44.5
Effective Green, g (s)	27.8	36.7	36.7	8.5	17.4	17.4	14.0	17.0		13.7	16.7	44.5
Actuated g/C Ratio	0.29	0.38	0.38	0.09	0.18	0.18	0.15	0.18		0.14	0.17	0.47
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0		2.0	2.0	2.0
Lane Grp Cap (vph)	925	1810	563	283	858	267	240	290		235	301	1202
v/s Ratio Prot	c0.32	0.15		0.04	c0.11		0.10	c0.10		c0.16	0.08	0.03
v/s Ratio Perm			0.07			0.04						0.02
v/c Ratio	1.11	0.39	0.19	0.47	0.60	0.22	0.68	0.56		1.11	0.44	0.10
Uniform Delay, d1	33.9	21.3	19.5	41.4	35.9	33.3	38.6	35.9		40.9	35.3	14.4
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	64.3	0.2	0.3	0.4	1.5	0.7	5.8	4.0		90.2	0.4	0.0
Delay (s)	98.2	21.5	19.8	41.8	37.3	34.0	44.4	39.9		131.1	35.6	14.4
Level of Service	F	C	B	D	D	C	D	D		F	D	B
Approach Delay (s)		60.6			36.8			42.1			64.4	
Approach LOS		E			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	53.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	95.6	Sum of lost time (s)	19.7
Intersection Capacity Utilization	74.9%	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)	119	742	61	123	740	85	56	14	106	60	12	92
Future Volume (vph)	119	742	61	123	740	85	56	14	106	60	12	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	4.9
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	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
Frt	1.00	0.99		1.00	0.98		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	4654		1641	4632		1641	1727	1450	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	4654		1641	4632		1641	1727	1450	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)	129	807	66	134	804	92	61	15	115	65	13	100
RTOR Reduction (vph)	0	8	0	0	12	0	0	0	101	0	0	87
Lane Group Flow (vph)	129	865	0	134	884	0	61	15	14	65	13	13
Confl. Peds. (#/hr)			4			2			1			
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)	9.9	20.4		8.0	18.5		4.4	7.2	7.2	4.8	7.6	7.6
Effective Green, g (s)	9.9	20.4		8.0	18.5		4.4	7.2	7.2	4.8	7.6	7.6
Actuated g/C Ratio	0.16	0.34		0.13	0.31		0.07	0.12	0.12	0.08	0.13	0.13
Clearance Time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	4.9
Vehicle Extension (s)	2.0	4.4		2.0	4.2		2.0	3.2	3.2	2.0	2.0	2.0
Lane Grp Cap (vph)	270	1579		218	1425		120	206	173	131	218	185
v/s Ratio Prot	0.08	0.19		c0.08	c0.19		0.04	0.01		c0.04	0.01	
v/s Ratio Perm									c0.01			0.01
v/c Ratio	0.48	0.55		0.61	0.62		0.51	0.07	0.08	0.50	0.06	0.07
Uniform Delay, d1	22.8	16.1		24.6	17.8		26.8	23.5	23.5	26.5	23.1	23.1
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	0.5	0.6		3.6	1.0		1.2	0.2	0.2	1.1	0.0	0.1
Delay (s)	23.2	16.7		28.2	18.8		28.0	23.6	23.7	27.6	23.1	23.2
Level of Service	C	B		C	B		C	C	C	C	C	C
Approach Delay (s)		17.5			20.0			25.1			24.8	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	60.1	Sum of lost time (s)	19.7
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Cactus Road & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	330	40	254	156	81	20	46	360	151	11	10
Future Volume (vph)	10	330	40	254	156	81	20	46	360	151	11	10
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
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.87		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3358		3433	1615		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	3358		3433	1615		3433	1863	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	359	43	276	170	88	22	50	391	164	12	11
RTOR Reduction (vph)	0	0	32	0	58	0	0	271	0	0	0	8
Lane Group Flow (vph)	11	359	11	276	200	0	22	170	0	164	12	3
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2									8
Actuated Green, G (s)	0.6	14.5	14.5	4.6	18.5		0.6	13.4		4.6	17.4	17.4
Effective Green, g (s)	0.6	14.5	14.5	4.6	18.5		0.6	13.4		4.6	17.4	17.4
Actuated g/C Ratio	0.01	0.26	0.26	0.08	0.34		0.01	0.24		0.08	0.32	0.32
Clearance Time (s)	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
Lane Grp Cap (vph)	19	931	416	286	1127		37	392		286	588	499
v/s Ratio Prot	0.01	c0.10		c0.08	c0.06		0.01	c0.11		c0.05	c0.01	
v/s Ratio Perm			0.01									0.00
v/c Ratio	0.58	0.39	0.03	0.97	0.18		0.59	0.43		0.57	0.02	0.01
Uniform Delay, d1	27.1	16.6	15.1	25.2	12.9		27.1	17.6		24.3	13.0	12.9
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	36.3	0.3	0.0	43.3	0.1		23.1	0.8		2.8	0.0	0.0
Delay (s)	63.4	16.9	15.1	68.5	13.0		50.2	18.4		27.1	13.0	12.9
Level of Service	E	B	B	E	B		D	B		C	B	B
Approach Delay (s)		18.0			41.7			19.9			25.3	
Approach LOS		B			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	55.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	421	363	164	360	621	401
Future Volume (vph)	421	363	164	360	621	401
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	5.3	4.4	6.0	5.3	5.3
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)	458	395	178	391	675	436
RTOR Reduction (vph)	0	156	0	0	0	297
Lane Group Flow (vph)	458	239	178	391	675	139
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	8	1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	15.5	36.2	12.8	32.7	20.7	20.7
Effective Green, g (s)	15.5	36.2	12.8	32.7	20.7	20.7
Actuated g/C Ratio	0.24	0.56	0.20	0.51	0.32	0.32
Clearance Time (s)	6.0	5.3	4.4	6.0	5.3	5.3
Vehicle Extension (s)	4.4	2.0	2.0	4.3	2.0	2.0
Lane Grp Cap (vph)	1129	941	324	2383	1018	469
v/s Ratio Prot	c0.10	0.08	c0.11	0.08	c0.21	
v/s Ratio Perm		0.08				0.10
v/c Ratio	0.41	0.25	0.55	0.16	0.66	0.30
Uniform Delay, d1	20.7	7.3	23.4	8.6	19.0	16.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	1.0	0.1	1.3	0.1
Delay (s)	21.1	7.4	24.4	8.7	20.3	16.7
Level of Service	C	A	C	A	C	B
Approach Delay (s)	14.8			13.6	18.8	
Approach LOS	B			B	B	

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	64.7	Sum of lost time (s)	15.7
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												
Traffic Volume (vph)	0	0	0	201	0	181	648	757	0	0	472	53
Future Volume (vph)	0	0	0	201	0	181	648	757	0	0	472	53
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			0.98	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1641	1395	1395	3183	4715			4644	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1395	1395	3183	4715			4644	
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	218	0	197	704	823	0	0	513	58
RTOR Reduction (vph)	0	0	0	0	77	76	0	0	0	0	23	0
Lane Group Flow (vph)	0	0	0	218	22	22	704	823	0	0	548	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)				12.2	12.2	12.2	15.1	32.8			13.0	
Effective Green, g (s)				12.2	12.2	12.2	15.1	32.8			13.0	
Actuated g/C Ratio				0.22	0.22	0.22	0.27	0.59			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)				362	308	308	870	2801			1093	
v/s Ratio Prot					0.02		c0.22	0.17			c0.12	
v/s Ratio Perm				c0.13		0.02						
v/c Ratio				0.60	0.07	0.07	0.81	0.29			0.50	
Uniform Delay, d1				19.3	17.0	17.0	18.7	5.5			18.3	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				2.8	0.1	0.1	5.6	0.1			0.4	
Delay (s)				22.1	17.1	17.1	24.3	5.6			18.7	
Level of Service				C	B	B	C	A			B	
Approach Delay (s)		0.0			19.8			14.2			18.7	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	55.2	Sum of lost time (s)	14.9
Intersection Capacity Utilization	65.9%	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)	221	3	1148	0	0	0	0	1191	124	31	642	0
Future Volume (vph)	221	3	1148	0	0	0	0	1191	124	31	642	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)		1646	2584					3235		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1646	2584					3235		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)	240	3	1248	0	0	0	0	1295	135	34	698	0
RTOR Reduction (vph)	0	0	190	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	243	1058	0	0	0	0	1424	0	34	698	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)		53.0	53.0					57.2		3.0	64.9	
Effective Green, g (s)		53.0	53.0					57.2		3.0	64.9	
Actuated g/C Ratio		0.41	0.41					0.45		0.02	0.51	
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)		681	1069					1444		74	2388	
v/s Ratio Prot								c0.44		0.01	c0.15	
v/s Ratio Perm		0.15	c0.41									
v/c Ratio		0.36	0.99					0.99		0.46	0.29	
Uniform Delay, d1		25.8	37.3					35.1		61.7	18.3	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.3	24.7					20.2		4.5	0.1	
Delay (s)		26.1	62.0					55.3		66.2	18.4	
Level of Service		C	E					E		E	B	
Approach Delay (s)		56.2			0.0			55.3			20.6	
Approach LOS		E			A			E			C	

Intersection Summary			
HCM 2000 Control Delay	48.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	128.1	Sum of lost time (s)	14.9
Intersection Capacity Utilization	65.9%	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)	581	195	59	39	101	142	45	499	54	336	839	340
Future Volume (vph)	581	195	59	39	101	142	45	499	54	336	839	340
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	5.3
Lane Util. Factor	0.97	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	0.97			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)	3183	1667			1704	1449	1641	3226		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)	3183	1667			1704	1449	1641	3226		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)	632	212	64	42	110	154	49	542	59	365	912	370
RTOR Reduction (vph)	0	7	0	0	0	133	0	5	0	0	0	98
Lane Group Flow (vph)	632	269	0	0	152	21	49	596	0	365	912	272
Confl. Peds. (#/hr)	1					1			2			
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	7		8	8		5	2		1	6	7
Permitted Phases						8						6
Actuated Green, G (s)	24.7	24.7			17.3	17.3	4.6	34.2		32.4	61.8	86.5
Effective Green, g (s)	24.7	24.7			17.3	17.3	4.6	34.2		32.4	61.8	86.5
Actuated g/C Ratio	0.19	0.19			0.13	0.13	0.04	0.27		0.25	0.48	0.67
Clearance Time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.3
Vehicle Extension (s)	2.0	2.0			3.7	3.7	2.0	3.8		2.0	3.8	2.0
Lane Grp Cap (vph)	612	320			229	195	58	859		414	831	988
v/s Ratio Prot	c0.20	0.16			c0.09		0.03	0.18		c0.22	c0.53	0.05
v/s Ratio Perm						0.01						0.13
v/c Ratio	1.03	0.84			0.66	0.11	0.84	0.69		0.88	1.10	0.28
Uniform Delay, d1	51.9	49.9			52.8	48.8	61.5	42.4		46.2	33.3	8.4
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	45.0	16.6			7.5	0.3	63.2	2.6		18.8	61.3	0.1
Delay (s)	96.9	66.6			60.3	49.1	124.7	45.0		64.9	94.6	8.4
Level of Service	F	E			E	D	F	D		E	F	A
Approach Delay (s)		87.7			54.6			51.0			68.7	
Approach LOS		F			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	69.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	128.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	88.9%	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)	627	59	4	460	57	8
Future Volume (vph)	627	59	4	460	57	8
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)	4655		1641	4715	1641	1450
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4655		1641	4715	1641	1450
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	682	64	4	500	62	9
RTOR Reduction (vph)	8	0	0	0	0	8
Lane Group Flow (vph)	738	0	4	500	62	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)	27.8		0.8	34.3	5.2	5.2
Effective Green, g (s)	27.8		0.8	34.3	5.2	5.2
Actuated g/C Ratio	0.53		0.02	0.65	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)	2450		24	3062	161	142
v/s Ratio Prot	c0.16		0.00	c0.11	c0.04	
v/s Ratio Perm						0.00
v/c Ratio	0.30		0.17	0.16	0.39	0.01
Uniform Delay, d1	7.0		25.7	3.6	22.3	21.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		1.2	0.1	0.6	0.0
Delay (s)	7.3		26.9	3.7	22.9	21.5
Level of Service	A		C	A	C	C
Approach Delay (s)	7.3			3.9	22.7	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	52.8	Sum of lost time (s)	19.0
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
13: La Media Road & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	421	165	730	322	247	119	418	948	79	307	45
Future Volume (vph)	85	421	165	730	322	247	119	418	948	79	307	45
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	0.93		1.00	0.90		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	1441	1641	4409		1641	1530		3183	1694	
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	4409		1641	1530		3183	1694	
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)	92	458	179	793	350	268	129	454	1030	86	334	49
RTOR Reduction (vph)	0	0	153	0	106	0	0	53	0	0	4	0
Lane Group Flow (vph)	92	458	26	793	512	0	129	1431	0	86	379	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)	12.1	20.7	20.7	28.0	36.6		16.6	62.2		9.2	55.7	
Effective Green, g (s)	12.1	20.7	20.7	28.0	36.6		16.6	62.2		9.2	55.7	
Actuated g/C Ratio	0.09	0.15	0.15	0.20	0.26		0.12	0.44		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)	141	697	213	328	1152		194	679		209	673	
v/s Ratio Prot	0.06	c0.10		c0.48	0.12		c0.08	c0.93		0.03	0.22	
v/s Ratio Perm			0.02									
v/c Ratio	0.65	0.66	0.12	2.42	0.44		0.66	2.11		0.41	0.56	
Uniform Delay, d1	61.9	56.3	51.8	56.0	43.2		59.0	38.9		62.8	32.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.0	4.8	1.2	647.2	1.2		6.5	503.1		0.5	1.9	
Delay (s)	69.9	61.1	53.0	703.2	44.4		65.5	542.0		63.3	34.6	
Level of Service	E	E	D	F	D		E	F		E	C	
Approach Delay (s)		60.2			414.7			503.9			39.9	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	345.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.83		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	161.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: La Media Road & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	136	58	27	107	86	43	328	10	269	585	66
Future Volume (vph)	66	136	58	27	107	86	43	328	10	269	585	66
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	0.95	1.00	0.97	0.95	0.88	0.97	0.95	1.00	0.97	0.91	0.88
Frpb, ped/bikes	1.00	1.00	0.99	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	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	3282	1448	3183	3282	2584	3183	3282	1468	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	3282	1448	3183	3282	2584	3183	3282	1468	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)	72	148	63	29	116	93	47	357	11	292	636	72
RTOR Reduction (vph)	0	0	49	0	0	76	0	0	8	0	0	43
Lane Group Flow (vph)	72	148	14	29	116	17	47	357	3	292	636	29
Confl. Bikes (#/hr)			2									
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)	2.1	10.3	10.3	0.6	8.8	8.8	1.4	13.0	13.0	8.0	19.6	19.6
Effective Green, g (s)	2.1	10.3	10.3	0.6	8.8	8.8	1.4	13.0	13.0	8.0	19.6	19.6
Actuated g/C Ratio	0.04	0.22	0.22	0.01	0.18	0.18	0.03	0.27	0.27	0.17	0.41	0.41
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)	139	705	311	39	602	474	93	890	398	531	1929	1057
v/s Ratio Prot	c0.02	c0.05		0.01	0.04		0.01	c0.11		c0.09	0.13	
v/s Ratio Perm			0.01			0.01			0.00			0.01
v/c Ratio	0.52	0.21	0.04	0.74	0.19	0.04	0.51	0.40	0.01	0.55	0.33	0.03
Uniform Delay, d1	22.4	15.5	14.9	23.6	16.5	16.1	22.9	14.3	12.7	18.3	9.7	8.5
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	3.2	0.1	0.1	54.3	0.2	0.0	4.3	0.3	0.0	1.2	0.1	0.0
Delay (s)	25.6	15.6	15.0	77.8	16.7	16.1	27.2	14.6	12.7	19.5	9.8	8.5
Level of Service	C	B	B	E	B	B	C	B	B	B	A	A
Approach Delay (s)		18.0			23.9			15.9			12.5	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	47.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	37.2%	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)	110	118	70	160	114	52
Future Volume (vph)	110	118	70	160	114	52
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	128	76	174	124	57

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	248	76	174	181
Volume Left (vph)	0	76	0	124
Volume Right (vph)	128	0	0	57
Hadj (s)	-0.14	0.67	0.17	0.12
Departure Headway (s)	4.7	5.9	5.4	5.2
Degree Utilization, x	0.32	0.12	0.26	0.26
Capacity (veh/h)	728	583	639	644
Control Delay (s)	9.9	8.6	9.1	10.0
Approach Delay (s)	9.9	9.0		10.0
Approach LOS	A	A		B

Intersection Summary			
Delay	9.6		
Level of Service	A		
Intersection Capacity Utilization	36.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	176	0	0	370
Future Volume (vph)	0	0	176	0	0	370
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	191	0	0	402

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	0	191	0	402
Volume Left (vph)	0	191	0	0
Volume Right (vph)	0	0	0	402
Hadj (s)	0.00	0.53	0.00	-0.57
Departure Headway (s)	5.2	5.9	5.4	3.9
Degree Utilization, x	0.00	0.31	0.00	0.44
Capacity (veh/h)	639	576	643	884
Control Delay (s)	8.2	10.4	7.2	10.0
Approach Delay (s)	0.0	10.4		10.0
Approach LOS	A	B		A

Intersection Summary			
Delay	10.1		
Level of Service	B		
Intersection Capacity Utilization	39.3%	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)	0	134	62	65	28	0
Future Volume (vph)	0	134	62	65	28	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	146	67	71	30	0

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	146	67	71	30
Volume Left (vph)	0	67	0	0
Volume Right (vph)	146	0	0	0
Hadj (s)	-0.57	0.53	0.03	0.03
Departure Headway (s)	3.7	5.4	4.9	4.5
Degree Utilization, x	0.15	0.10	0.10	0.04
Capacity (veh/h)	924	649	714	770
Control Delay (s)	7.4	7.8	7.2	7.7
Approach Delay (s)	7.4	7.5		7.7
Approach LOS	A	A		A

Intersection Summary			
Delay	7.5		
Level of Service	A		
Intersection Capacity Utilization	25.1%	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)	165	0	0	261	227	78
Future Volume (vph)	165	0	0	261	227	78
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	179	0	0	284	247	85

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	179	0	284	165	167
Volume Left (vph)	179	0	0	0	0
Volume Right (vph)	0	0	0	0	85
Hadj (s)	0.23	0.00	0.03	0.03	-0.32
Departure Headway (s)	5.6	5.4	5.4	5.4	5.0
Degree Utilization, x	0.28	0.00	0.43	0.25	0.23
Capacity (veh/h)	591	648	639	640	686
Control Delay (s)	10.8	7.2	11.3	8.9	8.4
Approach Delay (s)	10.8	11.3		8.6	
Approach LOS	B	B		A	

Intersection Summary			
Delay	10.1		
Level of Service	B		
Intersection Capacity Utilization	29.5%	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)	165	0	0	96	149	78
Future Volume (vph)	165	0	0	96	149	78
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	179	0	0	104	162	85

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	179	0	104	108	139
Volume Left (vph)	179	0	0	0	0
Volume Right (vph)	0	0	0	0	85
Hadj (s)	0.23	0.00	0.03	0.03	-0.39
Departure Headway (s)	5.0	5.2	5.3	5.1	4.7
Degree Utilization, x	0.25	0.00	0.15	0.15	0.18
Capacity (veh/h)	683	665	652	672	736
Control Delay (s)	9.6	7.0	8.0	7.9	7.5
Approach Delay (s)	9.6	8.0		7.7	
Approach LOS	A	A		A	

Intersection Summary			
Delay	8.4		
Level of Service	A		
Intersection Capacity Utilization	22.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1: Caliente Avenue & SR-905 WB On-Ramp/SR-905 WB Off-Ramp

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	168	2	140	401	1242	0	0	521	1813
Future Volume (vph)	0	0	0	168	2	140	401	1242	0	0	521	1813
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			0.96	
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)					1724	1538	1719	4940			4195	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1724	1538	1719	4940			4195	
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	183	2	152	436	1350	0	0	566	1971
RTOR Reduction (vph)	0	0	0	0	0	110	0	0	0	0	189	0
Lane Group Flow (vph)	0	0	0	0	185	42	436	1350	0	0	2348	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)					16.9	16.9	38.3	122.9			79.9	
Effective Green, g (s)					16.9	16.9	38.3	122.9			79.9	
Actuated g/C Ratio					0.11	0.11	0.26	0.82			0.53	
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)					194	173	438	4047			2234	
v/s Ratio Prot							c0.25	0.27			c0.56	
v/s Ratio Perm					0.11	0.03						
v/c Ratio					0.95	0.24	1.00	0.33			1.99dr	
Uniform Delay, d1					66.2	60.7	55.8	3.4			35.0	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					51.0	0.7	41.5	0.0			34.1	
Delay (s)					117.1	61.4	97.3	3.4			69.1	
Level of Service					F	E	F	A			E	
Approach Delay (s)		0.0			92.0			26.3			69.1	
Approach LOS		A			F			C			E	

Intersection Summary			
HCM 2000 Control Delay	54.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	95.8%	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	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	917	2	391	0	0	0	0	726	165	119	577	0
Future Volume (vph)	917	2	391	0	0	0	0	726	165	119	577	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	0.95	0.95						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	0.91						0.97		1.00	1.00	
Flt Protected	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (prot)	1559	1461						4561		1641	3282	
Flt Permitted	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (perm)	1559	1461						4561		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)	997	2	425	0	0	0	0	789	179	129	627	0
RTOR Reduction (vph)	0	65	0	0	0	0	0	41	0	0	0	0
Lane Group Flow (vph)	738	621	0	0	0	0	0	927	0	129	627	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)	44.0	44.0						21.4		8.3	34.4	
Effective Green, g (s)	44.0	44.0						21.4		8.3	34.4	
Actuated g/C Ratio	0.50	0.50						0.24		0.09	0.39	
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)	774	725						1101		153	1274	
v/s Ratio Prot								c0.20		c0.08	0.19	
v/s Ratio Perm	c0.47	0.43										
v/c Ratio	0.95	0.86						0.84		0.84	0.49	
Uniform Delay, d1	21.3	19.5						32.0		39.5	20.5	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	21.6	9.8						6.0		31.2	0.3	
Delay (s)	42.9	29.3						38.0		70.7	20.8	
Level of Service	D	C						D		E	C	
Approach Delay (s)		36.4			0.0			38.0			29.3	
Approach LOS		D			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	88.6	Sum of lost time (s)	14.9
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Caliente Avenue & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	227	20	40	0	63	420	15	275	2	230	425	361
Future Volume (vph)	227	20	40	0	63	420	15	275	2	230	425	361
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	
Lane Util. Factor	0.95	0.95			1.00	1.00	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	0.96			1.00	0.85	1.00	1.00		1.00	0.93	
Flt Protected	0.95	0.97			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1633	1601			1810	1449	1639	4933		1641	3087	
Flt Permitted	0.95	0.97			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1633	1601			1810	1449	1639	4933		1641	3087	
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)	247	22	43	0	68	457	16	299	2	250	462	392
RTOR Reduction (vph)	0	20	0	0	0	299	0	1	0	0	182	0
Lane Group Flow (vph)	158	134	0	0	68	158	16	300	0	250	672	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	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	10.9	10.9			11.1	11.1	0.6	13.2		11.3	23.9	
Effective Green, g (s)	10.9	10.9			11.1	11.1	0.6	13.2		11.3	23.9	
Actuated g/C Ratio	0.17	0.17			0.18	0.18	0.01	0.21		0.18	0.38	
Clearance Time (s)	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	
Lane Grp Cap (vph)	284	279			321	257	15	1041		296	1180	
v/s Ratio Prot	c0.10	0.08			0.04		0.01	0.06		c0.15	c0.22	
v/s Ratio Perm						c0.11						
v/c Ratio	0.56	0.48			0.21	0.61	1.07	0.29		0.84	0.57	
Uniform Delay, d1	23.6	23.3			22.0	23.7	30.9	20.7		24.8	15.2	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	1.3			0.3	4.3	255.5	0.2		19.3	0.6	
Delay (s)	25.9	24.6			22.3	28.0	286.4	20.9		44.0	15.9	
Level of Service	C	C			C	C	F	C		D	B	
Approach Delay (s)		25.3			27.3			34.3			22.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	62.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
4: Innovative Drive & Otay Mesa Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1077	2	0	1983	77	0	0	1	0	0	128
Future Volume (Veh/h)	0	1077	2	0	1983	77	0	0	1	0	0	128
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	1171	2	0	2155	84	0	0	1	0	0	139
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	2240			1173			2030	3412	391	2547	3329	720
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2240			1173			2030	3412	391	2547	3329	720
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	61
cM capacity (veh/h)	203			548			18	6	585	12	7	352

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	468	468	236	718	718	718	84	1	139
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	2	0	0	0	84	1	139
cSH	1700	1700	1700	1700	1700	1700	1700	585	352
Volume to Capacity	0.28	0.28	0.14	0.42	0.42	0.42	0.05	0.00	0.39
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	46
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.2	21.7
Lane LOS								B	C
Approach Delay (s)	0.0			0.0				11.2	21.7
Approach LOS								B	C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	53.2%	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)	344	637	200	52	782	395	278	135	84	449	138	1096
Future Volume (vph)	344	637	200	52	782	395	278	135	84	449	138	1096
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
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	0.94	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	0.94		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	1386	1641	1617		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	1386	1641	1617		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)	374	692	217	57	850	429	302	147	91	488	150	1191
RTOR Reduction (vph)	0	0	149	0	0	322	0	18	0	0	0	166
Lane Group Flow (vph)	374	692	68	57	850	107	302	220	0	488	150	1025
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)	11.7	35.2	35.2	4.7	28.2	28.2	24.9	22.5		30.5	28.1	39.8
Effective Green, g (s)	11.7	35.2	35.2	4.7	28.2	28.2	24.9	22.5		30.5	28.1	39.8
Actuated g/C Ratio	0.10	0.31	0.31	0.04	0.25	0.25	0.22	0.20		0.27	0.25	0.35
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0		2.0	2.0	2.0
Lane Grp Cap (vph)	330	1473	443	132	1180	347	362	323		444	430	913
v/s Ratio Prot	c0.12	0.15		0.02	c0.18		0.18	0.14		c0.30	0.09	c0.12
v/s Ratio Perm			0.05			0.08						0.28
v/c Ratio	1.13	0.47	0.15	0.43	0.72	0.31	0.83	0.68		1.10	0.35	1.12
Uniform Delay, d1	50.4	31.2	27.9	52.6	38.6	34.3	41.9	41.7		41.0	34.7	36.4
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	90.7	0.4	0.3	0.8	2.5	0.8	14.5	7.3		72.3	0.2	69.5
Delay (s)	141.1	31.6	28.2	53.5	41.1	35.1	56.4	49.0		113.4	34.9	105.9
Level of Service	F	C	C	D	D	D	E	D		F	C	F
Approach Delay (s)		62.9			39.7			53.1			102.0	
Approach LOS		E			D			D			F	

Intersection Summary			
HCM 2000 Control Delay	70.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	112.6	Sum of lost time (s)	19.7
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)	106	986	79	131	1080	77	59	15	150	95	18	113
Future Volume (vph)	106	986	79	131	1080	77	59	15	150	95	18	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	4.9
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	4654		1641	4660		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	4654		1641	4660		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)	115	1072	86	142	1174	84	64	16	163	103	20	123
RTOR Reduction (vph)	0	7	0	0	6	0	0	0	141	0	0	109
Lane Group Flow (vph)	115	1151	0	142	1252	0	64	16	22	103	20	14
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)	8.6	28.6		6.6	26.6		6.1	9.5	9.5	4.6	8.0	8.0
Effective Green, g (s)	8.6	28.6		6.6	26.6		6.1	9.5	9.5	4.6	8.0	8.0
Actuated g/C Ratio	0.12	0.41		0.10	0.39		0.09	0.14	0.14	0.07	0.12	0.12
Clearance Time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	4.9
Vehicle Extension (s)	2.0	4.4		2.0	4.2		2.0	3.2	3.2	2.0	2.0	2.0
Lane Grp Cap (vph)	204	1929		156	1796		145	237	202	109	200	170
v/s Ratio Prot	0.07	0.25		c0.09	c0.27		0.04	0.01		c0.06	0.01	
v/s Ratio Perm									c0.02			0.01
v/c Ratio	0.56	0.60		0.91	0.70		0.44	0.07	0.11	0.94	0.10	0.08
Uniform Delay, d1	28.4	15.7		30.9	17.8		29.8	25.9	26.1	32.1	27.3	27.2
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	2.1	0.7		45.9	1.3		0.8	0.1	0.3	67.7	0.1	0.1
Delay (s)	30.6	16.4		76.8	19.1		30.6	26.0	26.3	99.8	27.4	27.3
Level of Service	C	B		E	B		C	C	C	F	C	C
Approach Delay (s)		17.6			25.0			27.4			57.7	
Approach LOS		B			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	69.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	53.1%	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)	10	228	30	460	380	151	47	18	367	109	45	10
Future Volume (vph)	10	228	30	460	380	151	47	18	367	109	45	10
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
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	1.00		0.97	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	1.00	0.85	1.00	0.96		1.00	0.86		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1641	3282	1468	3183	3142		3183	1481		3183	1727	1468
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1641	3282	1468	3183	3142		3183	1481		3183	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)	11	248	33	500	413	164	51	20	399	118	49	11
RTOR Reduction (vph)	0	0	25	0	39	0	0	316	0	0	0	8
Lane Group Flow (vph)	11	248	8	500	538	0	51	103	0	118	49	3
Confl. Peds. (#/hr)				1						1		
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2									8
Actuated Green, G (s)	0.6	13.9	13.9	7.7	21.0		1.4	11.4		4.1	14.1	14.1
Effective Green, g (s)	0.6	13.9	13.9	7.7	21.0		1.4	11.4		4.1	14.1	14.1
Actuated g/C Ratio	0.01	0.25	0.25	0.14	0.38		0.03	0.21		0.07	0.26	0.26
Clearance Time (s)	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
Lane Grp Cap (vph)	17	827	370	444	1197		80	306		236	441	375
v/s Ratio Prot	0.01	0.08		c0.16	c0.17		0.02	c0.07		c0.04	c0.03	
v/s Ratio Perm			0.01									0.00
v/c Ratio	0.65	0.30	0.02	1.13	0.45		0.64	0.34		0.50	0.11	0.01
Uniform Delay, d1	27.1	16.7	15.5	23.7	12.7		26.6	18.6		24.5	15.7	15.3
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	62.0	0.2	0.0	81.9	0.3		15.5	0.7		1.7	0.1	0.0
Delay (s)	89.1	16.9	15.5	105.6	13.0		42.1	19.3		26.2	15.8	15.3
Level of Service	F	B	B	F	B		D	B		C	B	B
Approach Delay (s)		19.4			56.0			21.7			22.7	
Approach LOS		B			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	39.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	55.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	615	609	601	684	497	265
Future Volume (vph)	615	609	601	684	497	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	5.3	4.4	6.0	5.3	5.3
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)	668	662	653	743	540	288
RTOR Reduction (vph)	0	50	0	0	0	211
Lane Group Flow (vph)	668	612	653	743	540	77
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	8	1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	26.8	61.0	51.7	82.9	34.2	34.2
Effective Green, g (s)	26.8	61.0	51.7	82.9	34.2	34.2
Actuated g/C Ratio	0.21	0.48	0.40	0.65	0.27	0.27
Clearance Time (s)	6.0	5.3	4.4	6.0	5.3	5.3
Vehicle Extension (s)	4.4	2.0	2.0	4.3	2.0	2.0
Lane Grp Cap (vph)	984	758	660	3044	847	391
v/s Ratio Prot	0.14	c0.22	c0.40	0.16	0.17	
v/s Ratio Perm		0.20				0.05
v/c Ratio	0.68	0.81	0.99	0.24	0.64	0.20
Uniform Delay, d1	46.8	28.7	38.1	9.6	41.6	36.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	6.0	31.9	0.1	1.2	0.1
Delay (s)	49.0	34.7	70.0	9.6	42.8	36.5
Level of Service	D	C	E	A	D	D
Approach Delay (s)	41.9			37.9	40.6	
Approach LOS	D			D	D	

Intersection Summary			
HCM 2000 Control Delay	40.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	128.4	Sum of lost time (s)	15.7
Intersection Capacity Utilization	79.1%	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	122	1	115	1101	636	0	0	805	363
Future Volume (vph)	0	0	0	122	1	115	1101	636	0	0	805	363
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			0.95	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1641	1379	1375	3183	4715			4478	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1379	1375	3183	4715			4478	
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	133	1	125	1197	691	0	0	875	395
RTOR Reduction (vph)	0	0	0	0	54	53	0	0	0	0	89	0
Lane Group Flow (vph)	0	0	0	133	10	9	1197	691	0	0	1181	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)				11.9	11.9	11.9	34.3	63.9			24.9	
Effective Green, g (s)				11.9	11.9	11.9	34.3	63.9			24.9	
Actuated g/C Ratio				0.14	0.14	0.14	0.40	0.74			0.29	
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)				227	190	190	1269	3503			1296	
v/s Ratio Prot					0.01		c0.38	0.15			c0.26	
v/s Ratio Perm				c0.08		0.01						
v/c Ratio				0.59	0.05	0.05	0.94	0.20			0.91	
Uniform Delay, d1				34.7	32.2	32.1	24.9	3.3			29.5	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				3.8	0.1	0.1	13.8	0.0			9.8	
Delay (s)				38.6	32.3	32.2	38.7	3.4			39.3	
Level of Service				D	C	C	D	A			D	
Approach Delay (s)		0.0			35.5			25.8			39.3	
Approach LOS		A			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	74.3%	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												
Traffic Volume (vph)	97	1	831	0	0	0	0	1639	144	162	766	0
Future Volume (vph)	97	1	831	0	0	0	0	1639	144	162	766	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					3242		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1646	2584					3242		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)	105	1	903	0	0	0	0	1782	157	176	833	0
RTOR Reduction (vph)	0	0	290	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	106	613	0	0	0	0	1934	0	176	833	0
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)		34.5	34.5					81.3		8.9	94.9	
Effective Green, g (s)		34.5	34.5					81.3		8.9	94.9	
Actuated g/C Ratio		0.25	0.25					0.58		0.06	0.68	
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)		406	638					1888		202	3205	
v/s Ratio Prot								c0.60		c0.06	0.18	
v/s Ratio Perm		0.06	c0.24									
v/c Ratio		0.26	0.96					1.02		0.87	0.26	
Uniform Delay, d1		42.3	51.9					29.1		64.8	8.7	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.3	26.1					27.2		31.1	0.0	
Delay (s)		42.6	78.0					56.4		95.9	8.7	
Level of Service		D	E					E		F	A	
Approach Delay (s)		74.3			0.0			56.4			23.9	
Approach LOS		E			A			E			C	

Intersection Summary			
HCM 2000 Control Delay	52.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	139.6	Sum of lost time (s)	14.9
Intersection Capacity Utilization	74.3%	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												
Traffic Volume (vph)	518	168	54	76	240	342	78	874	63	278	624	714
Future Volume (vph)	518	168	54	76	240	342	78	874	63	278	624	714
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	5.3
Lane Util. Factor	0.97	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	0.99
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	0.85	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)	3183	1655			1707	1445	1641	3249		1641	1727	1447
Flt Permitted	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	1655			1707	1445	1641	3249		1641	1727	1447
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)	563	183	59	83	261	372	85	950	68	302	678	776
RTOR Reduction (vph)	0	7	0	0	0	209	0	4	0	0	0	91
Lane Group Flow (vph)	563	235	0	0	344	163	85	1014	0	302	678	685
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						1
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	7		8	8		5	2		1	6	7
Permitted Phases						8						6
Actuated Green, G (s)	25.7	25.7			32.5	32.5	8.7	44.5		26.0	61.6	87.3
Effective Green, g (s)	25.7	25.7			32.5	32.5	8.7	44.5		26.0	61.6	87.3
Actuated g/C Ratio	0.17	0.17			0.22	0.22	0.06	0.30		0.18	0.41	0.59
Clearance Time (s)	5.3	5.3			5.2	5.2	4.4	4.9		4.4	5.1	5.3
Vehicle Extension (s)	2.0	2.0			3.7	3.7	2.0	3.8		2.0	3.8	2.0
Lane Grp Cap (vph)	550	286			373	316	96	973		287	716	850
v/s Ratio Prot	c0.18	0.14			c0.20		0.05	c0.31		c0.18	0.39	0.14
v/s Ratio Perm						0.11						0.33
v/c Ratio	1.02	0.82			0.92	0.52	0.89	1.04		1.05	0.95	0.81
Uniform Delay, d1	61.4	59.2			56.8	51.1	69.4	52.0		61.2	41.9	24.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	44.5	16.2			28.2	1.8	55.0	40.6		67.5	21.6	5.3
Delay (s)	105.9	75.3			84.9	52.8	124.4	92.6		128.8	63.5	29.3
Level of Service	F	E			F	D	F	F		F	E	C
Approach Delay (s)		96.7			68.3			95.0			59.6	
Approach LOS		F			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	76.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	148.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	90.4%	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)	694	88	11	710	103	8
Future Volume (vph)	694	88	11	710	103	8
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)	4636		1641	4715	1641	1468
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4636		1641	4715	1641	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	754	96	12	772	112	9
RTOR Reduction (vph)	11	0	0	0	0	8
Lane Group Flow (vph)	839	0	12	772	112	1
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	30.4		0.9	37.0	8.0	8.0
Effective Green, g (s)	30.4		0.9	37.0	8.0	8.0
Actuated g/C Ratio	0.52		0.02	0.63	0.14	0.14
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)	2417		25	2992	225	201
v/s Ratio Prot	c0.18		0.01	c0.16	c0.07	
v/s Ratio Perm						0.00
v/c Ratio	0.35		0.48	0.26	0.50	0.01
Uniform Delay, d1	8.2		28.5	4.7	23.3	21.7
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3		5.2	0.2	0.6	0.0
Delay (s)	8.5		33.7	4.8	23.9	21.7
Level of Service	A		C	A	C	C
Approach Delay (s)	8.5			5.3	23.8	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	58.3	Sum of lost time (s)	19.0
Intersection Capacity Utilization	34.8%	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)	49	326	312	1202	470	119	167	316	755	226	532	74
Future Volume (vph)	49	326	312	1202	470	119	167	316	755	226	532	74
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	0.99	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	0.97		1.00	0.89		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	1447	1641	4573		1641	1529		3183	1696	
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	1447	1641	4573		1641	1529		3183	1696	
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)	53	354	339	1307	511	129	182	343	821	246	578	80
RTOR Reduction (vph)	0	0	152	0	33	0	0	62	0	0	4	0
Lane Group Flow (vph)	53	354	187	1307	607	0	182	1102	0	246	654	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)	6.3	23.6	23.6	29.0	46.3		14.7	52.8		14.7	53.7	
Effective Green, g (s)	6.3	23.6	23.6	29.0	46.3		14.7	52.8		14.7	53.7	
Actuated g/C Ratio	0.04	0.17	0.17	0.21	0.33		0.10	0.38		0.10	0.38	
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)	73	794	243	339	1512		172	576		334	650	
v/s Ratio Prot	0.03	0.08		c0.80	0.13		c0.11	c0.72		0.08	0.39	
v/s Ratio Perm			c0.13									
v/c Ratio	0.73	0.45	0.77	3.86	0.40		1.06	1.91		0.74	1.01	
Uniform Delay, d1	66.0	52.3	55.6	55.5	36.2		62.6	43.6		60.8	43.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	25.9	1.8	20.6	1292.1	0.8		84.9	417.6		7.1	36.9	
Delay (s)	91.9	54.1	76.2	1347.6	36.9		147.5	461.2		67.9	80.1	
Level of Service	F	D	E	F	D		F	F		E	F	
Approach Delay (s)		66.8			916.8			418.8			76.8	
Approach LOS		E			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	499.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	161.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: La Media Road & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	145	87	27	185	249	11	330	18	220	588	120
Future Volume (vph)	114	145	87	27	185	249	11	330	18	220	588	120
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	0.95	1.00	0.97	0.95	0.88	0.97	0.95	1.00	0.97	0.91	0.88
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.97	1.00	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	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	3282	1449	3183	3282	2519	3181	3282	1468	3183	4715	2528
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	3282	1449	3183	3282	2519	3181	3282	1468	3183	4715	2528
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)	124	158	95	29	201	271	12	359	20	239	639	130
RTOR Reduction (vph)	0	0	70	0	0	211	0	0	15	0	0	78
Lane Group Flow (vph)	124	158	25	29	201	60	12	359	5	239	639	52
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			1			3						
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)	3.0	13.8	13.8	0.6	11.4	11.4	0.6	14.2	14.2	7.1	20.7	20.7
Effective Green, g (s)	3.0	13.8	13.8	0.6	11.4	11.4	0.6	14.2	14.2	7.1	20.7	20.7
Actuated g/C Ratio	0.06	0.27	0.27	0.01	0.22	0.22	0.01	0.27	0.27	0.14	0.40	0.40
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)	184	876	386	36	723	555	36	901	403	437	1887	1012
v/s Ratio Prot	c0.04	0.05		0.01	c0.06		0.00	c0.11		c0.08	0.14	
v/s Ratio Perm			0.02			0.02			0.00			0.02
v/c Ratio	0.67	0.18	0.07	0.81	0.28	0.11	0.33	0.40	0.01	0.55	0.34	0.05
Uniform Delay, d1	23.9	14.6	14.1	25.5	16.7	16.1	25.4	15.3	13.7	20.8	10.8	9.5
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	9.4	0.1	0.1	75.6	0.2	0.1	5.4	0.3	0.0	1.4	0.1	0.0
Delay (s)	33.2	14.7	14.2	101.1	16.9	16.2	30.8	15.6	13.7	22.2	10.9	9.5
Level of Service	C	B	B	F	B	B	C	B	B	C	B	A
Approach Delay (s)		20.7			21.4			15.9			13.4	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	51.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	37.2%	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)	118	166	64	185	142	53
Future Volume (vph)	118	166	64	185	142	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	128	180	70	201	154	58

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	308	70	201	212
Volume Left (vph)	0	70	0	154
Volume Right (vph)	180	0	0	58
Hadj (s)	-0.18	0.67	0.17	0.15
Departure Headway (s)	4.8	6.1	5.6	5.5
Degree Utilization, x	0.41	0.12	0.31	0.32
Capacity (veh/h)	711	562	615	605
Control Delay (s)	11.2	8.7	9.9	11.0
Approach Delay (s)	11.2	9.6		11.0
Approach LOS	B	A		B

Intersection Summary			
Delay	10.6		
Level of Service	B		
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	427	0	0	258
Future Volume (vph)	0	0	427	0	0	258
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	464	0	0	280

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	0	464	0	280
Volume Left (vph)	0	464	0	0
Volume Right (vph)	0	0	0	280
Hadj (s)	0.00	0.53	0.00	-0.57
Departure Headway (s)	5.5	5.8	5.2	4.8
Degree Utilization, x	0.00	0.74	0.00	0.37
Capacity (veh/h)	617	612	684	708
Control Delay (s)	8.5	22.3	7.0	10.6
Approach Delay (s)	0.0	22.3		10.6
Approach LOS	A	C		B

Intersection Summary			
Delay	17.9		
Level of Service	C		
Intersection Capacity Utilization	46.3%	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)	0	90	140	29	64	0
Future Volume (vph)	0	90	140	29	64	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	98	152	32	70	0

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	98	152	32	70
Volume Left (vph)	0	152	0	0
Volume Right (vph)	98	0	0	0
Hadj (s)	-0.57	0.53	0.03	0.03
Departure Headway (s)	4.0	5.3	4.8	4.5
Degree Utilization, x	0.11	0.22	0.04	0.09
Capacity (veh/h)	858	662	728	783
Control Delay (s)	7.4	8.6	6.8	7.9
Approach Delay (s)	7.4	8.3		7.9
Approach LOS	A	A		A

Intersection Summary			
Delay	8.0		
Level of Service	A		
Intersection Capacity Utilization	26.7%	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)	120	0	0	312	345	190
Future Volume (vph)	120	0	0	312	345	190
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	130	0	0	339	375	207

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	130	0	339	250	332
Volume Left (vph)	130	0	0	0	0
Volume Right (vph)	0	0	0	0	207
Hadj (s)	0.23	0.00	0.03	0.03	-0.40
Departure Headway (s)	6.2	5.5	5.6	5.3	4.9
Degree Utilization, x	0.22	0.00	0.53	0.37	0.45
Capacity (veh/h)	534	633	629	657	718
Control Delay (s)	10.9	7.3	13.4	10.2	10.7
Approach Delay (s)	10.9	13.4		10.5	
Approach LOS	B	B		B	

Intersection Summary			
Delay	11.5		
Level of Service	B		
Intersection Capacity Utilization	29.7%	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)	120	0	0	192	155	190
Future Volume (vph)	120	0	0	192	155	190
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	130	0	0	209	168	207

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	130	0	209	112	263
Volume Left (vph)	130	0	0	0	0
Volume Right (vph)	0	0	0	0	207
Hadj (s)	0.23	0.00	0.03	0.03	-0.52
Departure Headway (s)	5.4	5.2	5.3	5.1	4.6
Degree Utilization, x	0.20	0.00	0.31	0.16	0.33
Capacity (veh/h)	608	683	660	678	764
Control Delay (s)	9.8	7.0	9.4	7.9	8.6
Approach Delay (s)	9.8	9.4		8.4	
Approach LOS	A	A		A	

Intersection Summary			
Delay	8.9		
Level of Service	A		
Intersection Capacity Utilization	23.7%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix O
Mitigation Worksheets & Trigger Calculations - Near-Term Year 2027 Plus Project (Full Development) Conditions

HCM Signalized Intersection Capacity Analysis
11: Britannia Boulevard & Airway Road

12/18/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	581	195	59	39	101	142	45	499	54	336	839	340
Future Volume (vph)	581	195	59	39	101	142	45	499	54	336	839	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.2		5.3	5.2	4.4	4.4	4.9		4.4	5.1	5.3
Lane Util. Factor	*1.00	1.00		1.00	1.00	1.00	1.00	*0.97		1.00	*0.97	*0.97
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	0.97		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)	3282	1667		1641	1727	1462	1641	3294		1641	3351	2848
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)	3282	1667		1641	1727	1462	1641	3294		1641	3351	2848
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)	632	212	64	42	110	154	49	542	59	365	912	370
RTOR Reduction (vph)	0	9	0	0	0	64	0	6	0	0	0	130
Lane Group Flow (vph)	632	267	0	42	110	90	49	595	0	365	912	240
Confl. Peds. (#/hr)	1					1			2			
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	3	8		7	4	1	5	2		1	6	3
Permitted Phases						4						6
Actuated Green, G (s)	24.6	32.6		6.3	14.3	42.4	5.3	26.2		28.1	48.8	73.4
Effective Green, g (s)	24.6	32.6		6.3	14.3	42.4	5.3	26.2		28.1	48.8	73.4
Actuated g/C Ratio	0.22	0.29		0.06	0.13	0.38	0.05	0.23		0.25	0.43	0.65
Clearance Time (s)	5.3	5.2		5.3	5.2	4.4	4.4	4.9		4.4	5.1	5.3
Vehicle Extension (s)	2.0	3.7		2.0	3.7	2.0	2.0	3.8		2.0	3.8	2.0
Lane Grp Cap (vph)	714	480		91	218	548	76	763		408	1447	1849
v/s Ratio Prot	c0.19	c0.16		0.03	0.06	0.04	0.03	c0.18		c0.22	0.27	0.03
v/s Ratio Perm						0.02						0.06
v/c Ratio	0.89	0.56		0.46	0.50	0.16	0.64	0.78		0.89	0.63	0.13
Uniform Delay, d1	42.8	34.1		51.7	46.0	23.5	52.9	40.7		41.0	25.1	7.6
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	12.3	1.6		1.3	2.3	0.1	13.2	5.3		20.9	1.0	0.0
Delay (s)	55.1	35.7		53.1	48.3	23.5	66.1	46.0		61.9	26.0	7.6
Level of Service	E	D		D	D	C	E	D		E	C	A
Approach Delay (s)		49.2			36.5			47.5			29.8	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	73.7%	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)	518	168	54	76	240	342	78	874	63	278	624	714
Future Volume (vph)	518	168	54	76	240	342	78	874	63	278	624	714
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.2	5.1	4.9	4.9		5.1	5.1	5.3
Lane Util. Factor	*1.00	1.00		1.00	1.00	1.00	1.00	*0.97		1.00	*0.97	*0.97
Frpb, ped/bikes	1.00	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	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)	3282	1659		1641	1727	1456	1641	3317		1641	3351	2808
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)	3282	1659		1641	1727	1456	1641	3317		1641	3351	2808
Peak-hour factor, PHF	0.95	0.92	0.92	0.92	0.92	0.95	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	545	183	59	83	261	360	85	950	68	293	657	752
RTOR Reduction (vph)	0	8	0	0	0	86	0	3	0	0	0	330
Lane Group Flow (vph)	545	234	0	83	261	274	85	1015	0	293	657	422
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	3	8		7	4	1	5	2		1	6	3
Permitted Phases						4						6
Actuated Green, G (s)	23.8	38.9		10.8	26.0	47.9	13.6	44.6		21.9	52.9	76.7
Effective Green, g (s)	23.8	38.9		10.8	26.0	47.9	13.6	44.6		21.9	52.9	76.7
Actuated g/C Ratio	0.17	0.28		0.08	0.19	0.35	0.10	0.33		0.16	0.39	0.56
Clearance Time (s)	5.3	5.3		5.3	5.2	5.1	4.9	4.9		5.1	5.1	5.3
Vehicle Extension (s)	2.0	2.0		2.0	3.7	3.8	3.8	3.8		3.8	3.8	2.0
Lane Grp Cap (vph)	570	471		129	328	509	163	1081		262	1295	1574
v/s Ratio Prot	c0.17	0.14		0.05	c0.15	0.09	0.05	c0.31		c0.18	0.20	0.05
v/s Ratio Perm						0.10						0.10
v/c Ratio	0.96	0.50		0.64	0.80	0.54	0.52	0.94		1.12	0.51	0.27
Uniform Delay, d1	56.0	40.8		61.1	52.9	35.6	58.5	44.8		57.5	32.0	15.5
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	26.7	0.3		8.0	13.0	1.3	3.7	14.9		91.2	0.4	0.0
Delay (s)	82.6	41.1		69.1	65.9	36.9	62.2	59.7		148.6	32.4	15.6
Level of Service	F	D		E	E	D	E	E		F	C	B
Approach Delay (s)		69.9			51.5			59.9			45.0	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	54.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	136.8	Sum of lost time (s)	20.6
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection No.	11	Peak:	PM									
Total ADT	15581											
Project Trip Generation	In	944	Out	588								
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Full with Project Volume	78	874	63	278	624	714	518	168	54	76	240	342
Project Volume	38	0	0	0	0	632	394	129	24	0	208	0
Type of Turning Movement	in					in	out	out	out		in	
Percentage of Project Volume	4.0%	0.0%	0.0%	0.0%	0.0%	67.0%	67.0%	22.0%	4.0%	0.0%	22.0%	0.0%
Base Volume	40	874	63	278	624	82	124	39	30	76	32	342
Trigger Calculation												
Trigger ADT	9026		Delay	54.9	LOS	D						
Percent Reduction	42.1%											
Trips Assignment	22	0	0	0	0	366	228	75	14	0	120	0
Base + Project	62	874	63	278	624	448	352	114	44	76	152	342
Arrange in EB - WB - NB - SB order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
	352	114	44	76	152	342	62	874	63	278	624	448
Trigger Calculation												
Trigger ADT	9050		Delay	55.0	LOS	E						
Percent Reduction	41.9%											
Trips Assignment	22	0	0	0	0	367	229	75	14	0	121	0
Base + Project	62	874	63	278	624	449	353	114	44	76	153	342
Arrange in EB - WB - NB - SB order	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
	353	114	44	76	153	342	62	874	63	278	624	449
Change when compare to previous ADT	1	0	0	0	1	0	0	0	0	0	0	1

Appendix P
Peak Hour Intersection LOS
– Buildout of Community Plan Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	85	5	220	900	1920	0	0	940	960
Future Volume (vph)	0	0	0	85	5	220	900	1920	0	0	940	960
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			0.92	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1728	1538	1719	4940			4490	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1728	1538	1719	4940			4490	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	89	5	232	947	2021	0	0	989	1011
RTOR Reduction (vph)	0	0	0	0	0	44	0	0	0	0	123	0
Lane Group Flow (vph)	0	0	0	0	94	188	947	2021	0	0	1877	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)					16.0	16.0	66.3	123.8			52.8	
Effective Green, g (s)					16.0	16.0	66.3	123.8			52.8	
Actuated g/C Ratio					0.11	0.11	0.44	0.83			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)					184	164	759	4077			1580	
v/s Ratio Prot							c0.55	0.41			c0.42	
v/s Ratio Perm					0.05	c0.12						
v/c Ratio					0.51	1.15	1.25	0.50			1.52dr	
Uniform Delay, d1					63.3	67.0	41.9	3.9			48.6	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					2.4	115.5	122.3	0.1			91.2	
Delay (s)					65.7	182.5	164.2	4.0			139.8	
Level of Service					E	F	F	A			F	
Approach Delay (s)		0.0			148.8			55.1			139.8	
Approach LOS		A			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	92.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	143.1%	ICU Level of Service	H
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)	1200	5	700	0	0	0	0	1620	145	220	775	0
Future Volume (vph)	1200	5	700	0	0	0	0	1620	145	220	775	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	0.95	0.95						0.91		1.00	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	0.88						0.99		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1559	1435						4647		1641	4715	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1559	1435						4647		1641	4715	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1263	5	737	0	0	0	0	1705	153	232	816	0
RTOR Reduction (vph)	0	52	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	1048	905	0	0	0	0	0	1851	0	232	816	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)	71.9	71.9						47.9		15.3	67.9	
Effective Green, g (s)	71.9	71.9						47.9		15.3	67.9	
Actuated g/C Ratio	0.48	0.48						0.32		0.10	0.45	
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)	747	687						1483		167	2134	
v/s Ratio Prot								c0.40		c0.14	0.17	
v/s Ratio Perm	c0.67	0.63										
v/c Ratio	1.40	1.32						1.25		1.39	0.38	
Uniform Delay, d1	39.0	39.0						51.0		67.3	27.2	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	189.4	152.9						117.5		207.6	0.1	
Delay (s)	228.4	192.0						168.6		275.0	27.3	
Level of Service	F	F						F		F	C	
Approach Delay (s)		211.0			0.0			168.6			82.1	
Approach LOS		F			A			F			F	

Intersection Summary			
HCM 2000 Control Delay	167.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	143.1%	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)	155	320	190	755	170	495	375	1115	1190	930	455	90
Future Volume (vph)	155	320	190	755	170	495	375	1115	1190	930	455	90
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	
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	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	0.94		1.00	1.00	0.85	1.00	0.92		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3335	3246		3183	3438	1445	3183	4414		3183	4611	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3335	3246		3183	3438	1445	3183	4414		3183	4611	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	163	337	200	795	179	521	395	1174	1253	979	479	95
RTOR Reduction (vph)	0	58	0	0	0	256	0	129	0	0	19	0
Lane Group Flow (vph)	163	479	0	795	179	265	395	2298	0	979	555	0
Confl. Peds. (#/hr)	1					1	6		1	1		6
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	10%	5%	10%	10%	5%	10%	10%	10%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	8.0	17.0		26.0	35.0	35.0	23.0	59.0		32.0	68.0	
Effective Green, g (s)	8.0	17.0		26.0	35.0	35.0	23.0	59.0		32.0	68.0	
Actuated g/C Ratio	0.05	0.11		0.17	0.23	0.23	0.15	0.39		0.21	0.45	
Clearance Time (s)	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	
Lane Grp Cap (vph)	177	367		551	802	337	488	1736		679	2090	
v/s Ratio Prot	0.05	c0.15		c0.25	0.05		0.12	c0.52		c0.31	0.12	
v/s Ratio Perm						0.18						
v/c Ratio	0.92	1.31		1.44	0.22	0.79	0.81	1.79dr		1.44	0.27	
Uniform Delay, d1	70.7	66.5		62.0	46.5	54.0	61.4	45.5		59.0	25.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	45.4	156.2		209.4	0.1	11.4	9.6	149.9		207.1	0.1	
Delay (s)	116.1	222.7		271.4	46.6	65.4	71.0	195.4		266.1	25.5	
Level of Service	F	F		F	D	E	E	F		F	C	
Approach Delay (s)		197.9			172.7			178.0			177.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	178.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	124.7%	ICU Level of Service	H
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)	510	2700	90	60	1320	430	40	15	25	245	40	255
Future Volume (vph)	510	2700	90	60	1320	430	40	15	25	245	40	255
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
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	1.00		1.00	0.95	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	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	1.00		1.00	1.00	0.85	1.00	0.91		1.00	0.89	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	4691		3183	4715	1428	1641	1567		1641	1461	1395
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	4691		3183	4715	1428	1641	1567		1641	1461	1395
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	537	2842	95	63	1389	453	42	16	26	258	42	268
RTOR Reduction (vph)	0	2	0	0	0	211	0	24	0	0	69	127
Lane Group Flow (vph)	537	2935	0	63	1389	242	42	18	0	258	88	26
Confl. Peds. (#/hr)						6						
Confl. Bikes (#/hr)			1									
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)	28.0	90.0		4.0	66.0	66.0	6.9	8.2		23.0	24.3	24.3
Effective Green, g (s)	28.0	90.0		4.0	66.0	66.0	6.9	8.2		23.0	24.3	24.3
Actuated g/C Ratio	0.20	0.64		0.03	0.47	0.47	0.05	0.06		0.16	0.17	0.17
Clearance Time (s)	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
Lane Grp Cap (vph)	631	2990		90	2203	667	80	91		267	251	240
v/s Ratio Prot	c0.17	c0.63		0.02	0.29		0.03	0.01		c0.16	c0.06	
v/s Ratio Perm						0.17						0.02
v/c Ratio	0.85	0.98		0.70	0.63	0.36	0.53	0.19		0.97	0.35	0.11
Uniform Delay, d1	54.6	24.8		68.0	28.4	24.1	65.6	63.3		58.7	51.5	49.3
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	10.7	12.4		21.1	0.6	0.3	6.1	1.0		45.3	0.9	0.2
Delay (s)	65.3	37.2		89.1	29.0	24.5	71.6	64.4		104.1	52.4	49.5
Level of Service	E	D		F	C	C	E	E		F	D	D
Approach Delay (s)		41.6			29.9			68.0			75.1	
Approach LOS		D			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	41.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	141.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.7%	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												
Traffic Volume (vph)	785	1845	335	290	705	850	345	800	565	1795	545	760
Future Volume (vph)	785	1845	335	290	705	850	345	800	565	1795	545	760
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91		0.97	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	4715	1468	3183	4715	1468	3183	4423		3183	4304	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4715	1468	3183	4715	1468	3183	4423		3183	4304	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	826	1942	353	305	742	895	363	842	595	1889	574	800
RTOR Reduction (vph)	0	0	230	0	0	220	0	66	0	0	101	0
Lane Group Flow (vph)	826	1942	123	305	742	675	363	1371	0	1889	1273	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	12.6	52.1	52.1	6.6	46.1	46.1	19.7	47.0		24.6	51.9	
Effective Green, g (s)	12.6	52.1	52.1	6.6	46.1	46.1	19.7	47.0		24.6	51.9	
Actuated g/C Ratio	0.08	0.35	0.35	0.04	0.31	0.31	0.13	0.31		0.16	0.35	
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0		2.0	2.0	
Lane Grp Cap (vph)	267	1637	509	140	1449	451	418	1385		522	1489	
v/s Ratio Prot	c0.26	0.41		0.10	0.16		0.11	c0.31		c0.59	0.30	
v/s Ratio Perm			0.08			c0.46						
v/c Ratio	3.09	1.19	0.24	2.18	0.51	1.50	0.87	1.13dr		3.62	1.32dr	
Uniform Delay, d1	68.7	49.0	34.9	71.7	42.7	52.0	63.9	51.3		62.7	45.6	
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	952.0	90.3	0.4	553.1	0.5	234.7	16.6	21.7		1183.2	4.8	
Delay (s)	1020.7	139.3	35.3	624.8	43.2	286.6	80.5	72.9		1245.9	50.4	
Level of Service	F	F	D	F	D	F	F	E		F	D	
Approach Delay (s)		360.8			246.7			74.5			742.5	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	411.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.87		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	139.7%	ICU Level of Service	H
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)	195	1960	1500	840	1050	55	975	70	675	35	25	55
Future Volume (vph)	195	1960	1500	840	1050	55	975	70	675	35	25	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	
Lane Util. Factor	1.00	0.91		0.97	0.91		0.97	0.95	0.95	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99	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	0.93		1.00	0.99		1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1641	4376		3183	4674		3183	1425	1377	1641	1548	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1641	4376		3183	4674		3183	1425	1377	1641	1548	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	2063	1579	884	1105	58	1026	74	711	37	26	58
RTOR Reduction (vph)	0	87	0	0	3	0	0	114	176	0	50	0
Lane Group Flow (vph)	205	3555	0	884	1160	0	1026	287	208	37	34	0
Confl. Peds. (#/hr)			4			2			1			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	20.5	63.8		16.7	60.0		18.7	35.7	35.7	3.2	20.2	
Effective Green, g (s)	20.5	63.8		16.7	60.0		18.7	35.7	35.7	3.2	20.2	
Actuated g/C Ratio	0.15	0.46		0.12	0.43		0.13	0.26	0.26	0.02	0.15	
Clearance Time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	
Vehicle Extension (s)	2.0	4.4		2.0	4.2		2.0	3.2	3.2	2.0	2.0	
Lane Grp Cap (vph)	241	2007		382	2016		427	365	353	37	224	
v/s Ratio Prot	0.12	c0.81		c0.28	0.25		c0.32	c0.20		0.02	0.02	
v/s Ratio Perm									0.15			
v/c Ratio	0.85	2.08dr		2.31	0.58		2.40	0.79	0.59	1.00	0.15	
Uniform Delay, d1	57.8	37.6		61.2	29.9		60.2	48.2	45.3	68.0	52.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	23.1	349.2		599.5	0.5		638.4	10.8	2.6	148.0	0.1	
Delay (s)	80.9	386.9		660.7	30.4		698.6	59.0	47.8	215.9	52.1	
Level of Service	F	F		F	C		F	E	D	F	D	
Approach Delay (s)		370.6			302.6			419.0			102.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	359.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.79		
Actuated Cycle Length (s)	139.1	Sum of lost time (s)	19.7
Intersection Capacity Utilization	143.0%	ICU Level of Service	H
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	905	1600	120	930	1035	765	375	115	665	345	510
Future Volume (vph)	770	905	1600	120	930	1035	765	375	115	665	345	510
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	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95		0.97	0.95	
Frt	1.00	0.90		1.00	0.92		1.00	0.96		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	4264		3433	4516		3183	3415		3433	3078	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4264		3433	4516		3183	3415		3433	3078	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	811	953	1684	126	979	1089	805	395	121	700	363	537
RTOR Reduction (vph)	0	266	0	0	167	0	0	24	0	0	212	0
Lane Group Flow (vph)	811	2371	0	126	1901	0	805	492	0	700	688	0
Heavy Vehicles (%)	10%	10%	10%	2%	10%	2%	10%	2%	2%	2%	2%	10%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	22.0	55.0		4.0	37.0		22.0	21.0		24.0	23.0	
Effective Green, g (s)	22.0	55.0		4.0	37.0		22.0	21.0		24.0	23.0	
Actuated g/C Ratio	0.18	0.46		0.03	0.31		0.18	0.18		0.20	0.19	
Clearance Time (s)	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	
Lane Grp Cap (vph)	583	1954		114	1392		583	597		686	589	
v/s Ratio Prot	c0.25	0.56		0.04	c0.42		c0.25	0.14		0.20	c0.22	
v/s Ratio Perm												
v/c Ratio	1.39	1.80dr		1.11	1.66dr		1.38	0.82		1.02	1.17	
Uniform Delay, d1	49.0	32.5		58.0	41.5		49.0	47.7		48.0	48.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	186.4	101.0		115.4	169.1		181.9	9.0		39.6	93.1	
Delay (s)	235.4	133.5		173.4	210.6		230.9	56.8		87.6	141.6	
Level of Service	F	F		F	F		F	E		F	F	
Approach Delay (s)		157.5			208.5			162.9			118.0	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	164.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	124.3%	ICU Level of Service	H
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)	20	2160	210	405	2045	10	365	35	450	5	15	10
Future Volume (vph)	20	2160	210	405	2045	10	365	35	450	5	15	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	5.3	4.4	6.0		5.3	5.3	5.3	4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.87	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1641	4715	1468	3183	4712		3183	1430	1395	1641	1622	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1641	4715	1468	3183	4712		3183	1430	1395	1641	1622	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	2274	221	426	2153	11	384	37	474	5	16	11
RTOR Reduction (vph)	0	0	74	0	0	0	0	171	206	0	11	0
Lane Group Flow (vph)	21	2274	147	426	2164	0	384	89	45	5	16	0
Turn Type	Prot	NA	pm+ov	Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2	8	1	6		8	8		4	4	
Permitted Phases			2						8			
Actuated Green, G (s)	2.2	56.3	77.1	14.6	69.1		20.8	20.8	20.8	4.4	4.4	
Effective Green, g (s)	2.2	56.3	77.1	14.6	69.1		20.8	20.8	20.8	4.4	4.4	
Actuated g/C Ratio	0.02	0.49	0.67	0.13	0.60		0.18	0.18	0.18	0.04	0.04	
Clearance Time (s)	4.0	6.0	5.3	4.4	6.0		5.3	5.3	5.3	4.0	4.0	
Vehicle Extension (s)	3.0	4.4	2.0	2.0	4.3		2.0	2.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	31	2292	1044	401	2811		571	256	250	62	61	
v/s Ratio Prot	0.01	c0.48	0.03	c0.13	0.46		c0.12	0.06		0.00	c0.01	
v/s Ratio Perm			0.07						0.03			
v/c Ratio	0.68	0.99	0.14	1.06	0.77		0.67	0.35	0.18	0.08	0.27	
Uniform Delay, d1	56.4	29.5	7.1	50.6	17.4		44.3	41.5	40.3	53.7	54.1	
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	45.6	16.9	0.0	62.4	1.5		2.5	0.3	0.1	0.6	2.4	
Delay (s)	102.1	46.5	7.2	113.0	18.9		46.8	41.8	40.4	54.3	56.5	
Level of Service	F	D	A	F	B		D	D	D	D	E	
Approach Delay (s)		43.5			34.4			43.6			56.2	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	39.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	115.8	Sum of lost time (s)	19.7
Intersection Capacity Utilization	83.5%	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)	0	0	0	1495	5	220	650	505	0	0	280	350
Future Volume (vph)	0	0	0	1495	5	220	650	505	0	0	280	350
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	0.86	0.85	1.00	1.00			0.92	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1641	1405	1395	3183	4715			4323	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1405	1395	3183	4715			4323	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	1574	5	232	684	532	0	0	295	368
RTOR Reduction (vph)	0	0	0	0	45	46	0	0	0	0	152	0
Lane Group Flow (vph)	0	0	0	1574	74	72	684	532	0	0	511	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)				89.9	89.9	89.9	20.3	47.4			22.4	
Effective Green, g (s)				89.9	89.9	89.9	20.3	47.4			22.4	
Actuated g/C Ratio				0.61	0.61	0.61	0.14	0.32			0.15	
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)				1000	856	850	438	1515			656	
v/s Ratio Prot					0.05		c0.21	0.11			c0.12	
v/s Ratio Perm				c0.96		0.05						
v/c Ratio				1.57	0.09	0.08	1.56	0.35			0.97dr	
Uniform Delay, d1				28.8	11.9	11.9	63.6	38.3			60.2	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				263.1	0.0	0.0	263.7	0.1			5.8	
Delay (s)				291.9	11.9	11.9	327.3	38.4			66.0	
Level of Service				F	B	B	F	D			E	
Approach Delay (s)		0.0			255.3			200.9			66.0	
Approach LOS		A			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	203.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.44		
Actuated Cycle Length (s)	147.5	Sum of lost time (s)	14.9
Intersection Capacity Utilization	233.9%	ICU Level of Service	H
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)	400	5	3295	0	0	0	0	725	485	210	1565	0
Future Volume (vph)	400	5	3295	0	0	0	0	725	485	210	1565	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					0.91		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					0.94		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1646	2584					4432		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1646	2584					4432		3183	4715	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	421	5	3468	0	0	0	0	763	511	221	1647	0
RTOR Reduction (vph)	0	0	18	0	0	0	0	80	0	0	0	0
Lane Group Flow (vph)	0	426	3450	0	0	0	0	1194	0	221	1647	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)		95.9	95.9					31.9		7.3	43.9	
Effective Green, g (s)		95.9	95.9					31.9		7.3	43.9	
Actuated g/C Ratio		0.64	0.64					0.21		0.05	0.29	
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)		1052	1652					942		154	1379	
v/s Ratio Prot								0.27		0.07	c0.35	
v/s Ratio Perm		0.26	c1.34									
v/c Ratio		0.40	2.09					1.28dr		1.44	1.19	
Uniform Delay, d1		13.2	27.0					59.0		71.3	53.0	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.3	491.9					128.7		228.8	94.9	
Delay (s)		13.4	519.0					187.8		300.1	147.9	
Level of Service		B	F					F		F	F	
Approach Delay (s)		463.7			0.0			187.8			165.9	
Approach LOS		F			A			F			F	

Intersection Summary			
HCM 2000 Control Delay	334.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.87		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	233.9%	ICU Level of Service	H
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)	735	365	305	380	820	825	855	1045	200	985	2480	1395
Future Volume (vph)	735	365	305	380	820	825	855	1045	200	985	2480	1395
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	4.9		4.4	5.1	
Lane Util. Factor	0.97	0.91		0.97	0.95		0.97	0.91		0.97	0.91	
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	0.93		1.00	0.92		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	4393		3183	3015		3183	4590		3183	4461	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4393		3183	3015		3183	4590		3183	4461	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	774	384	321	400	863	868	900	1100	211	1037	2611	1468
RTOR Reduction (vph)	0	105	0	0	125	0	0	19	0	0	70	0
Lane Group Flow (vph)	774	600	0	400	1606	0	900	1292	0	1037	4009	0
Confl. Peds. (#/hr)	1					1			2			
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	17.6	40.1		12.6	34.9		19.6	52.1		21.6	53.9	
Effective Green, g (s)	17.6	40.1		12.6	34.9		19.6	52.1		21.6	53.9	
Actuated g/C Ratio	0.12	0.28		0.09	0.24		0.14	0.36		0.15	0.37	
Clearance Time (s)	4.4	4.9		4.4	5.1		4.4	4.9		4.4	5.1	
Vehicle Extension (s)	2.0	3.8		2.0	3.8		2.0	3.8		2.0	3.8	
Lane Grp Cap (vph)	386	1214		276	725		430	1649		474	1658	
v/s Ratio Prot	c0.24	0.14		0.13	c0.53		0.28	0.28		c0.33	c0.90	
v/s Ratio Perm												
v/c Ratio	2.01	0.49		1.45	2.21		2.09	0.78		2.19	2.39dr	
Uniform Delay, d1	63.7	44.0		66.2	55.0		62.7	41.4		61.7	45.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	461.5	0.4		221.4	551.1		499.7	2.6		541.4	640.0	
Delay (s)	525.2	44.4		287.6	606.2		562.4	44.0		603.1	685.6	
Level of Service	F	D		F	F		F	D		F	F	
Approach Delay (s)		296.0			546.4			255.1			668.8	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	510.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.30		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	189.6%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2690	40	10	2430	55	20
Future Volume (vph)	2690	40	10	2430	55	20
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	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4705		1641	4715	1641	1448
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4705		1641	4715	1641	1448
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2832	42	11	2558	58	21
RTOR Reduction (vph)	0	0	0	0	0	20
Lane Group Flow (vph)	2874	0	11	2558	58	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)	90.4		1.0	97.1	8.1	8.1
Effective Green, g (s)	90.4		1.0	97.1	8.1	8.1
Actuated g/C Ratio	0.76		0.01	0.82	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)	3589		13	3863	112	98
v/s Ratio Prot	c0.61		0.01	c0.54	c0.04	
v/s Ratio Perm						0.00
v/c Ratio	0.80		0.85	0.66	0.52	0.01
Uniform Delay, d1	8.6		58.7	4.2	53.3	51.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7		162.2	0.8	1.7	0.0
Delay (s)	10.3		220.9	5.0	55.0	51.5
Level of Service	B		F	A	D	D
Approach Delay (s)	10.3			5.9	54.1	
Approach LOS	B			A	D	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	118.5	Sum of lost time (s)	19.0
Intersection Capacity Utilization	74.2%	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												
Traffic Volume (vph)	100	1405	665	860	1145	590	975	1105	980	775	520	815
Future Volume (vph)	100	1405	665	860	1145	590	975	1105	980	775	520	815
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7		4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91		0.97	0.95	
Frpb, ped/bikes	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	
Frt	1.00	0.95		1.00	0.95		1.00	0.93		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	4462		3183	4475		3183	4349		3183	2981	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4462		3183	4475		3183	4349		3183	2981	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	1479	700	905	1205	621	1026	1163	1032	816	547	858
RTOR Reduction (vph)	0	57	0	0	62	0	0	107	0	0	57	0
Lane Group Flow (vph)	105	2122	0	905	1764	0	1026	2088	0	816	1348	0
Confl. Peds. (#/hr)			3						3			
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	5.0	45.3		19.0	59.3		21.0	47.8		18.0	45.7	
Effective Green, g (s)	5.0	45.3		19.0	59.3		21.0	47.8		18.0	45.7	
Actuated g/C Ratio	0.03	0.30		0.13	0.40		0.14	0.32		0.12	0.30	
Clearance Time (s)	4.0	6.7		4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0		2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	106	1347		403	1769		445	1385		381	908	
v/s Ratio Prot	0.03	c0.48		c0.28	0.39		c0.32	c0.48		0.26	0.45	
v/s Ratio Perm												
v/c Ratio	0.99	1.58		2.25	1.00		2.31	1.81dr		2.14	1.70dr	
Uniform Delay, d1	72.5	52.4		65.5	45.3		64.5	51.1		66.0	52.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	84.1	262.4		568.5	20.8		594.6	232.2		522.5	224.0	
Delay (s)	156.6	314.8		634.0	66.1		659.1	283.3		588.5	276.1	
Level of Service	F	F		F	E		F	F		F	F	
Approach Delay (s)		307.5			254.3			403.0			390.9	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	340.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.77		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	150.9%	ICU Level of Service	H
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)	700	560	350	350	435	635	250	1380	150	1600	1850	1200
Future Volume (vph)	700	560	350	350	435	635	250	1380	150	1600	1850	1200
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	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.95		0.97	0.91	
Frpb, ped/bikes	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	
Frt	1.00	0.94		1.00	0.91		1.00	0.99		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	3076		3183	2990		3183	3234		3183	4437	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	3076		3183	2990		3183	3234		3183	4437	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	737	589	368	368	458	668	263	1453	158	1684	1947	1263
RTOR Reduction (vph)	0	65	0	0	176	0	0	6	0	0	78	0
Lane Group Flow (vph)	737	892	0	368	950	0	263	1605	0	1684	3132	0
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	19.0	37.0		10.0	28.0		8.0	45.0		42.0	79.0	
Effective Green, g (s)	19.0	37.0		10.0	28.0		8.0	45.0		42.0	79.0	
Actuated g/C Ratio	0.13	0.25		0.07	0.19		0.05	0.30		0.28	0.53	
Clearance Time (s)	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	
Lane Grp Cap (vph)	403	758		212	558		169	970		891	2336	
v/s Ratio Prot	c0.23	0.29		0.12	c0.32		0.08	c0.50		c0.53	0.71	
v/s Ratio Perm												
v/c Ratio	1.83	1.18		1.74	1.70		1.56	1.66		1.89	1.48dr	
Uniform Delay, d1	65.5	56.5		70.0	61.0		71.0	52.5		54.0	35.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	382.6	93.2		350.1	323.4		277.2	299.4		404.8	156.3	
Delay (s)	448.1	149.7		420.1	384.4		348.2	351.9		458.8	191.8	
Level of Service	F	F		F	F		F	F		F	F	
Approach Delay (s)		279.5			393.2			351.4			283.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	312.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.76		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	154.3%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1795	310	470	480	305	415
Future Volume (vph)	1795	310	470	480	305	415
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	0.95		0.97	0.95	0.97	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)	3209		3183	3282	3183	1468
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3209		3183	3282	3183	1468
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1889	326	495	505	321	437
RTOR Reduction (vph)	10	0	0	0	0	184
Lane Group Flow (vph)	2205	0	495	505	321	253
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	85.0		20.0	109.0	23.0	23.0
Effective Green, g (s)	85.0		20.0	109.0	23.0	23.0
Actuated g/C Ratio	0.61		0.14	0.78	0.16	0.16
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)	1948		454	2555	522	241
v/s Ratio Prot	c0.69		c0.16	0.15	0.10	
v/s Ratio Perm						c0.17
v/c Ratio	1.13		1.09	0.20	0.61	1.05
Uniform Delay, d1	27.5		60.0	4.1	54.4	58.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	66.5		68.9	0.0	2.2	71.8
Delay (s)	94.0		128.9	4.1	56.5	130.3
Level of Service	F		F	A	E	F
Approach Delay (s)	94.0			65.9	99.1	
Approach LOS	F			E	F	

Intersection Summary			
HCM 2000 Control Delay	87.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	310	1405	80	80	1985	335
Future Volume (vph)	310	1405	80	80	1985	335
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	0.97	0.88	0.95		0.97	0.95
Frt	1.00	0.85	0.93		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3183	2584	3036		3183	3282
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3183	2584	3036		3183	3282
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	326	1479	84	84	2089	353
RTOR Reduction (vph)	0	1232	78	0	0	0
Lane Group Flow (vph)	326	247	90	0	2089	353
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	21.9	21.9	9.2		88.1	101.3
Effective Green, g (s)	21.9	21.9	9.2		88.1	101.3
Actuated g/C Ratio	0.17	0.17	0.07		0.67	0.77
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)	531	431	212		2137	2534
v/s Ratio Prot	c0.10		c0.03		c0.66	0.11
v/s Ratio Perm		0.10				
v/c Ratio	0.61	0.57	0.42		0.98	0.14
Uniform Delay, d1	50.7	50.3	58.5		20.6	3.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.1	1.8	1.4		14.4	0.0
Delay (s)	52.8	52.2	59.8		35.0	3.8
Level of Service	D	D	E		C	A
Approach Delay (s)	52.3		59.8			30.5
Approach LOS	D		E			C

Intersection Summary			
HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	131.2	Sum of lost time (s)	12.0
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												
Traffic Volume (vph)	225	1080	370	450	1145	700	150	95	50	1235	1065	900
Future Volume (vph)	225	1080	370	450	1145	700	150	95	50	1235	1065	900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.9	4.9		4.0	4.9		4.0	4.9	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95		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	0.96		1.00	0.94		1.00	0.95		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	4517		3183	4426		3183	3111		3183	3037	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4517		3183	4426		3183	3111		3183	3037	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	237	1137	389	474	1205	737	158	100	53	1300	1121	947
RTOR Reduction (vph)	0	40	0	0	74	0	0	41	0	0	77	0
Lane Group Flow (vph)	237	1486	0	474	1868	0	158	112	0	1300	1991	0
Confl. Peds. (#/hr)			1	1								2
Confl. Bikes (#/hr)			2			1						1
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.0	40.0		26.3	60.2		5.0	34.0		31.0	60.0	
Effective Green, g (s)	7.0	40.0		26.3	60.2		5.0	34.0		31.0	60.0	
Actuated g/C Ratio	0.05	0.27		0.18	0.40		0.03	0.23		0.21	0.40	
Clearance Time (s)	4.0	4.9		4.9	4.9		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	3.0	4.8		3.0	3.0		3.0	3.3		3.0	4.4	
Lane Grp Cap (vph)	148	1204		558	1776		106	705		657	1214	
v/s Ratio Prot	c0.07	c0.33		0.15	c0.42		0.05	0.04		c0.41	c0.66	
v/s Ratio Perm												
v/c Ratio	1.60	1.23		0.85	1.12dr		1.49	0.16		1.98	1.64	
Uniform Delay, d1	71.5	55.0		59.9	44.9		72.5	46.5		59.5	45.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	299.8	112.6		11.6	36.5		263.9	0.1		445.9	291.6	
Delay (s)	371.3	167.6		71.5	81.4		336.4	46.6		505.4	336.6	
Level of Service	F	F		E	F		F	D		F	F	
Approach Delay (s)		195.0			79.5			193.9			401.8	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	248.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.52		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.7
Intersection Capacity Utilization	121.8%	ICU Level of Service	H
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)	945	640	0	0	2055	900	0	0	0	400	350	1085
Future Volume (vph)	945	640	0	0	2055	900	0	0	0	400	350	1085
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	0.97	0.91			0.91					0.97	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	1.00	1.00			0.95					1.00	0.89	
Flt Protected	0.95	1.00			1.00					0.95	1.00	
Satd. Flow (prot)	3183	4715			4482					3183	1531	
Flt Permitted	0.95	1.00			1.00					0.95	1.00	
Satd. Flow (perm)	3183	4715			4482					3183	1531	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	995	674	0	0	2163	947	0	0	0	421	368	1142
RTOR Reduction (vph)	0	0	0	0	56	0	0	0	0	0	80	0
Lane Group Flow (vph)	995	674	0	0	3054	0	0	0	0	421	1430	0
Confl. Peds. (#/hr)			7	7					2	2		
Confl. Bikes (#/hr)			3			2						
Turn Type	Prot	NA			NA					Split	NA	
Protected Phases	7	4			8					6	6	
Permitted Phases												
Actuated Green, G (s)	20.0	71.0			47.0					61.0	61.0	
Effective Green, g (s)	20.0	71.0			47.0					61.0	61.0	
Actuated g/C Ratio	0.14	0.51			0.34					0.44	0.44	
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)	454	2391			1504					1386	667	
v/s Ratio Prot	c0.31	0.14			c0.68					0.13	c0.93	
v/s Ratio Perm												
v/c Ratio	2.19	0.28			2.03					0.30	2.14	
Uniform Delay, d1	60.0	19.8			46.5					25.7	39.5	
Progression Factor	1.00	1.00			1.00					1.00	1.00	
Incremental Delay, d2	543.4	0.1			466.0					0.1	520.1	
Delay (s)	603.4	19.9			512.5					25.8	559.6	
Level of Service	F	B			F					C	F	
Approach Delay (s)		367.8			512.5			0.0			443.2	
Approach LOS		F			F			A			F	

Intersection Summary			
HCM 2000 Control Delay	456.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.11		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	182.0%	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)	300	10	275	60	5	65	70	2825	140	360	5355	75
Future Volume (vph)	300	10	275	60	5	65	70	2825	140	360	5355	75
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	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	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	
Frt	1.00	0.86		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1589		1641	1727	1468	1770	4682		1641	4710	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1589		1641	1727	1468	1770	4682		1641	4710	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	11	289	63	5	68	74	2974	147	379	5637	79
RTOR Reduction (vph)	0	98	0	0	0	63	0	3	0	0	1	0
Lane Group Flow (vph)	316	202	0	63	5	5	74	3118	0	379	5715	0
Confl. Peds. (#/hr)							1					
Heavy Vehicles (%)	2%	10%	2%	10%	10%	10%	2%	10%	10%	10%	10%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	21.0	21.0		10.9	10.9	10.9	4.0	77.0		20.0	93.0	
Effective Green, g (s)	21.0	21.0		10.9	10.9	10.9	4.0	77.0		20.0	93.0	
Actuated g/C Ratio	0.14	0.14		0.08	0.08	0.08	0.03	0.53		0.14	0.64	
Clearance Time (s)	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	
Lane Grp Cap (vph)	256	230		123	129	110	48	2488		226	3022	
v/s Ratio Prot	c0.18	0.13		c0.04	0.00		0.04	0.67		c0.23	c1.21	
v/s Ratio Perm						0.00						
v/c Ratio	1.23	0.88		0.51	0.04	0.05	1.54	1.25		1.68	1.89	
Uniform Delay, d1	62.0	60.7		64.4	62.1	62.2	70.5	34.0		62.5	26.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	134.5	29.0		3.6	0.1	0.2	324.0	117.4		323.2	402.3	
Delay (s)	196.5	89.7		68.0	62.3	62.4	394.5	151.3		385.7	428.3	
Level of Service	F	F		E	E	E	F	F		F	F	
Approach Delay (s)		144.4			65.0			157.0			425.6	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	318.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.68		
Actuated Cycle Length (s)	144.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	143.2%	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)	600	200	285	445	200	870	600	1385	500	1000	2375	1715
Future Volume (vph)	600	200	285	445	200	870	600	1385	500	1000	2375	1715
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	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.91		0.97	0.91	
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	0.91		1.00	0.88		1.00	0.96		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	2993		1641	2882		3183	4528		3183	4382	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	2993		1641	2882		3183	4528		3183	4382	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	211	300	468	211	916	632	1458	526	1053	2500	1805
RTOR Reduction (vph)	0	141	0	0	138	0	0	47	0	0	93	0
Lane Group Flow (vph)	632	370	0	468	989	0	632	1937	0	1053	4212	0
Confl. Peds. (#/hr)							3					3
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	29.0	18.0		35.0	24.0		12.0	53.0		18.0	59.0	
Effective Green, g (s)	29.0	18.0		35.0	24.0		12.0	53.0		18.0	59.0	
Actuated g/C Ratio	0.21	0.13		0.25	0.17		0.09	0.38		0.13	0.42	
Clearance Time (s)	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	
Lane Grp Cap (vph)	339	384		410	494		272	1714		409	1846	
v/s Ratio Prot	c0.39	0.12		0.29	c0.34		0.20	0.43		c0.33	c0.96	
v/s Ratio Perm												
v/c Ratio	1.86	0.96		1.14	2.35dr		2.32	1.13		2.57	2.56dr	
Uniform Delay, d1	55.5	60.7		52.5	58.0		64.0	43.5		61.0	40.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	400.1	36.1		89.0	457.7		607.0	66.7		715.7	578.6	
Delay (s)	455.6	96.8		141.5	515.7		671.0	110.2		776.7	619.1	
Level of Service	F	F		F	F		F	F		F	F	
Approach Delay (s)		295.2			405.9			245.7			650.1	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	477.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.22		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	181.8%	ICU Level of Service	H
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)	0	0	0	130	5	220	700	1680	0	0	1050	850
Future Volume (vph)	0	0	0	130	5	220	700	1680	0	0	1050	850
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			0.99	
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.93	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1726	1538	1719	4940			4541	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1726	1538	1719	4940			4541	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	137	5	232	737	1768	0	0	1105	895
RTOR Reduction (vph)	0	0	0	0	0	52	0	0	0	0	97	0
Lane Group Flow (vph)	0	0	0	0	142	180	737	1768	0	0	1903	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)					17.9	17.9	60.3	121.9			56.9	
Effective Green, g (s)					17.9	17.9	60.3	121.9			56.9	
Actuated g/C Ratio					0.12	0.12	0.40	0.81			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)					205	183	691	4014			1722	
v/s Ratio Prot							c0.43	0.36			c0.42	
v/s Ratio Perm					0.08	c0.12						
v/c Ratio					0.69	0.98	1.07	0.44			1.31dr	
Uniform Delay, d1					63.4	65.9	44.9	4.1			46.5	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					9.7	61.4	53.4	0.1			56.4	
Delay (s)					73.1	127.3	98.2	4.2			102.9	
Level of Service					E	F	F	A			F	
Approach Delay (s)		0.0			106.7			31.8			102.9	
Approach LOS		A			F			C			F	

Intersection Summary			
HCM 2000 Control Delay	66.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	108.6%	ICU Level of Service	G
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)	960	5	900	0	0	0	0	1420	100	220	960	0
Future Volume (vph)	960	5	900	0	0	0	0	1420	100	220	960	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	0.95	0.95						0.91		1.00	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	0.87						0.99		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1559	1413						4661		1641	4715	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1559	1413						4661		1641	4715	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1011	5	947	0	0	0	0	1495	105	232	1011	0
RTOR Reduction (vph)	0	21	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	910	1032	0	0	0	0	0	1595	0	232	1011	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)	76.9	76.9						42.9		15.3	62.9	
Effective Green, g (s)	76.9	76.9						42.9		15.3	62.9	
Actuated g/C Ratio	0.51	0.51						0.29		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)	799	724						1333		167	1977	
v/s Ratio Prot								c0.34		c0.14	0.21	
v/s Ratio Perm	0.58	0.73										
v/c Ratio	1.14	1.43						1.20		1.39	0.51	
Uniform Delay, d1	36.5	36.5						53.5		67.3	32.2	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	77.4	199.5						96.0		207.6	0.2	
Delay (s)	114.0	236.0						149.6		275.0	32.4	
Level of Service	F	F						F		F	C	
Approach Delay (s)		179.4			0.0			149.6			77.7	
Approach LOS		F			A			F			E	

Intersection Summary			
HCM 2000 Control Delay	143.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	108.6%	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)	95	170	375	1190	320	930	190	465	755	495	1220	145
Future Volume (vph)	95	170	375	1190	320	930	190	465	755	495	1220	145
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	
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	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	0.90		1.00	1.00	0.85	1.00	0.91		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3335	3083		3183	3438	1446	3183	4314		3183	4650	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3335	3083		3183	3438	1446	3183	4314		3183	4650	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	100	179	395	1253	337	979	200	489	795	521	1284	153
RTOR Reduction (vph)	0	101	0	0	0	199	0	227	0	0	11	0
Lane Group Flow (vph)	100	473	0	1253	337	780	200	1057	0	521	1426	0
Confl. Peds. (#/hr)	1					1	6		1	1		6
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	10%	5%	10%	10%	5%	10%	10%	10%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	5.0	18.0		47.0	60.0	60.0	9.0	30.0		19.0	40.0	
Effective Green, g (s)	5.0	18.0		47.0	60.0	60.0	9.0	30.0		19.0	40.0	
Actuated g/C Ratio	0.04	0.14		0.36	0.46	0.46	0.07	0.23		0.15	0.31	
Clearance Time (s)	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	
Lane Grp Cap (vph)	128	426		1150	1586	667	220	995		465	1430	
v/s Ratio Prot	0.03	0.15		c0.39	0.10		0.06	0.25		c0.16	c0.31	
v/s Ratio Perm						c0.54						
v/c Ratio	0.78	1.26dr		1.09	0.21	1.17	0.91	1.41dr		1.12	1.00	
Uniform Delay, d1	62.0	56.0		41.5	20.9	35.0	60.1	50.0		55.5	44.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	25.9	77.2		54.4	0.1	91.9	36.4	46.6		78.9	22.9	
Delay (s)	87.9	133.2		95.9	21.0	126.9	96.5	96.6		134.4	67.9	
Level of Service	F	F		F	C	F	F	F		F	E	
Approach Delay (s)		126.5			97.9			96.6			85.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	96.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	104.3%	ICU Level of Service	G
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)	275	1400	130	85	2495	235	170	70	115	435	90	510
Future Volume (vph)	275	1400	130	85	2495	235	170	70	115	435	90	510
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
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	1.00		1.00	0.95	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	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	0.85	1.00	0.91		1.00	0.89	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	4650		3183	4715	1427	1641	1567		1641	1468	1395
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	4650		3183	4715	1427	1641	1567		1641	1468	1395
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	289	1474	137	89	2626	247	179	74	121	458	95	537
RTOR Reduction (vph)	0	7	0	0	0	67	0	40	0	0	57	90
Lane Group Flow (vph)	289	1604	0	89	2626	180	179	155	0	458	264	221
Confl. Peds. (#/hr)						6						
Confl. Bikes (#/hr)			1									
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)	11.0	71.3		7.8	68.1	68.1	17.0	17.4		36.0	36.4	36.4
Effective Green, g (s)	11.0	71.3		7.8	68.1	68.1	17.0	17.4		36.0	36.4	36.4
Actuated g/C Ratio	0.07	0.48		0.05	0.46	0.46	0.11	0.12		0.24	0.25	0.25
Clearance Time (s)	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
Lane Grp Cap (vph)	235	2232		167	2162	654	187	183		397	359	341
v/s Ratio Prot	c0.09	c0.34		0.03	c0.56		0.11	c0.10		c0.28	0.18	
v/s Ratio Perm						0.13						0.16
v/c Ratio	1.23	0.72		0.53	1.21	0.28	0.96	0.85		1.15	0.73	0.65
Uniform Delay, d1	68.8	30.6		68.6	40.2	24.9	65.4	64.3		56.2	51.6	50.3
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	134.8	1.1		3.2	101.1	0.2	52.9	28.8		94.1	7.6	4.2
Delay (s)	203.6	31.8		71.8	141.3	25.1	118.3	93.1		150.4	59.2	54.5
Level of Service	F	C		E	F	C	F	F		F	E	D
Approach Delay (s)		57.9			129.5			105.1			96.2	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	100.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	148.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	104.2%	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)	760	845	345	645	1695	1470	335	545	235	685	800	785
Future Volume (vph)	760	845	345	645	1695	1470	335	545	235	685	800	785
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91		0.97	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	4715	1468	3183	4715	1468	3183	4503		3183	4365	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4715	1468	3183	4715	1468	3183	4503		3183	4365	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	800	889	363	679	1784	1547	353	574	247	721	842	826
RTOR Reduction (vph)	0	0	118	0	0	122	0	52	0	0	116	0
Lane Group Flow (vph)	800	889	245	679	1784	1425	353	769	0	721	1552	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	11.6	34.7	34.7	36.0	59.1	59.1	6.6	47.0		12.6	53.0	
Effective Green, g (s)	11.6	34.7	34.7	36.0	59.1	59.1	6.6	47.0		12.6	53.0	
Actuated g/C Ratio	0.08	0.23	0.23	0.24	0.39	0.39	0.04	0.31		0.08	0.35	
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0		2.0	2.0	
Lane Grp Cap (vph)	246	1090	339	763	1857	578	140	1410		267	1542	
v/s Ratio Prot	c0.25	0.19		0.21	0.38		0.11	0.17		c0.23	c0.36	
v/s Ratio Perm			0.17			c0.97						
v/c Ratio	3.25	0.82	0.72	0.89	0.96	2.47	2.52	0.55		2.70	1.30dr	
Uniform Delay, d1	69.2	54.6	53.2	55.1	44.3	45.4	71.7	42.6		68.7	48.5	
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	1023.9	5.2	8.2	12.0	13.0	664.8	705.3	0.8		775.7	24.5	
Delay (s)	1093.1	59.8	61.5	67.1	57.3	710.2	777.0	43.4		844.4	73.0	
Level of Service	F	E	E	E	E	F	F	D		F	E	
Approach Delay (s)		462.9			310.9			264.0			305.8	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	336.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.05		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	141.2%	ICU Level of Service	H
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)	140	785	975	610	1875	30	1500	50	850	110	80	180
Future Volume (vph)	140	785	975	610	1875	30	1500	50	850	110	80	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	
Lane Util. Factor	1.00	0.91		0.97	0.91		0.97	0.95	0.95	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99	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	0.92		1.00	1.00		1.00	0.87	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1641	4282		3183	4702		3183	1406	1377	1641	1548	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1641	4282		3183	4702		3183	1406	1377	1641	1548	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	826	1026	642	1974	32	1579	53	895	116	84	189
RTOR Reduction (vph)	0	148	0	0	1	0	0	174	174	0	54	0
Lane Group Flow (vph)	147	1704	0	642	2005	0	1579	300	300	116	219	0
Confl. Peds. (#/hr)			4			2			1			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	12.6	48.0		18.6	54.0		39.6	49.6	49.6	12.7	22.7	
Effective Green, g (s)	12.6	48.0		18.6	54.0		39.6	49.6	49.6	12.7	22.7	
Actuated g/C Ratio	0.08	0.32		0.13	0.36		0.27	0.33	0.33	0.09	0.15	
Clearance Time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	
Vehicle Extension (s)	2.0	4.4		2.0	4.2		2.0	3.2	3.2	2.0	2.0	
Lane Grp Cap (vph)	139	1383		398	1708		848	469	459	140	236	
v/s Ratio Prot	0.09	0.40		c0.20	c0.43		c0.50	0.21		0.07	c0.14	
v/s Ratio Perm									0.22			
v/c Ratio	1.06	1.66dr		1.61	1.17		1.86	0.64	0.65	0.83	0.93	
Uniform Delay, d1	68.0	50.3		65.0	47.3		54.5	41.9	42.2	66.9	62.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	92.5	110.9		287.3	84.7		392.4	2.9	3.4	30.2	38.3	
Delay (s)	160.5	161.2		352.3	132.0		446.9	44.9	45.6	97.1	100.4	
Level of Service	F	F		F	F		F	D	D	F	F	
Approach Delay (s)		161.1			185.4			296.2			99.4	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	211.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	148.6	Sum of lost time (s)	19.7
Intersection Capacity Utilization	129.2%	ICU Level of Service	H
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)	510	640	375	500	1055	550	1400	350	750	690	765	750
Future Volume (vph)	510	640	375	500	1055	550	1400	350	750	690	765	750
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	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95		0.97	0.95	
Frt	1.00	0.94		1.00	0.95		1.00	0.90		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	4454		3433	4587		3183	3177		3433	3154	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4454		3433	4587		3183	3177		3433	3154	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	537	674	395	526	1111	579	1474	368	789	726	805	789
RTOR Reduction (vph)	0	71	0	0	63	0	0	85	0	0	104	0
Lane Group Flow (vph)	537	998	0	526	1627	0	1474	1072	0	726	1490	0
Heavy Vehicles (%)	10%	10%	10%	2%	10%	2%	10%	2%	2%	2%	2%	10%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.0	38.0		8.0	31.0		43.0	57.0		31.0	45.0	
Effective Green, g (s)	15.0	38.0		8.0	31.0		43.0	57.0		31.0	45.0	
Actuated g/C Ratio	0.10	0.25		0.05	0.21		0.29	0.38		0.21	0.30	
Clearance Time (s)	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	
Lane Grp Cap (vph)	318	1128		183	947		912	1207		709	946	
v/s Ratio Prot	c0.17	0.22		c0.15	c0.35		c0.46	0.34		0.21	c0.47	
v/s Ratio Perm												
v/c Ratio	1.69	0.88		2.87	1.72		1.62	1.15dr		1.02	1.57	
Uniform Delay, d1	67.5	53.9		71.0	59.5		53.5	43.5		59.5	52.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	323.2	8.5		858.3	327.8		282.4	8.2		40.0	263.7	
Delay (s)	390.7	62.4		929.3	387.3		335.9	51.7		99.5	316.2	
Level of Service	F	E		F	F		F	D		F	F	
Approach Delay (s)		172.2			515.9			210.9			248.4	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	290.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.68		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	145.8%	ICU Level of Service	H
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)	15	1920	425	525	2120	10	260	20	385	15	40	35
Future Volume (vph)	15	1920	425	525	2120	10	260	20	385	15	40	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	4.0	4.4	6.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.86	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1641	4715	1468	3183	4712		3183	1419	1395	1641	1606	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1641	4715	1468	3183	4712		3183	1419	1395	1641	1606	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	2021	447	553	2232	11	274	21	405	16	42	37
RTOR Reduction (vph)	0	0	159	0	0	0	0	164	178	0	29	0
Lane Group Flow (vph)	16	2021	288	553	2243	0	274	51	33	16	50	0
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2	7	1	6		7	4		3	8	
Permitted Phases			2						4			
Actuated Green, G (s)	1.5	50.8	60.8	22.5	72.2		10.0	17.3	17.3	1.9	9.2	
Effective Green, g (s)	1.5	50.8	60.8	22.5	72.2		10.0	17.3	17.3	1.9	9.2	
Actuated g/C Ratio	0.01	0.46	0.55	0.20	0.65		0.09	0.16	0.16	0.02	0.08	
Clearance Time (s)	4.0	6.0	4.0	4.4	6.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	4.4	3.0	2.0	4.3		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	22	2159	804	645	3067		287	221	217	28	133	
v/s Ratio Prot	0.01	c0.43	0.03	c0.17	0.48		c0.09	0.04		0.01	c0.03	
v/s Ratio Perm			0.16						0.02			
v/c Ratio	0.73	0.94	0.36	0.86	0.73		0.95	0.23	0.15	0.57	0.37	
Uniform Delay, d1	54.5	28.5	14.1	42.7	12.9		50.2	41.0	40.5	54.1	48.1	
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	76.4	8.6	0.3	10.5	1.0		40.6	0.5	0.3	25.2	1.8	
Delay (s)	130.9	37.1	14.4	53.2	13.9		90.9	41.5	40.8	79.3	49.9	
Level of Service	F	D	B	D	B		F	D	D	E	D	
Approach Delay (s)		33.6			21.7			60.6			54.8	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	110.9	Sum of lost time (s)	18.4
Intersection Capacity Utilization	78.2%	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												
Traffic Volume (vph)	0	0	0	585	5	390	2770	360	0	0	590	440
Future Volume (vph)	0	0	0	585	5	390	2770	360	0	0	590	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	
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			0.94	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1641	1401	1395	3183	4715			4413	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1401	1395	3183	4715			4413	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	616	5	411	2916	379	0	0	621	463
RTOR Reduction (vph)	0	0	0	0	152	158	0	0	0	0	90	0
Lane Group Flow (vph)	0	0	0	616	54	52	2916	379	0	0	994	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)				36.9	36.9	36.9	68.3	102.9			29.9	
Effective Green, g (s)				36.9	36.9	36.9	68.3	102.9			29.9	
Actuated g/C Ratio				0.25	0.25	0.25	0.46	0.69			0.20	
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)				403	344	343	1449	3234			879	
v/s Ratio Prot					0.04		c0.92	0.08			c0.23	
v/s Ratio Perm				c0.38		0.04						
v/c Ratio				1.53	0.16	0.15	2.01	0.12			1.20dr	
Uniform Delay, d1				56.6	44.4	44.3	40.9	8.0			60.1	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				250.1	0.2	0.2	458.0	0.0			73.3	
Delay (s)				306.7	44.6	44.5	498.9	8.1			133.3	
Level of Service				F	D	D	F	A			F	
Approach Delay (s)		0.0			201.0			442.4			133.3	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	334.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.68		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	145.1%	ICU Level of Service	H
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)	400	5	885	0	0	0	0	2525	1190	200	600	0
Future Volume (vph)	400	5	885	0	0	0	0	2525	1190	200	600	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					0.91		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)		1646	2584					4489		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1646	2584					4489		3183	4715	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	421	5	932	0	0	0	0	2658	1253	211	632	0
RTOR Reduction (vph)	0	0	364	0	0	0	0	56	0	0	0	0
Lane Group Flow (vph)	0	426	568	0	0	0	0	3855	0	211	632	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)		43.6	43.6					81.0		8.3	94.0	
Effective Green, g (s)		43.6	43.6					81.0		8.3	94.0	
Actuated g/C Ratio		0.29	0.29					0.55		0.06	0.64	
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)		485	762					2460		178	2998	
v/s Ratio Prot								c0.86		c0.07	0.13	
v/s Ratio Perm		0.26	0.22									
v/c Ratio		0.88	0.74					1.57		1.19	0.21	
Uniform Delay, d1		49.6	47.1					33.4		69.8	11.3	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		16.3	4.0					257.3		126.2	0.0	
Delay (s)		65.9	51.0					290.7		195.9	11.3	
Level of Service		E	D					F		F	B	
Approach Delay (s)		55.7			0.0			290.7			57.5	
Approach LOS		E			A			F			E	

Intersection Summary			
HCM 2000 Control Delay	206.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	147.8	Sum of lost time (s)	14.9
Intersection Capacity Utilization	145.1%	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)	880	1020	705	145	845	900	735	1935	830	800	1000	855
Future Volume (vph)	880	1020	705	145	845	900	735	1935	830	800	1000	855
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	4.9		4.4	5.1	
Lane Util. Factor	0.97	0.91		0.97	0.95		0.97	0.91		0.97	0.91	
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	0.94		1.00	0.92		1.00	0.95		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	4426		3183	3007		3183	4483		3183	4390	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4426		3183	3007		3183	4483		3183	4390	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	926	1074	742	153	889	947	774	2037	874	842	1053	900
RTOR Reduction (vph)	0	86	0	0	133	0	0	53	0	0	107	0
Lane Group Flow (vph)	926	1730	0	153	1703	0	774	2858	0	842	1846	0
Confl. Peds. (#/hr)	1					1			2			
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	17.6	49.1		7.6	38.9		17.6	51.1		18.6	51.9	
Effective Green, g (s)	17.6	49.1		7.6	38.9		17.6	51.1		18.6	51.9	
Actuated g/C Ratio	0.12	0.34		0.05	0.27		0.12	0.35		0.13	0.36	
Clearance Time (s)	4.4	4.9		4.4	5.1		4.4	4.9		4.4	5.1	
Vehicle Extension (s)	2.0	3.8		2.0	3.8		2.0	3.8		2.0	3.8	
Lane Grp Cap (vph)	386	1498		166	806		386	1579		408	1571	
v/s Ratio Prot	c0.29	0.39		0.05	c0.57		0.24	c0.64		c0.26	0.42	
v/s Ratio Perm												
v/c Ratio	2.40	1.27dr		0.92	2.11		2.01	1.81		2.06	1.42dr	
Uniform Delay, d1	63.7	48.0		68.4	53.0		63.7	47.0		63.2	46.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	637.4	77.7		46.9	504.9		461.5	367.0		487.1	85.9	
Delay (s)	701.1	125.7		115.3	558.0		525.2	414.0		550.3	132.5	
Level of Service	F	F		F	F		F	F		F	F	
Approach Delay (s)		320.0			523.9			437.3			258.4	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	379.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.02		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	171.9%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2270	80	20	2175	55	20
Future Volume (vph)	2270	80	20	2175	55	20
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)	4691		1641	4715	1641	1449
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4691		1641	4715	1641	1449
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2389	84	21	2289	58	21
RTOR Reduction (vph)	1	0	0	0	0	19
Lane Group Flow (vph)	2472	0	21	2289	58	2
Confl. Peds. (#/hr)						2
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	76.3		2.0	84.0	8.0	8.0
Effective Green, g (s)	76.3		2.0	84.0	8.0	8.0
Actuated g/C Ratio	0.72		0.02	0.80	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)	3399		31	3761	124	110
v/s Ratio Prot	c0.53		0.01	c0.49	c0.04	
v/s Ratio Perm						0.00
v/c Ratio	0.73		0.68	0.61	0.47	0.01
Uniform Delay, d1	8.4		51.3	4.2	46.6	45.0
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3		37.4	0.6	1.0	0.0
Delay (s)	9.7		88.8	4.8	47.6	45.0
Level of Service	A		F	A	D	D
Approach Delay (s)	9.7			5.5	46.9	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	105.3	Sum of lost time (s)	19.0
Intersection Capacity Utilization	66.9%	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)	650	970	1100	990	1435	780	670	620	850	400	630	90
Future Volume (vph)	650	970	1100	990	1435	780	670	620	850	400	630	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7		4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91		0.97	0.95	
Frpb, ped/bikes	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	
Frt	1.00	0.92		1.00	0.95		1.00	0.91		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)	3183	4298		3183	4466		3183	4265		3183	3220	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4298		3183	4466		3183	4265		3183	3220	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	684	1021	1158	1042	1511	821	705	653	895	421	663	95
RTOR Reduction (vph)	0	136	0	0	65	0	0	165	0	0	8	0
Lane Group Flow (vph)	684	2043	0	1042	2267	0	705	1383	0	421	750	0
Confl. Peds. (#/hr)			3						3			
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	19.0	49.3		28.0	58.3		19.0	39.8		13.0	34.7	
Effective Green, g (s)	19.0	49.3		28.0	58.3		19.0	39.8		13.0	34.7	
Actuated g/C Ratio	0.13	0.33		0.19	0.39		0.13	0.27		0.09	0.23	
Clearance Time (s)	4.0	6.7		4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0		2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	403	1412		594	1735		403	1131		275	744	
v/s Ratio Prot	0.21	c0.48		c0.33	0.51		c0.22	c0.32		0.13	0.23	
v/s Ratio Perm												
v/c Ratio	1.70	1.89dr		1.75	1.31		1.75	1.62dr		1.53	1.01	
Uniform Delay, d1	65.5	50.4		61.0	45.9		65.5	55.1		68.5	57.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	324.3	205.1		346.3	142.2		347.3	108.2		256.5	35.1	
Delay (s)	389.8	255.4		407.3	188.0		412.8	163.3		325.0	92.7	
Level of Service	F	F		F	F		F	F		F	F	
Approach Delay (s)		287.5			255.7			241.4			175.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	252.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.52		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
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)	800	480	500	200	255	700	295	2325	300	800	1430	700
Future Volume (vph)	800	480	500	200	255	700	295	2325	300	800	1430	700
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	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.95		0.97	0.91	
Frpb, ped/bikes	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	
Frt	1.00	0.92		1.00	0.89		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	3009		3183	2921		3183	3226		3183	4483	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	3009		3183	2921		3183	3226		3183	4483	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	842	505	526	211	268	737	311	2447	316	842	1505	737
RTOR Reduction (vph)	0	125	0	0	145	0	0	7	0	0	59	0
Lane Group Flow (vph)	842	906	0	211	860	0	311	2756	0	842	2183	0
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	20.0	38.0		8.0	26.0		15.0	68.0		20.0	73.0	
Effective Green, g (s)	20.0	38.0		8.0	26.0		15.0	68.0		20.0	73.0	
Actuated g/C Ratio	0.13	0.25		0.05	0.17		0.10	0.45		0.13	0.49	
Clearance Time (s)	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	
Lane Grp Cap (vph)	424	762		169	506		318	1462		424	2181	
v/s Ratio Prot	c0.26	0.30		0.07	c0.29		0.10	c0.85		c0.26	0.49	
v/s Ratio Perm												
v/c Ratio	1.99	1.19		1.25	1.85dr		0.98	1.89		1.99	1.00	
Uniform Delay, d1	65.0	56.0		71.0	62.0		67.3	41.0		65.0	38.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	452.0	98.1		151.4	323.5		44.0	401.0		452.0	19.5	
Delay (s)	517.0	154.1		222.4	385.5		111.3	442.0		517.0	58.0	
Level of Service	F	F		F	F		F	F		F	E	
Approach Delay (s)		317.3			357.2			408.6			183.4	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	308.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.88		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	162.5%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	100	110	65	155	40	55
Future Volume (vph)	100	110	65	155	40	55
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	0.95		0.97	0.95	0.97	1.00
Frt	0.92		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3023		3183	3282	3183	1468
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3023		3183	3282	3183	1468
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	116	68	163	42	58
RTOR Reduction (vph)	100	0	0	0	0	36
Lane Group Flow (vph)	121	0	68	163	42	22
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	3.8		1.2	9.0	10.4	10.4
Effective Green, g (s)	3.8		1.2	9.0	10.4	10.4
Actuated g/C Ratio	0.14		0.04	0.33	0.38	0.38
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)	419		139	1078	1208	557
v/s Ratio Prot	c0.04		c0.02	0.05	0.01	
v/s Ratio Perm						c0.01
v/c Ratio	0.29		0.49	0.15	0.03	0.04
Uniform Delay, d1	10.6		12.8	6.5	5.3	5.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4		2.7	0.1	0.0	0.0
Delay (s)	11.0		15.5	6.6	5.4	5.4
Level of Service	B		B	A	A	A
Approach Delay (s)	11.0			9.2	5.4	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.14		
Actuated Cycle Length (s)	27.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	23.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	80	2095	335	310	1755	75
Future Volume (vph)	80	2095	335	310	1755	75
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	0.97	0.88	0.95		0.97	0.95
Frt	1.00	0.85	0.93		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3183	2584	3045		3183	3282
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3183	2584	3045		3183	3282
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	84	2205	353	326	1847	79
RTOR Reduction (vph)	0	989	112	0	0	0
Lane Group Flow (vph)	84	1216	567	0	1847	79
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	47.0	47.0	24.0		67.0	95.0
Effective Green, g (s)	47.0	47.0	24.0		67.0	95.0
Actuated g/C Ratio	0.31	0.31	0.16		0.45	0.63
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)	997	809	487		1421	2078
v/s Ratio Prot	0.03		c0.19		c0.58	0.02
v/s Ratio Perm		c0.47				
v/c Ratio	0.08	1.50	1.16		1.30	0.04
Uniform Delay, d1	36.3	51.5	63.0		41.5	10.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	233.0	94.7		140.2	0.0
Delay (s)	36.4	284.5	157.7		181.7	10.3
Level of Service	D	F	F		F	B
Approach Delay (s)	275.4		157.7			174.7
Approach LOS	F		F			F

Intersection Summary			
HCM 2000 Control Delay	219.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	99.2%	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												
Traffic Volume (vph)	780	1590	100	160	595	1500	440	270	480	800	760	690
Future Volume (vph)	780	1590	100	160	595	1500	440	270	480	800	760	690
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.9		4.9	4.9		4.0	4.9		4.0	4.9	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95		0.97	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	0.99		1.00	0.89		1.00	0.90		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	4670		3183	4171		3183	2967		3183	3026	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4670		3183	4171		3183	2967		3183	3026	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	821	1674	105	168	626	1579	463	284	505	842	800	726
RTOR Reduction (vph)	0	4	0	0	253	0	0	217	0	0	109	0
Lane Group Flow (vph)	821	1775	0	168	1952	0	463	572	0	842	1417	0
Confl. Peds. (#/hr)			1	1								2
Confl. Bikes (#/hr)			2			1						1
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	23.0	57.9		13.3	49.1		16.0	37.1		23.0	44.1	
Effective Green, g (s)	23.0	57.9		13.3	49.1		16.0	37.1		23.0	44.1	
Actuated g/C Ratio	0.15	0.39		0.09	0.33		0.11	0.25		0.15	0.29	
Clearance Time (s)	4.0	4.9		4.9	4.9		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	3.0	4.8		3.0	3.0		3.0	3.3		3.0	4.4	
Lane Grp Cap (vph)	488	1802		282	1365		339	733		488	889	
v/s Ratio Prot	c0.26	0.38		0.05	c0.47		0.15	0.19		c0.26	c0.47	
v/s Ratio Perm												
v/c Ratio	1.68	0.99		0.60	2.17dr		1.37	0.87dr		1.73	1.59	
Uniform Delay, d1	63.5	45.6		65.8	50.5		67.0	52.7		63.5	53.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	315.9	17.7		3.4	197.8		182.5	5.5		335.0	272.7	
Delay (s)	379.4	63.4		69.1	248.3		249.5	58.2		398.5	325.7	
Level of Service	F	E		E	F		F	E		F	F	
Approach Delay (s)		163.2			235.6			128.9			351.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	230.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.61		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.7
Intersection Capacity Utilization	138.3%	ICU Level of Service	H
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)	1080	1785	0	0	395	700	0	0	0	700	350	1355
Future Volume (vph)	1080	1785	0	0	395	700	0	0	0	700	350	1355
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	0.97	0.91			0.91					0.97	1.00	
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	1.00			0.90					1.00	0.88	
Flt Protected	0.95	1.00			1.00					0.95	1.00	
Satd. Flow (prot)	3183	4715			4224					3183	1521	
Flt Permitted	0.95	1.00			1.00					0.95	1.00	
Satd. Flow (perm)	3183	4715			4224					3183	1521	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1137	1879	0	0	416	737	0	0	0	737	368	1426
RTOR Reduction (vph)	0	0	0	0	355	0	0	0	0	0	155	0
Lane Group Flow (vph)	1137	1879	0	0	798	0	0	0	0	737	1639	0
Confl. Peds. (#/hr)			7	7					2	2		
Confl. Bikes (#/hr)			3			2						
Turn Type	Prot	NA			NA					Split	NA	
Protected Phases	7	4			8					6	6	
Permitted Phases												
Actuated Green, G (s)	17.0	37.0			16.0					45.0	45.0	
Effective Green, g (s)	17.0	37.0			16.0					45.0	45.0	
Actuated g/C Ratio	0.19	0.41			0.18					0.50	0.50	
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)	601	1938			750					1591	760	
v/s Ratio Prot	c0.36	c0.40			0.19					0.23	c1.08	
v/s Ratio Perm												
v/c Ratio	1.89	0.97			1.19dr					0.46	2.16	
Uniform Delay, d1	36.5	25.9			37.0					14.6	22.5	
Progression Factor	1.00	1.00			1.00					1.00	1.00	
Incremental Delay, d2	407.6	13.8			51.1					0.2	524.8	
Delay (s)	444.1	39.7			88.1					14.9	547.3	
Level of Service	F	D			F					B	F	
Approach Delay (s)		192.2			88.1			0.0			392.3	
Approach LOS		F			F			A			F	

Intersection Summary			
HCM 2000 Control Delay	249.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	166.1%	ICU Level of Service	H
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)	75	5	70	140	10	360	275	4725	60	65	2955	300
Future Volume (vph)	75	5	70	140	10	360	275	4725	60	65	2955	300
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	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	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	
Frt	1.00	0.86		1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1593		1641	1727	1468	1770	4707		1641	4682	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1593		1641	1727	1468	1770	4707		1641	4682	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	5	74	147	11	379	289	4974	63	68	3111	316
RTOR Reduction (vph)	0	68	0	0	0	86	0	1	0	0	8	0
Lane Group Flow (vph)	79	11	0	147	11	293	289	5036	0	68	3419	0
Confl. Peds. (#/hr)							1					
Heavy Vehicles (%)	2%	10%	2%	10%	10%	10%	2%	10%	10%	10%	10%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	11.7	11.7		20.0	20.0	20.0	15.0	94.0		4.0	83.0	
Effective Green, g (s)	11.7	11.7		20.0	20.0	20.0	15.0	94.0		4.0	83.0	
Actuated g/C Ratio	0.08	0.08		0.14	0.14	0.14	0.10	0.65		0.03	0.57	
Clearance Time (s)	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	
Lane Grp Cap (vph)	142	127		225	237	201	182	3036		45	2667	
v/s Ratio Prot	c0.04	0.01		0.09	0.01		c0.16	c1.07		0.04	0.73	
v/s Ratio Perm						c0.20						
v/c Ratio	0.56	0.09		0.65	0.05	1.46	1.59	1.66		1.51	1.28	
Uniform Delay, d1	64.5	62.0		59.6	54.6	62.8	65.3	25.8		70.8	31.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.7	0.3		6.7	0.1	230.8	289.0	298.0		316.1	129.9	
Delay (s)	69.2	62.3		66.2	54.7	293.6	354.4	323.8		386.9	161.3	
Level of Service	E	E		E	D	F	F	F		F	F	
Approach Delay (s)		65.8			226.5			325.5			165.7	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	256.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.55		
Actuated Cycle Length (s)	145.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	129.1%	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)	1900	200	470	455	200	800	210	2065	435	1025	1345	630
Future Volume (vph)	1900	200	470	455	200	800	210	2065	435	1025	1345	630
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	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.91		0.97	0.91	
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	0.89		1.00	0.88		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	2937		1641	2888		3183	4592		3183	4461	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	2937		1641	2888		3183	4592		3183	4461	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2000	211	495	479	211	842	221	2174	458	1079	1416	663
RTOR Reduction (vph)	0	93	0	0	117	0	0	22	0	0	56	0
Lane Group Flow (vph)	2000	614	0	479	936	0	221	2610	0	1079	2023	0
Confl. Peds. (#/hr)							3					3
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	58.0	39.0		42.0	23.0		6.0	36.0		17.0	47.0	
Effective Green, g (s)	58.0	39.0		42.0	23.0		6.0	36.0		17.0	47.0	
Actuated g/C Ratio	0.39	0.26		0.28	0.15		0.04	0.24		0.11	0.31	
Clearance Time (s)	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	
Lane Grp Cap (vph)	634	763		459	442		127	1102		360	1397	
v/s Ratio Prot	c1.22	0.21		0.29	c0.32		0.07	c0.57		c0.34	0.45	
v/s Ratio Perm												
v/c Ratio	3.15	1.04dr		1.04	2.47dr		1.74	2.37		3.00	1.45	
Uniform Delay, d1	46.0	51.9		54.0	63.5		72.0	57.0		66.5	51.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	973.7	6.2		53.8	510.7		363.6	618.6		906.2	205.6	
Delay (s)	1019.7	58.1		107.8	574.2		435.6	675.6		972.7	257.1	
Level of Service	F	E		F	F		F	F		F	F	
Approach Delay (s)		768.8			428.4			657.0			501.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	604.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.74		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	228.8%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Appendix Q
Peak Hour Intersection LOS
– Buildout of Community Plan Plus Project (Full Development) Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	145	5	220	900	1920	0	0	940	960
Future Volume (vph)	0	0	0	145	5	220	900	1920	0	0	940	960
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			0.92	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1726	1538	1719	4940			4490	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1726	1538	1719	4940			4490	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	153	5	232	947	2021	0	0	989	1011
RTOR Reduction (vph)	0	0	0	0	0	44	0	0	0	0	123	0
Lane Group Flow (vph)	0	0	0	0	158	188	947	2021	0	0	1877	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)					16.0	16.0	66.3	123.8			52.8	
Effective Green, g (s)					16.0	16.0	66.3	123.8			52.8	
Actuated g/C Ratio					0.11	0.11	0.44	0.83			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)					184	164	759	4077			1580	
v/s Ratio Prot							c0.55	0.41			c0.42	
v/s Ratio Perm					0.09	c0.12						
v/c Ratio					0.86	1.15	1.25	0.50			1.52dr	
Uniform Delay, d1					65.9	67.0	41.9	3.9			48.6	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					30.5	115.5	122.3	0.1			91.2	
Delay (s)					96.4	182.5	164.2	4.0			139.8	
Level of Service					F	F	F	A			F	
Approach Delay (s)		0.0			147.6			55.1			139.8	
Approach LOS		A			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	93.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	143.6%	ICU Level of Service	H
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)	1200	5	700	0	0	0	0	1620	170	220	835	0
Future Volume (vph)	1200	5	700	0	0	0	0	1620	170	220	835	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	0.95	0.95						0.91		1.00	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	0.88						0.99		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1559	1435						4636		1641	4715	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1559	1435						4636		1641	4715	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1263	5	737	0	0	0	0	1705	179	232	879	0
RTOR Reduction (vph)	0	43	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	1048	914	0	0	0	0	0	1876	0	232	879	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)	71.9	71.9						47.9		15.3	67.9	
Effective Green, g (s)	71.9	71.9						47.9		15.3	67.9	
Actuated g/C Ratio	0.48	0.48						0.32		0.10	0.45	
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)	747	687						1480		167	2134	
v/s Ratio Prot								c0.40		c0.14	0.19	
v/s Ratio Perm	c0.67	0.64										
v/c Ratio	1.40	1.33						1.27		1.39	0.41	
Uniform Delay, d1	39.0	39.0						51.0		67.3	27.6	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	189.4	158.8						125.9		207.6	0.1	
Delay (s)	228.4	197.8						176.9		275.0	27.7	
Level of Service	F	F						F		F	C	
Approach Delay (s)		213.8			0.0			176.9			79.4	
Approach LOS		F			A			F			E	

Intersection Summary			
HCM 2000 Control Delay	170.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	143.6%	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)	170	320	190	755	170	495	375	1125	1190	930	480	120
Future Volume (vph)	170	320	190	755	170	495	375	1125	1190	930	480	120
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	
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	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	0.94		1.00	1.00	0.85	1.00	0.92		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3335	3246		3183	3438	1445	3183	4416		3183	4590	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3335	3246		3183	3438	1445	3183	4416		3183	4590	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	179	337	200	795	179	521	395	1184	1253	979	505	126
RTOR Reduction (vph)	0	58	0	0	0	256	0	128	0	0	28	0
Lane Group Flow (vph)	179	479	0	795	179	265	395	2309	0	979	603	0
Confl. Peds. (#/hr)	1					1	6		1	1		6
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	10%	5%	10%	10%	5%	10%	10%	10%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	10.0	17.0		27.0	34.0	34.0	23.0	58.0		32.0	67.0	
Effective Green, g (s)	10.0	17.0		27.0	34.0	34.0	23.0	58.0		32.0	67.0	
Actuated g/C Ratio	0.07	0.11		0.18	0.23	0.23	0.15	0.39		0.21	0.45	
Clearance Time (s)	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	
Lane Grp Cap (vph)	222	367		572	779	327	488	1707		679	2050	
v/s Ratio Prot	0.05	c0.15		c0.25	0.05		0.12	c0.52		c0.31	0.13	
v/s Ratio Perm						0.18						
v/c Ratio	0.81	1.31		1.39	0.23	0.81	0.81	1.82dr		1.44	0.29	
Uniform Delay, d1	69.0	66.5		61.5	47.3	54.9	61.4	46.0		59.0	26.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.9	156.2		186.0	0.2	14.1	9.6	162.8		207.1	0.1	
Delay (s)	87.9	222.7		247.5	47.5	69.0	71.0	208.8		266.1	26.5	
Level of Service	F	F		F	D	E	E	F		F	C	
Approach Delay (s)		189.0			161.4			189.5			172.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	179.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	124.9%	ICU Level of Service	H
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)	510	2725	90	60	1380	445	40	15	25	245	40	275
Future Volume (vph)	510	2725	90	60	1380	445	40	15	25	245	40	275
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
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	1.00		1.00	0.95	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	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	1.00		1.00	1.00	0.85	1.00	0.91		1.00	0.89	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	4691		3183	4715	1428	1641	1567		1641	1456	1395
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	4691		3183	4715	1428	1641	1567		1641	1456	1395
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	537	2868	95	63	1453	468	42	16	26	258	42	289
RTOR Reduction (vph)	0	2	0	0	0	208	0	24	0	0	75	134
Lane Group Flow (vph)	537	2961	0	63	1453	260	42	18	0	258	94	28
Confl. Peds. (#/hr)						6						
Confl. Bikes (#/hr)			1									
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)	28.0	90.0		4.0	66.0	66.0	6.9	8.2		23.0	24.3	24.3
Effective Green, g (s)	28.0	90.0		4.0	66.0	66.0	6.9	8.2		23.0	24.3	24.3
Actuated g/C Ratio	0.20	0.64		0.03	0.47	0.47	0.05	0.06		0.16	0.17	0.17
Clearance Time (s)	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
Lane Grp Cap (vph)	631	2990		90	2203	667	80	91		267	250	240
v/s Ratio Prot	c0.17	c0.63		0.02	0.31		0.03	0.01		c0.16	c0.06	
v/s Ratio Perm						0.18						0.02
v/c Ratio	0.85	0.99		0.70	0.66	0.39	0.53	0.19		0.97	0.37	0.12
Uniform Delay, d1	54.6	25.2		68.0	28.9	24.5	65.6	63.3		58.7	51.7	49.4
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	10.7	14.2		21.1	0.7	0.4	6.1	1.0		45.3	0.9	0.2
Delay (s)	65.3	39.4		89.1	29.7	24.9	71.6	64.4		104.1	52.7	49.6
Level of Service	E	D		F	C	C	E	E		F	D	D
Approach Delay (s)		43.3			30.4			68.0			74.3	
Approach LOS		D			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	141.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.2%	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)	785	1880	335	315	780	950	345	800	575	1845	545	760
Future Volume (vph)	785	1880	335	315	780	950	345	800	575	1845	545	760
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91		0.97	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	4715	1468	3183	4715	1468	3183	4420		3183	4304	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4715	1468	3183	4715	1468	3183	4420		3183	4304	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	826	1979	353	332	821	1000	363	842	605	1942	574	800
RTOR Reduction (vph)	0	0	228	0	0	213	0	66	0	0	88	0
Lane Group Flow (vph)	826	1979	125	332	821	787	363	1381	0	1942	1286	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	11.6	53.1	53.1	6.6	48.1	48.1	19.3	47.0		23.6	51.3	
Effective Green, g (s)	11.6	53.1	53.1	6.6	48.1	48.1	19.3	47.0		23.6	51.3	
Actuated g/C Ratio	0.08	0.35	0.35	0.04	0.32	0.32	0.13	0.31		0.16	0.34	
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0		2.0	2.0	
Lane Grp Cap (vph)	246	1669	519	140	1511	470	409	1384		500	1471	
v/s Ratio Prot	c0.26	0.42		0.10	0.17		0.11	c0.31		c0.61	c0.30	
v/s Ratio Perm			0.09			c0.54						
v/c Ratio	3.36	1.19	0.24	2.37	0.54	1.67	0.89	1.15dr		3.88	1.36dr	
Uniform Delay, d1	69.2	48.5	34.2	71.7	41.9	50.9	64.3	51.5		63.2	46.3	
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	1071.3	90.0	0.4	638.6	0.6	312.4	19.6	23.6		1302.6	5.9	
Delay (s)	1140.5	138.4	34.6	710.3	42.5	363.4	83.9	75.0		1365.8	52.2	
Level of Service	F	F	C	F	D	F	F	E		F	D	
Approach Delay (s)		388.9			294.5			76.8			821.5	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	452.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.92		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	142.7%	ICU Level of Service	H
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)	195	2050	1500	885	1245	85	975	70	695	50	25	55
Future Volume (vph)	195	2050	1500	885	1245	85	975	70	695	50	25	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	
Lane Util. Factor	1.00	0.91		0.97	0.91		0.97	0.95	0.95	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99	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	0.94		1.00	0.99		1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1641	4385		3183	4663		3183	1424	1377	1641	1548	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1641	4385		3183	4663		3183	1424	1377	1641	1548	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	2158	1579	932	1311	89	1026	74	732	53	26	58
RTOR Reduction (vph)	0	83	0	0	5	0	0	119	192	0	50	0
Lane Group Flow (vph)	205	3654	0	932	1395	0	1026	292	203	53	34	0
Confl. Peds. (#/hr)			4			2			1			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	20.6	60.3		17.7	57.4		19.7	34.2	34.2	5.6	20.1	
Effective Green, g (s)	20.6	60.3		17.7	57.4		19.7	34.2	34.2	5.6	20.1	
Actuated g/C Ratio	0.15	0.44		0.13	0.42		0.14	0.25	0.25	0.04	0.15	
Clearance Time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	
Vehicle Extension (s)	2.0	4.4		2.0	4.2		2.0	3.2	3.2	2.0	2.0	
Lane Grp Cap (vph)	245	1923		409	1946		456	354	342	66	226	
v/s Ratio Prot	0.12	c0.83		c0.29	0.30		c0.32	c0.20		0.03	0.02	
v/s Ratio Perm									0.15			
v/c Ratio	0.84	2.19dr		2.28	0.72		2.25	0.82	0.59	0.80	0.15	
Uniform Delay, d1	56.8	38.6		59.9	33.3		58.9	48.8	45.5	65.4	51.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	20.4	407.1		583.2	1.4		569.5	14.5	2.8	46.6	0.1	
Delay (s)	77.3	445.7		643.1	34.7		628.4	63.3	48.3	112.0	51.4	
Level of Service	E	F		F	C		F	E	D	F	D	
Approach Delay (s)		426.6			277.8			376.6			74.8	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	367.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.85		
Actuated Cycle Length (s)	137.5	Sum of lost time (s)	19.7
Intersection Capacity Utilization	148.7%	ICU Level of Service	H
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	1235	1640	275	1085	1095	785	375	425	800	345	510
Future Volume (vph)	770	1235	1640	275	1085	1095	785	375	425	800	345	510
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	0.97	0.91		0.97	0.91		0.97	0.95		0.97	0.95	
Frt	1.00	0.91		1.00	0.92		1.00	0.92		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4650		3433	4702		3433	3257		3433	3222	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4650		3433	4702		3433	3257		3433	3222	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	811	1300	1726	289	1142	1153	826	395	447	842	363	537
RTOR Reduction (vph)	0	157	0	0	120	0	0	80	0	0	137	0
Lane Group Flow (vph)	811	2869	0	289	2175	0	826	762	0	842	763	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	18.5	64.0		7.5	53.0		18.5	38.5		19.5	39.5	
Effective Green, g (s)	18.5	64.0		7.5	53.0		18.5	38.5		19.5	39.5	
Actuated g/C Ratio	0.13	0.43		0.05	0.36		0.13	0.26		0.13	0.27	
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)	430	2017		174	1689		430	850		453	862	
v/s Ratio Prot	c0.24	c0.62		0.08	0.46		0.24	0.23		c0.25	c0.24	
v/s Ratio Perm												
v/c Ratio	1.89	2.05dr		1.66	1.67dr		1.92	0.90		1.86	0.96dr	
Uniform Delay, d1	64.5	41.8		70.0	47.2		64.5	52.6		64.0	51.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	407.4	193.0		321.5	134.0		423.0	12.0		394.8	10.8	
Delay (s)	471.9	234.7		391.5	181.2		487.5	64.6		458.8	62.6	
Level of Service	F	F		F	F		F	E		F	E	
Approach Delay (s)		284.9			204.7			274.0			254.1	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	256.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	147.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	131.9%	ICU Level of Service	H
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)	20	2160	340	455	2045	10	640	35	560	5	15	10
Future Volume (vph)	20	2160	340	455	2045	10	640	35	560	5	15	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	5.3	4.4	6.0		5.3	5.3	5.3	4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.87	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1641	4715	1468	3183	4712		3183	1424	1395	1641	1622	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1641	4715	1468	3183	4712		3183	1424	1395	1641	1622	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	2274	358	479	2153	11	674	37	589	5	16	11
RTOR Reduction (vph)	0	0	106	0	0	0	0	189	228	0	11	0
Lane Group Flow (vph)	21	2274	252	479	2164	0	674	125	84	5	16	0
Turn Type	Prot	NA	pm+ov	Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2	8	1	6		8	8		4	4	
Permitted Phases			2						8			
Actuated Green, G (s)	2.2	56.3	91.4	14.5	69.0		35.1	35.1	35.1	4.5	4.5	
Effective Green, g (s)	2.2	56.3	91.4	14.5	69.0		35.1	35.1	35.1	4.5	4.5	
Actuated g/C Ratio	0.02	0.43	0.70	0.11	0.53		0.27	0.27	0.27	0.03	0.03	
Clearance Time (s)	4.0	6.0	5.3	4.4	6.0		5.3	5.3	5.3	4.0	4.0	
Vehicle Extension (s)	3.0	4.4	2.0	2.0	4.3		2.0	2.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	27	2040	1091	354	2499		858	384	376	56	56	
v/s Ratio Prot	0.01	c0.48	0.06	c0.15	0.46		c0.21	0.09		0.00	c0.01	
v/s Ratio Perm			0.11						0.06			
v/c Ratio	0.78	1.11	0.23	1.35	0.87		0.79	0.33	0.22	0.09	0.29	
Uniform Delay, d1	63.7	36.9	6.9	57.8	26.5		44.0	38.0	36.9	60.8	61.2	
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	81.9	59.1	0.0	176.4	3.6		4.4	0.2	0.1	0.7	2.9	
Delay (s)	145.6	96.0	6.9	234.2	30.1		48.4	38.2	37.0	61.5	64.1	
Level of Service	F	F	A	F	C		D	D	D	E	E	
Approach Delay (s)		84.4			67.1			43.2			63.7	
Approach LOS		F			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	69.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	130.1	Sum of lost time (s)	19.7
Intersection Capacity Utilization	92.7%	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												
Traffic Volume (vph)	0	0	0	1500	5	220	815	885	0	0	460	350
Future Volume (vph)	0	0	0	1500	5	220	815	885	0	0	460	350
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	0.86	0.85	1.00	1.00			0.94	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1641	1405	1395	3183	4715			4410	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1405	1395	3183	4715			4410	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	1579	5	232	858	932	0	0	484	368
RTOR Reduction (vph)	0	0	0	0	14	21	0	0	0	0	92	0
Lane Group Flow (vph)	0	0	0	1579	105	97	858	932	0	0	760	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)				85.9	85.9	85.9	24.3	53.9			24.9	
Effective Green, g (s)				85.9	85.9	85.9	24.3	53.9			24.9	
Actuated g/C Ratio				0.57	0.57	0.57	0.16	0.36			0.17	
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)				939	804	798	515	1694			732	
v/s Ratio Prot					0.07		c0.27	0.20			c0.17	
v/s Ratio Perm				c0.96		0.07						
v/c Ratio				1.68	0.13	0.12	1.67	0.55			1.09dr	
Uniform Delay, d1				32.0	14.8	14.7	62.9	38.4			62.5	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				311.4	0.1	0.1	308.2	0.4			43.7	
Delay (s)				343.4	14.9	14.8	371.1	38.8			106.2	
Level of Service				F	B	B	F	D			F	
Approach Delay (s)		0.0			300.5			198.0			106.2	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	222.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.56		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	250.8%	ICU Level of Service	H
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)	400	5	3370	0	0	0	0	1265	490	210	1750	0
Future Volume (vph)	400	5	3370	0	0	0	0	1265	490	210	1750	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					0.91		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)		1646	2584					4518		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1646	2584					4518		3183	4715	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	421	5	3547	0	0	0	0	1332	516	221	1842	0
RTOR Reduction (vph)	0	0	21	0	0	0	0	47	0	0	0	0
Lane Group Flow (vph)	0	426	3526	0	0	0	0	1801	0	221	1842	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)		86.9	86.9					40.9		7.3	52.9	
Effective Green, g (s)		86.9	86.9					40.9		7.3	52.9	
Actuated g/C Ratio		0.58	0.58					0.27		0.05	0.35	
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)		953	1496					1231		154	1662	
v/s Ratio Prot								c0.40		0.07	c0.39	
v/s Ratio Perm		0.26	c1.36									
v/c Ratio		0.45	2.36					1.46		1.44	1.11	
Uniform Delay, d1		17.9	31.5					54.5		71.3	48.6	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.3	612.8					213.1		228.8	58.0	
Delay (s)		18.2	644.4					267.6		300.1	106.6	
Level of Service		B	F					F		F	F	
Approach Delay (s)		577.2			0.0			267.6			127.3	
Approach LOS		F			A			F			F	

Intersection Summary			
HCM 2000 Control Delay	386.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.04		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	250.8%	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)	1285	445	335	380	860	825	870	1045	200	985	2480	1655
Future Volume (vph)	1285	445	335	380	860	825	870	1045	200	985	2480	1655
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	4.9		4.4	5.1	
Lane Util. Factor	0.97	0.91		0.97	0.95		0.97	0.91		0.97	0.91	
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	0.94		1.00	0.93		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	4411		3183	3021		3183	4590		3183	4432	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4411		3183	3021		3183	4590		3183	4432	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1353	468	353	400	905	868	916	1100	211	1037	2611	1742
RTOR Reduction (vph)	0	94	0	0	119	0	0	20	0	0	83	0
Lane Group Flow (vph)	1353	727	0	400	1654	0	916	1291	0	1037	4270	0
Confl. Peds. (#/hr)	1					1			2			
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	23.6	44.1		12.6	32.9		18.6	50.1		19.6	50.9	
Effective Green, g (s)	23.6	44.1		12.6	32.9		18.6	50.1		19.6	50.9	
Actuated g/C Ratio	0.16	0.30		0.09	0.23		0.13	0.35		0.14	0.35	
Clearance Time (s)	4.4	4.9		4.4	5.1		4.4	4.9		4.4	5.1	
Vehicle Extension (s)	2.0	3.8		2.0	3.8		2.0	3.8		2.0	3.8	
Lane Grp Cap (vph)	518	1341		276	685		408	1585		430	1555	
v/s Ratio Prot	c0.43	0.16		0.13	c0.55		0.29	0.28		c0.33	c0.96	
v/s Ratio Perm												
v/c Ratio	2.61	0.54		1.45	2.41		2.25	0.81		2.41	2.91dr	
Uniform Delay, d1	60.7	42.0		66.2	56.1		63.2	43.2		62.7	47.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	731.0	0.5		221.4	641.0		568.1	3.5		642.3	787.5	
Delay (s)	791.7	42.6		287.6	697.0		631.3	46.7		705.0	834.5	
Level of Service	F	D		F	F		F	D		F	F	
Approach Delay (s)		508.8			621.7			287.2			809.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	623.6	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)	19.0
Intersection Capacity Utilization	212.6%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2740	65	10	2450	65	20
Future Volume (vph)	2740	65	10	2450	65	20
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	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4699		1641	4715	1641	1448
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4699		1641	4715	1641	1448
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2884	68	11	2579	68	21
RTOR Reduction (vph)	1	0	0	0	0	20
Lane Group Flow (vph)	2951	0	11	2579	68	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)	89.9		1.0	96.6	8.4	8.4
Effective Green, g (s)	89.9		1.0	96.6	8.4	8.4
Actuated g/C Ratio	0.76		0.01	0.82	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)	3570		13	3850	116	102
v/s Ratio Prot	c0.63		0.01	c0.55	c0.04	
v/s Ratio Perm						0.00
v/c Ratio	0.83		0.85	0.67	0.59	0.01
Uniform Delay, d1	9.2		58.6	4.4	53.3	51.1
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1		162.2	0.8	4.8	0.0
Delay (s)	11.2		220.8	5.2	58.1	51.1
Level of Service	B		F	A	E	D
Approach Delay (s)	11.2			6.1	56.4	
Approach LOS	B			A	E	

Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	118.3	Sum of lost time (s)	19.0
Intersection Capacity Utilization	75.7%	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)	115	1435	665	860	1160	590	975	1105	980	775	520	820
Future Volume (vph)	115	1435	665	860	1160	590	975	1105	980	775	520	820
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7		4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91		0.97	0.95	
Frpb, ped/bikes	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	
Frt	1.00	0.95		1.00	0.95		1.00	0.93		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	4466		3183	4477		3183	4349		3183	2981	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4466		3183	4477		3183	4349		3183	2981	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	121	1511	700	905	1221	621	1026	1163	1032	816	547	863
RTOR Reduction (vph)	0	56	0	0	61	0	0	107	0	0	66	0
Lane Group Flow (vph)	121	2155	0	905	1781	0	1026	2088	0	816	1344	0
Confl. Peds. (#/hr)			3						3			
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.0	44.3		20.0	58.3		21.0	48.8		17.0	45.7	
Effective Green, g (s)	6.0	44.3		20.0	58.3		21.0	48.8		17.0	45.7	
Actuated g/C Ratio	0.04	0.30		0.13	0.39		0.14	0.33		0.11	0.30	
Clearance Time (s)	4.0	6.7		4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0		2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	127	1318		424	1740		445	1414		360	908	
v/s Ratio Prot	0.04	c0.48		c0.28	0.40		c0.32	c0.48		0.26	0.45	
v/s Ratio Perm												
v/c Ratio	0.95	1.64		2.13	1.02		2.31	1.78dr		2.27	1.68dr	
Uniform Delay, d1	71.9	52.9		65.0	45.9		64.5	50.6		66.5	52.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	64.5	289.4		518.4	27.7		594.6	218.5		578.8	222.0	
Delay (s)	136.3	342.2		583.4	73.6		659.1	269.1		645.3	274.1	
Level of Service	F	F		F	E		F	F		F	F	
Approach Delay (s)		331.5			241.5			393.3			410.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	343.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.77		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	151.7%	ICU Level of Service	H
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)	700	585	350	350	445	635	250	1380	150	1600	1850	1200
Future Volume (vph)	700	585	350	350	445	635	250	1380	150	1600	1850	1200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5		4.0	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.95		0.97	0.91	
Frpb, ped/bikes	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	
Frt	1.00	0.94		1.00	0.91		1.00	0.99		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	3082		3183	2992		3183	3234		3183	4437	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	3082		3183	2992		3183	3234		3183	4437	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	737	616	368	368	468	668	263	1453	158	1684	1947	1263
RTOR Reduction (vph)	0	59	0	0	173	0	0	6	0	0	78	0
Lane Group Flow (vph)	737	925	0	368	963	0	263	1605	0	1684	3132	0
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	18.0	33.5		10.0	25.5		15.1	44.5		44.5	73.9	
Effective Green, g (s)	18.0	33.5		10.0	25.5		15.1	44.5		44.5	73.9	
Actuated g/C Ratio	0.12	0.22		0.07	0.17		0.10	0.30		0.30	0.49	
Clearance Time (s)	4.0	4.5		4.0	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)	381	688		212	508		320	959		944	2185	
v/s Ratio Prot	c0.23	0.30		0.12	c0.32		0.08	c0.50		c0.53	0.71	
v/s Ratio Perm												
v/c Ratio	1.93	1.34		1.74	1.90		0.82	1.67		1.78	1.58dr	
Uniform Delay, d1	66.0	58.2		70.0	62.2		66.1	52.8		52.8	38.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	430.0	164.6		350.1	410.7		15.5	307.9		357.0	197.8	
Delay (s)	496.0	222.9		420.1	473.0		81.6	360.6		409.8	235.8	
Level of Service	F	F		F	F		F	F		F	F	
Approach Delay (s)		339.8			460.0			321.5			295.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	332.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.79		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	155.9%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1800	310	470	485	305	415
Future Volume (vph)	1800	310	470	485	305	415
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	0.95		0.97	0.95	0.97	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)	3210		3183	3282	3183	1468
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3210		3183	3282	3183	1468
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1895	326	495	511	321	437
RTOR Reduction (vph)	9	0	0	0	0	202
Lane Group Flow (vph)	2212	0	495	511	321	235
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	90.0		24.0	118.0	24.0	24.0
Effective Green, g (s)	90.0		24.0	118.0	24.0	24.0
Actuated g/C Ratio	0.60		0.16	0.79	0.16	0.16
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)	1926		509	2581	509	234
v/s Ratio Prot	c0.69		c0.16	0.16	0.10	
v/s Ratio Perm						c0.16
v/c Ratio	1.15		0.97	0.20	0.63	1.00
Uniform Delay, d1	30.0		62.7	4.0	58.9	63.0
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	73.4		32.7	0.0	2.5	59.4
Delay (s)	103.4		95.4	4.1	61.4	122.4
Level of Service	F		F	A	E	F
Approach Delay (s)	103.4			49.0	96.6	
Approach LOS	F			D	F	

Intersection Summary			
HCM 2000 Control Delay	88.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
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)	3280	0	176	2205	0	370
Future Volume (vph)	3280	0	176	2205	0	370
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3453	0	185	2321	0	389

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	3453	185	2321	389
Volume Left (vph)	0	185	0	0
Volume Right (vph)	0	0	0	389
Hadj (s)	0.03	0.53	0.03	-0.57
Departure Headway (s)	6.4	7.3	6.8	6.4
Degree Utilization, x	6.18	0.38	4.41	0.69
Capacity (veh/h)	570	486	533	551
Control Delay (s)	2346.2	13.5	1551.9	22.6
Approach Delay (s)	2346.2	1438.3		22.6
Approach LOS	F	F		C

Intersection Summary			
Delay	1845.4		
Level of Service	F		
Intersection Capacity Utilization	202.2%	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)	0	134	60	2180	1520	0
Future Volume (vph)	0	134	60	2180	1520	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	141	63	2295	1600	0

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	141	63	2295	1067	533
Volume Left (vph)	0	63	0	0	0
Volume Right (vph)	141	0	0	0	0
Hadj (s)	-0.57	0.53	0.03	0.03	0.03
Departure Headway (s)	6.4	7.0	6.5	5.8	5.8
Degree Utilization, x	0.25	0.12	4.13	1.71	0.86
Capacity (veh/h)	556	502	562	630	617
Control Delay (s)	11.5	9.7	1424.9	341.6	32.5
Approach Delay (s)	11.5	1387.1		238.6	
Approach LOS	B	F		F	

Intersection Summary			
Delay	891.5		
Level of Service	F		
Intersection Capacity Utilization	129.7%	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)	165	155	65	1420	2185	78
Future Volume (vph)	165	155	65	1420	2185	78
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	174	163	68	1495	2300	82

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	337	68	1495	1533	849
Volume Left (vph)	174	68	0	0	0
Volume Right (vph)	163	0	0	0	82
Hadj (s)	-0.15	0.53	0.03	0.03	-0.03
Departure Headway (s)	6.8	7.8	7.3	6.8	6.7
Degree Utilization, x	0.64	0.15	3.02	2.89	1.58
Capacity (veh/h)	516	458	500	535	541
Control Delay (s)	21.1	10.9	927.0	869.8	288.5
Approach Delay (s)	21.1	887.2		662.7	
Approach LOS	C	F		F	

Intersection Summary			
Delay	694.2		
Level of Service	F		
Intersection Capacity Utilization	100.0%	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)	165	10	10	1320	2260	78
Future Volume (vph)	165	10	10	1320	2260	78
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	174	11	11	1389	2379	82

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	185	11	1389	1586	875
Volume Left (vph)	174	11	0	0	0
Volume Right (vph)	11	0	0	0	82
Hadj (s)	0.19	0.53	0.03	0.03	-0.03
Departure Headway (s)	7.2	7.3	6.8	6.0	5.9
Degree Utilization, x	0.37	0.02	2.63	2.64	1.44
Capacity (veh/h)	498	484	541	604	611
Control Delay (s)	14.3	9.3	753.2	756.8	224.6
Approach Delay (s)	14.3	747.4		567.5	
Approach LOS	B	F		F	

Intersection Summary			
Delay	604.5		
Level of Service	F		
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	310	1455	85	80	2095	340
Future Volume (vph)	310	1455	85	80	2095	340
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	0.97	0.88	0.95		0.97	0.95
Frt	1.00	0.85	0.93		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3183	2584	3043		3183	3282
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3183	2584	3043		3183	3282
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	326	1532	89	84	2205	358
RTOR Reduction (vph)	0	1291	78	0	0	0
Lane Group Flow (vph)	326	241	95	0	2205	358
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	20.8	20.8	9.4		90.1	103.5
Effective Green, g (s)	20.8	20.8	9.4		90.1	103.5
Actuated g/C Ratio	0.16	0.16	0.07		0.68	0.78
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)	500	406	216		2167	2567
v/s Ratio Prot	c0.10		c0.03		c0.69	0.11
v/s Ratio Perm		0.09				
v/c Ratio	0.65	0.59	0.44		1.02	0.14
Uniform Delay, d1	52.4	51.8	58.9		21.1	3.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.0	2.3	1.4		23.8	0.0
Delay (s)	55.4	54.1	60.4		44.9	3.5
Level of Service	E	D	E		D	A
Approach Delay (s)	54.4		60.4			39.2
Approach LOS	D		E			D

Intersection Summary			
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	132.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.5%	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	1190	370	450	1195	700	150	100	50	1235	1080	900
Future Volume (vph)	225	1190	370	450	1195	700	150	100	50	1235	1080	900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.9	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95		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	0.96		1.00	0.94		1.00	0.95		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	4531		3183	4433		3183	3117		3183	3039	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4531		3183	4433		3183	3117		3183	3039	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	237	1253	389	474	1258	737	158	105	53	1300	1137	947
RTOR Reduction (vph)	0	36	0	0	71	0	0	41	0	0	82	0
Lane Group Flow (vph)	237	1606	0	474	1924	0	158	117	0	1300	2002	0
Confl. Peds. (#/hr)			1	1								2
Confl. Bikes (#/hr)			2			1						1
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.6	41.0		26.3	60.2		5.6	34.0		29.6	58.0	
Effective Green, g (s)	7.6	41.0		26.3	60.2		5.6	34.0		29.6	58.0	
Actuated g/C Ratio	0.05	0.27		0.18	0.40		0.04	0.23		0.20	0.39	
Clearance Time (s)	4.4	4.9		4.9	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	4.8		3.0	3.0		2.0	3.3		2.0	4.4	
Lane Grp Cap (vph)	161	1238		558	1779		118	706		628	1175	
v/s Ratio Prot	c0.07	c0.35		0.15	c0.43		0.05	0.04		c0.41	c0.66	
v/s Ratio Perm												
v/c Ratio	1.47	1.30		0.85	1.12dr		1.34	0.17		2.07	1.70	
Uniform Delay, d1	71.2	54.5		59.9	44.9		72.2	46.6		60.2	46.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	242.9	139.7		11.6	47.2		198.8	0.1		487.0	320.6	
Delay (s)	314.1	194.2		71.5	92.1		271.0	46.7		547.2	366.6	
Level of Service	F	F		E	F		F	D		F	F	
Approach Delay (s)		209.3			88.1			158.9			436.0	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	265.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.57		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.1
Intersection Capacity Utilization	123.8%	ICU Level of Service	H
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)	970	715	0	0	2090	900	0	0	0	400	350	1095
Future Volume (vph)	970	715	0	0	2090	900	0	0	0	400	350	1095
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	0.97	0.91			0.91					0.97	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	1.00	1.00			0.95					1.00	0.89	
Flt Protected	0.95	1.00			1.00					0.95	1.00	
Satd. Flow (prot)	3183	4715			4485					3183	1531	
Flt Permitted	0.95	1.00			1.00					0.95	1.00	
Satd. Flow (perm)	3183	4715			4485					3183	1531	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1021	753	0	0	2200	947	0	0	0	421	368	1153
RTOR Reduction (vph)	0	0	0	0	55	0	0	0	0	0	81	0
Lane Group Flow (vph)	1021	753	0	0	3092	0	0	0	0	421	1440	0
Confl. Peds. (#/hr)			7	7					2	2		
Confl. Bikes (#/hr)			3			2						
Turn Type	Prot	NA			NA					Split	NA	
Protected Phases	7	4			8					6	6	
Permitted Phases												
Actuated Green, G (s)	20.0	71.0			47.0					61.0	61.0	
Effective Green, g (s)	20.0	71.0			47.0					61.0	61.0	
Actuated g/C Ratio	0.14	0.51			0.34					0.44	0.44	
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)	454	2391			1505					1386	667	
v/s Ratio Prot	c0.32	0.16			c0.69					0.13	c0.94	
v/s Ratio Perm												
v/c Ratio	2.25	0.31			2.05					0.30	2.16	
Uniform Delay, d1	60.0	20.2			46.5					25.7	39.5	
Progression Factor	1.00	1.00			1.00					1.00	1.00	
Incremental Delay, d2	569.1	0.1			476.8					0.1	526.7	
Delay (s)	629.1	20.3			523.3					25.8	566.2	
Level of Service	F	C			F					C	F	
Approach Delay (s)		370.7			523.3			0.0			449.1	
Approach LOS		F			F			A			F	

Intersection Summary			
HCM 2000 Control Delay	462.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.13		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	184.0%	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)	300	10	275	60	5	65	70	2920	140	360	5400	75
Future Volume (vph)	300	10	275	60	5	65	70	2920	140	360	5400	75
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	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	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	
Frt	1.00	0.86		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1589		1641	1727	1468	1770	4683		1641	4710	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1589		1641	1727	1468	1770	4683		1641	4710	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	11	289	63	5	68	74	3074	147	379	5684	79
RTOR Reduction (vph)	0	98	0	0	0	63	0	3	0	0	1	0
Lane Group Flow (vph)	316	202	0	63	5	5	74	3218	0	379	5762	0
Confl. Peds. (#/hr)							1					
Heavy Vehicles (%)	2%	10%	2%	10%	10%	10%	2%	10%	10%	10%	10%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	21.0	21.0		10.9	10.9	10.9	4.0	77.0		20.0	93.0	
Effective Green, g (s)	21.0	21.0		10.9	10.9	10.9	4.0	77.0		20.0	93.0	
Actuated g/C Ratio	0.14	0.14		0.08	0.08	0.08	0.03	0.53		0.14	0.64	
Clearance Time (s)	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	
Lane Grp Cap (vph)	256	230		123	129	110	48	2488		226	3022	
v/s Ratio Prot	c0.18	0.13		c0.04	0.00		0.04	0.69		c0.23	c1.22	
v/s Ratio Perm						0.00						
v/c Ratio	1.23	0.88		0.51	0.04	0.05	1.54	1.29		1.68	1.91	
Uniform Delay, d1	62.0	60.7		64.4	62.1	62.2	70.5	34.0		62.5	26.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	134.5	29.0		3.6	0.1	0.2	324.0	135.1		323.2	409.3	
Delay (s)	196.5	89.7		68.0	62.3	62.4	394.5	169.0		385.7	435.2	
Level of Service	F	F		E	E	E	F	F		F	F	
Approach Delay (s)		144.4			65.0			174.1			432.2	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	326.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.69		
Actuated Cycle Length (s)	144.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	144.1%	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)	600	200	330	445	200	870	690	1395	500	1000	2385	1715
Future Volume (vph)	600	200	330	445	200	870	690	1395	500	1000	2385	1715
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	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.91		0.97	0.91	
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	0.91		1.00	0.88		1.00	0.96		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	2976		1641	2882		3183	4529		3183	4382	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	2976		1641	2882		3183	4529		3183	4382	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	211	347	468	211	916	726	1468	526	1053	2511	1805
RTOR Reduction (vph)	0	134	0	0	151	0	0	43	0	0	86	0
Lane Group Flow (vph)	632	424	0	468	976	0	726	1951	0	1053	4230	0
Confl. Peds. (#/hr)							3					3
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	31.0	39.0		17.0	25.0		15.0	58.0		20.0	63.0	
Effective Green, g (s)	31.0	39.0		17.0	25.0		15.0	58.0		20.0	63.0	
Actuated g/C Ratio	0.21	0.26		0.11	0.17		0.10	0.39		0.13	0.42	
Clearance Time (s)	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	
Lane Grp Cap (vph)	339	773		185	480		318	1751		424	1840	
v/s Ratio Prot	c0.39	0.14		c0.29	c0.34		0.23	0.43		c0.33	c0.97	
v/s Ratio Perm												
v/c Ratio	1.86	0.55		2.53	2.32dr		2.28	1.11		2.48	2.59dr	
Uniform Delay, d1	59.5	47.9		66.5	62.5		67.5	46.0		65.0	43.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	400.1	0.8		704.1	472.4		587.3	60.0		674.6	586.1	
Delay (s)	459.6	48.7		770.6	534.9		654.8	106.0		739.6	629.6	
Level of Service	F	D		F	F		F	F		F	F	
Approach Delay (s)		266.9			604.1			252.5			651.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	502.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.28		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	184.6%	ICU Level of Service	H
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)	0	0	0	170	5	220	700	1680	0	0	1050	850
Future Volume (vph)	0	0	0	170	5	220	700	1680	0	0	1050	850
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			0.99	
Flpb, ped/bikes					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.93	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1726	1538	1719	4940			4541	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1726	1538	1719	4940			4541	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	179	5	232	737	1768	0	0	1105	895
RTOR Reduction (vph)	0	0	0	0	0	52	0	0	0	0	97	0
Lane Group Flow (vph)	0	0	0	0	184	180	737	1768	0	0	1903	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)					17.9	17.9	60.3	121.9			56.9	
Effective Green, g (s)					17.9	17.9	60.3	121.9			56.9	
Actuated g/C Ratio					0.12	0.12	0.40	0.81			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)					205	183	691	4014			1722	
v/s Ratio Prot							c0.43	0.36			c0.42	
v/s Ratio Perm					0.11	c0.12						
v/c Ratio					0.90	0.98	1.07	0.44			1.31dr	
Uniform Delay, d1					65.1	65.9	44.9	4.1			46.5	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					35.7	61.4	53.4	0.1			56.4	
Delay (s)					100.9	127.3	98.2	4.2			102.9	
Level of Service					F	F	F	A			F	
Approach Delay (s)		0.0			115.6			31.8			102.9	
Approach LOS		A			F			C			F	

Intersection Summary			
HCM 2000 Control Delay	67.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	110.0%	ICU Level of Service	H
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)	960	5	900	0	0	0	0	1420	165	220	1000	0
Future Volume (vph)	960	5	900	0	0	0	0	1420	165	220	1000	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	0.95	0.95						0.91		1.00	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	0.87						0.98		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1559	1413						4629		1641	4715	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1559	1413						4629		1641	4715	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1011	5	947	0	0	0	0	1495	174	232	1053	0
RTOR Reduction (vph)	0	18	0	0	0	0	0	9	0	0	0	0
Lane Group Flow (vph)	910	1035	0	0	0	0	0	1660	0	232	1053	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)	76.9	76.9						42.9		15.3	62.9	
Effective Green, g (s)	76.9	76.9						42.9		15.3	62.9	
Actuated g/C Ratio	0.51	0.51						0.29		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)	799	724						1323		167	1977	
v/s Ratio Prot								c0.36		c0.14	0.22	
v/s Ratio Perm	0.58	0.73										
v/c Ratio	1.14	1.43						1.25		1.39	0.53	
Uniform Delay, d1	36.5	36.5						53.5		67.3	32.6	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	77.4	201.2						120.9		207.6	0.3	
Delay (s)	114.0	237.8						174.4		275.0	32.8	
Level of Service	F	F						F		F	C	
Approach Delay (s)		180.4			0.0			174.4			76.6	
Approach LOS		F			A			F			E	

Intersection Summary			
HCM 2000 Control Delay	151.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	110.0%	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)	135	170	375	1190	320	930	190	490	755	495	1235	170
Future Volume (vph)	135	170	375	1190	320	930	190	490	755	495	1235	170
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	
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	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	0.90		1.00	1.00	0.85	1.00	0.91		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3335	3083		3183	3438	1446	3183	4327		3183	4641	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3335	3083		3183	3438	1446	3183	4327		3183	4641	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	142	179	395	1253	337	979	200	516	795	521	1300	179
RTOR Reduction (vph)	0	90	0	0	0	194	0	214	0	0	14	0
Lane Group Flow (vph)	142	484	0	1253	337	785	200	1097	0	521	1465	0
Confl. Peds. (#/hr)	1					1	6		1	1		6
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	10%	5%	10%	10%	5%	10%	10%	10%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	5.0	18.0		47.0	60.0	60.0	8.0	30.0		19.0	41.0	
Effective Green, g (s)	5.0	18.0		47.0	60.0	60.0	8.0	30.0		19.0	41.0	
Actuated g/C Ratio	0.04	0.14		0.36	0.46	0.46	0.06	0.23		0.15	0.32	
Clearance Time (s)	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	
Lane Grp Cap (vph)	128	426		1150	1586	667	195	998		465	1463	
v/s Ratio Prot	0.04	0.16		c0.39	0.10		0.06	c0.25		c0.16	0.32	
v/s Ratio Perm						c0.54						
v/c Ratio	1.11	1.30dr		1.09	0.21	1.18	1.03	1.45dr		1.12	1.00	
Uniform Delay, d1	62.5	56.0		41.5	20.9	35.0	61.0	50.0		55.5	44.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	111.9	85.9		54.4	0.1	94.8	71.3	59.7		78.9	23.9	
Delay (s)	174.4	141.9		95.9	21.0	129.8	132.3	109.7		134.4	68.4	
Level of Service	F	F		F	C	F	F	F		F	E	
Approach Delay (s)		148.4			99.0			112.7			85.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	103.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	104.7%	ICU Level of Service	G
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)	275	1465	130	85	2535	250	170	70	115	450	90	510
Future Volume (vph)	275	1465	130	85	2535	250	170	70	115	450	90	510
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
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	1.00		1.00	0.95	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	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	0.85	1.00	0.91		1.00	0.89	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	4653		3183	4715	1426	1641	1567		1641	1468	1395
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	4653		3183	4715	1426	1641	1567		1641	1468	1395
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	289	1542	137	89	2668	263	179	74	121	474	95	537
RTOR Reduction (vph)	0	7	0	0	0	71	0	40	0	0	58	81
Lane Group Flow (vph)	289	1672	0	89	2668	192	179	155	0	474	263	230
Confl. Peds. (#/hr)						6						
Confl. Bikes (#/hr)			1									
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)	11.0	74.0		6.0	69.0	69.0	17.0	17.0		36.0	36.0	36.0
Effective Green, g (s)	11.0	74.0		6.0	69.0	69.0	17.0	17.0		36.0	36.0	36.0
Actuated g/C Ratio	0.07	0.50		0.04	0.46	0.46	0.11	0.11		0.24	0.24	0.24
Clearance Time (s)	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
Lane Grp Cap (vph)	234	2310		128	2183	660	187	178		396	354	337
v/s Ratio Prot	c0.09	0.36		0.03	c0.57		0.11	c0.10		c0.29	0.18	
v/s Ratio Perm						0.13						0.16
v/c Ratio	1.24	0.72		0.70	1.22	0.29	0.96	0.87		1.20	0.74	0.68
Uniform Delay, d1	69.0	29.5		70.6	40.0	24.8	65.6	64.9		56.5	52.2	51.3
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	137.0	1.1		15.1	104.3	0.2	52.9	34.2		110.7	8.2	5.6
Delay (s)	206.0	30.6		85.7	144.3	25.1	118.5	99.1		167.2	60.5	56.9
Level of Service	F	C		F	F	C	F	F		F	E	E
Approach Delay (s)		56.4			132.2			108.4			105.2	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	103.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	149.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	105.8%	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)	760	930	345	660	1750	1540	335	545	260	800	800	785
Future Volume (vph)	760	930	345	660	1750	1540	335	545	260	800	800	785
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91		0.97	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	4715	1468	3183	4715	1468	3183	4487		3183	4365	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4715	1468	3183	4715	1468	3183	4487		3183	4365	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	800	979	363	695	1842	1621	353	574	274	842	842	826
RTOR Reduction (vph)	0	0	91	0	0	113	0	58	0	0	105	0
Lane Group Flow (vph)	800	979	272	695	1842	1508	353	790	0	842	1563	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	10.6	36.8	36.8	34.9	61.1	61.1	6.6	47.0		11.6	52.0	
Effective Green, g (s)	10.6	36.8	36.8	34.9	61.1	61.1	6.6	47.0		11.6	52.0	
Actuated g/C Ratio	0.07	0.25	0.25	0.23	0.41	0.41	0.04	0.31		0.08	0.35	
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0		2.0	2.0	
Lane Grp Cap (vph)	224	1156	360	740	1920	597	140	1405		246	1513	
v/s Ratio Prot	c0.25	0.21		0.22	0.39		0.11	0.18		c0.26	c0.36	
v/s Ratio Perm			0.19			c1.03						
v/c Ratio	3.57	0.85	0.75	0.94	0.96	2.53	2.52	0.56		3.42	1.35dr	
Uniform Delay, d1	69.7	53.9	52.4	56.5	43.2	44.5	71.7	42.9		69.2	49.0	
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	1168.2	6.3	9.5	19.3	12.4	691.5	705.3	0.9		1100.5	32.1	
Delay (s)	1237.9	60.2	62.0	75.8	55.6	735.9	777.0	43.8		1169.7	81.1	
Level of Service	F	E	E	E	E	F	F	D		F	F	
Approach Delay (s)		500.3			324.2			259.3			446.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	384.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.17		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	146.1%	ICU Level of Service	H
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)	140	1015	975	640	2015	55	1500	50	900	150	80	180
Future Volume (vph)	140	1015	975	640	2015	55	1500	50	900	150	80	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	
Lane Util. Factor	1.00	0.91		0.97	0.91		0.97	0.95	0.95	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99	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	0.93		1.00	1.00		1.00	0.87	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1641	4332		3183	4693		3183	1404	1377	1641	1548	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1641	4332		3183	4693		3183	1404	1377	1641	1548	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	1068	1026	674	2121	58	1579	53	947	158	84	189
RTOR Reduction (vph)	0	115	0	0	2	0	0	165	165	0	55	0
Lane Group Flow (vph)	147	1979	0	674	2177	0	1579	343	327	158	218	0
Confl. Peds. (#/hr)			4			2			1			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	12.6	47.0		19.6	54.0		38.6	47.9	47.9	13.6	22.9	
Effective Green, g (s)	12.6	47.0		19.6	54.0		38.6	47.9	47.9	13.6	22.9	
Actuated g/C Ratio	0.09	0.32		0.13	0.37		0.26	0.32	0.32	0.09	0.15	
Clearance Time (s)	4.4	6.0		4.4	6.0		4.4	4.9	4.9	4.4	4.9	
Vehicle Extension (s)	2.0	4.4		2.0	4.2		2.0	3.2	3.2	2.0	2.0	
Lane Grp Cap (vph)	139	1377		422	1714		831	455	446	150	239	
v/s Ratio Prot	0.09	c0.46		c0.21	0.46		c0.50	0.24		0.10	c0.14	
v/s Ratio Perm									0.24			
v/c Ratio	1.06	1.78dr		1.60	1.27		1.90	0.75	0.73	1.05	0.91	
Uniform Delay, d1	67.6	50.4		64.1	46.9		54.6	44.7	44.3	67.1	61.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	92.5	201.1		279.7	126.3		409.6	7.0	6.2	88.4	34.9	
Delay (s)	160.1	251.5		343.8	173.2		464.2	51.7	50.5	155.5	96.3	
Level of Service	F	F		F	F		F	D	D	F	F	
Approach Delay (s)		245.5			213.5			304.0			118.0	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	246.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.51		
Actuated Cycle Length (s)	147.8	Sum of lost time (s)	19.7
Intersection Capacity Utilization	134.4%	ICU Level of Service	H
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)	510	1125	475	500	1835	550	1560	350	750	690	765	750
Future Volume (vph)	510	1125	475	500	1835	550	1560	350	750	690	765	750
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	0.97	0.91		0.97	0.91		0.97	0.95		0.97	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	0.90		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4859		3433	4909		3433	3177		3433	3276	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4859		3433	4909		3433	3177		3433	3276	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	537	1184	500	526	1932	579	1642	368	789	726	805	789
RTOR Reduction (vph)	0	51	0	0	36	0	0	90	0	0	89	0
Lane Group Flow (vph)	537	1633	0	526	2475	0	1642	1067	0	726	1505	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	9.5	48.5		9.5	48.5		26.5	61.5		12.5	47.5	
Effective Green, g (s)	9.5	48.5		9.5	48.5		26.5	61.5		12.5	47.5	
Actuated g/C Ratio	0.06	0.32		0.06	0.32		0.18	0.41		0.08	0.32	
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)	217	1571		217	1587		606	1302		286	1037	
v/s Ratio Prot	c0.16	0.34		0.15	c0.50		c0.48	0.34		0.21	c0.46	
v/s Ratio Perm												
v/c Ratio	2.47	1.04		2.42	1.56		2.71	1.07dr		2.54	1.45	
Uniform Delay, d1	70.2	50.8		70.2	50.8		61.8	39.3		68.8	51.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	677.2	33.7		654.6	255.0		774.0	4.2		702.5	208.6	
Delay (s)	747.5	84.5		724.9	305.7		835.7	43.5		771.3	259.8	
Level of Service	F	F		F	F		F	D		F	F	
Approach Delay (s)		244.8			378.3			508.3			419.9	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	394.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.82		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	167.0%	ICU Level of Service	H
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)	15	1920	735	650	2120	10	455	20	460	15	40	35
Future Volume (vph)	15	1920	735	650	2120	10	455	20	460	15	40	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	4.0	4.4	6.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.86	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1641	4715	1468	3183	4712		3183	1415	1395	1641	1606	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1641	4715	1468	3183	4712		3183	1415	1395	1641	1606	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	2021	774	684	2232	11	479	21	484	16	42	37
RTOR Reduction (vph)	0	0	112	0	0	0	0	183	198	0	23	0
Lane Group Flow (vph)	16	2021	662	684	2243	0	479	70	54	16	56	0
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2	7	1	6		7	4		3	8	
Permitted Phases			2						4			
Actuated Green, G (s)	2.0	63.5	83.5	29.6	91.5		20.0	30.7	30.7	2.0	12.7	
Effective Green, g (s)	2.0	63.5	83.5	29.6	91.5		20.0	30.7	30.7	2.0	12.7	
Actuated g/C Ratio	0.01	0.44	0.58	0.21	0.63		0.14	0.21	0.21	0.01	0.09	
Clearance Time (s)	4.0	6.0	4.0	4.4	6.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	4.4	3.0	2.0	4.3		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	22	2076	850	653	2989		441	301	296	22	141	
v/s Ratio Prot	0.01	c0.43	0.11	c0.21	0.48		c0.15	0.05		0.01	c0.03	
v/s Ratio Perm			0.34						0.04			
v/c Ratio	0.73	0.97	0.78	1.05	0.75		1.09	0.23	0.18	0.73	0.40	
Uniform Delay, d1	70.8	39.5	23.3	57.3	18.4		62.1	47.0	46.5	70.8	62.1	
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	76.4	14.1	4.6	48.3	1.2		68.1	0.4	0.3	76.4	1.8	
Delay (s)	147.2	53.6	27.8	105.6	19.6		130.2	47.4	46.8	147.2	64.0	
Level of Service	F	D	C	F	B		F	D	D	F	E	
Approach Delay (s)		47.0			39.7			87.5			78.0	
Approach LOS		D			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	50.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	144.2	Sum of lost time (s)	18.4
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	595	5	390	2890	630	0	0	1020	440
Future Volume (vph)	0	0	0	595	5	390	2890	630	0	0	1020	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	
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			0.95	
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1641	1401	1395	3183	4715			4502	
Flt Permitted				0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1641	1401	1395	3183	4715			4502	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	626	5	411	3042	663	0	0	1074	463
RTOR Reduction (vph)	0	0	0	0	154	161	0	0	0	0	52	0
Lane Group Flow (vph)	0	0	0	626	52	49	3042	663	0	0	1485	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)				34.9	34.9	34.9	66.3	104.9			33.9	
Effective Green, g (s)				34.9	34.9	34.9	66.3	104.9			33.9	
Actuated g/C Ratio				0.23	0.23	0.23	0.44	0.70			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)				381	325	324	1406	3297			1017	
v/s Ratio Prot					0.04		c0.96	0.14			c0.33	
v/s Ratio Perm				c0.38		0.04						
v/c Ratio				1.64	0.16	0.15	2.16	0.20			1.46	
Uniform Delay, d1				57.6	45.9	45.8	41.9	7.9			58.1	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				301.0	0.2	0.2	526.0	0.0			212.6	
Delay (s)				358.5	46.1	46.0	567.8	7.9			270.7	
Level of Service				F	D	D	F	A			F	
Approach Delay (s)		0.0			233.8			467.6			270.7	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	380.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.85		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	157.4%	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)	400	5	1075	0	0	0	0	2910	1200	200	1045	0
Future Volume (vph)	400	5	1075	0	0	0	0	2910	1200	200	1045	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					0.91		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)		1646	2584					4509		3183	4715	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1646	2584					4509		3183	4715	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	421	5	1132	0	0	0	0	3063	1263	211	1100	0
RTOR Reduction (vph)	0	0	139	0	0	0	0	49	0	0	0	0
Lane Group Flow (vph)	0	426	993	0	0	0	0	4277	0	211	1100	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)		43.9	43.9					83.9		7.3	95.9	
Effective Green, g (s)		43.9	43.9					83.9		7.3	95.9	
Actuated g/C Ratio		0.29	0.29					0.56		0.05	0.64	
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)		481	756					2522		154	3014	
v/s Ratio Prot								c0.95		c0.07	0.23	
v/s Ratio Perm		0.26	c0.38									
v/c Ratio		0.89	1.31					1.70		1.37	0.36	
Uniform Delay, d1		50.7	53.0					33.0		71.3	12.7	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		17.5	150.2					314.8		202.2	0.1	
Delay (s)		68.1	203.3					347.9		273.5	12.8	
Level of Service		E	F					F		F	B	
Approach Delay (s)		166.3			0.0			347.9			54.8	
Approach LOS		F			A			F			D	

Intersection Summary			
HCM 2000 Control Delay	255.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.55		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	157.4%	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)	1275	1080	730	145	935	900	775	1935	830	800	1000	1485
Future Volume (vph)	1275	1080	730	145	935	900	775	1935	830	800	1000	1485
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	4.9		4.4	5.1	
Lane Util. Factor	0.97	0.91		0.97	0.95		0.97	0.91		0.97	0.91	
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	0.94		1.00	0.93		1.00	0.95		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	4430		3183	3021		3183	4483		3183	4293	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4430		3183	3021		3183	4483		3183	4293	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1342	1137	768	153	984	947	816	2037	874	842	1053	1563
RTOR Reduction (vph)	0	84	0	0	120	0	0	53	0	0	185	0
Lane Group Flow (vph)	1342	1821	0	153	1811	0	816	2858	0	842	2431	0
Confl. Peds. (#/hr)	1					1			2			
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	23.6	54.1		7.6	37.9		16.6	48.1		16.6	47.9	
Effective Green, g (s)	23.6	54.1		7.6	37.9		16.6	48.1		16.6	47.9	
Actuated g/C Ratio	0.16	0.37		0.05	0.26		0.11	0.33		0.11	0.33	
Clearance Time (s)	4.4	4.9		4.4	5.1		4.4	4.9		4.4	5.1	
Vehicle Extension (s)	2.0	3.8		2.0	3.8		2.0	3.8		2.0	3.8	
Lane Grp Cap (vph)	518	1652		166	789		364	1487		364	1418	
v/s Ratio Prot	c0.42	0.41		0.05	c0.60		0.26	c0.64		c0.26	0.57	
v/s Ratio Perm												
v/c Ratio	2.59	1.22dr		0.92	2.30		2.24	1.92		2.31	2.34dr	
Uniform Delay, d1	60.7	45.5		68.4	53.5		64.2	48.5		64.2	48.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	721.4	55.7		46.9	587.1		567.6	417.3		599.5	324.5	
Delay (s)	782.1	101.2		115.3	640.7		631.8	465.7		663.7	373.1	
Level of Service	F	F		F	F		F	F		F	F	
Approach Delay (s)		382.6			602.1			502.1			443.9	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	471.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.21		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	185.7%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2305	95	20	2230	80	20
Future Volume (vph)	2305	95	20	2230	80	20
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)	4687		1641	4715	1641	1448
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4687		1641	4715	1641	1448
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2426	100	21	2347	84	21
RTOR Reduction (vph)	2	0	0	0	0	19
Lane Group Flow (vph)	2524	0	21	2347	84	2
Confl. Peds. (#/hr)						2
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	83.9		2.0	91.6	11.2	11.2
Effective Green, g (s)	83.9		2.0	91.6	11.2	11.2
Actuated g/C Ratio	0.72		0.02	0.79	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)	3387		28	3720	158	139
v/s Ratio Prot	c0.54		0.01	c0.50	c0.05	
v/s Ratio Perm						0.00
v/c Ratio	0.75		0.75	0.63	0.53	0.01
Uniform Delay, d1	9.7		56.8	5.1	50.0	47.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4		65.7	0.7	1.7	0.0
Delay (s)	11.0		122.5	5.8	51.7	47.5
Level of Service	B		F	A	D	D
Approach Delay (s)	11.0			6.9	50.8	
Approach LOS	B			A	D	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	116.1	Sum of lost time (s)	19.0
Intersection Capacity Utilization	67.9%	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)	665	995	1100	990	1475	780	670	620	850	400	630	105
Future Volume (vph)	665	995	1100	990	1475	780	670	620	850	400	630	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.7		4.0	6.7		4.0	5.2		4.0	4.3	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91		0.97	0.95	
Frpb, ped/bikes	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	
Frt	1.00	0.92		1.00	0.95		1.00	0.91		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)	3183	4303		3183	4471		3183	4265		3183	3211	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4303		3183	4471		3183	4265		3183	3211	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	700	1047	1158	1042	1553	821	705	653	895	421	663	111
RTOR Reduction (vph)	0	133	0	0	63	0	0	165	0	0	9	0
Lane Group Flow (vph)	700	2072	0	1042	2311	0	705	1383	0	421	765	0
Confl. Peds. (#/hr)			3						3			
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	18.0	50.3		28.0	60.3		19.0	39.8		12.0	33.7	
Effective Green, g (s)	18.0	50.3		28.0	60.3		19.0	39.8		12.0	33.7	
Actuated g/C Ratio	0.12	0.34		0.19	0.40		0.13	0.27		0.08	0.22	
Clearance Time (s)	4.0	6.7		4.0	6.7		4.0	5.2		4.0	4.3	
Vehicle Extension (s)	2.0	5.0		2.0	4.9		2.0	3.2		2.0	5.3	
Lane Grp Cap (vph)	381	1442		594	1797		403	1131		254	721	
v/s Ratio Prot	0.22	c0.48		c0.33	0.52		c0.22	c0.32		0.13	0.24	
v/s Ratio Perm												
v/c Ratio	1.84	1.87dr		1.75	1.29		1.75	1.62dr		1.66	1.06	
Uniform Delay, d1	66.0	49.9		61.0	44.9		65.5	55.1		69.0	58.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	386.9	200.6		346.3	133.0		347.3	108.2		312.8	50.8	
Delay (s)	452.9	250.5		407.3	177.8		412.8	163.3		381.8	108.9	
Level of Service	F	F		F	F		F	F		F	F	
Approach Delay (s)		299.3			247.8			241.4			205.0	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	256.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.52		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	131.6%	ICU Level of Service	H
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)	800	495	500	200	280	700	295	2325	300	800	1430	700
Future Volume (vph)	800	495	500	200	280	700	295	2325	300	800	1430	700
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5		4.0	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95		0.97	0.95		0.97	0.95		0.97	0.91	
Frpb, ped/bikes	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	
Frt	1.00	0.92		1.00	0.89		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	3013		3183	2930		3183	3226		3183	4483	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	3013		3183	2930		3183	3226		3183	4483	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	842	521	526	211	295	737	311	2447	316	842	1505	737
RTOR Reduction (vph)	0	121	0	0	184	0	0	7	0	0	59	0
Lane Group Flow (vph)	842	926	0	211	848	0	311	2756	0	842	2183	0
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	18.0	36.5		6.0	24.5		15.5	65.5		24.5	74.5	
Effective Green, g (s)	18.0	36.5		6.0	24.5		15.5	65.5		24.5	74.5	
Actuated g/C Ratio	0.12	0.24		0.04	0.16		0.10	0.44		0.16	0.50	
Clearance Time (s)	4.0	4.5		4.0	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)	381	733		127	478		328	1408		519	2226	
v/s Ratio Prot	c0.26	0.31		0.07	c0.29		0.10	c0.85		c0.26	0.49	
v/s Ratio Perm												
v/c Ratio	2.21	1.26		1.66	1.74dr		0.95	1.96		1.62	0.98	
Uniform Delay, d1	66.0	56.8		72.0	62.8		66.9	42.2		62.8	37.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	553.0	129.2		329.8	356.7		35.8	433.5		288.8	14.7	
Delay (s)	619.0	186.0		401.8	419.4		102.7	475.7		351.6	51.8	
Level of Service	F	F		F	F		F	F		F	D	
Approach Delay (s)		379.0			416.4			438.0			133.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	322.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.89		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	164.4%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	105	125	65	160	65	55
Future Volume (vph)	105	125	65	160	65	55
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	0.95		0.97	0.95	0.97	1.00
Frt	0.92		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3014		3183	3282	3183	1468
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3014		3183	3282	3183	1468
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	111	132	68	168	68	58
RTOR Reduction (vph)	106	0	0	0	0	39
Lane Group Flow (vph)	137	0	68	168	68	19
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	5.6		1.3	10.9	9.3	9.3
Effective Green, g (s)	5.6		1.3	10.9	9.3	9.3
Actuated g/C Ratio	0.20		0.05	0.39	0.33	0.33
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)	598		146	1268	1049	484
v/s Ratio Prot	c0.05		c0.02	0.05	c0.02	
v/s Ratio Perm						0.01
v/c Ratio	0.23		0.47	0.13	0.06	0.04
Uniform Delay, d1	9.5		13.1	5.6	6.5	6.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		2.3	0.0	0.0	0.0
Delay (s)	9.7		15.5	5.6	6.5	6.5
Level of Service	A		B	A	A	A
Approach Delay (s)	9.7			8.5	6.5	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	28.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	23.6%	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)	1600	0	427	3400	0	258
Future Volume (vph)	1600	0	427	3400	0	258
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1684	0	449	3579	0	272

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	1684	449	3579	272
Volume Left (vph)	0	449	0	0
Volume Right (vph)	0	0	0	272
Hadj (s)	0.03	0.53	0.03	-0.57
Departure Headway (s)	5.9	6.8	6.3	6.4
Degree Utilization, x	2.78	0.85	6.25	0.48
Capacity (veh/h)	618	525	584	557
Control Delay (s)	819.8	35.6	2380.3	15.3
Approach Delay (s)	819.8	2118.9		15.3
Approach LOS	F	F		C

Intersection Summary			
Delay	1657.7		
Level of Service	F		
Intersection Capacity Utilization	201.6%	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)	0	90	140	1270	2115	0
Future Volume (vph)	0	90	140	1270	2115	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	95	147	1337	2226	0

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	95	147	1337	1484	742
Volume Left (vph)	0	147	0	0	0
Volume Right (vph)	95	0	0	0	0
Hadj (s)	-0.57	0.53	0.03	0.03	0.03
Departure Headway (s)	6.4	7.0	6.5	5.7	5.7
Degree Utilization, x	0.17	0.29	2.41	2.37	1.18
Capacity (veh/h)	555	509	567	640	634
Control Delay (s)	10.7	11.6	654.0	632.7	118.0
Approach Delay (s)	10.7	590.4		461.1	
Approach LOS	B	F		F	

Intersection Summary			
Delay	500.3		
Level of Service	F		
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	120	60	60	2540	1550	190
Future Volume (vph)	120	60	60	2540	1550	190
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	126	63	63	2674	1632	200

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	189	63	2674	1088	744
Volume Left (vph)	126	63	0	0	0
Volume Right (vph)	63	0	0	0	200
Hadj (s)	-0.03	0.53	0.03	0.03	-0.15
Departure Headway (s)	6.9	7.3	6.8	6.1	5.9
Degree Utilization, x	0.36	0.13	5.06	1.84	1.22
Capacity (veh/h)	514	486	537	600	620
Control Delay (s)	13.9	10.2	1844.1	397.5	131.6
Approach Delay (s)	13.9	1801.8		289.5	
Approach LOS	B	F		F	

Intersection Summary			
Delay	1148.5		
Level of Service	F		
Intersection Capacity Utilization	150.7%	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)	120	60	60	2480	1420	190
Future Volume (vph)	120	60	60	2480	1420	190
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	126	63	63	2611	1495	200

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	189	63	2611	997	698
Volume Left (vph)	126	63	0	0	0
Volume Right (vph)	63	0	0	0	200
Hadj (s)	-0.03	0.53	0.03	0.03	-0.17
Departure Headway (s)	6.9	7.3	6.8	6.1	5.9
Degree Utilization, x	0.36	0.13	4.94	1.68	1.14
Capacity (veh/h)	514	486	537	599	618
Control Delay (s)	13.9	10.2	1790.5	329.5	102.6
Approach Delay (s)	13.9	1748.5		236.0	
Approach LOS	B	F		F	

Intersection Summary			
Delay	1114.1		
Level of Service	F		
Intersection Capacity Utilization	147.5%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	80	2220	345	310	1830	85
Future Volume (vph)	80	2220	345	310	1830	85
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	0.97	0.88	0.95		0.97	0.95
Frt	1.00	0.85	0.93		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3183	2584	3049		3183	3282
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3183	2584	3049		3183	3282
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	84	2337	363	326	1926	89
RTOR Reduction (vph)	0	974	126	0	0	0
Lane Group Flow (vph)	84	1363	563	0	1926	89
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	41.0	41.0	21.0		56.0	81.0
Effective Green, g (s)	41.0	41.0	21.0		56.0	81.0
Actuated g/C Ratio	0.32	0.32	0.16		0.43	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)	1003	814	492		1371	2044
v/s Ratio Prot	0.03		c0.18		c0.61	0.03
v/s Ratio Perm		c0.53				
v/c Ratio	0.08	1.68	1.14		1.40	0.04
Uniform Delay, d1	31.3	44.5	54.5		37.0	9.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	309.2	86.9		186.6	0.0
Delay (s)	31.3	353.7	141.4		223.6	9.5
Level of Service	C	F	F		F	A
Approach Delay (s)	342.5		141.4			214.2
Approach LOS	F		F			F

Intersection Summary			
HCM 2000 Control Delay	265.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.45		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	103.8%	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)	780	1665	100	160	720	1500	440	285	480	800	775	690
Future Volume (vph)	780	1665	100	160	720	1500	440	285	480	800	775	690
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.9	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95		0.97	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	0.99		1.00	0.90		1.00	0.91		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3183	4671		3183	4201		3183	2973		3183	3029	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3183	4671		3183	4201		3183	2973		3183	3029	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	821	1753	105	168	758	1579	463	300	505	842	816	726
RTOR Reduction (vph)	0	4	0	0	244	0	0	202	0	0	107	0
Lane Group Flow (vph)	821	1854	0	168	2093	0	463	603	0	842	1435	0
Confl. Peds. (#/hr)			1	1								2
Confl. Bikes (#/hr)			2			1						1
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	21.6	57.9		13.3	50.1		15.6	37.1		22.6	44.1	
Effective Green, g (s)	21.6	57.9		13.3	50.1		15.6	37.1		22.6	44.1	
Actuated g/C Ratio	0.14	0.39		0.09	0.33		0.10	0.25		0.15	0.29	
Clearance Time (s)	4.4	4.9		4.9	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	4.8		3.0	3.0		2.0	3.3		2.0	4.4	
Lane Grp Cap (vph)	458	1803		282	1403		331	735		479	890	
v/s Ratio Prot	c0.26	0.40		0.05	c0.50		0.15	0.20		c0.26	c0.47	
v/s Ratio Perm												
v/c Ratio	1.79	1.03		0.60	2.16dr		1.40	0.90dr		1.76	1.61	
Uniform Delay, d1	64.2	46.0		65.8	50.0		67.2	53.3		63.7	53.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	365.3	28.8		3.4	225.2		196.8	7.4		349.5	281.0	
Delay (s)	429.5	74.9		69.1	275.2		264.0	60.7		413.2	333.9	
Level of Service	F	E		E	F		F	E		F	F	
Approach Delay (s)		183.6			261.3			135.0			361.9	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	246.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.66		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.1
Intersection Capacity Utilization	141.7%	ICU Level of Service	H
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)	1095	1840	0	0	445	700	0	0	0	700	350	1380
Future Volume (vph)	1095	1840	0	0	445	700	0	0	0	700	350	1380
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	0.97	0.91			0.91					0.97	1.00	
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	1.00			0.91					1.00	0.88	
Flt Protected	0.95	1.00			1.00					0.95	1.00	
Satd. Flow (prot)	3183	4715			4245					3183	1521	
Flt Permitted	0.95	1.00			1.00					0.95	1.00	
Satd. Flow (perm)	3183	4715			4245					3183	1521	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1153	1937	0	0	468	737	0	0	0	737	368	1453
RTOR Reduction (vph)	0	0	0	0	317	0	0	0	0	0	158	0
Lane Group Flow (vph)	1153	1937	0	0	888	0	0	0	0	737	1663	0
Confl. Peds. (#/hr)			7	7					2	2		
Confl. Bikes (#/hr)			3			2						
Turn Type	Prot	NA			NA					Split	NA	
Protected Phases	7	4			8					6	6	
Permitted Phases												
Actuated Green, G (s)	21.0	41.0			16.0					41.0	41.0	
Effective Green, g (s)	21.0	41.0			16.0					41.0	41.0	
Actuated g/C Ratio	0.23	0.46			0.18					0.46	0.46	
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)	742	2147			754					1450	692	
v/s Ratio Prot	c0.36	0.41			c0.21					0.23	c1.09	
v/s Ratio Perm												
v/c Ratio	1.55	0.90			1.27dr					0.51	2.40	
Uniform Delay, d1	34.5	22.6			37.0					17.4	24.5	
Progression Factor	1.00	1.00			1.00					1.00	1.00	
Incremental Delay, d2	255.9	5.7			93.3					0.3	635.9	
Delay (s)	290.4	28.4			130.3					17.6	660.4	
Level of Service	F	C			F					B	F	
Approach Delay (s)		126.2			130.3			0.0			475.2	
Approach LOS		F			F			A			F	

Intersection Summary			
HCM 2000 Control Delay	257.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	169.0%	ICU Level of Service	H
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)	75	5	70	140	10	360	275	4790	60	65	3060	300
Future Volume (vph)	75	5	70	140	10	360	275	4790	60	65	3060	300
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	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91		1.00	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	
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	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1727	1583	1641	1727	1468	1770	4707		1641	4683	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1727	1583	1641	1727	1468	1770	4707		1641	4683	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	5	74	147	11	379	289	5042	63	68	3221	316
RTOR Reduction (vph)	0	0	68	0	0	86	0	1	0	0	7	0
Lane Group Flow (vph)	79	5	6	147	11	293	289	5104	0	68	3530	0
Confl. Peds. (#/hr)							1					
Heavy Vehicles (%)	2%	10%	2%	10%	10%	10%	2%	10%	10%	10%	10%	2%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	11.7	11.7	11.7	20.0	20.0	20.0	15.0	94.0		4.0	83.0	
Effective Green, g (s)	11.7	11.7	11.7	20.0	20.0	20.0	15.0	94.0		4.0	83.0	
Actuated g/C Ratio	0.08	0.08	0.08	0.14	0.14	0.14	0.10	0.65		0.03	0.57	
Clearance Time (s)	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	
Lane Grp Cap (vph)	142	138	127	225	237	201	182	3036		45	2667	
v/s Ratio Prot	c0.04	0.00		0.09	0.01		c0.16	c1.08		0.04	0.75	
v/s Ratio Perm			0.00			c0.20						
v/c Ratio	0.56	0.04	0.05	0.65	0.05	1.46	1.59	1.68		1.51	1.32	
Uniform Delay, d1	64.5	61.8	61.9	59.6	54.6	62.8	65.3	25.8		70.8	31.3	
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	4.7	0.1	0.2	6.7	0.1	230.8	289.0	308.0		316.1	148.3	
Delay (s)	69.2	61.9	62.0	66.2	54.7	293.6	354.4	333.9		386.9	179.6	
Level of Service	E	E	E	E	D	F	F	F		F	F	
Approach Delay (s)		65.6			226.5			335.0			183.5	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	268.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.57		
Actuated Cycle Length (s)	145.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	130.3%	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)	1900	200	575	465	200	800	275	2065	445	1025	1345	630
Future Volume (vph)	1900	200	575	465	200	800	275	2065	445	1025	1345	630
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	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.91		0.97	0.91	
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	0.89		1.00	0.88		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	2917		1641	2888		3183	4590		3183	4461	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1641	2917		1641	2888		3183	4590		3183	4461	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2000	211	605	489	211	842	289	2174	468	1079	1416	663
RTOR Reduction (vph)	0	67	0	0	117	0	0	23	0	0	56	0
Lane Group Flow (vph)	2000	749	0	489	936	0	289	2619	0	1079	2023	0
Confl. Peds. (#/hr)							3					3
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	58.0	65.0		15.0	22.0		7.0	37.0		17.0	47.0	
Effective Green, g (s)	58.0	65.0		15.0	22.0		7.0	37.0		17.0	47.0	
Actuated g/C Ratio	0.39	0.43		0.10	0.15		0.05	0.25		0.11	0.31	
Clearance Time (s)	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	
Lane Grp Cap (vph)	634	1264		164	423		148	1132		360	1397	
v/s Ratio Prot	c1.22	0.26		0.30	c0.32		0.09	c0.57		c0.34	0.45	
v/s Ratio Perm												
v/c Ratio	3.15	0.86dr		2.98	2.54dr		1.95	2.31		3.00	1.45	
Uniform Delay, d1	46.0	32.4		67.5	64.0		71.5	56.5		66.5	51.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	973.7	0.7		908.0	553.5		452.3	594.1		906.2	205.6	
Delay (s)	1019.7	33.1		975.5	617.5		523.8	650.6		972.7	257.1	
Level of Service	F	C		F	F		F	F		F	F	
Approach Delay (s)		733.8			731.0			638.1			501.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	636.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.75		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	229.1%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Appendix R
Mitigation Worksheets, Triggers, & Fair Share Calculations - Buildout of Community Plan Plus Project (Full Development) Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1200	5	700	0	0	0	0	1620	170	220	835	0
Future Volume (vph)	1200	5	700	0	0	0	0	1620	170	220	835	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					5.1	5.1	4.7	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Frt	1.00	0.98	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.96	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1559	1472	1395					4715	1445	3183	4715	
Flt Permitted	0.95	0.96	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1559	1472	1395					4715	1445	3183	4715	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1263	5	737	0	0	0	0	1705	179	232	879	0
RTOR Reduction (vph)	0	6	52	0	0	0	0	0	87	0	0	0
Lane Group Flow (vph)	695	678	574	0	0	0	0	1705	92	232	879	0
Confl. Peds. (#/hr)									2			
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	57.9	57.9	57.9					47.2	47.2	10.0	61.9	
Effective Green, g (s)	57.9	57.9	57.9					47.2	47.2	10.0	61.9	
Actuated g/C Ratio	0.45	0.45	0.45					0.36	0.36	0.08	0.48	
Clearance Time (s)	5.1	5.1	5.1					5.1	5.1	4.7	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)	694	655	621					1711	524	244	2245	
v/s Ratio Prot								c0.36		c0.07	0.19	
v/s Ratio Perm	0.45	0.46	0.41						0.06			
v/c Ratio	1.00	1.04	0.92					1.00	0.18	0.95	0.39	
Uniform Delay, d1	36.0	36.0	34.0					41.3	28.2	59.8	21.9	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2	34.5	44.7	19.6					20.8	0.2	43.7	0.1	
Delay (s)	70.6	80.8	53.5					62.1	28.3	103.4	22.0	
Level of Service	E	F	D					E	C	F	C	
Approach Delay (s)		68.7			0.0			58.9			39.0	
Approach LOS		E			A			E			D	

Intersection Summary			
HCM 2000 Control Delay	58.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	125.5%	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												
Traffic Volume (vph)	170	320	190	755	170	495	375	1125	1190	930	480	120
Future Volume (vph)	170	320	190	755	170	495	375	1125	1190	930	480	120
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	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	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	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	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3335	3438	1538	3183	3438	1445	3183	4940	1447	3183	4590	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3335	3438	1538	3183	3438	1445	3183	4940	1447	3183	4590	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	179	337	200	795	179	521	395	1184	1253	979	505	126
RTOR Reduction (vph)	0	0	178	0	0	256	0	0	229	0	28	0
Lane Group Flow (vph)	179	337	22	795	179	265	395	1184	1024	979	603	0
Confl. Peds. (#/hr)	1					1	6		1	1		6
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	10%	5%	10%	10%	5%	10%	10%	10%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	10.0	16.7	16.7	27.0	33.7	33.7	23.0	58.0	58.0	32.0	67.0	
Effective Green, g (s)	10.0	16.7	16.7	27.0	33.7	33.7	23.0	58.0	58.0	32.0	67.0	
Actuated g/C Ratio	0.07	0.11	0.11	0.18	0.23	0.23	0.15	0.39	0.39	0.21	0.45	
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	
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)	222	383	171	574	773	325	489	1913	560	680	2054	
v/s Ratio Prot	0.05	0.10		c0.25	0.05		0.12	0.24		c0.31	0.13	
v/s Ratio Perm			0.01			c0.18			c0.71			
v/c Ratio	0.81	0.88	0.13	1.39	0.23	0.81	0.81	0.62	1.83	1.44	0.29	
Uniform Delay, d1	68.9	65.5	60.0	61.3	47.4	55.0	61.2	36.9	45.8	58.8	26.3	
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	18.9	19.9	0.3	183.9	0.2	14.4	9.5	0.6	379.7	206.2	0.1	
Delay (s)	87.8	85.4	60.3	245.2	47.6	69.4	70.7	37.5	425.6	265.0	26.4	
Level of Service	F	F	E	F	D	E	E	D	F	F	C	
Approach Delay (s)		79.0			160.3			213.9			171.5	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	177.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.53		
Actuated Cycle Length (s)	149.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	119.2%	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)	510	2725	90	60	1380	445	40	15	25	245	40	275
Future Volume (vph)	510	2725	90	60	1380	445	40	15	25	245	40	275
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
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	1.00		0.97	0.95	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	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	1.00		1.00	1.00	0.85	1.00	0.91		1.00	0.89	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	4691		3183	4715	1429	1641	1567		3183	1456	1395
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	4691		3183	4715	1429	1641	1567		3183	1456	1395
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	537	2868	95	63	1453	468	42	16	26	258	42	289
RTOR Reduction (vph)	0	2	0	0	0	195	0	24	0	0	79	141
Lane Group Flow (vph)	537	2961	0	63	1453	273	42	18	0	258	90	21
Confl. Peds. (#/hr)						6						
Confl. Bikes (#/hr)			1									
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)	26.9	90.2		4.0	67.3	67.3	6.8	8.1		16.1	17.4	17.4
Effective Green, g (s)	26.9	90.2		4.0	67.3	67.3	6.8	8.1		16.1	17.4	17.4
Actuated g/C Ratio	0.20	0.67		0.03	0.50	0.50	0.05	0.06		0.12	0.13	0.13
Clearance Time (s)	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
Lane Grp Cap (vph)	637	3148		94	2361	715	83	94		381	188	180
v/s Ratio Prot	c0.17	c0.63		0.02	0.31		0.03	0.01		c0.08	c0.06	
v/s Ratio Perm						0.19						0.02
v/c Ratio	0.84	0.94		0.67	0.62	0.38	0.51	0.19		0.68	0.48	0.12
Uniform Delay, d1	51.7	19.7		64.5	24.2	20.7	62.2	60.0		56.7	54.3	51.7
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	9.9	6.6		17.2	0.5	0.3	4.8	1.0		4.7	1.9	0.3
Delay (s)	61.6	26.3		81.7	24.7	21.0	66.9	61.0		61.4	56.2	52.0
Level of Service	E	C		F	C	C	E	E		E	E	D
Approach Delay (s)		31.7			25.6			64.0			57.3	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	134.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.4%	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)	785	1880	335	315	780	950	345	800	575	1845	545	760
Future Volume (vph)	785	1880	335	315	780	950	345	800	575	1845	545	760
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9	4.9	4.4	4.9	4.9
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	0.88	0.97	0.91	1.00	0.97	0.91	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	4715	2584	3183	4715	1468	3183	4715	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	3183	4715	2584	3183	4715	1468	3183	4715	1468
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	826	1979	353	332	821	1000	363	842	605	1942	574	800
RTOR Reduction (vph)	0	0	184	0	0	425	0	0	103	0	0	102
Lane Group Flow (vph)	826	1979	169	332	821	575	363	842	502	1942	574	698
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)	13.6	49.1	49.1	6.6	42.1	42.1	7.6	47.0	47.0	27.6	67.0	67.0
Effective Green, g (s)	13.6	49.1	49.1	6.6	42.1	42.1	7.6	47.0	47.0	27.6	67.0	67.0
Actuated g/C Ratio	0.09	0.33	0.33	0.04	0.28	0.28	0.05	0.31	0.31	0.18	0.45	0.45
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9	4.9	4.4	4.9	4.9
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0	5.0	2.0	2.0	2.0
Lane Grp Cap (vph)	288	1543	480	140	1323	725	161	1477	459	585	2106	655
v/s Ratio Prot	c0.26	c0.42		0.10	0.17		0.11	0.18		c0.61	0.12	
v/s Ratio Perm			0.12			0.22			0.34			c0.48
v/c Ratio	2.87	1.28	0.35	2.37	0.62	0.79	2.25	0.57	1.09	3.32	0.27	1.07
Uniform Delay, d1	68.2	50.5	38.4	71.7	47.0	49.9	71.2	43.1	51.5	61.2	26.1	41.5
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	850.1	132.2	0.7	638.6	1.1	6.6	584.0	0.9	69.8	1048.2	0.0	53.8
Delay (s)	918.3	182.7	39.1	710.3	48.1	56.5	655.2	43.9	121.3	1109.4	26.2	95.3
Level of Service	F	F	D	F	D	E	F	D	F	F	C	F
Approach Delay (s)		359.0			154.1			192.4			677.3	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	389.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.84		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	137.3%	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)	195	2050	1500	885	1245	85	975	70	695	50	25	55
Future Volume (vph)	195	2050	1500	885	1245	85	975	70	695	50	25	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9	4.9	4.4	4.9	
Lane Util. Factor	1.00	0.91	0.88	0.97	0.91	1.00	0.97	0.95	0.95	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.99	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	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1641	4715	2510	3183	4715	1430	3183	1424	1377	1641	1548	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1641	4715	2510	3183	4715	1430	3183	1424	1377	1641	1548	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	2158	1579	932	1311	89	1026	74	732	53	26	58
RTOR Reduction (vph)	0	0	506	0	0	53	0	118	256	0	52	0
Lane Group Flow (vph)	205	2158	1073	932	1311	36	1026	293	139	53	32	0
Confl. Peds. (#/hr)			4			2			1			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	20.8	52.1	52.1	25.7	57.0	57.0	27.7	36.4	36.4	5.6	14.3	
Effective Green, g (s)	20.8	52.1	52.1	25.7	57.0	57.0	27.7	36.4	36.4	5.6	14.3	
Actuated g/C Ratio	0.15	0.37	0.37	0.18	0.41	0.41	0.20	0.26	0.26	0.04	0.10	
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9	4.9	4.4	4.9	
Vehicle Extension (s)	2.0	4.4	4.4	2.0	4.2	4.2	2.0	3.2	3.2	2.0	2.0	
Lane Grp Cap (vph)	244	1760	937	586	1926	584	632	371	359	65	158	
v/s Ratio Prot	0.12	c0.46		c0.29	0.28		c0.32	c0.21		0.03	0.02	
v/s Ratio Perm			0.43			0.03			0.10			
v/c Ratio	0.84	1.23	1.14	1.59	0.68	0.06	1.62	0.79	0.39	0.82	0.20	
Uniform Delay, d1	57.7	43.7	43.7	56.9	33.8	25.0	55.9	48.0	42.4	66.4	57.4	
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	21.3	107.0	77.9	273.7	1.1	0.1	287.8	11.1	0.7	50.2	0.2	
Delay (s)	79.0	150.7	121.6	330.6	34.9	25.1	343.7	59.1	43.1	116.6	57.6	
Level of Service	E	F	F	F	C	C	F	E	D	F	E	
Approach Delay (s)		135.3			152.7			215.0			80.4	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	157.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	139.5	Sum of lost time (s)	19.7
Intersection Capacity Utilization	114.9%	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)	770	1235	1640	275	1085	1095	785	375	425	800	345	510
Future Volume (vph)	770	1235	1640	275	1085	1095	785	375	425	800	345	510
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	4.5
Lane Util. Factor	0.97	0.86	0.86	0.97	0.91	0.88	0.97	0.95	1.00	0.97	0.91	0.91
Frt	1.00	0.94	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	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)	3433	4518	1362	3433	5085	2787	3433	3539	1583	3433	3179	1441
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)	3433	4518	1362	3433	5085	2787	3433	3539	1583	3433	3179	1441
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	811	1300	1726	289	1142	1153	826	395	447	842	363	537
RTOR Reduction (vph)	0	78	280	0	0	326	0	0	95	0	77	182
Lane Group Flow (vph)	811	2085	583	289	1142	827	826	395	352	842	544	97
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6			4			8
Actuated Green, G (s)	23.5	57.1	57.1	9.5	43.1	43.1	24.6	36.1	36.1	24.6	36.1	36.1
Effective Green, g (s)	23.5	57.1	57.1	9.5	43.1	43.1	24.6	36.1	36.1	24.6	36.1	36.1
Actuated g/C Ratio	0.16	0.39	0.39	0.07	0.30	0.30	0.17	0.25	0.25	0.17	0.25	0.25
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	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	3.0
Lane Grp Cap (vph)	555	1775	535	224	1508	826	581	879	393	581	789	358
v/s Ratio Prot	c0.24	c0.46		0.08	0.22		0.24	0.11		c0.25	0.17	
v/s Ratio Perm			0.43			0.30			c0.22			0.07
v/c Ratio	1.46	1.29dr	1.09	1.29	0.76	1.00	1.42	0.45	0.90	1.45	0.69	0.27
Uniform Delay, d1	60.9	44.1	44.1	67.9	46.4	51.1	60.4	46.2	52.8	60.4	49.5	44.0
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	217.4	85.0	65.6	159.8	2.2	31.5	199.7	0.4	22.1	211.7	2.5	0.4
Delay (s)	278.3	129.1	109.7	227.7	48.6	82.6	260.0	46.6	74.9	272.0	52.0	44.4
Level of Service	F	F	F	F	D	F	F	D	E	F	D	D
Approach Delay (s)		156.3			83.8			159.9			157.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	138.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	145.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	101.8%	ICU Level of Service	G
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)	20	2160	340	455	2045	10	640	35	560	5	15	10
Future Volume (vph)	20	2160	340	455	2045	10	640	35	560	5	15	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	4.0	4.4	6.0	6.0	4.0	5.3	5.3	4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1641	4715	1468	3183	4715	1468	3183	1424	1395	1641	1622	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1641	4715	1468	3183	4715	1468	3183	1424	1395	1641	1622	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	2274	358	479	2153	11	674	37	589	5	16	11
RTOR Reduction (vph)	0	0	118	0	0	5	0	194	210	0	11	0
Lane Group Flow (vph)	21	2274	240	479	2153	6	674	120	102	5	16	0
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	2.3	61.8	91.9	20.3	80.2	80.2	30.1	34.2	34.2	0.8	6.2	
Effective Green, g (s)	2.3	61.8	91.9	20.3	80.2	80.2	30.1	34.2	34.2	0.8	6.2	
Actuated g/C Ratio	0.02	0.45	0.67	0.15	0.59	0.59	0.22	0.25	0.25	0.01	0.05	
Clearance Time (s)	4.0	6.0	4.0	4.4	6.0	6.0	4.0	5.3	5.3	4.0	4.0	
Vehicle Extension (s)	3.0	4.4	3.0	2.0	4.3	4.3	3.0	2.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	27	2130	986	472	2764	860	700	356	348	9	73	
v/s Ratio Prot	0.01	c0.48	0.05	c0.15	0.46		c0.21	c0.08		0.00	0.01	
v/s Ratio Perm			0.11			0.00			0.07			
v/c Ratio	0.78	1.07	0.24	1.01	0.78	0.01	0.96	0.34	0.29	0.56	0.23	
Uniform Delay, d1	67.0	37.5	8.8	58.3	21.5	11.8	52.8	42.0	41.5	67.8	63.0	
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	81.9	40.5	0.1	45.2	1.6	0.0	25.0	0.2	0.2	58.1	1.6	
Delay (s)	148.9	78.0	8.9	103.5	23.1	11.8	77.8	42.2	41.7	125.9	64.6	
Level of Service	F	E	A	F	C	B	E	D	D	F	E	
Approach Delay (s)		69.2			37.6			60.5			74.2	
Approach LOS		E			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	54.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	136.8	Sum of lost time (s)	19.7
Intersection Capacity Utilization	91.6%	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												
Traffic Volume (vph)	0	0	0	1500	5	220	815	885	0	0	460	350
Future Volume (vph)	0	0	0	1500	5	220	815	885	0	0	460	350
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				0.95	0.91	0.95	0.97	0.91			0.86	0.86
Frt				1.00	1.00	0.85	1.00	1.00			0.96	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1559	1493	1395	3183	4715			4280	1263
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1559	1493	1395	3183	4715			4280	1263
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	1579	5	232	858	932	0	0	484	368
RTOR Reduction (vph)	0	0	0	0	1	34	0	0	0	0	44	164
Lane Group Flow (vph)	0	0	0	805	801	175	858	932	0	0	613	31
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				73.3	73.3	73.3	37.5	66.1			23.9	23.9
Effective Green, g (s)				73.3	73.3	73.3	37.5	66.1			23.9	23.9
Actuated g/C Ratio				0.49	0.49	0.49	0.25	0.44			0.16	0.16
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)				763	731	683	797	2083			683	201
v/s Ratio Prot							c0.27	0.20			c0.14	
v/s Ratio Perm				0.52	0.54	0.13						0.02
v/c Ratio				1.06	1.10	0.26	1.08	0.45			0.90	0.15
Uniform Delay, d1				38.1	38.1	22.3	56.0	29.0			61.7	54.1
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				48.1	62.8	0.2	54.5	0.2			14.5	0.4
Delay (s)				86.2	100.9	22.5	110.6	29.2			76.2	54.5
Level of Service				F	F	C	F	C			E	D
Approach Delay (s)		0.0			85.4			68.2			71.2	
Approach LOS		A			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	75.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	149.6	Sum of lost time (s)	14.9
Intersection Capacity Utilization	198.4%	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)	400	5	3370	0	0	0	0	1265	490	210	1750	0
Future Volume (vph)	400	5	3370	0	0	0	0	1265	490	210	1750	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	5.1	4.7	5.1	
Lane Util. Factor		1.00	0.88					0.91	0.88	0.97	0.91	
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	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1646	2584					4715	2584	3183	4715	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1646	2584					4715	2584	3183	4715	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	421	5	3547	0	0	0	0	1332	516	221	1842	0
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	246	0	0	0
Lane Group Flow (vph)	0	426	3530	0	0	0	0	1332	270	221	1842	0
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	4	4						2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)		105.9	105.9					40.9	40.9	8.3	53.9	
Effective Green, g (s)		105.9	105.9					40.9	40.9	8.3	53.9	
Actuated g/C Ratio		0.62	0.62					0.24	0.24	0.05	0.32	
Clearance Time (s)		5.1	5.1					5.1	5.1	4.7	5.1	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1025	1609					1134	621	155	1494	
v/s Ratio Prot		0.26						0.28		0.07	c0.39	
v/s Ratio Perm			c1.37						0.10			
v/c Ratio		0.42	2.19					1.17	0.43	1.43	1.23	
Uniform Delay, d1		16.3	32.0					64.5	54.7	80.8	58.0	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.3	539.4					88.1	0.5	224.8	110.8	
Delay (s)		16.6	571.5					152.6	55.2	305.6	168.9	
Level of Service		B	F					F	E	F	F	
Approach Delay (s)		512.0			0.0			125.4			183.5	
Approach LOS		F			A			F			F	

Intersection Summary			
HCM 2000 Control Delay	335.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.93		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	198.4%	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)	1285	445	335	380	860	825	870	1045	200	985	2480	1655
Future Volume (vph)	1285	445	335	380	860	825	870	1045	200	985	2480	1655
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.4	5.1	5.1	4.4	4.9	4.9	4.4	5.1	5.1
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	0.98	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	2549	3183	4715	1446	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	2549	3183	4715	1446	3183	4715	2584
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1353	468	353	400	905	868	916	1100	211	1037	2611	1742
RTOR Reduction (vph)	0	0	213	0	0	387	0	0	143	0	0	407
Lane Group Flow (vph)	1353	468	140	400	905	481	916	1100	68	1037	2611	1335
Confl. Peds. (#/hr)	1					1			2			
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6			4			8
Actuated Green, G (s)	30.6	36.8	36.8	21.9	27.9	27.9	22.6	43.1	43.1	24.6	44.9	44.9
Effective Green, g (s)	30.6	36.8	36.8	21.9	27.9	27.9	22.6	43.1	43.1	24.6	44.9	44.9
Actuated g/C Ratio	0.21	0.25	0.25	0.15	0.19	0.19	0.16	0.30	0.30	0.17	0.31	0.31
Clearance Time (s)	4.4	4.9	4.9	4.4	5.1	5.1	4.4	4.9	4.9	4.4	5.1	5.1
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.8	3.8	2.0	3.8	3.8	2.0	3.8	3.8
Lane Grp Cap (vph)	671	1196	372	480	631	490	496	1401	429	540	1460	800
v/s Ratio Prot	c0.43	0.10		0.13	c0.28		0.29	0.23		c0.33	c0.55	
v/s Ratio Perm			0.10			0.19			0.05			0.52
v/c Ratio	2.02	0.39	0.38	0.83	1.43	0.98	1.85	0.79	0.16	1.92	1.79	1.67
Uniform Delay, d1	57.2	44.8	44.6	59.8	58.5	58.3	61.2	46.7	37.6	60.2	50.0	50.0
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	462.6	0.3	0.8	11.3	204.4	35.9	388.8	3.1	0.2	421.0	357.5	306.3
Delay (s)	519.8	45.1	45.4	71.1	263.0	94.2	450.0	49.8	37.8	481.2	407.6	356.3
Level of Service	F	D	D	E	F	F	F	D	D	F	F	F
Approach Delay (s)		340.6			160.2			213.3			405.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	313.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.82		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	149.0%	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)	115	1435	665	860	1160	590	975	1105	980	775	520	820
Future Volume (vph)	115	1435	665	860	1160	590	975	1105	980	775	520	820
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	6.7	4.0	5.2	5.2	4.0	4.3	4.3
Lane Util. Factor	0.97	0.91	0.88	0.97	0.91	0.88	0.97	0.91	0.88	0.97	0.95	0.88
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.97	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	2537	3183	4715	2584	3183	4715	2513	3183	3282	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	2537	3183	4715	2584	3183	4715	2513	3183	3282	2584
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	121	1511	700	905	1221	621	1026	1163	1032	816	547	863
RTOR Reduction (vph)	0	0	334	0	0	361	0	0	390	0	0	194
Lane Group Flow (vph)	121	1511	366	905	1221	260	1026	1163	642	816	547	669
Confl. Peds. (#/hr)			3						3			
Confl. Bikes (#/hr)			1						1			
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)	9.6	40.1	40.1	28.0	58.5	58.5	32.0	37.0	37.0	25.0	30.9	30.9
Effective Green, g (s)	9.6	40.1	40.1	28.0	58.5	58.5	32.0	37.0	37.0	25.0	30.9	30.9
Actuated g/C Ratio	0.06	0.27	0.27	0.19	0.39	0.39	0.21	0.25	0.25	0.17	0.21	0.21
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	5.2	5.2	4.0	4.3	4.3
Vehicle Extension (s)	2.0	5.0	5.0	2.0	4.9	4.9	2.0	3.2	3.2	2.0	5.3	5.3
Lane Grp Cap (vph)	203	1260	678	594	1838	1007	679	1163	619	530	676	532
v/s Ratio Prot	0.04	c0.32		c0.28	0.26		c0.32	0.25		0.26	0.17	
v/s Ratio Perm			0.14			0.10			0.26			c0.26
v/c Ratio	0.60	1.20	0.54	1.52	0.66	0.26	1.51	1.00	1.04	1.54	0.81	1.26
Uniform Delay, d1	68.3	54.9	47.0	61.0	37.7	31.0	59.0	56.5	56.5	62.5	56.7	59.5
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	3.1	97.5	3.1	244.1	1.9	0.6	237.6	26.4	46.0	252.2	8.2	130.8
Delay (s)	71.4	152.5	50.1	305.1	39.6	31.7	296.6	82.9	102.5	314.7	64.9	190.3
Level of Service	E	F	D	F	D	C	F	F	F	F	E	F
Approach Delay (s)		117.6			125.3			157.2			205.1	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	150.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	113.1%	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)	700	585	350	350	445	635	250	1380	150	1600	1850	1200
Future Volume (vph)	700	585	350	350	445	635	250	1380	150	1600	1850	1200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	1.00	0.97	0.91	0.88
Frpb, ped/bikes	1.00	1.00	0.99	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	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	3282	1447	3183	3282	2584	3183	3282	1468	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	3282	1447	3183	3282	2584	3183	3282	1468	3183	4715	2584
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	737	616	368	368	468	668	263	1453	158	1684	1947	1263
RTOR Reduction (vph)	0	0	141	0	0	590	0	0	94	0	0	303
Lane Group Flow (vph)	737	616	227	368	468	78	263	1453	64	1684	1947	960
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	20.0	27.5	27.5	10.0	17.5	17.5	15.1	45.5	45.5	49.5	79.9	79.9
Effective Green, g (s)	20.0	27.5	27.5	10.0	17.5	17.5	15.1	45.5	45.5	49.5	79.9	79.9
Actuated g/C Ratio	0.13	0.18	0.18	0.07	0.12	0.12	0.10	0.30	0.30	0.33	0.53	0.53
Clearance Time (s)	4.0	4.5	4.5	4.0	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	3.0
Lane Grp Cap (vph)	424	601	265	212	382	301	320	995	445	1050	2511	1376
v/s Ratio Prot	c0.23	0.19		0.12	c0.14		0.08	c0.44		c0.53	0.41	
v/s Ratio Perm			0.16			0.03			0.04			0.37
v/c Ratio	1.74	1.02	0.86	1.74	1.23	0.26	0.82	1.46	0.14	1.60	0.78	0.70
Uniform Delay, d1	65.0	61.2	59.3	70.0	66.2	60.3	66.1	52.2	38.1	50.2	27.9	26.1
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	341.9	43.2	22.7	350.1	122.5	0.5	15.5	212.7	0.1	276.2	1.6	1.6
Delay (s)	406.9	104.5	82.0	420.1	188.8	60.8	81.6	265.0	38.2	326.4	29.5	27.6
Level of Service	F	F	F	F	F	E	F	F	D	F	C	C
Approach Delay (s)		229.2			188.5			220.1			131.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	173.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.52		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	130.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1800	310	470	485	305	415
Future Volume (vph)	1800	310	470	485	305	415
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	0.95		0.97	0.95	0.97	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)	3210		3183	3282	3183	1468
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3210		3183	3282	3183	1468
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1895	326	495	511	321	437
RTOR Reduction (vph)	9	0	0	0	0	202
Lane Group Flow (vph)	2212	0	495	511	321	235
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	90.0		24.0	118.0	24.0	24.0
Effective Green, g (s)	90.0		24.0	118.0	24.0	24.0
Actuated g/C Ratio	0.60		0.16	0.79	0.16	0.16
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)	1926		509	2581	509	234
v/s Ratio Prot	c0.69		c0.16	0.16	0.10	
v/s Ratio Perm						c0.16
v/c Ratio	1.15		0.97	0.20	0.63	1.00
Uniform Delay, d1	30.0		62.7	4.0	58.9	63.0
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	73.4		32.7	0.0	2.5	59.4
Delay (s)	103.4		95.4	4.1	61.4	122.4
Level of Service	F		F	A	E	F
Approach Delay (s)	103.4			49.0	96.6	
Approach LOS	F			D	F	

Intersection Summary			
HCM 2000 Control Delay	88.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	3280	0	176	2205	0	370
Future Volume (vph)	3280	0	176	2205	0	370
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	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3453	0	185	2321	0	389
RTOR Reduction (vph)	0	0	0	0	127	0
Lane Group Flow (vph)	3453	0	185	2321	262	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases						
Actuated Green, G (s)	98.5		15.5	118.5	22.5	
Effective Green, g (s)	98.5		15.5	118.5	22.5	
Actuated g/C Ratio	0.66		0.10	0.79	0.15	
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)	3339		182	4017	241	
v/s Ratio Prot	c0.68		c0.10	0.46	c0.16	
v/s Ratio Perm						
v/c Ratio	1.03		1.02	0.58	1.09	
Uniform Delay, d1	25.8		67.2	6.1	63.8	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	25.3		71.1	0.2	83.6	
Delay (s)	51.0		138.3	6.3	147.4	
Level of Service	D		F	A	F	
Approach Delay (s)	51.0			16.0	147.4	
Approach LOS	D			B	F	

Intersection Summary			
HCM 2000 Control Delay	43.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	107.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	134	60	2180	1520	0
Future Volume (vph)	0	134	60	2180	1520	0
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	0.95	0.95	
Frt	0.86		1.00	1.00	1.00	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1611		1770	3539	3539	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	1611		1770	3539	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	141	63	2295	1600	0
RTOR Reduction (vph)	122	0	0	0	0	0
Lane Group Flow (vph)	19	0	63	2295	1600	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)	7.1		4.8	65.1	55.8	
Effective Green, g (s)	7.1		4.8	65.1	55.8	
Actuated g/C Ratio	0.09		0.06	0.80	0.69	
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)	140		104	2837	2431	
v/s Ratio Prot	c0.01		0.04	c0.65	0.45	
v/s Ratio Perm						
v/c Ratio	0.13		0.61	0.81	0.66	
Uniform Delay, d1	34.2		37.3	4.5	7.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.4		9.6	1.8	0.7	
Delay (s)	34.6		46.9	6.3	7.9	
Level of Service	C		D	A	A	
Approach Delay (s)	34.6			7.4	7.9	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	81.2	Sum of lost time (s)	13.5
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	165	155	65	1420	2185	78
Future Volume (vph)	165	155	65	1420	2185	78
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	0.95	0.95	
Frt	0.93		1.00	1.00	0.99	
Flt Protected	0.97		0.95	1.00	1.00	
Satd. Flow (prot)	1697		1770	3539	3521	
Flt Permitted	0.97		0.95	1.00	1.00	
Satd. Flow (perm)	1697		1770	3539	3521	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	174	163	68	1495	2300	82
RTOR Reduction (vph)	23	0	0	0	2	0
Lane Group Flow (vph)	314	0	68	1495	2380	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)	27.9		7.2	113.1	101.4	
Effective Green, g (s)	27.9		7.2	113.1	101.4	
Actuated g/C Ratio	0.19		0.05	0.75	0.68	
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)	315		84	2668	2380	
v/s Ratio Prot	c0.19		c0.04	0.42	c0.68	
v/s Ratio Perm						
v/c Ratio	1.00		0.81	0.56	1.00	
Uniform Delay, d1	61.0		70.7	7.9	24.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	49.7		41.7	0.3	18.5	
Delay (s)	110.7		112.4	8.1	42.8	
Level of Service	F		F	A	D	
Approach Delay (s)	110.7			12.7	42.8	
Approach LOS	F			B	D	

Intersection Summary			
HCM 2000 Control Delay	37.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	165	10	10	1320	2260	78
Future Volume (vph)	165	10	10	1320	2260	78
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	0.95	0.95	
Frt	0.99		1.00	1.00	1.00	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1765		1770	3539	3522	
Flt Permitted	0.96		0.95	1.00	1.00	
Satd. Flow (perm)	1765		1770	3539	3522	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	174	11	11	1389	2379	82
RTOR Reduction (vph)	2	0	0	0	2	0
Lane Group Flow (vph)	183	0	11	1389	2459	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)	15.3		0.8	85.1	79.8	
Effective Green, g (s)	15.3		0.8	85.1	79.8	
Actuated g/C Ratio	0.14		0.01	0.78	0.73	
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)	246		12	2752	2569	
v/s Ratio Prot	c0.10		0.01	c0.39	c0.70	
v/s Ratio Perm						
v/c Ratio	0.75		0.92	0.50	0.96	
Uniform Delay, d1	45.2		54.3	4.4	13.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	11.6		212.2	0.1	9.6	
Delay (s)	56.8		266.4	4.6	22.9	
Level of Service	E		F	A	C	
Approach Delay (s)	56.8			6.6	22.9	
Approach LOS	E			A	C	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	109.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	310	1455	85	80	2095	340
Future Volume (vph)	310	1455	85	80	2095	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.95	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3183	2584	3282	1468	3183	3282
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3183	2584	3282	1468	3183	3282
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	326	1532	89	84	2205	358
RTOR Reduction (vph)	0	1289	0	78	0	0
Lane Group Flow (vph)	326	243	89	6	2205	358
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	20.9	20.9	9.0	9.0	90.1	103.1
Effective Green, g (s)	20.9	20.9	9.0	9.0	90.1	103.1
Actuated g/C Ratio	0.16	0.16	0.07	0.07	0.68	0.78
Clearance Time (s)	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
Lane Grp Cap (vph)	503	409	223	100	2172	2563
v/s Ratio Prot	c0.10		c0.03		c0.69	0.11
v/s Ratio Perm		0.09		0.00		
v/c Ratio	0.65	0.59	0.40	0.06	1.02	0.14
Uniform Delay, d1	52.1	51.6	58.9	57.5	21.0	3.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	2.3	1.2	0.2	23.2	0.0
Delay (s)	55.0	53.9	60.1	57.8	44.1	3.6
Level of Service	D	D	E	E	D	A
Approach Delay (s)	54.1		59.0			38.5
Approach LOS	D		E			D

Intersection Summary			
HCM 2000 Control Delay	45.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.9%	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)	225	1190	370	450	1195	700	150	100	50	1235	1080	900
Future Volume (vph)	225	1190	370	450	1195	700	150	100	50	1235	1080	900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.9	4.9	4.9	4.4	4.9	4.9	4.4	4.9	4.9
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	0.88	0.97	0.95	1.00	0.97	0.95	0.88
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)	3183	4715	1445	3183	4715	2551	3183	3282	1468	3183	3282	2548
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	1445	3183	4715	2551	3183	3282	1468	3183	3282	2548
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	237	1253	389	474	1258	737	158	105	53	1300	1137	947
RTOR Reduction (vph)	0	0	113	0	0	416	0	0	42	0	0	263
Lane Group Flow (vph)	237	1253	276	474	1258	321	158	105	11	1300	1137	684
Confl. Peds. (#/hr)			1	1								2
Confl. Bikes (#/hr)			2			1						1
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)	13.4	34.2	34.2	25.6	46.9	46.9	9.7	29.1	29.1	35.8	55.2	55.2
Effective Green, g (s)	13.4	34.2	34.2	25.6	46.9	46.9	9.7	29.1	29.1	35.8	55.2	55.2
Actuated g/C Ratio	0.09	0.24	0.24	0.18	0.33	0.33	0.07	0.20	0.20	0.25	0.38	0.38
Clearance Time (s)	4.4	4.9	4.9	4.9	4.9	4.9	4.4	4.9	4.9	4.4	4.9	4.9
Vehicle Extension (s)	2.0	4.8	4.8	3.0	3.0	3.0	2.0	3.3	3.3	2.0	4.4	4.4
Lane Grp Cap (vph)	296	1121	343	566	1537	832	214	664	297	792	1259	978
v/s Ratio Prot	0.07	c0.27		c0.15	0.27		0.05	0.03		c0.41	c0.35	
v/s Ratio Perm			0.19			0.13			0.01			0.27
v/c Ratio	0.80	1.12	0.81	0.84	0.82	0.39	0.74	0.16	0.04	1.64	0.90	0.70
Uniform Delay, d1	63.9	54.8	51.7	57.1	44.5	37.3	65.8	47.3	46.1	54.0	41.8	37.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.6	65.3	14.4	10.4	3.5	0.3	10.9	0.1	0.1	294.3	9.6	2.5
Delay (s)	77.5	120.1	66.0	67.5	48.1	37.6	76.7	47.4	46.1	348.3	51.3	39.8
Level of Service	E	F	E	E	D	D	E	D	D	F	D	D
Approach Delay (s)		103.6			48.7			61.8			162.2	
Approach LOS		F			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	109.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	143.8	Sum of lost time (s)	19.1
Intersection Capacity Utilization	90.3%	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)	970	715	0	0	2090	900	0	0	0	400	350	1095
Future Volume (vph)	970	715	0	0	2090	900	0	0	0	400	350	1095
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
Lane Util. Factor	0.97	0.91			0.91	0.88				0.97	1.00	0.88
Frpb, ped/bikes	1.00	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
Frt	1.00	1.00			1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	3183	4715			4715	2550				3183	1727	2584
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	3183	4715			4715	2550				3183	1727	2584
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1021	753	0	0	2200	947	0	0	0	421	368	1153
RTOR Reduction (vph)	0	0	0	0	0	332	0	0	0	0	0	615
Lane Group Flow (vph)	1021	753	0	0	2200	615	0	0	0	421	368	538
Confl. Peds. (#/hr)			7	7					2	2		
Confl. Bikes (#/hr)			3			2						
Turn Type	Prot	NA			NA	Perm				Split	NA	Perm
Protected Phases	7	4			8					6	6	
Permitted Phases						8						6
Actuated Green, G (s)	40.0	103.0			59.0	59.0				29.0	29.0	29.0
Effective Green, g (s)	40.0	103.0			59.0	59.0				29.0	29.0	29.0
Actuated g/C Ratio	0.29	0.74			0.42	0.42				0.21	0.21	0.21
Clearance Time (s)	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
Lane Grp Cap (vph)	909	3468			1987	1074				659	357	535
v/s Ratio Prot	c0.32	0.16			c0.47					0.13	c0.21	
v/s Ratio Perm						0.24						0.21
v/c Ratio	1.12	0.22			1.11	0.57				0.64	1.03	1.01
Uniform Delay, d1	50.0	5.8			40.5	30.9				50.7	55.5	55.5
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	69.8	0.0			56.3	0.7				2.0	55.8	40.2
Delay (s)	119.8	5.9			96.8	31.6				52.8	111.3	95.7
Level of Service	F	A			F	C				D	F	F
Approach Delay (s)		71.4			77.2			0.0			89.3	
Approach LOS		E			E			A			F	

Intersection Summary			
HCM 2000 Control Delay	79.1	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)	12.0
Intersection Capacity Utilization	96.5%	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												
Traffic Volume (vph)	600	200	330	445	200	870	690	1395	500	1000	2385	1715
Future Volume (vph)	600	200	330	445	200	870	690	1395	500	1000	2385	1715
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	0.95	1.00	0.97	0.95	1.00	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	1.00	1.00	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	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	3282	1468	3183	3282	1468	3183	4715	1468	3183	4715	2532
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	3282	1468	3183	3282	1468	3183	4715	1468	3183	4715	2532
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	211	347	468	211	916	726	1468	526	1053	2511	1805
RTOR Reduction (vph)	0	0	196	0	0	223	0	0	258	0	0	518
Lane Group Flow (vph)	632	211	151	468	211	693	726	1468	268	1053	2511	1287
Confl. Peds. (#/hr)							3					3
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	22.0	35.1	35.1	24.9	38.0	38.0	21.0	45.0	45.0	29.0	53.0	53.0
Effective Green, g (s)	22.0	35.1	35.1	24.9	38.0	38.0	21.0	45.0	45.0	29.0	53.0	53.0
Actuated g/C Ratio	0.15	0.23	0.23	0.17	0.25	0.25	0.14	0.30	0.30	0.19	0.35	0.35
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)	466	767	343	528	831	371	445	1414	440	615	1665	894
v/s Ratio Prot	c0.20	0.06		0.15	0.06		0.23	0.31		c0.33	c0.53	
v/s Ratio Perm			0.10			c0.47			0.18			0.51
v/c Ratio	1.36	0.28	0.44	0.89	0.25	1.87	1.63	1.04	0.61	1.71	1.51	1.44
Uniform Delay, d1	64.0	47.0	49.1	61.2	44.7	56.0	64.5	52.5	45.0	60.5	48.5	48.5
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	173.9	0.2	0.9	16.3	0.2	401.3	294.2	34.4	2.4	327.4	231.8	204.2
Delay (s)	237.9	47.2	50.0	77.5	44.8	457.3	358.7	86.9	47.3	387.9	280.3	252.7
Level of Service	F	D	D	E	D	F	F	F	D	F	F	F
Approach Delay (s)		149.3			291.3			151.8			292.1	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	241.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.66		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	107.9%	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)	960	5	900	0	0	0	0	1420	164	220	1002	0
Future Volume (vph)	960	5	900	0	0	0	0	1420	164	220	1002	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					5.1	5.1	4.7	5.1	
Lane Util. Factor	0.95	0.91	0.95					0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	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	
Frt	1.00	0.92	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1559	1419	1395					4715	1446	3183	4715	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1559	1419	1395					4715	1446	3183	4715	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1011	5	947	0	0	0	0	1495	173	232	1055	0
RTOR Reduction (vph)	0	28	42	0	0	0	0	0	115	0	0	0
Lane Group Flow (vph)	687	632	574	0	0	0	0	1495	58	232	1055	0
Confl. Peds. (#/hr)									2			
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)	43.9	43.9	43.9					33.3	33.3	7.9	45.9	
Effective Green, g (s)	43.9	43.9	43.9					33.3	33.3	7.9	45.9	
Actuated g/C Ratio	0.44	0.44	0.44					0.33	0.33	0.08	0.46	
Clearance Time (s)	5.1	5.1	5.1					5.1	5.1	4.7	5.1	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)	684	622	612					1570	481	251	2164	
v/s Ratio Prot								c0.32		c0.07	0.22	
v/s Ratio Perm	0.44	0.45	0.41						0.04			
v/c Ratio	1.00	1.02	0.94					0.95	0.12	0.92	0.49	
Uniform Delay, d1	28.1	28.1	26.8					32.6	23.2	45.8	18.9	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2	35.5	40.2	22.2					13.1	0.1	36.3	0.2	
Delay (s)	63.5	68.2	48.9					45.6	23.3	82.0	19.0	
Level of Service	E	E	D					D	C	F	B	
Approach Delay (s)		60.5			0.0			43.3			30.4	
Approach LOS		E			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	46.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	100.5%	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)	135	170	375	1190	320	930	190	491	755	495	1236	171
Future Volume (vph)	135	170	375	1190	320	930	190	491	755	495	1236	171
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	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.91	
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	
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	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3335	3438	1538	3183	3438	1447	3183	4940	1447	3183	4641	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3335	3438	1538	3183	3438	1447	3183	4940	1447	3183	4641	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	142	179	395	1253	337	979	200	517	795	521	1301	180
RTOR Reduction (vph)	0	0	132	0	0	184	0	0	544	0	15	0
Lane Group Flow (vph)	142	179	263	1253	337	795	200	517	251	521	1466	0
Confl. Peds. (#/hr)	1					1	6		1	1		6
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	5%	5%	10%	5%	10%	10%	5%	10%	10%	10%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	6.0	18.0	18.0	45.0	57.0	57.0	7.0	24.0	24.0	17.0	34.0	
Effective Green, g (s)	6.0	18.0	18.0	45.0	57.0	57.0	7.0	24.0	24.0	17.0	34.0	
Actuated g/C Ratio	0.05	0.15	0.15	0.38	0.48	0.48	0.06	0.20	0.20	0.14	0.28	
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	
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)	166	515	230	1193	1633	687	185	988	289	450	1314	
v/s Ratio Prot	0.04	0.05		c0.39	0.10		0.06	0.10		c0.16	c0.32	
v/s Ratio Perm			0.17			c0.55			0.17			
v/c Ratio	0.86	0.35	1.14	1.05	0.21	1.16	1.08	0.52	0.87	1.16	1.12	
Uniform Delay, d1	56.6	45.7	51.0	37.5	18.3	31.5	56.5	42.9	46.5	51.5	43.0	
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	32.5	0.4	103.9	40.3	0.1	86.4	89.4	0.5	23.0	93.3	63.0	
Delay (s)	89.1	46.1	154.9	77.8	18.4	117.9	145.9	43.4	69.5	144.8	106.0	
Level of Service	F	D	F	E	B	F	F	D	E	F	F	
Approach Delay (s)		114.6			85.3			70.7			116.1	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	94.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.9%	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												
Traffic Volume (vph)	275	1466	130	85	2537	248	170	70	115	452	90	510
Future Volume (vph)	275	1466	130	85	2537	248	170	70	115	452	90	510
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
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	1.00		0.97	0.95	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	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	0.85	1.00	0.91		1.00	0.89	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	4653		3183	4715	1430	1641	1567		3183	1468	1395
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	4653		3183	4715	1430	1641	1567		3183	1468	1395
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	289	1543	137	89	2671	261	179	74	121	476	95	537
RTOR Reduction (vph)	0	8	0	0	0	81	0	46	0	0	66	88
Lane Group Flow (vph)	289	1672	0	89	2671	180	179	149	0	476	255	223
Confl. Peds. (#/hr)						6						
Confl. Bikes (#/hr)			1									
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)	11.0	72.1		6.9	68.0	68.0	14.0	16.0		19.0	21.0	21.0
Effective Green, g (s)	11.0	72.1		6.9	68.0	68.0	14.0	16.0		19.0	21.0	21.0
Actuated g/C Ratio	0.08	0.55		0.05	0.52	0.52	0.11	0.12		0.15	0.16	0.16
Clearance Time (s)	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
Lane Grp Cap (vph)	269	2580		168	2466	748	176	192		465	237	225
v/s Ratio Prot	c0.09	0.36		0.03	c0.57		0.11	0.10		c0.15	c0.17	
v/s Ratio Perm						0.13						0.16
v/c Ratio	1.07	0.65		0.53	1.08	0.24	1.02	0.78		1.02	1.07	0.99
Uniform Delay, d1	59.5	20.1		60.0	31.0	16.9	58.0	55.3		55.5	54.5	54.4
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	76.0	0.6		3.0	45.3	0.2	72.4	17.8		47.9	79.8	57.2
Delay (s)	135.5	20.7		63.0	76.3	17.1	130.4	73.1		103.4	134.3	111.6
Level of Service	F	C		E	E	B	F	E		F	F	F
Approach Delay (s)		37.5			70.8			100.5			114.7	
Approach LOS		D			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	69.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.8%	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												
Traffic Volume (vph)	760	928	345	661	1750	1541	335	545	261	799	800	785
Future Volume (vph)	760	928	345	661	1750	1541	335	545	261	799	800	785
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9	4.9	4.4	4.9	4.9
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	0.88	0.97	0.91	1.00	0.97	0.91	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	4715	2584	3183	4715	1468	3183	4715	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	3183	4715	2584	3183	4715	1468	3183	4715	1468
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	800	977	363	696	1842	1622	353	574	275	841	842	826
RTOR Reduction (vph)	0	0	110	0	0	291	0	0	189	0	0	162
Lane Group Flow (vph)	800	977	253	696	1842	1331	353	574	86	841	842	664
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)	16.6	35.0	35.0	30.7	49.1	49.1	8.6	47.0	47.0	17.6	56.0	56.0
Effective Green, g (s)	16.6	35.0	35.0	30.7	49.1	49.1	8.6	47.0	47.0	17.6	56.0	56.0
Actuated g/C Ratio	0.11	0.23	0.23	0.20	0.33	0.33	0.06	0.31	0.31	0.12	0.37	0.37
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9	4.9	4.4	4.9	4.9
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.4	4.4	2.0	5.0	5.0	2.0	2.0	2.0
Lane Grp Cap (vph)	352	1100	342	651	1543	845	182	1477	459	373	1760	548
v/s Ratio Prot	c0.25	0.21		0.22	0.39		0.11	0.12		c0.26	0.18	
v/s Ratio Perm			0.17			c0.51			0.06			c0.45
v/c Ratio	2.27	0.89	0.74	1.07	1.19	1.57	1.94	0.39	0.19	2.25	0.48	1.21
Uniform Delay, d1	66.7	55.6	53.3	59.6	50.5	50.5	70.7	40.3	37.6	66.2	35.9	47.0
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	581.7	9.3	9.2	55.2	93.9	264.4	442.3	0.4	0.4	573.2	0.1	111.1
Delay (s)	648.4	64.9	62.5	114.9	144.3	314.8	513.0	40.6	38.0	639.4	35.9	158.1
Level of Service	F	E	E	F	F	F	F	D	D	F	D	F
Approach Delay (s)		282.6			205.9			178.8			278.4	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	237.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.65		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	105.2%	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)	140	1014	975	639	2014	56	1500	50	898	150	80	180
Future Volume (vph)	140	1014	975	639	2014	56	1500	50	898	150	80	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9	4.9	4.4	4.9	
Lane Util. Factor	1.00	0.91	0.88	0.97	0.91	1.00	0.97	0.95	0.95	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.99	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	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1641	4715	2509	3183	4715	1429	3183	1404	1377	1641	1548	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1641	4715	2509	3183	4715	1429	3183	1404	1377	1641	1548	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	1067	1026	673	2120	59	1579	53	945	158	84	189
RTOR Reduction (vph)	0	0	693	0	0	41	0	198	198	0	54	0
Lane Group Flow (vph)	147	1067	333	673	2120	18	1579	309	293	158	219	0
Confl. Peds. (#/hr)			4			2			1			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	13.6	37.0	37.0	22.6	46.0	46.0	48.6	55.2	55.2	15.5	22.1	
Effective Green, g (s)	13.6	37.0	37.0	22.6	46.0	46.0	48.6	55.2	55.2	15.5	22.1	
Actuated g/C Ratio	0.09	0.25	0.25	0.15	0.31	0.31	0.32	0.37	0.37	0.10	0.15	
Clearance Time (s)	4.4	6.0	6.0	4.4	6.0	6.0	4.4	4.9	4.9	4.4	4.9	
Vehicle Extension (s)	2.0	4.4	4.4	2.0	4.2	4.2	2.0	3.2	3.2	2.0	2.0	
Lane Grp Cap (vph)	148	1163	618	479	1445	438	1031	516	506	169	228	
v/s Ratio Prot	0.09	0.23		c0.21	c0.45		c0.50	0.22		0.10	c0.14	
v/s Ratio Perm			0.13			0.01			0.21			
v/c Ratio	0.99	0.92	0.54	1.41	1.47	0.04	1.53	0.60	0.58	0.93	0.96	
Uniform Delay, d1	68.2	55.0	49.1	63.7	52.0	36.5	50.7	38.4	38.1	66.7	63.5	
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	71.6	11.6	1.4	194.5	214.0	0.1	244.1	1.9	1.7	49.6	48.4	
Delay (s)	139.7	66.6	50.4	258.2	266.0	36.6	294.8	40.3	39.7	116.4	111.9	
Level of Service	F	E	D	F	F	D	F	D	D	F	F	
Approach Delay (s)		64.0			259.4			196.1			113.5	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	177.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.42		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	121.1%	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)	510	1126	476	500	1837	550	1558	350	750	690	765	750
Future Volume (vph)	510	1126	476	500	1837	550	1558	350	750	690	765	750
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	4.5
Lane Util. Factor	0.97	0.86	0.86	0.97	0.91	0.88	0.97	0.95	1.00	0.97	0.91	0.91
Frt	1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	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)	3433	4737	1362	3433	5085	2787	3433	3539	1583	3433	3252	1441
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)	3433	4737	1362	3433	5085	2787	3433	3539	1583	3433	3252	1441
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	537	1185	501	526	1934	579	1640	368	789	726	805	789
RTOR Reduction (vph)	0	8	118	0	0	98	0	0	115	0	24	115
Lane Group Flow (vph)	537	1302	258	526	1934	481	1640	368	674	726	1081	374
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6			4			8
Actuated Green, G (s)	12.5	42.5	42.5	12.5	42.5	42.5	34.5	61.5	61.5	15.5	42.5	42.5
Effective Green, g (s)	12.5	42.5	42.5	12.5	42.5	42.5	34.5	61.5	61.5	15.5	42.5	42.5
Actuated g/C Ratio	0.08	0.28	0.28	0.08	0.28	0.28	0.23	0.41	0.41	0.10	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	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	3.0
Lane Grp Cap (vph)	286	1342	385	286	1440	789	789	1450	649	354	921	408
v/s Ratio Prot	c0.16	0.27		0.15	c0.38		c0.48	0.10		0.21	c0.33	
v/s Ratio Perm			0.19			0.17			0.43			0.26
v/c Ratio	1.88	0.97	0.67	1.84	1.34	0.61	2.08	0.25	1.04	2.05	1.17	0.92
Uniform Delay, d1	68.8	53.1	47.6	68.8	53.8	46.6	57.8	29.1	44.2	67.2	53.8	52.1
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	408.0	17.9	4.6	390.9	159.1	1.3	489.7	0.1	45.7	482.6	89.8	25.1
Delay (s)	476.7	71.0	52.1	459.7	212.9	47.9	547.5	29.2	89.9	549.9	143.6	77.1
Level of Service	F	E	D	F	F	D	F	C	F	F	F	E
Approach Delay (s)		165.8			224.2			350.2			256.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	252.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.53		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	138.6%	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)	15	1920	736	648	2120	10	454	20	461	15	40	35
Future Volume (vph)	15	1920	736	648	2120	10	454	20	461	15	40	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	4.0	4.4	6.0	6.0	4.0	5.3	5.3	4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1641	4715	1468	3183	4715	1468	3183	1415	1395	1641	1606	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1641	4715	1468	3183	4715	1468	3183	1415	1395	1641	1606	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	2021	775	682	2232	11	478	21	485	16	42	37
RTOR Reduction (vph)	0	0	134	0	0	4	0	177	191	0	22	0
Lane Group Flow (vph)	16	2021	641	682	2232	7	478	77	61	16	57	0
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	1.5	58.8	83.7	29.0	86.7	86.7	24.9	34.7	34.7	1.5	12.6	
Effective Green, g (s)	1.5	58.8	83.7	29.0	86.7	86.7	24.9	34.7	34.7	1.5	12.6	
Actuated g/C Ratio	0.01	0.41	0.58	0.20	0.60	0.60	0.17	0.24	0.24	0.01	0.09	
Clearance Time (s)	4.0	6.0	4.0	4.4	6.0	6.0	4.0	5.3	5.3	4.0	4.0	
Vehicle Extension (s)	3.0	4.4	3.0	2.0	4.3	4.3	3.0	2.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	17	1929	855	642	2844	885	551	341	336	17	140	
v/s Ratio Prot	0.01	c0.43	0.13	c0.21	0.47		c0.15	0.05		0.01	c0.04	
v/s Ratio Perm			0.31			0.00			0.04			
v/c Ratio	0.94	1.05	0.75	1.06	0.78	0.01	0.87	0.23	0.18	0.94	0.41	
Uniform Delay, d1	71.1	42.4	22.2	57.3	21.5	11.4	57.8	43.7	43.2	71.1	62.0	
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	188.5	34.3	3.7	53.2	1.6	0.0	13.5	0.1	0.1	188.5	1.9	
Delay (s)	259.6	76.7	26.0	110.6	23.1	11.4	71.3	43.9	43.3	259.6	64.0	
Level of Service	F	E	C	F	C	B	E	D	D	F	E	
Approach Delay (s)		63.8			43.4			57.1			96.9	
Approach LOS		E			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	54.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	143.7	Sum of lost time (s)	19.7
Intersection Capacity Utilization	88.1%	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)	0	0	0	594	5	390	2888	629	0	0	1022	440
Future Volume (vph)	0	0	0	594	5	390	2888	629	0	0	1022	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				0.95	0.91	0.95	0.97	0.91			0.86	0.86
Frt				1.00	0.96	0.85	1.00	1.00			0.98	0.85
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1559	1460	1395	3183	4715			4389	1263
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1559	1460	1395	3183	4715			4389	1263
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	625	5	411	3040	662	0	0	1076	463
RTOR Reduction (vph)	0	0	0	0	7	269	0	0	0	0	9	208
Lane Group Flow (vph)	0	0	0	362	347	56	3040	662	0	0	1187	135
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				25.9	25.9	25.9	78.3	113.9			30.9	30.9
Effective Green, g (s)				25.9	25.9	25.9	78.3	113.9			30.9	30.9
Actuated g/C Ratio				0.17	0.17	0.17	0.52	0.76			0.21	0.21
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)				269	252	240	1661	3580			904	260
v/s Ratio Prot							c0.95	0.14			c0.27	
v/s Ratio Perm				0.23	0.24	0.04						0.11
v/c Ratio				1.35	1.38	0.23	1.83	0.18			1.31	0.52
Uniform Delay, d1				62.1	62.1	53.5	35.9	5.1			59.5	52.9
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				178.3	191.9	0.5	376.0	0.0			148.9	1.7
Delay (s)				240.4	253.9	54.0	411.8	5.1			208.5	54.7
Level of Service				F	F	D	F	A			F	D
Approach Delay (s)		0.0			186.8			339.1			174.2	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	273.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.62		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	135.1%	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)	400	5	1074	0	0	0	0	2912	1198	200	1044	0
Future Volume (vph)	400	5	1074	0	0	0	0	2912	1198	200	1044	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	5.1	4.7	5.1	
Lane Util. Factor		1.00	0.88					0.91	0.88	0.97	0.91	
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	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1646	2584					4715	2584	3183	4715	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1646	2584					4715	2584	3183	4715	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	421	5	1131	0	0	0	0	3065	1261	211	1099	0
RTOR Reduction (vph)	0	0	121	0	0	0	0	0	296	0	0	0
Lane Group Flow (vph)	0	426	1010	0	0	0	0	3065	965	211	1099	0
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	4	4						2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)		47.9	47.9					78.9	78.9	8.3	91.9	
Effective Green, g (s)		47.9	47.9					78.9	78.9	8.3	91.9	
Actuated g/C Ratio		0.32	0.32					0.53	0.53	0.06	0.61	
Clearance Time (s)		5.1	5.1					5.1	5.1	4.7	5.1	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		525	825					2480	1359	176	2888	
v/s Ratio Prot		0.26						c0.65		c0.07	0.23	
v/s Ratio Perm			c0.39						0.37			
v/c Ratio		0.81	1.22					1.24	0.71	1.20	0.38	
Uniform Delay, d1		46.9	51.0					35.5	26.9	70.8	14.7	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		9.3	111.6					109.8	1.7	131.5	0.1	
Delay (s)		56.2	162.6					145.4	28.6	202.3	14.8	
Level of Service		E	F					F	C	F	B	
Approach Delay (s)		133.5			0.0			111.3			45.0	
Approach LOS		F			A			F			D	

Intersection Summary			
HCM 2000 Control Delay	104.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	135.1%	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)	1275	1079	731	145	937	900	775	1935	830	800	1000	1485
Future Volume (vph)	1275	1079	731	145	937	900	775	1935	830	800	1000	1485
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.4	5.1	5.1	4.4	4.9	4.9	4.4	5.1	5.1
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	0.98	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	2549	3183	4715	1446	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	2549	3183	4715	1446	3183	4715	2584
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1342	1136	769	153	986	947	816	2037	874	842	1053	1563
RTOR Reduction (vph)	0	0	184	0	0	313	0	0	78	0	0	423
Lane Group Flow (vph)	1342	1136	585	153	986	634	816	2037	796	842	1053	1140
Confl. Peds. (#/hr)	1					1			2			
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6			4			8
Actuated Green, G (s)	28.6	53.1	53.1	6.6	30.9	30.9	18.6	47.1	47.1	19.6	47.9	47.9
Effective Green, g (s)	28.6	53.1	53.1	6.6	30.9	30.9	18.6	47.1	47.1	19.6	47.9	47.9
Actuated g/C Ratio	0.20	0.37	0.37	0.05	0.21	0.21	0.13	0.32	0.32	0.14	0.33	0.33
Clearance Time (s)	4.4	4.9	4.9	4.4	5.1	5.1	4.4	4.9	4.9	4.4	5.1	5.1
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.8	3.8	2.0	3.8	3.8	2.0	3.8	3.8
Lane Grp Cap (vph)	627	1726	537	144	699	543	408	1531	469	430	1557	853
v/s Ratio Prot	c0.42	0.24		0.05	c0.30		0.26	0.43		c0.26	0.22	
v/s Ratio Perm			0.40			0.25			c0.55			0.44
v/c Ratio	2.14	0.66	1.09	1.06	1.41	1.17	2.00	1.33	1.70	1.96	0.68	1.34
Uniform Delay, d1	58.2	38.4	45.9	69.2	57.0	57.0	63.2	49.0	49.0	62.7	41.9	48.5
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	518.5	1.0	65.1	92.6	193.2	93.8	458.7	153.3	323.2	439.6	1.3	159.3
Delay (s)	576.7	39.4	111.0	161.8	250.3	150.9	521.9	202.3	372.1	502.3	43.1	207.8
Level of Service	F	D	F	F	F	F	F	F	F	F	D	F
Approach Delay (s)		278.4			198.7			312.1			229.4	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	261.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.77		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	138.2%	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)	663	996	1100	990	1475	780	670	620	850	400	630	107
Future Volume (vph)	663	996	1100	990	1475	780	670	620	850	400	630	107
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	6.7	4.0	5.2	5.2	4.0	4.3	4.3
Lane Util. Factor	0.97	0.91	0.88	0.97	0.91	0.88	0.97	0.91	0.88	0.97	0.95	0.88
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.97	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	2537	3183	4715	2584	3183	4715	2513	3183	3282	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	2537	3183	4715	2584	3183	4715	2513	3183	3282	2584
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	698	1048	1158	1042	1553	821	705	653	895	421	663	113
RTOR Reduction (vph)	0	0	368	0	0	272	0	0	524	0	0	93
Lane Group Flow (vph)	698	1048	790	1042	1553	549	705	653	371	421	663	20
Confl. Peds. (#/hr)			3						3			
Confl. Bikes (#/hr)			1						1			
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)	23.0	43.1	43.1	36.0	56.1	56.1	25.0	36.0	36.0	15.0	26.9	26.9
Effective Green, g (s)	23.0	43.1	43.1	36.0	56.1	56.1	25.0	36.0	36.0	15.0	26.9	26.9
Actuated g/C Ratio	0.15	0.29	0.29	0.24	0.37	0.37	0.17	0.24	0.24	0.10	0.18	0.18
Clearance Time (s)	4.0	6.7	6.7	4.0	6.7	6.7	4.0	5.2	5.2	4.0	4.3	4.3
Vehicle Extension (s)	2.0	5.0	5.0	2.0	4.9	4.9	2.0	3.2	3.2	2.0	5.3	5.3
Lane Grp Cap (vph)	488	1354	728	763	1763	966	530	1131	603	318	588	463
v/s Ratio Prot	0.22	0.22		c0.33	0.33		c0.22	0.14		0.13	c0.20	
v/s Ratio Perm			c0.31			0.21			0.15			0.01
v/c Ratio	1.43	0.77	1.09	1.37	0.88	0.57	1.33	0.58	0.62	1.32	1.13	0.04
Uniform Delay, d1	63.5	49.0	53.4	57.0	43.8	37.3	62.5	50.3	50.8	67.5	61.5	50.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	205.2	4.4	59.0	172.9	6.7	2.4	161.2	0.7	1.9	166.1	77.5	0.1
Delay (s)	268.7	53.4	112.4	229.9	50.5	39.8	223.7	51.0	52.7	233.6	139.0	51.0
Level of Service	F	D	F	F	D	D	F	D	D	F	F	D
Approach Delay (s)		128.7			102.7			105.7			164.0	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	118.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	101.4%	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)	800	496	500	200	281	700	295	2325	300	800	1430	700
Future Volume (vph)	800	496	500	200	281	700	295	2325	300	800	1430	700
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	1.00	0.97	0.91	0.88
Frpb, ped/bikes	1.00	1.00	0.99	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	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	3282	1447	3183	3282	2584	3183	3282	1468	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	3282	1447	3183	3282	2584	3183	3282	1468	3183	4715	2584
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	842	522	526	211	296	737	311	2447	316	842	1505	737
RTOR Reduction (vph)	0	0	201	0	0	350	0	0	73	0	0	336
Lane Group Flow (vph)	842	522	325	211	296	387	311	2447	243	842	1505	401
Confl. Bikes (#/hr)			2									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	22.0	30.5	30.5	7.0	15.5	15.5	19.1	68.5	68.5	26.5	75.9	75.9
Effective Green, g (s)	22.0	30.5	30.5	7.0	15.5	15.5	19.1	68.5	68.5	26.5	75.9	75.9
Actuated g/C Ratio	0.15	0.20	0.20	0.05	0.10	0.10	0.13	0.46	0.46	0.18	0.51	0.51
Clearance Time (s)	4.0	4.5	4.5	4.0	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	3.0
Lane Grp Cap (vph)	466	667	294	148	339	267	405	1498	670	562	2385	1307
v/s Ratio Prot	c0.26	0.16		0.07	0.09		0.10	c0.75		c0.26	0.32	
v/s Ratio Perm			0.22			c0.15			0.17			0.16
v/c Ratio	1.81	0.78	1.11	1.43	0.87	1.45	0.77	1.63	0.36	1.50	0.63	0.31
Uniform Delay, d1	64.0	56.6	59.8	71.5	66.3	67.2	63.3	40.8	26.5	61.8	26.9	21.7
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	371.5	6.0	84.1	226.1	21.1	222.5	8.5	288.1	0.3	233.4	0.6	0.1
Delay (s)	435.5	62.6	143.8	297.6	87.4	289.8	71.8	328.9	26.9	295.2	27.4	21.8
Level of Service	F	E	F	F	F	F	E	F	C	F	C	C
Approach Delay (s)		251.3			242.9			271.8			99.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	206.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.61		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	132.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	106	127	64	162	66	53
Future Volume (vph)	106	127	64	162	66	53
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	0.95		0.97	0.95	0.97	1.00
Frt	0.92		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3014		3183	3282	3183	1468
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3014		3183	3282	3183	1468
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	112	134	67	171	69	56
RTOR Reduction (vph)	108	0	0	0	0	38
Lane Group Flow (vph)	138	0	67	171	69	18
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	5.7		2.1	11.8	9.3	9.3
Effective Green, g (s)	5.7		2.1	11.8	9.3	9.3
Actuated g/C Ratio	0.20		0.07	0.41	0.32	0.32
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)	590		229	1330	1017	469
v/s Ratio Prot	c0.05		c0.02	0.05	c0.02	
v/s Ratio Perm						0.01
v/c Ratio	0.23		0.29	0.13	0.07	0.04
Uniform Delay, d1	9.9		12.8	5.4	6.9	6.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		0.7	0.0	0.0	0.0
Delay (s)	10.1		13.5	5.5	6.9	6.9
Level of Service	B		B	A	A	A
Approach Delay (s)	10.1			7.7	6.9	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.15		
Actuated Cycle Length (s)	29.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	23.7%	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)	1600	0	427	3400	0	258
Future Volume (vph)	1600	0	427	3400	0	258
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	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1684	0	449	3579	0	272
RTOR Reduction (vph)	0	0	0	0	253	0
Lane Group Flow (vph)	1684	0	449	3579	19	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases						
Actuated Green, G (s)	25.2		17.0	46.7	4.3	
Effective Green, g (s)	25.2		17.0	46.7	4.3	
Actuated g/C Ratio	0.42		0.28	0.78	0.07	
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)	2135		501	3957	115	
v/s Ratio Prot	0.33		0.25	c0.70	c0.01	
v/s Ratio Perm						
v/c Ratio	0.79		0.90	0.90	0.17	
Uniform Delay, d1	15.1		20.7	5.0	26.2	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	2.0		18.4	3.4	0.7	
Delay (s)	17.1		39.0	8.3	26.9	
Level of Service	B		D	A	C	
Approach Delay (s)	17.1			11.8	26.9	
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	0.92		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	90	140	1270	2115	0
Future Volume (vph)	0	90	140	1270	2115	0
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	0.95	0.95	
Frt	0.86		1.00	1.00	1.00	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1611		1770	3539	3539	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	1611		1770	3539	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	95	147	1337	2226	0
RTOR Reduction (vph)	89	0	0	0	0	0
Lane Group Flow (vph)	6	0	147	1337	2226	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)	5.2		5.9	66.3	55.9	
Effective Green, g (s)	5.2		5.9	66.3	55.9	
Actuated g/C Ratio	0.06		0.07	0.82	0.69	
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)	104		129	2914	2457	
v/s Ratio Prot	c0.00		c0.08	0.38	c0.63	
v/s Ratio Perm						
v/c Ratio	0.06		1.14	0.46	0.91	
Uniform Delay, d1	35.4		37.3	2.0	10.1	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.2		121.6	0.1	5.3	
Delay (s)	35.6		158.9	2.1	15.4	
Level of Service	D		F	A	B	
Approach Delay (s)	35.6			17.7	15.4	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	80.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	120	60	60	2538	1551	190
Future Volume (vph)	120	60	60	2538	1551	190
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	0.95	0.95	
Frt	0.95		1.00	1.00	0.98	
Flt Protected	0.97		0.95	1.00	1.00	
Satd. Flow (prot)	1722		1770	3539	3481	
Flt Permitted	0.97		0.95	1.00	1.00	
Satd. Flow (perm)	1722		1770	3539	3481	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	63	63	2672	1633	200
RTOR Reduction (vph)	13	0	0	0	5	0
Lane Group Flow (vph)	176	0	63	2672	1828	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)	19.6		7.2	113.3	101.6	
Effective Green, g (s)	19.6		7.2	113.3	101.6	
Actuated g/C Ratio	0.14		0.05	0.80	0.72	
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)	237		89	2825	2492	
v/s Ratio Prot	c0.10		0.04	c0.75	0.52	
v/s Ratio Perm						
v/c Ratio	0.74		0.71	0.95	0.73	
Uniform Delay, d1	58.7		66.3	11.8	12.1	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	11.9		22.6	7.7	1.1	
Delay (s)	70.6		88.9	19.4	13.2	
Level of Service	E		F	B	B	
Approach Delay (s)	70.6			21.0	13.2	
Approach LOS	E			C	B	

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	141.9	Sum of lost time (s)	13.5
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	120	60	60	2478	1421	190
Future Volume (vph)	120	60	60	2478	1421	190
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	0.95	0.95	
Frt	0.95		1.00	1.00	0.98	
Flt Protected	0.97		0.95	1.00	1.00	
Satd. Flow (prot)	1722		1770	3539	3477	
Flt Permitted	0.97		0.95	1.00	1.00	
Satd. Flow (perm)	1722		1770	3539	3477	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	63	63	2608	1496	200
RTOR Reduction (vph)	17	0	0	0	9	0
Lane Group Flow (vph)	172	0	63	2608	1687	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)	15.1		4.1	84.6	76.0	
Effective Green, g (s)	15.1		4.1	84.6	76.0	
Actuated g/C Ratio	0.14		0.04	0.78	0.70	
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)	239		66	2754	2431	
v/s Ratio Prot	c0.10		0.04	c0.74	0.49	
v/s Ratio Perm						
v/c Ratio	0.72		0.95	0.95	0.69	
Uniform Delay, d1	44.8		52.2	10.2	9.6	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	9.9		94.1	7.9	0.9	
Delay (s)	54.7		146.3	18.1	10.4	
Level of Service	D		F	B	B	
Approach Delay (s)	54.7			21.1	10.4	
Approach LOS	D			C	B	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	108.7	Sum of lost time (s)	13.5
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	80	2218	344	310	1831	83
Future Volume (vph)	80	2218	344	310	1831	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.95	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3183	2584	3282	1468	3183	3282
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3183	2584	3282	1468	3183	3282
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	84	2335	362	326	1927	87
RTOR Reduction (vph)	0	1023	0	289	0	0
Lane Group Flow (vph)	84	1312	362	37	1927	87
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	51.0	51.0	17.0	17.0	70.0	91.0
Effective Green, g (s)	51.0	51.0	17.0	17.0	70.0	91.0
Actuated g/C Ratio	0.34	0.34	0.11	0.11	0.47	0.61
Clearance Time (s)	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
Lane Grp Cap (vph)	1082	878	371	166	1485	1991
v/s Ratio Prot	0.03		c0.11		c0.61	0.03
v/s Ratio Perm		c0.51		0.03		
v/c Ratio	0.08	1.49	0.98	0.22	1.30	0.04
Uniform Delay, d1	33.6	49.5	66.3	60.5	40.0	11.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	228.5	39.9	0.7	139.0	0.0
Delay (s)	33.6	278.0	106.2	61.2	179.0	11.9
Level of Service	C	F	F	E	F	B
Approach Delay (s)	269.5		84.9			171.8
Approach LOS	F		F			F

Intersection Summary			
HCM 2000 Control Delay	206.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.8%	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												
Traffic Volume (vph)	780	1666	100	160	718	1500	440	287	480	800	773	690
Future Volume (vph)	780	1666	100	160	718	1500	440	287	480	800	773	690
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9	4.9	4.9	4.9	4.9	4.4	4.9	4.9	4.4	4.9	4.9
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	0.88	0.97	0.95	1.00	0.97	0.95	0.88
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	0.98
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	1446	3183	4715	2551	3183	3282	1468	3183	3282	2545
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	1446	3183	4715	2551	3183	3282	1468	3183	3282	2545
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	821	1754	105	168	756	1579	463	302	505	842	814	726
RTOR Reduction (vph)	0	0	64	0	0	467	0	0	241	0	0	416
Lane Group Flow (vph)	821	1754	41	168	756	1112	463	302	264	842	814	310
Confl. Peds. (#/hr)			1	1								2
Confl. Bikes (#/hr)			2			1						1
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)	23.6	57.9	57.9	13.3	48.1	48.1	22.6	35.1	35.1	24.6	37.1	37.1
Effective Green, g (s)	23.6	57.9	57.9	13.3	48.1	48.1	22.6	35.1	35.1	24.6	37.1	37.1
Actuated g/C Ratio	0.16	0.39	0.39	0.09	0.32	0.32	0.15	0.23	0.23	0.16	0.25	0.25
Clearance Time (s)	4.4	4.9	4.9	4.9	4.9	4.9	4.4	4.9	4.9	4.4	4.9	4.9
Vehicle Extension (s)	2.0	4.8	4.8	3.0	3.0	3.0	2.0	3.3	3.3	2.0	4.4	4.4
Lane Grp Cap (vph)	500	1819	558	282	1511	818	479	767	343	522	811	629
v/s Ratio Prot	c0.26	0.37		0.05	0.16		0.15	0.09		c0.26	c0.25	
v/s Ratio Perm			0.03			c0.44			0.18			0.12
v/c Ratio	1.64	0.96	0.07	0.60	0.50	1.36	0.97	0.39	0.77	1.61	1.00	0.49
Uniform Delay, d1	63.2	45.0	29.1	65.8	41.2	50.9	63.3	48.5	53.7	62.7	56.5	48.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	297.8	13.8	0.1	3.4	0.3	169.8	32.1	0.4	10.4	284.7	32.5	1.0
Delay (s)	361.0	58.8	29.2	69.1	41.5	220.8	95.5	48.8	64.1	347.4	89.0	49.4
Level of Service	F	E	C	E	D	F	F	D	E	F	F	D
Approach Delay (s)		150.2			156.4			71.9			168.2	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	145.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.1
Intersection Capacity Utilization	96.6%	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												
Traffic Volume (vph)	1096	1840	0	0	443	700	0	0	0	700	350	1381
Future Volume (vph)	1096	1840	0	0	443	700	0	0	0	700	350	1381
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
Lane Util. Factor	0.97	0.91			0.91	0.88				0.97	1.00	0.88
Frpb, ped/bikes	1.00	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
Frt	1.00	1.00			1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	3183	4715			4715	2547				3183	1727	2584
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	3183	4715			4715	2547				3183	1727	2584
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1154	1937	0	0	466	737	0	0	0	737	368	1454
RTOR Reduction (vph)	0	0	0	0	0	588	0	0	0	0	0	900
Lane Group Flow (vph)	1154	1937	0	0	466	149	0	0	0	737	368	554
Confl. Peds. (#/hr)			7	7					2	2		
Confl. Bikes (#/hr)			3			2						
Turn Type	Prot	NA			NA	Perm				Split	NA	Perm
Protected Phases	7	4			8					6	6	
Permitted Phases						8						6
Actuated Green, G (s)	29.0	49.0			16.0	16.0				22.0	22.0	22.0
Effective Green, g (s)	29.0	49.0			16.0	16.0				22.0	22.0	22.0
Actuated g/C Ratio	0.37	0.62			0.20	0.20				0.28	0.28	0.28
Clearance Time (s)	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
Lane Grp Cap (vph)	1168	2924			954	515				886	480	719
v/s Ratio Prot	c0.36	c0.41			0.10					c0.23	0.21	
v/s Ratio Perm						0.06						0.21
v/c Ratio	0.99	0.66			0.49	0.29				0.83	0.77	0.77
Uniform Delay, d1	24.8	9.7			27.9	26.7				26.8	26.1	26.2
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	23.2	0.6			0.4	0.3				6.7	7.2	5.0
Delay (s)	48.0	10.2			28.3	27.0				33.5	33.3	31.2
Level of Service	D	B			C	C				C	C	C
Approach Delay (s)		24.3			27.5			0.0			32.1	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.8%	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												
Traffic Volume (vph)	1900	200	576	464	200	800	273	2065	443	1025	1345	630
Future Volume (vph)	1900	200	576	464	200	800	273	2065	443	1025	1345	630
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	0.95	1.00	0.97	0.95	1.00	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	1.00	1.00	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	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	3282	1468	3183	3282	1468	3183	4715	1468	3183	4715	2532
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	3282	1468	3183	3282	1468	3183	4715	1468	3183	4715	2532
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2000	211	606	488	211	842	287	2174	466	1079	1416	663
RTOR Reduction (vph)	0	0	96	0	0	164	0	0	154	0	0	337
Lane Group Flow (vph)	2000	211	510	488	211	678	287	2174	312	1079	1416	326
Confl. Peds. (#/hr)							3					3
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	46.0	64.0	64.0	12.0	30.0	30.0	10.0	36.0	36.0	22.0	48.0	48.0
Effective Green, g (s)	46.0	64.0	64.0	12.0	30.0	30.0	10.0	36.0	36.0	22.0	48.0	48.0
Actuated g/C Ratio	0.31	0.43	0.43	0.08	0.20	0.20	0.07	0.24	0.24	0.15	0.32	0.32
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)	976	1400	626	254	656	293	212	1131	352	466	1508	810
v/s Ratio Prot	c0.63	0.06		0.15	0.06		0.09	c0.46		c0.34	0.30	
v/s Ratio Perm			0.35			c0.46			0.21			0.13
v/c Ratio	2.05	0.15	0.82	1.92	0.32	2.31	1.35	1.92	0.89	2.32	0.94	0.40
Uniform Delay, d1	52.0	26.3	37.8	69.0	51.3	60.0	70.0	57.0	55.0	64.0	49.6	39.8
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	475.7	0.1	8.0	428.9	0.3	601.9	186.9	418.3	22.3	598.7	11.5	0.3
Delay (s)	527.7	26.4	45.8	497.9	51.6	661.9	256.9	475.3	77.3	662.7	61.1	40.1
Level of Service	F	C	D	F	D	F	F	F	E	F	E	D
Approach Delay (s)		386.5			526.4			390.5			262.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	370.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.12		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	153.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

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	Buildout + Project AM	Buildout + Project PM	AM Fair Share	PM Fair Share
2	946	-	3804	-	85	-	4750	-	2.23%	-
3	260	-	6060		85		6320		1.40%	-
4	-	978	-	5170	-	138	-	6148	-	2.67%
5	973	-	8942	-	292	-	9915	-	3.27%	
6	680	-	7150	-	402	-	7830	-	5.62%	-
7	-	221	-	8357	-	1505	-	9862	-	15.61%
8	-	1512	-	5769	-	705	-	6474	-	14.21%
9	-	1503	-	5137	-	831	-	5968	-	18.61%
10	1444	-	6046	-	813	-	7490	-	13.45%	-
11	941	-	10382	-	983	-	11365	-	9.43%	-
13	1595	-	9927	-	73	-	10000	-	0.87%	-
14	705	-	9458	-	37	-	9495	-	0.42%	-
16	0	-	5485	-	546	0	6031	0	9.05%	-
17	0	-	3698	-	196	0	3894	0	5.03%	-
18	-	0	-	3900	-	620	-	4520	-	13.72%
19	-	0	-	4000		330		4330	-	7.62%
20	-	292	-	0	-	214	-	4866	-	4.68%
21	370	-	0	-	182	-	7645	-	2.50%	-
22	338	-	0	-	146	-	6520	-	2.36%	-
23	432	-	9248	-	134	-	9680	-	1.45%	-
24	-	860	-	9061	-	188	-	9921		2.07%

Fair Share = Proposed Project Trips / (Cumulative Projects Trips + Proposed Project Trips)

Appendix S
San Diego Forward RTP 2050 – Relevant Excerpts

Table 6.2 – Phased Transit Services – Revenue Constrained Plan

Decade	Service	Route	Description	Peak Headway (Minutes)	Off-Peak Headway (Minutes)
2018	COASTER	398	Double tracking/Increased Frequency between Oceanside and downtown San Diego with extension to Convention Center/Petco Park	20	current
2018	Trolley	510	Mid-Coast LRT Extension (peak frequencies 7.5 to downtown/15 to UTC)	7.5/15	15
2018	Trolley	530	Green Line Extend to downtown - Bayside	15	15
2018	BRT	470	Escondido-UTC/UCSD via Mira Mesa Blvd	10	-
2018	BRT	607	Rancho Bernardo - downtown Express	10	-
2018	BRT	608	Escondido - downtown Express	10	-
2018	BRT	610	Temecula (Peak Only)/Escondido - downtown	10	10
2018	BRT	628	South Bay BRT (Otay Mesa - downtown) via Otay Ranch/Millenia	15	-
2018	BRT	680	Otay Mesa to Sorrento Mesa via I-805 Corridor, Otay Ranch/Millenia, National City, Southeastern San Diego, Kearny Mesa	15	15
2018	BRT	688	San Ysidro to Sorrento Mesa Express	15	-
2018	BRT	689	Millenia/Otay Ranch to UTC/Torrey Pines Express	15	-
2018	Rapid	15	Mid-City Rapid (SDSU - downtown) via Mid-City, El Cajon and Park Blvds	10	10
2018	Rapid	201/202	UTC Area Super Loop	10	15
2018	Rapid	350	Escondido to Del Lago via Escondido Blvd and Bear Valley	10	10
2020	Streetcar	554	Hillcrest/Balboa Park/downtown San Diego Loop	10	10
2020	BRT	90	Santee/El Cajon Transit Centers to downtown via SR 94	15	-
2020	BRT	640	I-5 - San Ysidro to downtown and Kearny Mesa via I-5 shoulder lane/HOV lanes, downtown, Hillcrest, Mission Valley	15	15
2020	BRT	870	El Cajon to UTC/Campus Point via Santee, SR 52, I-805 (Peak only)	10	-
2020	Rapid	10	La Mesa to Ocean Beach via Mid-City, Hillcrest, Old Town	10	10
2020	Shuttle	448/449	San Marcos Shuttle	15	15
2020	Airport Express		I-5 from McClellan-Palomar Airport to San Diego International Airport	30	30
2020	Airport Express		I-15 from Escondido Transit Center to San Diego International Airport	30	30
2020	Airport Express		I-15 from Escondido Transit Center to Crossborder Facility	30	30
2020			Local Bus Routes - 15 minutes in key corridors	15	15

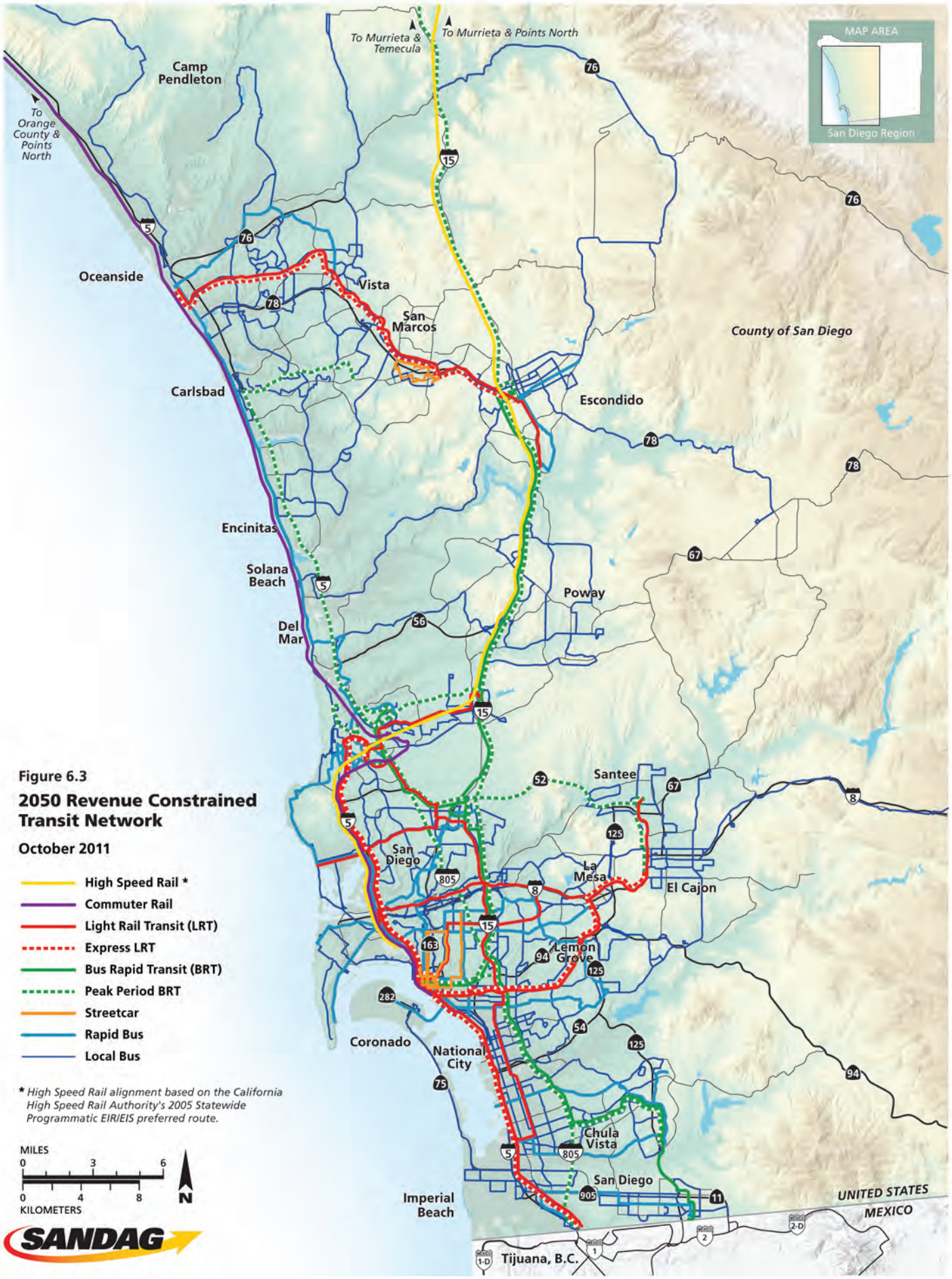

Figure 6.3

2050 Revenue Constrained Transit Network

October 2011

Table 6.2 – Phased Transit Services – Revenue Constrained Plan (Continued)

Decade	Service	Route	Description	Peak Headway (Minutes)	Off-Peak Headway (Minutes)
2035	Rapid	637	North Park to 32nd Street Trolley via Golden Hill	10	10
2035	Rapid	638	San Ysidro to Otay Mesa via Otay, SR 905 Corridor	10	10
2035	Shuttle	448/449	San Marcos - Increase Frequencies	10	10
2035			Local Bus Routes - 10 minutes in key corridors	10	10
2040	Trolley	520	Orange Line - Increased Frequencies	7.5	7.5
2040	Trolley	522	Orange Line Express - El Cajon to downtown San Diego	10	10
2040	Trolley	530	Green Line Extend to downtown - Bayside	7.5	7.5
2040	Trolley	540	Blue Line Express - UTC to San Ysidro via downtown	10	10
2050	Trolley	560	SDSU to downtown (Phase 2) via Mid-City, El Cajon and Park Blvds	7.5	7.5
2050	Trolley	562	UTC to San Ysidro via Kearny Mesa, Mission Valley, Mid-City, Southeastern San Diego, National City, Chula Vista via Highland Ave/4th Avenue	7.5	10

Lumina Development

April 2018

Prepared for:

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OWD Work Order No.:

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SUB-AREA WATER MASTER PLAN
FOR LUMINA DEVELOPMENT

April 2018

CH2M Project No.: 677633

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Figures

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Figure 1-2. Project Phasing

Figure 3-1. Proposed Ultimate SPA Water System (Phase III)

Figure 3-2. Proposed Project Water System (Lumina)

Figure 3-3. Proposed Project Phase 1 Water System

Project Team

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Abbreviations and Terms

AAD	Average annual day
ac	Acre
CFC	California Fire Code
CIP	Capital Improvement Program
City	City of San Diego
DU	Dwelling Unit
fps	Feet per second
ft	Feet
gpd/ac	Gallons per day per acre
gpm	Gallons per minute
in	Inch
MDD	Maximum Day Demand
MG	Million gallons
MGD	Million gallons per day
OWD	Otay Water District
PH	Peak Hour
PHD	Peak Hour Demand
Project	Lumina Development
psi	Pounds per square inch
SAMP	Sub-Area Master Plan
SDCWA	San Diego County Water Authority
SPA	Specific Plan Area
WFMP	Water Facilities Master Plan
WRMP	Water Resource Master Plan
WSAV	Water Supply Assessment and Verification

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CHAPTER 1 INTRODUCTION

1.1 PURPOSE

The purpose of the study is to determine the water distribution system requirements to serve the Otay Mesa Central Village Specific Plan Area (SPA) and the Lumina Development (Project), which represents a portion of the SPA. This approach is necessary to adequately size facility through the Project for the entire SPA area. The SAMP is a requirement of development established by the land use agency, the City of San Diego (City) and the water purveyor, Otay Water District (OWD) for the Project Tentative Map. Accordingly, this SAMP will primarily be used by OWD for improvement plan checks and review of the potable water system sizing. The Project and ultimate potable water facilities presented in this SAMP meet OWD planning and design criteria. Future facilities to serve the remaining SPA development at ultimate buildout are shown conceptually in this report; however, they will be analyzed by other developers as part of future proposed tentative maps.

1.2 SCOPE

The Project is the first anticipated development in the SPA and will be developed in two phases, a north and south phase. Infrastructure, including all utilities, roadways, and proposed grading, will be designed to support the Project and, where required, sized for ultimate buildout. Therefore, this SAMP includes the potable water system that will serve the Project (Phase I and Phase II) and ultimate development of the SPA (Phase III) consistent with OWD's design criteria.

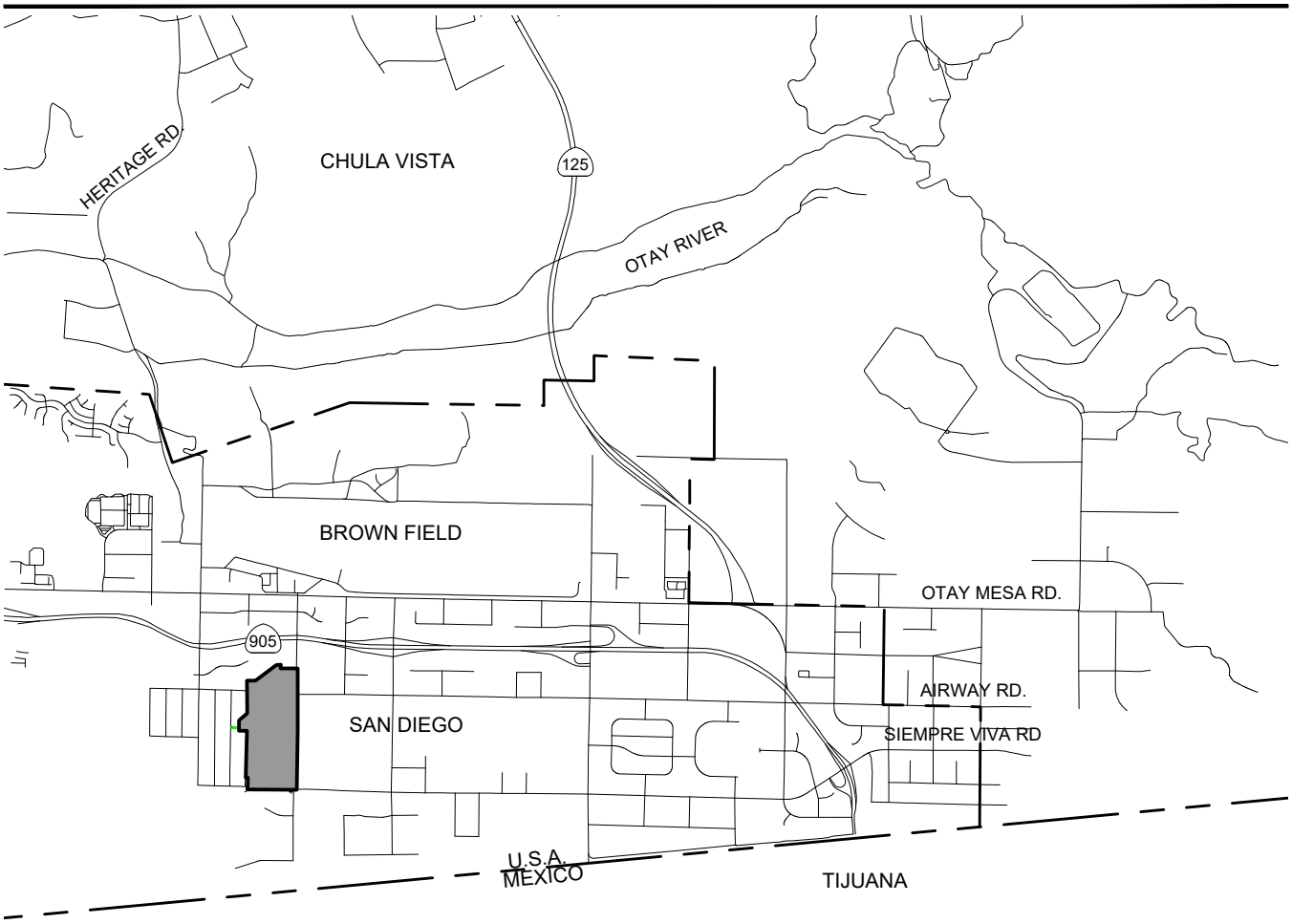
The scope of this SAMP includes the following principal elements:

- Estimate the potable water demands for the Project and SPA.
- Evaluate the existing capacity of regional pumping, storage, and transmission facilities to serve the proposed developments based on anticipated development demands and required fire flows. Identify any new regional facilities required to serve the Project and SPA.
- Recommend the on-site facilities required to serve the Project and SPA based on OWD criteria.

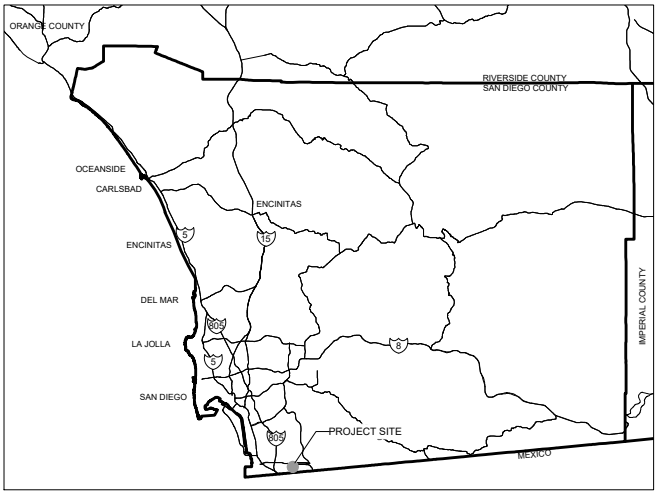
1.3 PLANNING AREA

The Project is located in the City of San Diego within the Otay Mesa Central Village Specific Plan Area (SPA) and will be served by OWD. The SPA is bounded by State Route 905 to the north, Siempre Viva Road to the south, Cactus Road to the east, and Spring Canyon to the west. The project encompasses the southwestern portions of the SPA and will include 1,868 multi-family residential units. A project vicinity map is provided in Figure 1-1. Project phasing and tentative map lot numbering are shown in Figure 1-2.

The SPA analyzed in this SAMP includes approximately 229 net acres and 4,485 residential units. Table 1-1 summarizes the various land uses associated with the Project and remaining development area within the SPA. Residential land use allocations are based on target densities. Actual land use intensities for both residential and non-residential land uses within the SPA may vary and will be determined at the time of final site plan and tentative map approvals by the City.



VICINITY MAP



LOCATION MAP

PROJECT SITE

N

0 5000 10000

SCALE: 1" = 5000'

PROJECT LOCATION
FIGURE 1-1

PROJECT PHASING
FIGURE 1-2

Table 1-1. SPA Land Use Summary

Land Use	Net Acres (nac)	Max Commercial Square Footage (sq ft)	Residential Units (DUs)
Project (Phase I)			
Commercial		62,525	
Mixed Use Residential	32.58		1,129
Parks and Open Space	7.21		
Institutional			
Circulation	16.19		
Subtotal	55.98	62,525	1,129
Project (Phase II)			
Commercial			
Mixed Use Residential	22.58		739
Parks and Open Space	8.57		
Institutional	6.30		
Subtotal	37.44		739
Remaining SPA (Phase III)			
Commercial		77,175	
Mixed Use Residential	91.11*		2,617
Parks and Open Space	15.45		
Institutional	6.8		
Circulation	22.41		
Subtotal	135.77*	77,175	2,617
Total SPA	229.2	139,700	4,485

*TM Lot 21 Area has been subtracted from Mixed Use Residential Area since it has been already accounted in the Lumina Development Phase II

As part of the Otay Mesa Community Plan Update, the proposed Project was included in the required Water Supply Assessment and Verification (WSAV) report in accordance with Senate Bill 610 and Senate Bill 221. The OWD Board approved the WSAV report in August 2007, affirming OWD's ability to supply water to the SPA. The WSAV report estimated a potential water demand of 1.45 million gallons per day (mgd) for the entire SPA, which is slightly higher than the potable demand estimate of 1.35 mgd presented in this SAMP.

Based on the proposed graded topography, the Project lies within OWD's 870 potable water pressure zone (Zone). The current Tentative Map dated April 2018, serves as a basis for utility locations and preliminary sizing, proposed graded elevations, and allowable land uses per lot.

CHAPTER 2 LAND USE

This chapter contains a summary of the land use plan, residential units, non-residential square footages, and proposed lotting for the Project.

2.1 INTRODUCTION

The Project SAMP is based on proposed land uses, street layouts, and graded elevations presented in the current Tentative Map. Appendix A includes a reduced copy of the Tentative Map title sheet, which is on file with the City of San Diego and Figure 1-2 presents proposed Project lot numbering.

2.2 PROPOSED LAND USES

Proposed land uses within the Project are summarized in Table 2-1. The proposed land uses include residential, mixed-use residential, institutional, parks, and open space areas. The Project encompasses approximately 77 acres of the 229 acres in the SPA. The lots being developed for the Project will be primarily accessed off Cactus Road, an extension of Ariway Road and two new streets in the south (Street C and Central Main Street).

Table 2-1. SPA Land Use by TM Lot

TM Lot	Planning Area.	Land Use	Net Acres (nac)
Phase I (Project)			
1	9	Medium High Mixed Use	6.97
2	9	Medium High Mixed Use	4.19
3	4	Medium High Mixed Use	4.17
4	4	Medium High Mixed Use	3.93
5	4	Medium High Mixed Use	2.98
6	16	Park	3.39
7	4	Medium High Mixed Use	3.14
8	3	Medium High Mixed Use	1.90
9	3	Medium High Mixed Use	2.04
10	3	Medium High Mixed Use	2.49
22	8	Basin	1.04
23	20	Open Space	1.89
24	20	Open Space	0.89
25	5	Medium Density Multi Family (Developed as recreation area)	0.77
		Subtotal	39.79
Phase II (Project)			
11	5	Medium Density Multi Family	4.38
12	5	Medium Density Multi Family	3.06
13	5	Medium Density Multi Family	4.44
14	5	Medium Density Multi Family	5.03
15	14	Institutional	2.32
16	14	Institutional	1.53
17	14	Institutional	2.43
18	18	Park	3.50
19	8	Low Density Multi Family	5.68
20	8	Drainage Basin	2.64
21	8/18	Slope Area	2.43
-	-	-	37.44
		Total Ultimate	77.23

TM Lot	Planning Area.	Land Use	Net Acres (nac)
Phase III (Remaining SPA Areas)			
-	1	Medium High Mixed Use	3.50
-	2	Medium High Multi Family	6.70
-	3	Medium High Mixed Use	2.60
-	4	Medium High Mixed Use	6.70
-	5	Park	3.50
-	6	Medium Density Multi Family	4.80
-	7	Medium Density Multi Family	7.70
-	8	Open Space	1.30
-	9	Low Density Multi Family	5.40
-	10	Open Space	4.40
-	11	Low Density Multi Family	7.70
-	12	Park	2.50
-	13	Institutional	7.76
-	14	Medium High Mixed Use	3.97
-	15	Open Space	4.22
-	17	Medium Density Multi Family	0.68
	19	Medium Density Multi Family	1.12
-	20	Low Density Multi Family	6.47
-	21	Medium Density Multi Family	0.88
-	22	Medium High Mixed Use	0.60
-	23	Low Density Multi Family	0.95
-	24	Medium High Mixed Use	5.20
-	25	Medium Density Multi Family	9.70
-	26	Medium Density Multi Family	9.40
-	27	Medium High Mixed Use	5.70
-	28	Park	3.50
-	29	Open Space	3.20
-	--	Circulation	37.25
Subtotal	--	--	157
Total	--	--	229

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CHAPTER 3 POTABLE WATER SYSTEM

This chapter presents planning criteria used to estimate water demand projections for the SPA and Project and recommends an on-site water distribution system layout. Based on the projections, water system improvements required to provide potable water service are determined. An inventory of existing regional water conveyance and storage facilities is presented and available water system improvements, including regional storage, conveyance, and pumping facilities are described.

3.1 CRITERIA

OWD has established criteria to determine pressure zone boundaries within new and existing developments. The criteria, as is defined in the OWD Water Facilities Master Plan (WFMP), constitute minimum and maximum allowable pressures. Minimum pressure requirements are based on the water system supplying both peak hour domestic and firefighting operational requirements. The maximum pressure limitations are established to protect residential and commercial plumbing as well as distribution piping and appurtenances. In addition, potable water mains are sized to limit the maximum velocity to 10 feet per second (fps) under maximum day demands (MDD) plus fire flow and 6 fps under peak hour (PH) flow conditions. Table 3-1 lists the criteria thresholds within the distribution piping system under specified system operating conditions.

Table 3-1 Potable Water System Criteria

Parameter[1]	Potable Water Criteria
MDD peaking factor	See Appendix B
PH peaking factor	See Appendix B
Hazen-Williams C-factor (12-inch diameter and smaller)	120
Hazen-Williams C-factor (>12-inch diameter)	130
Maximum Velocity, PH	6 fps
Maximum Velocity, MDD + fire	10 fps
Maximum Static Pressure	200 psi
Minimum Static Pressure	65 psi
Minimum Pressure, PH	40 psi
Minimum Pressure, MDD + fire	20 psi
Storage Needs	1.3 MDD + fire
Pumping Needs	MDD + fire recharge

[1]A peaking factor of 2.4 was used for MDD, and a factor of 4.8 was used for PHD. The curves from the 2015 WFMP are included in Appendix B for reference.

The proposed site grading for the Project is anticipated to range from approximately 480 feet to 510 feet. Based on the proposed grading, static pressures are expected to range from approximately 155 psi to 170 psi, respectively, based on the 870 Zone and high water level of the 870-1 reservoir. Based on the high static pressures, it is recommended that a minimum Class 200 pressure rating of pipeline be used. Pressure regulators will be required for water services to individual lots.

3.2 WATER DEMANDS

3.2.1. Unit Demands

Water use projections for the SPA and the Project utilize the District's standard water projection methodology and unit use factors as contained in the OWD WFMP. The WFMP established unit use factors for single and multi-family residential units, industrial, institutional, and commercial land uses, and park irrigation uses, as summarized below:

- Single Family Residential = **500 gpd per dwelling unit**
- Multi-Family Residential = **300 gpd per dwelling unit**
- Commercial/Office = **1,785 gpd per acre (0.041 gpd/sf)**
- Industrial = **893 gpd per acre**
- Institutional = **1,785 gpd per acre**
- Parks = **2,155 gpd per acre**

3.2.2. Project Demands (Phase I & II)

Table 3-2 presents the projected average annual demand (AAD) for the Project by Phase. The demand projections were estimated by applying the unit demand factors to the total anticipated building square footage and/or residential dwelling units. The total estimated potable water use for Phase I and II of the project is 524,800 gpd (0.53 mgd).

The Maximum Day Demand (MDD) and Peak Hour Demand (PHD) are computed by multiplying the AAD by the appropriate peaking factors. OWD's peaking curves from the WFMP, provided in Appendix B for reference, was used to determine the appropriate MDD and PHD peaking factors. Based on an AAD of 0.53 mgd, a peaking factor of 2.7 was used to estimate a MDD of 984 gpm (1.42 mgd), and a peaking factor of 5.5 was used to estimate a PHD of approximately 2,000 gpm (2.89 mgd).

Table 3-2. Phase I and II (Project) Average Annual Day Potable Water Demands

TM Lot	Planning Area.	Land Use	Net Acres (nac)	Non-Residential Square Footage	Residential Units (DUs)	Unit Demand		Total Demand (mgd)
						gpd/sf	gpd/DU	
Phase I (Project)								
1	9	Medium High Mixed Use	6.97	9,410	188	0.041	300	0.06
2	9	Medium High Mixed Use	4.19	15,352	115	0.041	300	0.04
3	4	Medium High Mixed Use	4.17	7,975	173	0.041	300	0.05
4	4	Medium High Mixed Use	3.93	7,700	167	0.041	300	0.04
5	4	Medium High Mixed Use	2.98	5,775	126	0.041	300	0.04
6	16	Park	3.39		0	0.050	-	0.01
7	4	Medium High Mixed Use	3.14	6,050	132	0.041	300	0.04
8	3	Medium High Mixed Use	1.90	3,284	73	0.041	300	0.02
9	3	Medium High Mixed Use	2.04	3,490	78	0.041	300	0.02
10	3	Medium High Mixed Use	2.49	3,489	77	0.041	300	0.02
22	8	Basin	1.04		0	0.050	-	0.00
23	20	Open Space	1.89		0	0.050	-	0.00
24	20	Open Space	0.89		0	0.050	-	0.00
25	5	Medium Density Multi Family (Developed as recreation area)	0.77		0	0.050	300	0.00
		Subtotal	**39.79**	**62,525**	**1,129**	**-**	**-**	**0.29**
Phase II (Project)								
11	5	Medium Density Multi Family	4.38		137	0.041	300	0.04
12	5	Medium Density Multi Family	3.06		94	0.041	300	0.03
13	5	Medium Density Multi Family	4.44		137	0.041	300	0.04
14	5	Medium Density Multi Family	5.03		158	0.041	300	0.05
15	14	Institutional	2.32		0	0.041	-	0.00
16	14	Institutional	1.53		0	0.041	-	0.00
17	14	Institutional	2.43		0	0.041	-	0.00
18	18	Park	3.50		0	0.050	-	0.01
19	8	Low Density Multi Family	5.68		213	0.041	300	0.06
20	8	Drainage Basin	2.64			0.041	-	0.00
21	8/18	Slope Area	2.43			0.041	-	0.00
-	**-**	**-**	**37.44**	**0.00**	**739**	**-**	**-**	**0.24**
		Total Ultimate	**77.23**	**62,525**	**1,868**			**0.53**

3.2.3. Ultimate Demands (SPA)

The demand projections were estimated by applying the unit demand factors to the total anticipated building square footage and/or residential dwelling units. The total estimated potable water use for the Central Village is 1.35 mgd (Table 3-3). This estimate is consistent with the water demand estimate of 1.45 mgd presented in the WSA.

Based on an ultimate AAD of 1.35 mgd, a peaking factor of 2.4 was used to estimate a MDD of 2,250 gpm (3.24 mgd), and a peaking factor of 4.8 was used to estimate a PHD of approximately 4,500 gpm (6.48 mgd). The ultimate demands for the SPA are summarized by planning area in Table 3-3 below.

Table 3-3 Ultimate Average Annual Day Potable Water Demands

Land Use	Net Acres (nac) TM	Max Commercial Square Footage (sq ft)	Residential Units (DUs)	Total Demand (mgd)
Project (Phase I)				
Subtotal	55.98	62,525	1,129	0.29
Project (Phase II)				
Subtotal	37.44		739	0.24
Remaining SPA (Phase III)				
Subtotal	135.77*	77,175	2,617	0.82
Total SPA	229.2	139,700	4,485	1.35

3.2.4 Fire Flow Requirements

The City of San Diego Fire Department will provide fire protection service to the SPA and the Project. The City utilizes the California Fire Code (CFC). The CFC requires the construction of fire sprinkler systems for all new residential development. In addition to the above standards the City also utilizes the CFC to provide guidelines to distribute total fire flow between multiple hydrants in the water system.

OWD has historically approved planning level fire flows based on general planned land use for the purposes of sizing major components of its water system including pump stations, reservoirs and transmission systems. These fire flow requirements are consistent with other San Diego County water agencies, including the City of San Diego and City of Carlsbad, for example. Table 3-4 below is an excerpt from the OWD WFMP documenting the current OWD fire flows.

Table 3-4. Master Plan Approved Fire Flows

Land Use	Fire Flow (gpm)	Duration (hrs)
Single Family Residential	1,500	2
Multi-Family Residential	2,500	2
Commercial/Business	3,500	3
Industrial	3,500	4
Schools/Hospitals/Resorts/Hotels	5,000	4

The public water system within the Project is sized to deliver a total fire flow of 5,000 gpm based on a proposed school site (institutional land use), with flows split for each individually block Individual lots will likely be served by a looped onsite private fire sysem, assuming hydrants are required onsite. It is anticipated that most developments will require between 2,500 and 3,500 gpm fire flow demand based on building sizes and construction types.

3.3 REGIONAL WATER FACILITY ANALYSIS

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 870 Pressure Zone water distribution system by the 870 Pump Station to the 11 MG 870-1 reservoir. As part of the District's Capital Improvement Program (CIP), construction of a new pump station to replace the 870 Pump Station is expected to start construction this year.

The Project is located at the westernmost part of the 870 pressure zone and will be supplied by a well looped distribution system, primarily including existing 14 inch and 16 inch diameter mains on Airway Road, a 12 inch diameter main on Siempre Viva Road, and a 10 inch diameter main along Cactus Road.

3.4 HYDRAULIC ANALYSIS

The proposed on-site distribution system was evaluated using a hydraulic computer model and a review of the recently completed WFMP. Analyses consisted of assessing the existing and proposed water system's ability to supply PHD and MDD plus fire conditions based on OWD's design criteria (see Table 3-1). The hydraulic computer model of the proposed system was developed based on an assumed boundary condition HGL of 800 feet at Cactus Road, Siempre Viva Road and Airway Road.

3.4.1. MODEL SCENARIOS

Three development phasing scenarios were modeled. The first scenario represented the ultimate development of the SPA which includes the Project and allows for proper sizing of the water system. The second phasing scenario includes only the Project which is anticipated to be the first development within SPA. The third scenario represented the development of Phase I of the Project. Each scenario was analyzed under max day plus fire and peak hour conditions.

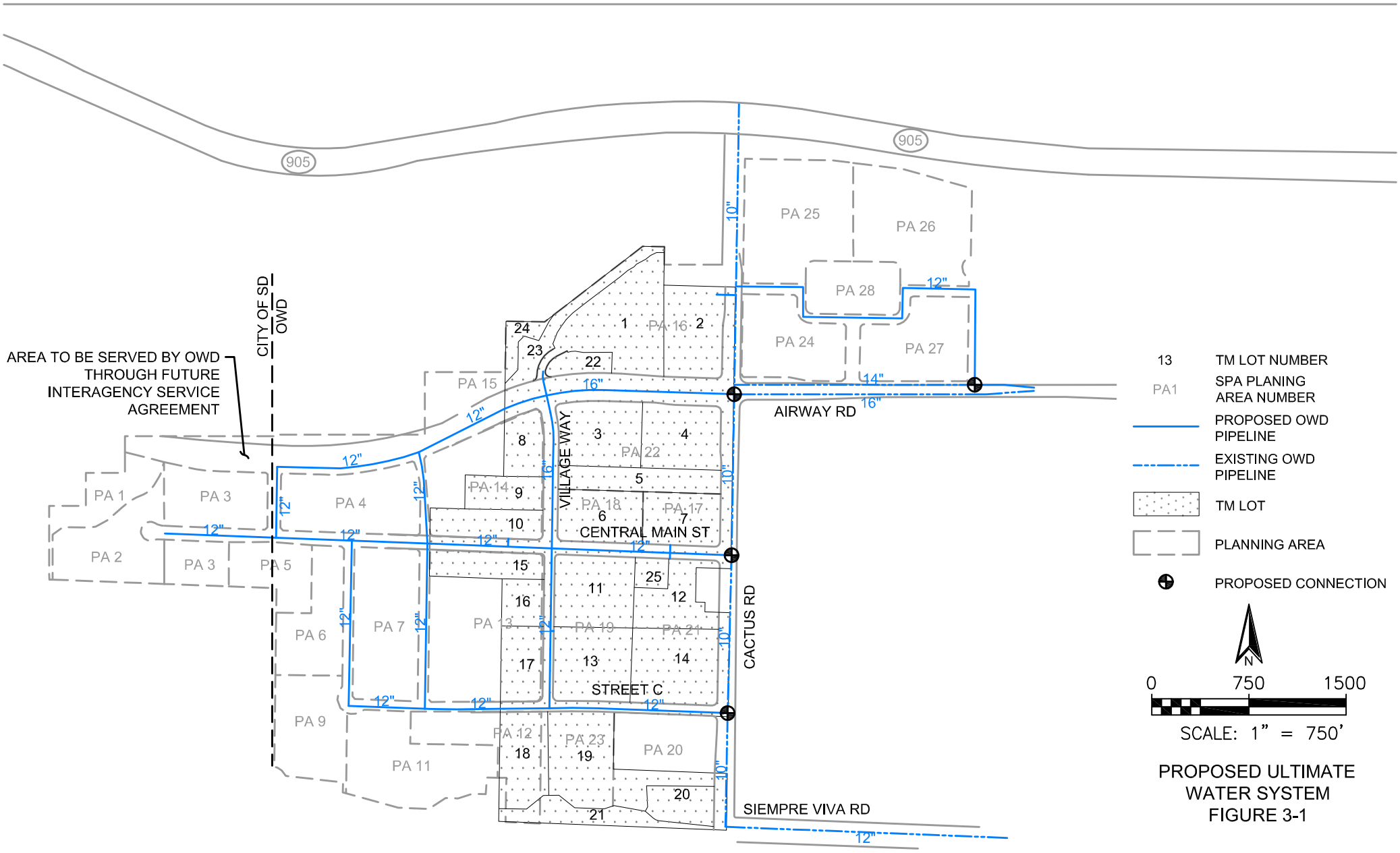
3.4.2. ANALYSIS RESULTS

Water model simulations were performed to verify the hydraulic performance of the existing regional facilities and proposed on-site distribution system. Table 3-5 presents a summary of the simulation results. Appendix B contains the hydraulic simulation results and model pipe and node exhibit.

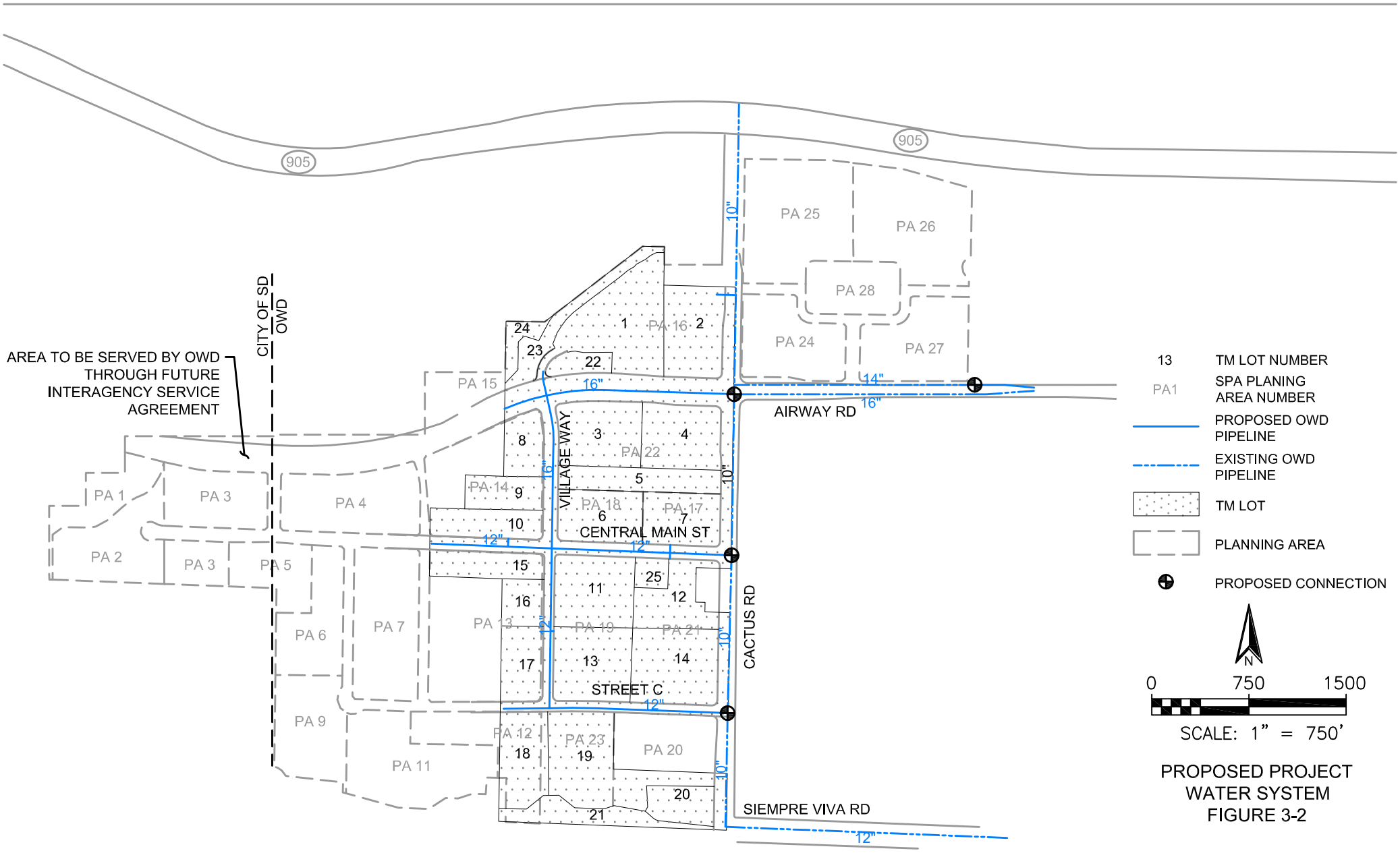
Table 3-5. Hydraulic Analysis Results Summary

Run No.	Description	Fire Condition	Minimum Pressure (psi)	Maximum Velocity
1A	Ultimate – MDD plus 5,000 gpm Fire	J6	113	9.1 fps at P10 (10”)
1B	Ultimate – Peak Hour Demands	N/A		
2A	Project – MDD plus 5,000 gpm Fire	J6	114	8.0 fps at P10 (10”)
2B	Project – Peak Hour Demands	N/A		
3A	Phase I – MDD plus 5,000 gpm Fire	J6	111	8.2 fps at P10 (10”)
3B	Phase I – Peak Hour Demands	N/A		

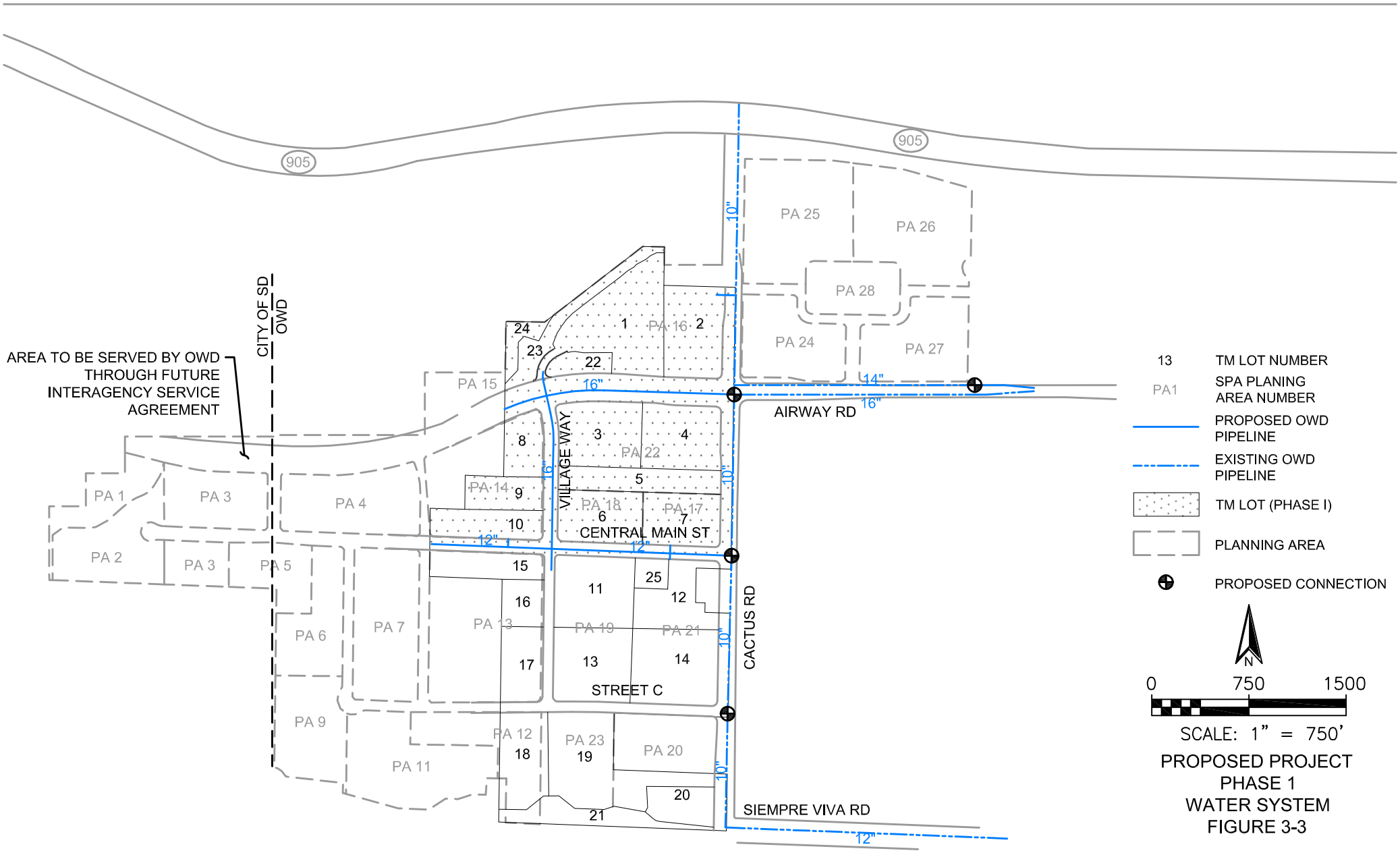
The results presented in Table 3-5 above show that the proposed water system meets the District design criteria under ultimate development conditions and phasing of the project. The recommended ultimate water system is shown in Figure 3-1. The project onsite water system is shown in Figure 3-2, and the proposed Phase I water system is shown in Figure 3-3.



PROPOSED ULTIMATE WATER SYSTEM
FIGURE 3-1



PROPOSED PROJECT WATER SYSTEM
FIGURE 3-2



PROPOSED PROJECT
PHASE 1
WATER SYSTEM
FIGURE 3-3

Appendix A

Peaking Curves

Figure 4-2. MDD Peaking Factor Curve

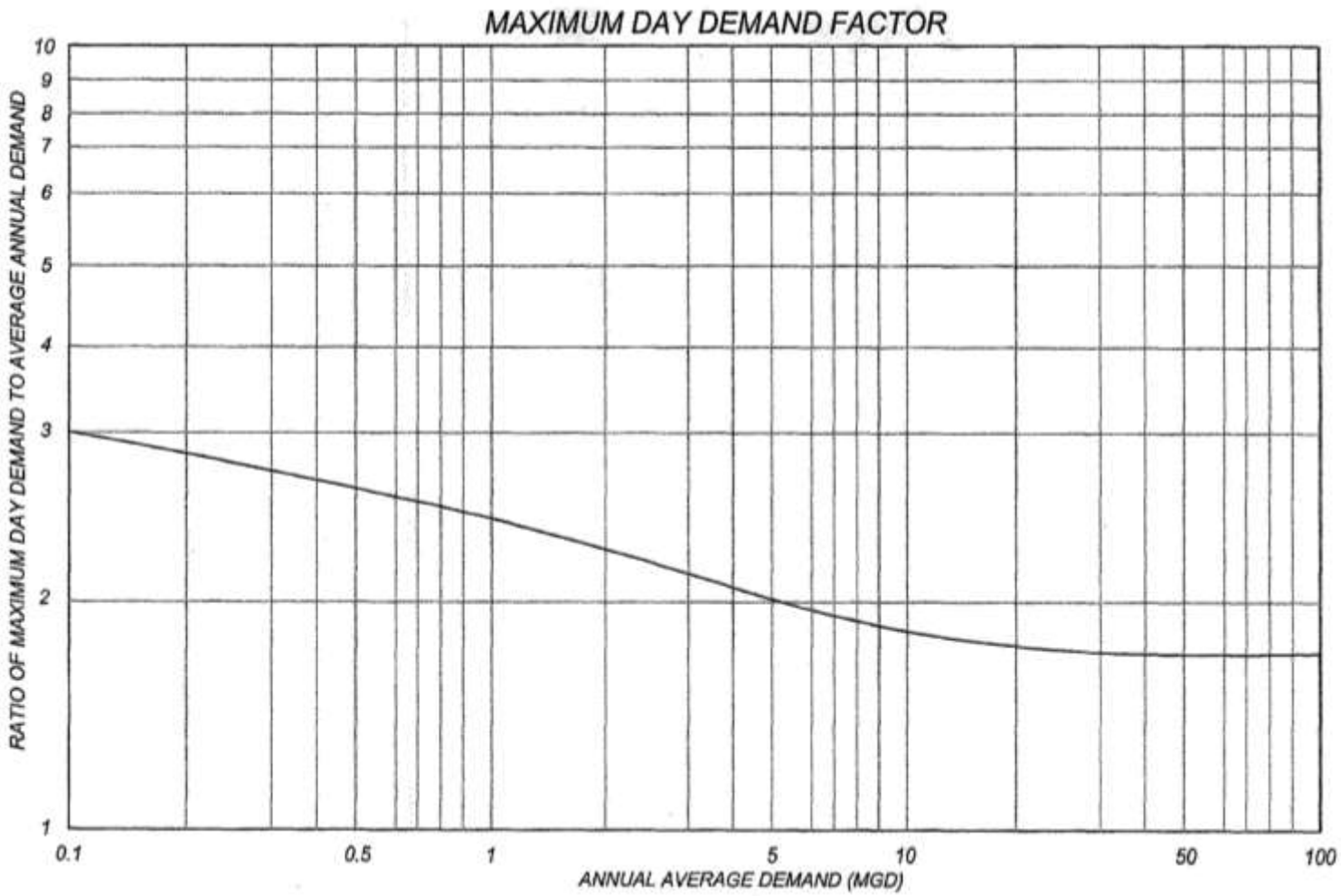
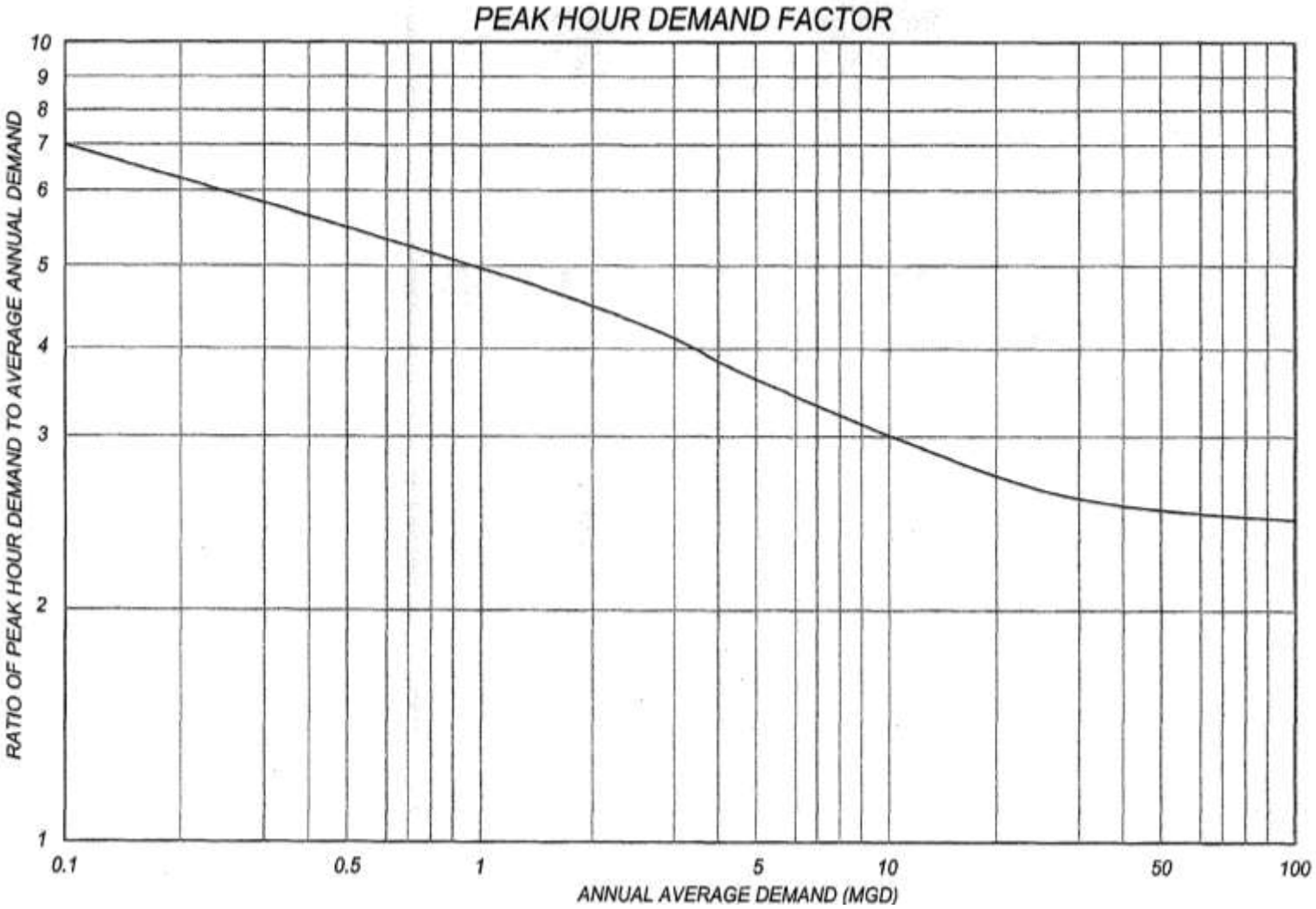
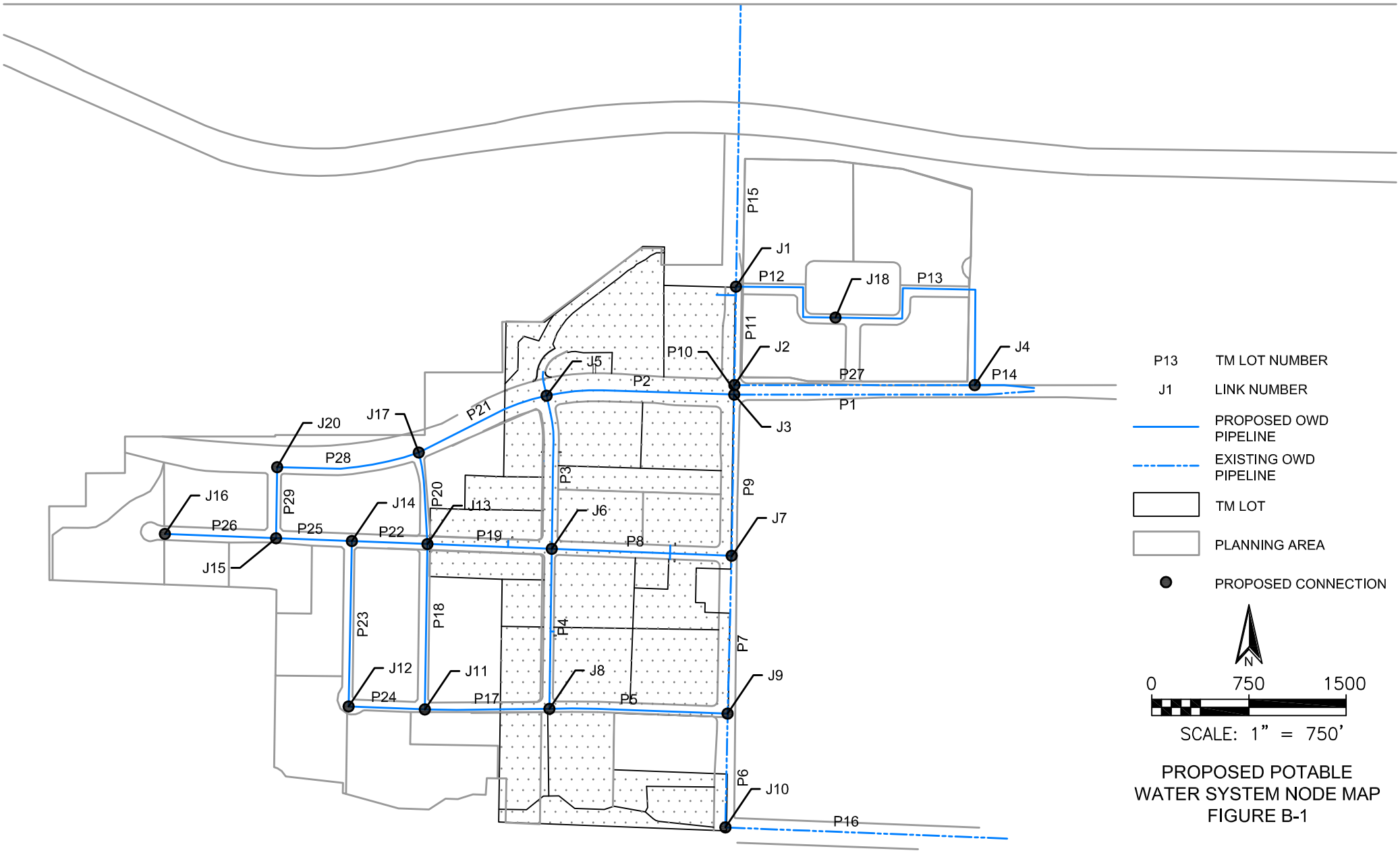


Figure 4-3. Peak Hour Peaking Curve



Appendix B

Model Results



PROPOSED POTABLE WATER SYSTEM NODE MAP
FIGURE B-1

SCENARIO 1. ULTIMATE CONDITION MODEL RESULTS

1A. MAX DAY + FIRE

Node	Demand (gpm)	Head (feet)	Elevation (feet)	Pressure (psi)
J1	199.1	791.1	501.0	125.7
J2	115.9	787.7	510.0	120.4
J3	84.0	785.4	511.0	118.9
J4	100.0	793.7	508.0	123.8
J5	218.4	770.7	498.0	118.2
J6	179.1	768.2	489.0	121.0
J7	145.1	773.3	509.0	114.5
J8	194.9	766.6	481.0	123.8
J9	79.0	773.4	492.0	121.9
J10	-	786.6	475.0	135.0
J11	30.6	758.5	485.0	118.5
J12	150.1	755.9	484.0	117.8
J13	85.3	757.7	498.0	112.5
J14	142.5	751.3	498.0	109.8
J15	1,767.4	738.1	501.0	102.8
J16	1,913.0	729.3	499.0	99.8
J17	56.0	757.3	497.0	112.8
J18	276.5	791.5	511.0	121.6
J20	1,698.9	739.2	495.0	105.8
RES19	(5,316.6)	800.0	800.0	-
RES21	(622.9)	800.0	800.0	-
RES22	(1,496.4)	800.0	800.0	-
Demand =	7,435.9			

Link	Diameter	Flow (gpm)	Velocity (fps)	Headloss (feet)
P1	16	3,128.5	5.0	8.4
P2	16	4,054.3	6.5	13.6
P3	16	1,722.0	2.8	2.8
P4	12	624.8	1.8	1.7
P5	12	(1,285.2)	3.7	6.6
P6	10	(1,450.6)	5.9	19.9
P7	10	(86.5)	0.4	0.1
P8	12	1,096.8	3.1	4.9
P9	10	(1,155.5)	4.7	13.1
P10	10	2,165.3	8.9	41.9
P11	10	748.0	3.1	5.6
P12	12	(319.8)	0.9	0.5
P13	12	(596.3)	1.7	1.6
P14	12	(2,229.6)	6.3	18.2
P15	10	(627.2)	2.6	4.2
P16	12	1,450.6	4.1	8.2
P17	12	1,715.0	4.9	11.2
P18	12	453.1	1.3	1.0
P19	12	(2,015.0)	5.7	15.1
P20	12	402.2	1.1	0.8
P21	12	(2,113.9)	6.0	16.5
P22	12	1,980.5	5.6	14.6
P23	12	(1,081.2)	3.1	4.8
P24	12	(1,231.3)	3.5	6.1
P25	12	2,919.2	8.3	30.0
P26	12	1,913.0	5.4	13.7
P27	14	(1,533.3)	3.2	4.3
P28	12	2,460.1	7.0	21.8
P29	12	(761.2)	2.2	2.5

1B. PEAK HOUR

Node	Demand (gpm)	Head (feet)	Elevation (feet)	Pressure (psi)
J1	381.5	794.9	501.0	127.3
J2	222.1	794.8	510.0	123.4
J3	161.1	794.5	511.0	122.8
J4	191.7	796.7	508.0	125.1
J5	418.6	791.1	498.0	127.0
J6	343.3	790.5	489.0	130.7
J7	278.1	791.3	509.0	122.3
J8	373.6	790.2	481.0	134.0
J9	151.4	791.5	492.0	129.8
J10	-	795.7	475.0	139.0
J11	58.7	789.6	485.0	132.0
J12	287.7	789.2	484.0	132.3
J13	163.6	789.6	498.0	126.4
J14	273.2	789.1	498.0	126.1
J15	192.3	788.9	501.0	124.7
J16	471.5	788.2	499.0	125.3
J17	107.2	789.7	497.0	126.8
J18	530.0	794.9	511.0	123.0
J20	61.1	789.1	495.0	127.4
RES19	(3,416.8)	800.0	800.0	-
RES21	(465.0)	800.0	800.0	-
RES22	(785.0)	800.0	800.0	-
Demand =	4,666.8			

Link	Diameter	Flow (gpm)	Velocity (fps)	Headloss (feet)
P1	16	1,848.5	3.0	3.2
P2	16	1,833.7	2.9	3.1
P3	16	777.2	1.2	0.6
P4	12	277.7	0.8	0.4
P5	12	(522.2)	1.5	1.2
P6	10	(785.0)	3.2	6.4
P7	10	(111.4)	0.5	0.2
P8	12	395.1	1.1	0.7
P9	10	(561.8)	2.3	3.4
P10	10	708.1	2.9	5.3
P11	10	97.4	0.4	0.1
P12	12	(13.9)	0.0	-
P13	12	(543.9)	1.5	1.3
P14	12	(1,568.3)	4.5	9.5
P15	10	(465.0)	1.9	2.4
P16	12	785.0	2.2	2.6
P17	12	426.3	1.2	0.9
P18	12	(52.4)	0.2	0.0
P19	12	(551.3)	1.6	1.4
P20	12	(148.4)	0.4	0.1
P21	12	(637.9)	1.8	1.8
P22	12	483.7	1.4	1.1
P23	12	(132.3)	0.4	0.1
P24	12	(420.0)	1.2	0.8
P25	12	342.8	1.0	0.6
P26	12	471.5	1.3	1.0
P27	14	(832.8)	1.7	1.4
P28	12	382.2	1.1	0.7
P29	12	(321.1)	0.9	0.5

SCENARIO 2. PROJECT MODEL RESULTS

2A. MAX DAY + FIRE

Node	Demand (gpm)	Head (feet)	Elevation (feet)	Pressure (psi)
J1	58.6	793.0	501.0	126.5
J2	-	791.5	510.0	122.0
J3	84.0	789.6	511.0	120.7
J4	-	797.1	508.0	125.3
J5	218.4	779.4	498.0	121.9
J6	1,846.1	772.1	489.0	122.7
J7	145.1	776.9	509.0	116.1
J8	1,861.9	770.5	481.0	125.5
J9	79.0	776.9	492.0	123.4
J10	-	788.4	475.0	135.8
J11	-	770.6	485.0	123.7
J13	1,689.8	764.5	498.0	115.5
J17	-	779.4	497.0	122.4
RES19	(4,089.6)	800.0	800.0	
RES21	549.1	800.0	800.0	
RES22	1,344.3	800.0	800.0	

Demand = 5,983.0

Link	Diameter	Flow (gpm)	Velocity (fps)	Headloss (feet)
P1	16	2,612.8	4.2	6.0
P2	16	3,313.0	5.3	9.3
P3	16	3,094.6	4.9	8.2
P4	12	619.9	1.8	1.7
P5	12	(1,242.1)	3.5	6.2
P6	10	(1,344.3)	5.5	17.3
P7	10	(23.3)	0.1	0.0
P8	12	1,061.2	3.0	4.6
P9	10	(1,183.1)	4.8	13.7
P10	10	1,967.3	8.0	35.1
P11	10	490.5	2.0	2.7
P14	12	(1,476.8)	4.2	8.5
P15	10	(549.1)	2.2	3.3
P16	12	1,344.3	3.8	7.1
P17	12	-	-	-
P19	12	(1,689.8)	4.8	10.9
P21	12	-	-	-
P27	14	(1,476.8)	3.1	4.0

2B. PEAK HOUR

Node	Demand (gpm)	Head (feet)	Elevation (feet)	Pressure (psi)
J1	112.2	799.0	501.0	129.1
J2	-	799.0	510.0	125.2
J3	161.1	798.8	511.0	124.7
J4	-	799.6	508.0	136.4
J5	418.6	797.9	498.0	129.9
J6	343.3	797.6	489.0	133.7
J7	278.1	797.7	509.0	125.1
J8	373.6	797.5	481.0	137.1
J9	151.4	797.7	492.0	132.5
J10	-	798.8	475.0	140.3
J11	-	797.5	485.0	135.4
J13	43.7	797.6	498.0	129.8
J17	-	797.9	497.0	130.4
RES19	(1,301.6)	800.0	800.0	-
RES21	(191.8)	800.0	800.0	-
RES22	(388.7)	800.0	800.0	-

Demand = 1,882.1

Link	Diameter	Flow (gpm)	Velocity (fps)	Headloss (feet)
P1	16	824.9	1.3	0.7
P2	16	902.6	1.4	0.8
P3	16	483.9	0.8	0.3
P4	12	175.6	0.5	0.2
P5	12	(198.0)	0.6	0.2
P6	10	(388.7)	1.6	1.7
P7	10	(39.3)	0.2	0.0
P8	12	78.7	0.2	0.0
P9	10	(317.6)	1.3	1.2
P10	10	556.3	2.3	3.4
P11	10	79.6	0.3	0.1
P14	12	(476.7)	1.4	1.0
P15	10	(191.8)	0.8	0.5
P16	12	388.7	1.1	0.7
P17	12	-	-	-
P19	12	(43.7)	0.1	0.0
P21	12	-	-	-
P27	14	(476.7)	1.0	0.5

SCENARIO 3. PHASE I MODEL RESULTS

3A. MAX DAY + FIRE

Node	Demand (gpm)	Head (feet)	Elevation (feet)	Pressure (psi)
J1	58.6	729.8	501.0	126.4
J2	-	791.2	510.0	121.9
J3	84.0	789.2	511.0	120.6
J4	-	797.0	508.0	125.2
J5	1,885.4	776.2	498.0	120.6
J6	1,769.6	773.3	489.0	123.2
J7	98.1	783.1	509.0	118.8
J9	-	790.0	492.0	129.1
J10	-	794.9	475.0	138.6
J13	1,686.4	765.7	498.0	116.0
J17	-	776.2	497.0	121.0
J8	-	773.3	481.0	126.6
Res 19	(4,165.4)	800.0	800.0	-
Res 21	(559.0)	800.0	800.0	-
Res 22	(857.7)	800.0	800.0	-
Demand =	5,582.1			

Link	Diameter	Flow (gpm)	Velocity (fps)	Headloss (feet)
P1	16	2,661.3	4.3	6.2
P2	16	3,781.4	6.0	11.9
P3	16	1,896.0	3.0	3.3
P6	10	(857.7)	3.5	7.5
P7	10	(857.7)	3.5	7.5
P8	12	1,560.0	4.4	9.4
P9	10	(800.4)	3.3	6.6
P10	10	2,004.6	8.2	36.3
P11	10	500.5	2.0	2.8
P14	12	(1,504.1)	4.3	8.8
P15	10	(559.0)	2.3	3.4
P16	12	857.7	2.4	3.1
P19	12	(1,686.4)	4.8	10.9
P21	12	-	-	-
P27	14	(1,504.1)	3.1	4.1
P4	12	-	-	-

3B. PEAK HOUR

Node	Demand (gpm)	Head (feet)	Elevation (feet)	Pressure (psi)
J1	112.2	799.5	501.0	129.4
J2	-	799.5	510.0	125.5
J3	161.1	799.5	511.0	125.0
J4	-	799.8	508.0	126.5
J5	418.6	799.1	498.0	130.5
J6	196.7	799.1	489.0	134.4
J7	188.1	799.2	509.0	125.8
J9	-	799.5	492.0	133.3
J10	-	799.8	475.0	140.7
J13	37.1	799.1	498.0	130.5
J17	-	799.1	497.0	130.9
J8	-	799.1	481.0	137.8
Res 19	(824.1)	800.0	800.0	-
Res 21	(125.8)	800.0	800.0	-
Res 22	(163.9)	800.0	800.0	-
Demand =	1,113.7			

Link	Diameter	Flow (gpm)	Velocity (fps)	Headloss (feet)
P1	16	519.3	0.8	0.3
P2	16	529.4	0.8	0.3
P3	16	110.8	0.2	0.0
P4	12	(163.9)	0.7	0.4
P5	12	(163.9)	0.7	0.4
P6	10	123.0	0.4	0.1
P7	10	(147.1)	0.6	0.3
P8	12	318.3	1.3	1.2
P9	10	13.6	0.1	-
P10	10	(304.8)	0.9	0.5
P11	10	(125.8)	0.5	0.2
P14	12	163.9	0.5	0.1
P15	10	(37.1)	0.1	0.0
P16	12	-	-	-
P17	12	(304.8)	0.6	0.2
P19	12	-	-	-

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May 7, 2019

City of San Diego Development Services Department
Attn: Leonard Wilson
1222 First Avenue, MS 301
San Diego, CA 92101

SUBJECT: Otay Mesa Central Village Lumina Development On-Site Sewer Study (Tentative Map No. 1972222 | PTS No. 555609)

Dear Mr. Wilson,

CH2M Hill Engineers, Inc. (CH2M, now part of Jacobs), in association with West Coast Civil, is pleased to submit the revised Otay Mesa Central Village Lumina On Site Sewer System Study (Study) for the City of San Diego (City) review and approval. The revisions are in response to the following:

- City meetings on April 18, 2019 and March 28, 2019 to discuss the preferred option and Tentative Map
- Comments received February 5, 2019 (see Appendix G, Response to Comments)
- Comments received January 17, 2019 (see Appendix F, Response to Comments)
- Cycle issue comments dated June 12, 2018 (see Appendix E, Response to Comments)
- City meetings dated June 27, 2018, with Davisson (developer)
- Cycle Issue comments dated March 1, 2018 (see Appendix D, Response to Comments)
- City meeting on March 29, 2018 to discuss the shallow and deep sewer options

The purpose of the study is to size and layout the onsite public sewer system in support of the Lumina Development Tentative Map submittal. The sewer system layout considers proper sewer drainage of the proposed Lumina Development and planned future development within Otay Mesa Central Village Specific Plan (CVSP) in accordance with the City's Sewer Design Guide (2015), Land Development Code and Municipal Code.

BACKGROUND

The City of San Diego (City), in 2014, adopted the 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, PBS&J) was prepared outlining onsite and offsite water and sewer facility requirements to serve the community plan area at build-out. Consistent with the Sewer Design Guide, the infrastructure as designed to accommodate gravity sewer facilities at standard depth and grade.

In 2016 the City adopted the Otay Mesa CVSP including over 200 acres of the western area of the OMCPU. In support of the CVSP, a conceptual system was developed for water and sewer service (Otay Mesa Central Village Water and Sewer Conceptual Service Plan by Atkins, dated February 2016). The Lumina Development is a part of the Otay Mesa CVSP. This revised onsite study provides a detailed hydraulic

analysis for the proposed onsite sewer system for the Lumina Development as required by the City of San Diego in support of the proposed tentative map.

PROJECT OVERVIEW

The current site planning for the Lumina Development consists of proposed mixed-use development including Neighborhood Villages, Residential, and Institutional Land Uses within the Otay Mesa CVSP. The site is located within the City of San Diego, west of Cactus Road between Siempre Viva Road and Airway Road. The Lumina Development consists of approximately 25 lots for future residential and institutional development and open space and will be developed in two phases from north to south. The hydraulic analysis is consistent with the OMCPU and CVSP infrastructure studies. Table 1 provides a summary of the proposed Lumina Development land use and size for each of the TM Lots.

Table 1. Proposed Lumina Development

TM Lot	Land Use	Gross Acres	Net Acres	Max Commercial Square Feet	Unit Yield	Phase
1	Medium High Mixed Use	6.11	6.11	9,410	188	1
2	Medium High Mixed Use	4.19	4.19	15,352	115	1
3	Medium High Mixed Use	4.17	4.17	7,975	173	1
4	Medium High Mixed Use	3.93	3.93	7,700	167	1
5	Medium High Mixed Use	2.89	2.89	5,775	126	1
6	Park	3.32	3.32		-	1
7	Medium High Mixed Use	3.29	3.29	6,050	132	1
8	Medium High Mixed Use	1.90	1.90	3,284	73	1
9	Medium High Mixed Use	2.04	2.04	3,490	78	1
10	Medium High Mixed Use	2.49	2.49	3,489	77	1
11	Medium Density Multi Family	4.38	4.38		137	2
12	Medium Density Multi Family	3.06	3.06		94	2
13	Medium Density Multi Family	4.44	4.44		137	2
14	Medium Density Multi Family	5.03	5.03		158	2
15	Institutional	2.32	2.32		-	2
16	Institutional	1.53	1.53		-	2
17	Institutional	2.43	2.43		-	2
18	Park	3.74	3.74		-	2
19	Low Density Multi Family	5.84	5.84		213	2
20	Drainage Basin	2.29	2.29		-	2
21	Open Space	2.38	2.38		-	2
22	Drainage Basin	1.97	1.97		-	1
23	Open Space	2.72	2.72		-	1
24	Medium Density Multi Family*	0.77	0.77		-	1
Circulation	Circulation	16.19	16.19		-	-
TOTAL		**93.4**	**93.4**	**62,525**	**1,868**	**-**

Source: 5th Tentative Map Submittal dated 8/24/18

SEWER GENERATION

Sewer generation for the project was estimated based on the methodology provided in the approved OMCPU and Otay Mesa CVSP and Sewer Design Guide. Provided below is a summary of the sewer generation criteria.

- 3.45 persons per household [(1)]
- 80 gallons per capita day
- 75% return to sewer of 865 gpd/acre water demand for non-residential uses.

The average annual sewer generation from the Lumina Development was estimated at 0.52 mgd. The Water and Sewer Conceptual Service Plan estimated the average annual sewer generation for the entire Otay Mesa CVSP at 1.26 mgd. Lumina represents about 40 percent of the projected sewer flows within the CVSP. In addition to the CVSP, it is anticipated that future sewer flows from approximately 40 acres of a planned business park, east of Cactus Road, has the potential to be served by the proposed sewer in Cactus Road, and has been included in the analysis. Table 2 summarizes the estimated sewer generation for the Lumina Development. Table 3 summarizes the total sewer generation anticipated to utilize the proposed public sewer system constructed as part of the Lumina Development.

[(1)] The City design guide uses 3.5 people per household and represents a conservative "worst-case" scenario of project related sewer generation rates. Since the Lumina Development is tiering off the OMCPU, this study uses 3.45 people per household to be consistent with the approved OMCPU.

Table 2. Proposed Lumina Development Sewer Generation

TM Lot	Land Use	Gross Acres	Net Acres	Max Commercial Square Feet	Unit Yield	Sewer Generation (mgd)
1	Medium High Mixed Use	6.11	6.11	9,410	188	0.05
2	Medium High Mixed Use	4.19	4.19	15,352	115	0.03
3	Medium High Mixed Use	4.17	4.17	7,975	173	0.05
4	Medium High Mixed Use	3.93	3.93	7,700	167	0.05
5	Medium High Mixed Use	2.89	2.89	5,775	126	0.03
6	Park	3.32	3.32		-	0.00
7	Medium High Mixed Use	3.29	3.29	6,050	132	0.04
8	Medium High Mixed Use	1.90	1.90	3,284	73	0.02
9	Medium High Mixed Use	2.04	2.04	3,490	78	0.02
10	Medium High Mixed Use	2.49	2.49	3,489	77	0.02
11	Medium Density Multi Family	4.38	4.38		137	0.04
12	Medium Density Multi Family	3.06	3.06		94	0.03
13	Medium Density Multi Family	4.44	4.44		137	0.04
14	Medium Density Multi Family	5.03	5.03		158	0.04
15	Institutional	2.32	2.32		-	0.00
16	Institutional	1.53	1.53		-	0.00
17	Institutional	2.43	2.43		-	0.00
18	Park	3.74	3.74		-	0.00
19	Low Density Multi Family	5.84	5.84		213	0.06
20	Drainage Basin	2.29	2.29		-	0.00
21	Open Space	2.38	2.38		-	0.00
22	Drainage Basin	1.97	1.97		-	0.00
23	Open Space	2.72	2.72		-	0.00
24	Medium Density Multi Family	0.77	0.77		-	0.01
-	Circulation	16.19	16.19		-	-
	TOTAL	**93.4**	**93.4**	**62,525**	**1,868**	**0.52**

Table 3. Anticipated Total Sewer Generation

Development	Area	Land Use	Max. Commercial Square Footage	Unit Yield	Sewer Generation (mgd)
Lumina	93	Mixed-Use	62,525	1,868	0.52
Remaining Areas of CVSP	136	Mixed-Use	77,175	2,617	0.74
Subtotal	**229**	**-**	**139,700**	**4,489**	**1.26**
Adjacent Business Park	40	Business Park	-	-	0.03
Total	**269**	**-**	**139,700**	**-**	**1.29**

LUMINA DEVELOPMENT - PUBLIC SEWER SYSTEM CRITERIA

The proposed public sewer system will be located in public right of way. It is anticipated that site specific development plans for each individual tentative map lot will include a private on-site sewer system. The proposed public sewer system was sized in accordance with the City Sewer Design Guide criteria listed in Table 4. The estimated peak wet weather flow for the Lumina Development is approximately 1.22 mgd. The estimated peak wet weather flow for the CVSP is approximately 2.40 mgd. The estimated peak wet weather flow in the Cactus Road, including the adjacent business park future land use is 0.03 mgd. Figure 1 presents the recommended public sewer system. Sewer main capacity calculation are provided in Appendix A.

Table 4. Design Criteria

Item	Subdivision Manual Criteria
Dry Weather Peaking Factor	$6.2945 \times pop^{-0.1342}$
Wet Weather Allowed	10% allowance for I&I, conservative for new development
PVC Roughness Coefficient, n	0.013
d/D for proposed sewer pipe	0.50 for diameters ≤ 15 inches 0.75 for diameters > 15 inches
Minimum velocity	2 fps (or 1% slope if 2 fps cannot be achieved)
Minimum slope	0.2%
Separation for public water and sewer	10 ft clear separation
Depth of Sewer	Minimum of 20 feet

The City, as part of its review comments dated February 5, 2019, noted the existing force main and water line appear to be located under a future raised median in Cactus Road which, under current design criteria, should be considered for relocation. The issue was further discussed with the City in a February 7, 2019 meeting. The following items were reviewed and further mitigation options will be evaluated during final design:

- The 10-inch Water is owned and Operated by Otay Water District and is not a City utility subject to City design criteria.
- The existing 16-inch Force Main is not located under the median for the full length of Cactus Road, but for only 500 feet under the future curb line.
- The raised median is a requirement of the City and the approved CVSP.
- During final design, the raised median requirement will be reviewed with the City give the location of existing utilities.
- Alternative median designs including painted median and smaller-width median, will be reviewed with the City during design.
- If the City, will not accept a modification to the median design, then City Public Utilities Department would process a waiver for this segment of Cactus Road.
- The City will be getting a new parallel force main as part of the Lumina project.
- The City ultimately may replace the existing 16-inch force main in the future with a large force main which could be aligned to meet current design criteria.

LUMINA DEVELOPMENT TRUNK SEWER ALTERNATIVES

The conceptual system layout presented in the Water and Sewer Conceptual Service Plan would require a deep sewer along the proposed Street C to Cactus Road in order to provide gravity flow for the CVSP. However, during initial project planning and tentative map review, the City of San Diego Development Services Department (DSD) identified the depth of the sewer as a potential concern for access, maintenance and operations and requested that a shallower sewer system with depths less than 20 feet be analyzed. The deep sewer was inconsistent with section 2.2.1.5 of the City Sewer Design Guide.

A shallower sewer system could be provided; however, this system may necessitate a public and/or private pump station to serve the southwestern portions of the remaining CVSP. The site planning for the remaining CVSP has not advanced in parallel with Lumina. Accordingly, it is possible that Davisson may be able to design a grading scheme to minimize or eliminate future pumping. At a meeting with the City and Davisson (Developer) on June 27, 2018 to discuss a deep sewer option and subsequent follow-up by the developer's engineer for Davisson, it was determined that a sewer depth of 31 feet at Cactus Road would provide gravity sewer flow from the Davisson property. No information was available from other properties to determine if some areas would need to still be pumped. The City has obtained acceptance from City Operations for a proposed 31 feet deep sewer. In accordance with the Design Guide, mains deeper than 20 feet require special approval from the Public Utilities Department, Wastewater Collection Division Senior Civil Engineer and are only approved in exceptional cases when adequate justification is provided.

At the City's request, provided in this section is a description of the various sewer alternatives evaluated. Additionally, potential adjustments to the preferred alternative were identified that may mitigate some of the need for future public pump stations, but still requires a manhole depth in Cactus Road that exceeds 20 feet. Additional coordination between the City and Developers of the remaining CVSP areas, including Davisson, will be required to determine the feasibility of adjusting the final sewer system depths, as future grading options may eliminate the need for a deep sewer.

<u>Alternative 1. Preferred Sewer System (20 feet depth)</u>

The preferred sewer system was designed to minimize the depth of the sewer to 20 feet maximum to be consistent with the City Design Guide for public sewer system design. The slope of the proposed replacement sewer in Cactus Road was steepened and the slope of the deep sewer section along Street C was shallowed to 0.3 percent to provide a manhole depth of less than 20 feet at Cactus Road. The shallowing of the Street C sewer required an increase in the diameter of the main to 18 inches to provide sufficient capacity, to serve the southwestern portion of the remaining CVSP and the planned business park. Appendix B presents the shallow sewer system alternative layout. The remaining CVSP developments were evaluated for their feasibility to connect to the preferred sewer system. It was determined that there may be a need for a public pump station in the southwestern portion of the CVSP. However, future grading to the west may mitigate the need, as this evaluation was based on the preliminary grades developed in the CVSP.

<u>Alternative 2. Deep Sewer System (31 feet depth)</u>

The Water and Sewer Conceptual Service Plan deep sewer layout attempts to provide gravity flow for the majority of the CVSP. The proposed deep sewer along Street C between Village Way and Cactus Road exceeds 20 feet in depth, reaching a 31-foot deep manhole at Cactus Road. The benefit of the deep sewer option is it may eliminate the need for a public or private sewer pump stations for some of the properties to the southwest including Davisson, which has long term operational benefits to the City. However, this

cannot be determined until preliminary Tentative Map grades are established to the west. Appendix C presents this deep sewer system alternative layout. Deep sewers require special design because of the depth and operations and maintenance considerations for access at manholes. One of the special design features is the City will require a parallel shallow collector sewer along Street C for individual lot sewer lateral connections to avoid deep laterals.

Potential Sewer System Adjustments (25 feet depth)

Based on the preliminary sewer system layout presented in the deep sewer alternative above, there are potential adjustments to the sewer system layout that could be made with approval of the City during final design that may eliminate the need for a public sewer pump station, but still require private sewer pump stations. The potential adjustments are as follows:

- Reduce deep sewer from 31 feet to approximately 25 feet
- City would need to accept shallow sewers with a minimum depth to cover of 5 feet
- Reduce the slope of the Street C sewer to 0.2 percent
- City to accept private sewer lift stations in Planning Areas 9 and 11 (Low Density Multi-Family) and Planning Area 12 (Park) and potentially on the other properties

It is recommended that the remaining CVSP developments review the grading opportunities prior to final trunk sewer for design of the Lumina Development, to provide the City sufficient technical information for the City to confirm the Preferred Option at time final engineering design is commenced. The technical information must be provided timely to avoid delay of the implementation of the Lumina project and to the reasonable satisfaction of the City.

Summary of Options

At a March 28, 2019 meeting with the City, given the uncertainty of future grading to the west, the City requested Lumina to submit a revised onsite sewer study with a 20-foot-deep sewer as the preferred option. This study still includes two viable options that may be implemented based on final grading and cost sharing commitments.

At a prior meeting with the City (June 27, 2018), each of the sewer options were reviewed including design constraints, system benefits, and overall implementation schedule. The City confirmed that City Operations would accept a 31-foot deep sewer as an option to minimize the future construction of sewer pump stations and allow for a gravity maintained system for Otay Mesa CVSP. A design guide waiver would be processed allowing for the future design of the deep sewer, which would require special manhole design and a parallel collection sewer. Any mitigation measures for the design waiver/deviation imposed by the City should be included in the fair share cost analysis described below. The following section discusses the implementation plan for the deep sewer option, only.

Considerations for a Deep Sewer Option and Cost Sharing

During the final design phase of the Lumina subdivision and prior to the first submittal to the City for sewer improvements, the City will request adjacent property owners, including Davisson and others ("Property Owners"), to provide final technical sewer information for the sewer design. At a minimum, the City will require the following:

- Sewer invert depth at Lumina property boundary
- Confirmation of assumed sewer flows in this study from benefitting property
- Final confirmation of the depth of the deep sewer (assumed depth of 31 feet)

The City will consider the deep sewer option under the following conditions:

- Special design requirements for deep manholes and deep sewer main
- Parallel shallow collection sewer that will serve Lumina service laterals in the southeast
- An incremental construction cost increase estimate to increase the depth of the sewer from shallow and cost of any mitigation measures for approval of Deviation Standards.
- Approval of Deviation Standards

Furthermore, under the deep sewer option, the City will require incremental cost sharing for the deep sewer from benefitting property owners. Anticipated cost sharing mechanism and/or financing strategies the City will support includes but not limited to:

- Joint Work and Cost Sharing Agreement for Improvements between Property Owners.
- Amendment/update of Otay Mesa Public Facilities Financing Plan and Facilities Benefit Assessment ("Financing Plan") to include cost of deep sewer.
- Reimbursement Agreement pursuant to Council Policy 400-7, when the first developer in an area constructs necessary water and sewer facilities for an entire developing area.
- Reimbursement agreement pursuant to Government Code sections 66485-66489 and San Diego Municipal Code 144.0205 for improvements that contain supplemental size, capacity, number or length for the benefit of property not within the subdivision.
- Conditions of approval of land use entitlements of a benefitting property requiring reimbursement or payment of fair share of improvements.
- Formation of a special assessment of Mello-Roos Community Facility districts in accordance with Council Policy 800-3

PHASING

Project phasing will generally be from north to south. To provide adequate sewer service to Phase 1, the entire public sewer system will be constructed in Phase 1 as shown on Figure 1.

REGIONAL SEWERAGE FACILITIES

Wastewater gathered from the Lumina Development is conveyed to the regional Sewer Pump Station (SPS) 23T, along with existing flows in Otay Mesa within the City and a small part of the County of San Diego East Otay Mesa area. As part of the OMCPU, regional sewer infrastructure improvements were identified. A separate Regional Sewer Study is currently being prepared to update identified improvements, phasing, and a method of cost sharing for planned regional infrastructure construction.

At the June 27, 2018 meeting, the City Public Works Department provided an update on the upgrade of SPS 23T. The improvements include pump and motor replacement, electrical upgrades and the installation of odor control equipment. The City recently added the rehabilitation of the existing wet well to the project. Once completed, the upgraded SPS 23T will have restored full existing capacity and provide a more reliable facility for Otay Mesa. The Regional Sewer Study will review the available existing capacity of SPS 23T and existing force main, and conformance to City pump station design standards. It is anticipated future improvements will include a new redundant force main (sized at 24-inches in diameter) within Cactus Road and the addition of emergency storage at SPS 23T, and the siting and facility lay-out of a new SPS 23.

We look forward to continuing to support the City on the sewer infrastructure plan for Otay Mesa. Please feel free to contact me at (619) 272-7283 with any questions or concerns you may have.

Mark B. Elliott, PE
Project Manager

REGISTERED PROFESSIONAL ENGINEER
MARK B. ELLIOTT
No. 42064
Exp. 3/31/2020
CIVIL
STATE OF CALIFORNIA

CC:
Jason Shepard, ColRich
Kyle McCarty, West Coast Civil
Greg Shields, Project Design Consultants

Enclosures:
Figure 1 – Proposed Lumina Sewer System
Appendix A – Sewer System Sizing
Appendix B – Preferred Sewer Alternative Exhibit
Appendix C – Deep Sewer Alternative
Appendix D – Response to Comments (March 1, 2018)
Appendix E – Response to Comments (June 12, 2018)
Appendix F – Response to Comments (January 17, 2019)
Appendix G – Response to Comments (February 5, 2019)

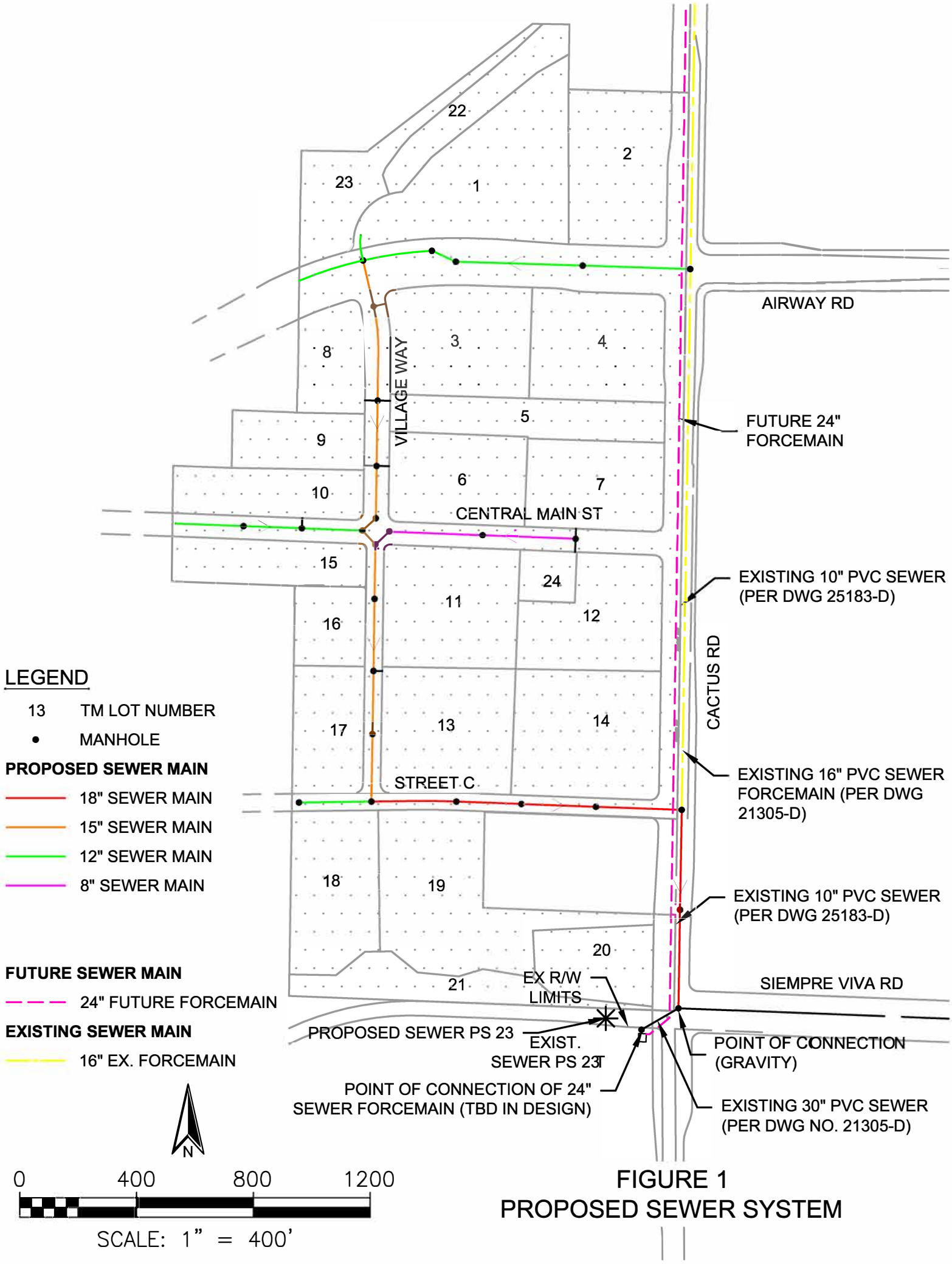


FIGURE 1
PROPOSED SEWER SYSTEM

Appendix A

Sewer System Sizing

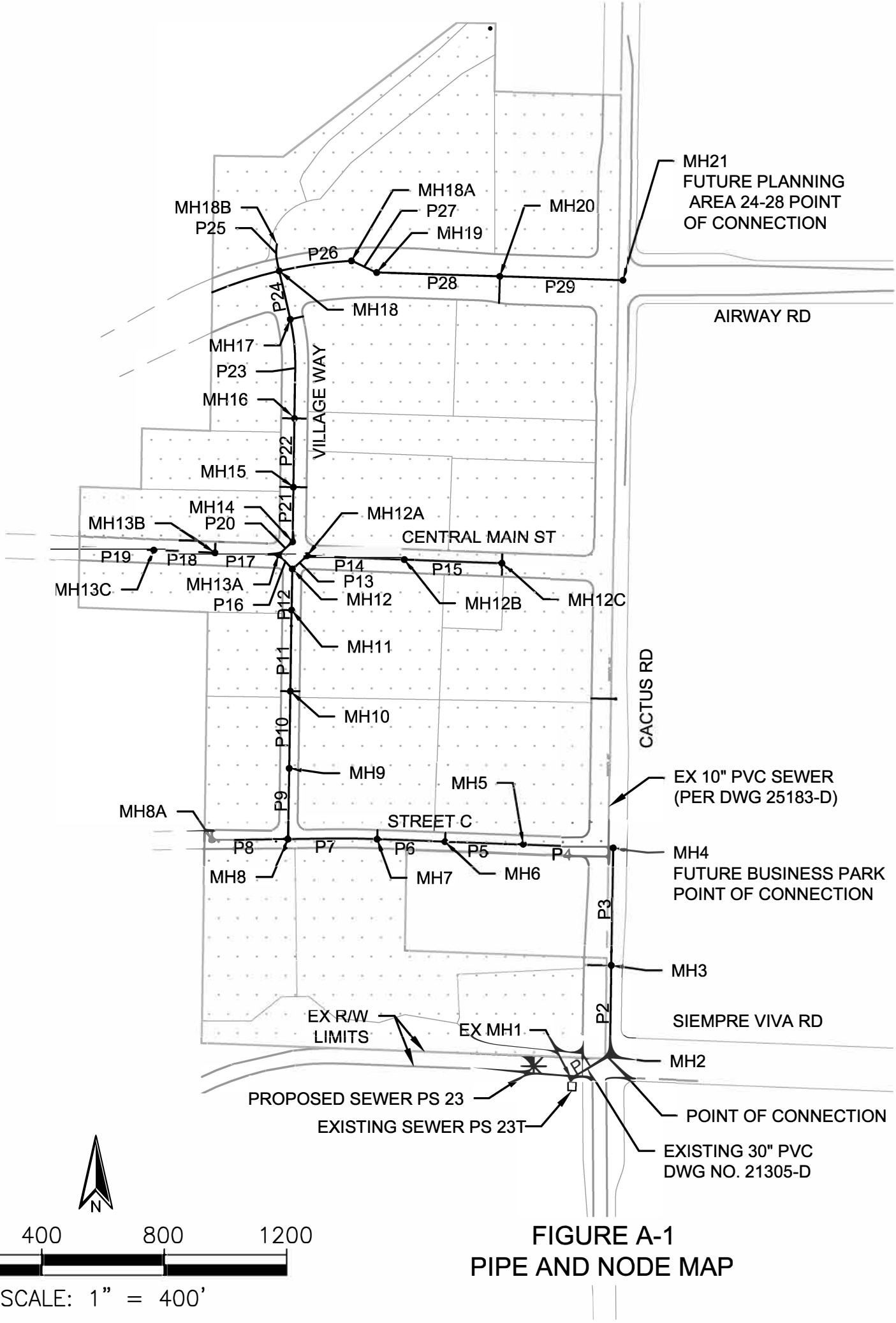


FIGURE A-1
PIPE AND NODE MAP

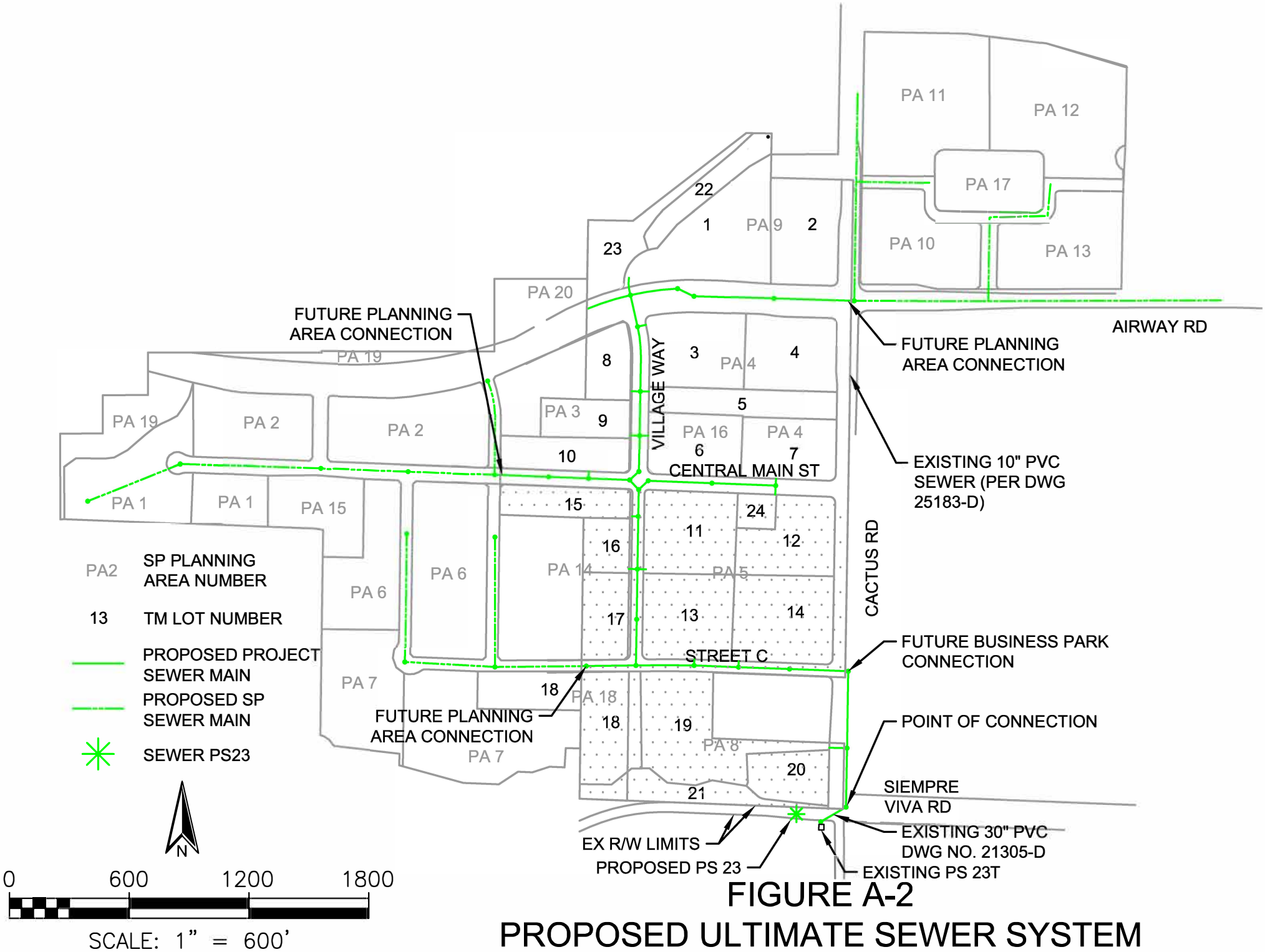


FIGURE A-2
PROPOSED ULTIMATE SEWER SYSTEM

Estimated Sewer Generation to Manholes

TABLE A-1 LUMINA DEVELOPMENT		
TM Lot	Avg. Flow (mgd)	Tributary MH
Lumina Development		
1	0.05	18B
2	0.03	18B
3	0.05	17
4	0.05	20
5	0.03	16
6	0.00	15
7	0.04	12C
8	0.02	16
9	0.02	15
10	0.02	13B
11	0.04	10
12	0.03	12C
13	0.04	7
14	0.04	6
15	0.00	11
16	0.00	10
17	0.00	8A
18	0.00	-
19	0.06	3
20	0.00	-
21	0.00	-
22	0.00	-
23	0.00	-
24	0.00	-
25	0.00	12C
Total	**0.52**	**-**

TABLE A-2 ANTICIPATED TRIBUTARY FLOWS		
Planning Area	Avg. Flow (mgd)	Tributary MH
Remaining SPA Areas		
1	0.04	13C
2	0.08	13C
3	0.03	13C
4	0.08	13C
5	0.00	-
6	0.04	8A
7	0.06	8A
8	0.00	-
9	0.02	8A
10	0.00	-
11	0.03	8A
12	0.00	-
13	0.01	8A
14	0.03	13C
15	0.00	-
16	0.00	-
17	0.00	12C
18	0.00	-
19	0.00	-
20	0.03	3
21	0.00	-
22	0.00	-
23	0.01	3
24	0.06	21
25	0.08	21
26	0.08	21
27	0.06	21
28	0.00	-
29	0.00	-
Subtotal	**0.74**	**-**
Business Park		
-	0.03	4
Total	**0.77**	**-**

TABLE A-3 TOTAL FLOWS TO MANHOLES	
Tributary MH	Avg. Flow (mgd)
3	0.10
4	0.03
6	0.04
7	0.04
8A	0.17
10	0.04
11	0.00
12C	0.07
13B	0.02
13C	0.27
15	0.02
16	0.05
17	0.05
18B	0.08
20	0.05
21	0.27
Total	**1.29**

TABLE A-4

PUBLIC SEWER LINE SIZING (TENTATIVE MAP)

Line No.	From MH	To MH	Avg flow (mgd) In-Line	Avg flow (mgd) Total	Length (feet)	Peak Design Flow (mgd)	Peak Design Flow (cfs)	Line Size (inches)	Design Slope (%)	dn (feet)	dn/D	Velocity (fps)	Comments
P29	21	20	0.27	0.27	398	0.63	0.98	12	1.0	0.36	0.36	3.87	Future Planning Area POC
P28	20	19	0.05	0.32	398	0.73	1.13	12	1.0	0.39	0.39	4.03	
P27	19	18A	0.00	0.32	87	0.73	1.13	12	1.4	0.35	0.35	4.53	
P25	18B	18	0.08	0.08	86	0.22	0.34	12	1.2	0.20	0.20	3.06	
P26	18A	18	0.00	0.32	234	0.73	1.13	12	0.7	0.42	0.42	3.56	
P24	18	17	0.00	0.40	153	0.89	1.37	15	0.5	0.46	0.37	3.25	
P23	17	16	0.05	0.45	325	0.98	1.52	15	0.5	0.49	0.39	3.32	
P22	16	15	0.05	0.50	220	1.07	1.66	15	1.1	0.41	0.33	4.50	
P21	15	14	0.02	0.52	175	1.10	1.71	15	1.1	0.43	0.34	4.64	
P20	14	13A	0.00	0.52	59	1.10	1.71	15	1.5	0.39	0.31	5.14	
P19	Cap	13C	0.27	0.27	231	0.62	0.96	12	2.0	0.30	0.30	4.94	Future Planning Area POC
P18	13C	13B	0.00	0.27	196	0.62	0.96	12	2.3	0.29	0.29	5.20	
P17	13B	13A	0.02	0.29	204	0.67	1.03	12	1.0	0.37	0.37	3.90	
P16	13A	12	0.00	0.81	62	1.62	2.51	15	1.0	0.54	0.43	4.94	
P15	12C	12B	0.07	0.07	315	0.20	0.31	8	2.3	0.19	0.28	3.92	
P14	12B	12A	0.00	0.07	315	0.20	0.31	8	1.2	0.22	0.33	3.14	
P13	12A	12	0.00	0.07	62	0.20	0.31	8	1.0	0.23	0.35	2.91	
P12	12	11	0.00	0.88	130	1.75	2.70	15	0.4	0.74	0.59	3.56	
P11	11	10	0.00	0.88	260	1.75	2.70	15	0.3	0.82	0.65	3.18	
P10	10	9	0.04	0.92	247	1.82	2.81	15	0.3	0.80	0.64	3.38	
P9	9	8	0.00	0.92	227	1.82	2.81	15	0.3	0.84	0.67	3.20	
P8	8A	8	0.17	0.17	239	0.42	0.65	12	0.3	0.39	0.39	2.26	Future Planning Area POC
P7	8	7	0.00	1.09	287	2.10	3.25	18	0.3	0.81	0.54	3.35	
P6	7	6	0.04	1.13	218	2.17	3.36	18	0.3	0.82	0.55	3.39	
P5	6	5	0.04	1.16	252	2.23	3.45	18	0.3	0.83	0.56	3.41	
P4	5	4	0.00	1.16	290	2.23	3.45	18	0.3	0.84	0.56	3.40	
P3	4	3	0.03	1.19	380	2.28	3.52	18	1.7	0.52	0.35	6.49	Business Park Connection
P2	3	2	0.10	1.29	291	2.44	3.77	18	1.6	0.54	0.36	6.52	
P1	2	1	0.00	1.29	144	2.44	3.77	30	12.3	0.28	0.11	12.59	

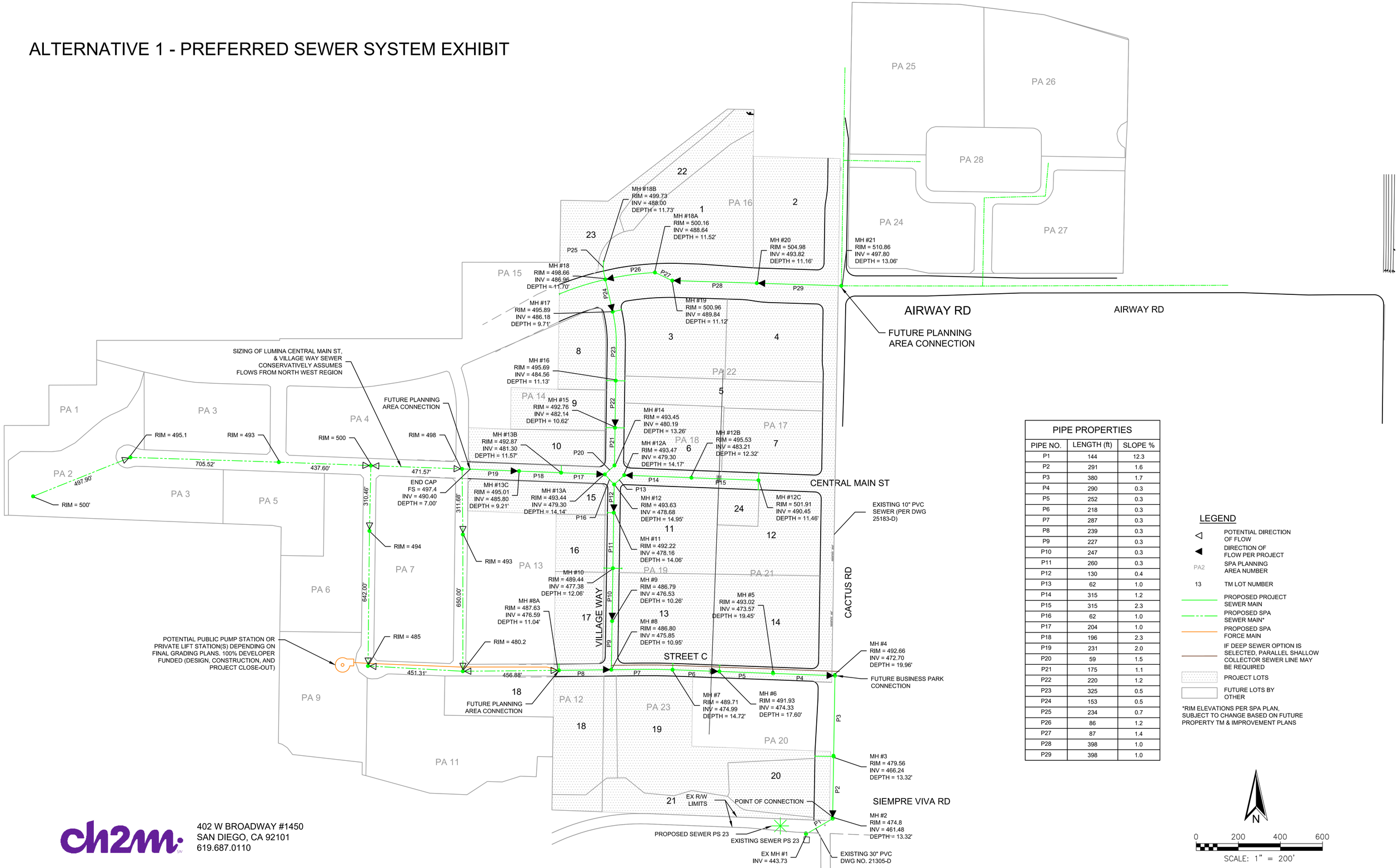
Table A-5 Manhole Properties
(Shallow Option)

MH#	Rim Elevation	Invert Elevation	Depth of Cover
MH2	474.80	461.48	13.32
MH3	479.56	466.24	13.32
MH4	492.66	472.70	19.96
MH5	493.02	473.57	19.45
MH6	491.93	474.33	17.60
MH7	489.71	474.99	14.72
MH8	486.80	475.85	10.95
MH8A	487.63	476.59	11.04
MH9	486.79	476.53	10.26
MH10	489.44	477.38	12.06
MH11	492.22	478.16	14.06
MH12	493.63	478.68	14.95
MH12A	493.47	479.30	14.17
MH12B	495.53	483.21	12.32
MH12C	501.91	490.45	11.46
MH13A	493.44	479.30	14.14
MH13B	492.87	481.30	11.57
MH13C	495.01	485.80	9.21
CAP	497.40	490.40	7.00
MH14	493.45	480.19	13.26
MH15	492.76	482.14	10.62
MH16	495.69	484.56	11.13
MH17	495.89	486.18	9.71
MH18	498.66	486.96	11.70
MH18A	500.16	488.64	11.52
MH18B	499.73	488.00	11.73
MH19	500.96	489.84	11.12
MH20	504.98	493.82	11.16
MH21	510.86	497.80	13.06

Appendix B

Preferred Sewer Alternative

ALTERNATIVE 1 - PREFERRED SEWER SYSTEM EXHIBIT



PIPE PROPERTIES		
PIPE NO.	LENGTH (ft)	SLOPE %
P1	144	12.3
P2	291	1.6
P3	380	1.7
P4	290	0.3
P5	252	0.3
P6	218	0.3
P7	287	0.3
P8	239	0.3
P9	227	0.3
P10	247	0.3
P11	260	0.3
P12	130	0.4
P13	62	1.0
P14	315	1.2
P15	315	2.3
P16	62	1.0
P17	204	1.0
P18	196	2.3
P19	231	2.0
P20	59	1.5
P21	175	1.1
P22	220	1.2
P23	325	0.5
P24	153	0.5
P25	234	0.7
P26	86	1.2
P27	87	1.4
P28	398	1.0
P29	398	1.0

LEGEND

- POTENTIAL DIRECTION OF FLOW
- DIRECTION OF FLOW PER PROJECT
- PA2 — SPA PLANNING AREA NUMBER
- 13 — TM LOT NUMBER
- PROPOSED PROJECT SEWER MAIN
- PROPOSED SPA SEWER MAIN*
- PROPOSED SPA FORCE MAIN
- IF DEEP SEWER OPTION IS SELECTED, PARALLEL SHALLOW COLLECTOR SEWER LINE MAY BE REQUIRED
- PROJECT LOTS
- FUTURE LOTS BY OTHER

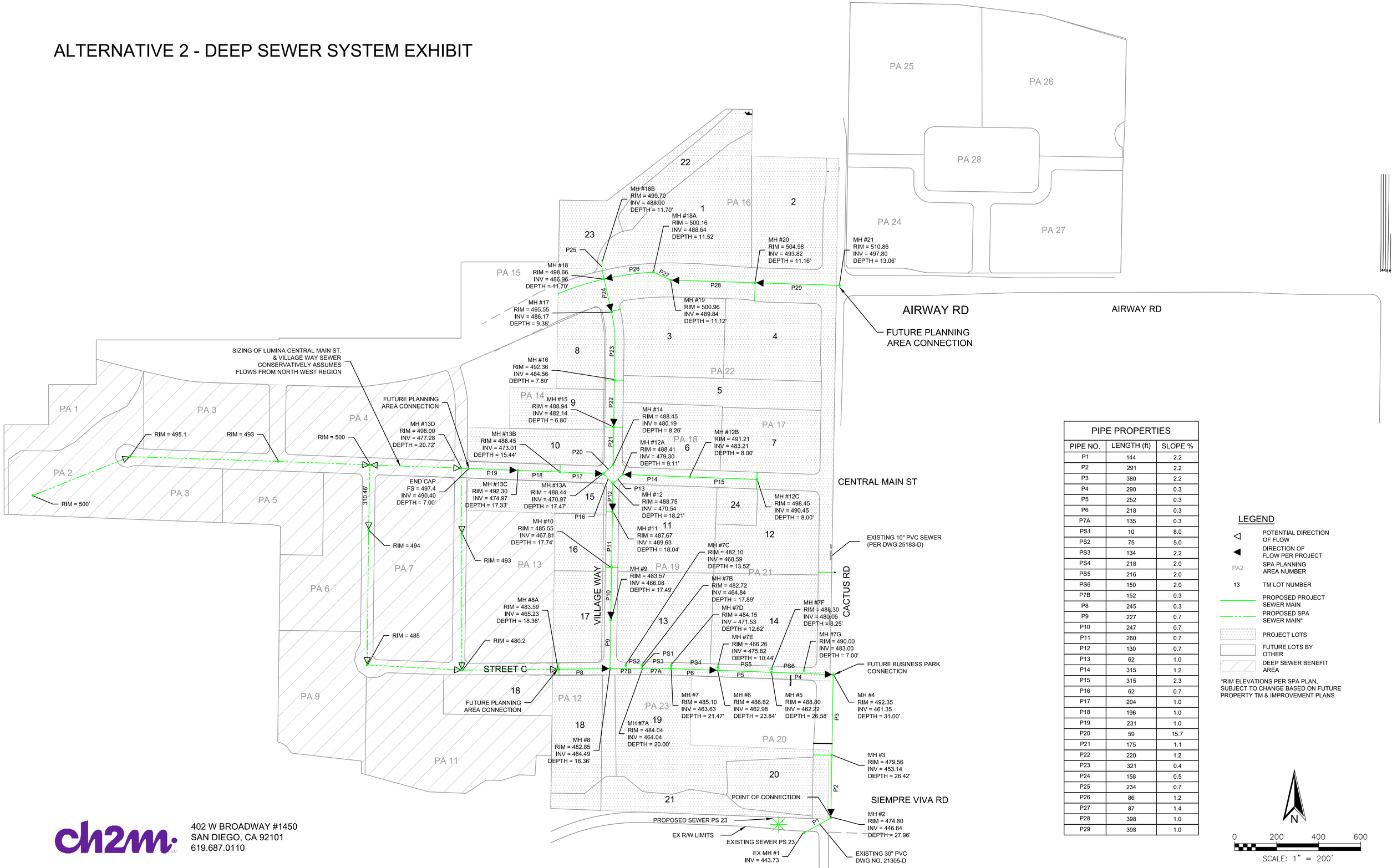
*RIM ELEVATIONS PER SPA PLAN, SUBJECT TO CHANGE BASED ON FUTURE PROPERTY TM & IMPROVEMENT PLANS

ch2m
402 W BROADWAY #1450
SAN DIEGO, CA 92101
619.687.0110

Appendix C

Deep Sewer Alternative Exhibit

ALTERNATIVE 2 - DEEP SEWER SYSTEM EXHIBIT



PIPE PROPERTIES		
PIPE NO.	LENGTH (ft)	SLOPE %
P1	144	2.2
P2	291	2.2
P3	380	2.2
P4	290	0.3
P5	252	0.3
P6	218	0.3
P7A	135	0.3
PS1	10	8.0
PS2	75	5.0
PS3	134	2.2
PS4	218	2.0
PS5	216	2.0
PS6	150	2.0
P7B	152	0.3
P8	245	0.3
P9	227	0.7
P10	247	0.7
P11	260	0.7
P12	130	0.7
P13	62	1.0
P14	315	1.2
P15	315	2.3
P16	62	0.7
P17	204	1.0
P18	196	1.0
P19	231	1.0
P20	59	15.7
P21	175	1.1
P22	220	1.2
P23	321	0.4
P24	158	0.5
P25	234	0.7
P26	86	1.2
P27	87	1.4
P28	398	1.0
P29	398	1.0

LEGEND

- POTENTIAL DIRECTION OF FLOW
- DIRECTION OF FLOW PER PROJECT
- PA2 — SPA PLANNING AREA NUMBER
- 13 — TM LOT NUMBER
- PROPOSED PROJECT SEWER MAIN
- PROPOSED SPA SEWER MAIN*
- PROJECT LOTS
- FUTURE LOTS BY OTHER
- DEEP SEWER BENEFIT AREA

*RIM ELEVATIONS PER SPA PLAN, SUBJECT TO CHANGE BASED ON FUTURE PROPERTY TM & IMPROVEMENT PLANS

N

0 200 400 600

SCALE: 1" = 200'

ch2m

402 W BROADWAY #1450
SAN DIEGO, CA 92101
619.687.0110

Estimated Sewer Generation to Manholes

TABLE C-1 LUMINA DEVELOPMENT		
TM Lot	Avg. Flow (mgd)	Tributary MH
Lumina Development		
1	0.05	18B
2	0.03	18B
3	0.05	17
4	0.05	20
5	0.03	16
6	0.00	15
7	0.04	12C
8	0.02	16
9	0.02	15
10	0.02	13B
11	0.04	10
12	0.03	12C
13	0.04	7D
14	0.04	7E
15	0.00	11
16	0.00	10
17	0.00	8A
18	0.00	-
19	0.06	3
20	0.00	-
21	0.00	-
22	0.00	-
23	0.00	-
24	0.00	-
25	0.00	12C
Total	**0.52**	**-**

TABLE C-2 ANTICIPATED TRIBUTARY FLOWS		
Planning Area	Avg. Flow (mgd)	Tributary MH
Remaining SPA Areas		
1	0.04	13C
2	0.08	13C
3	0.03	13C
4	0.08	13C
5	0.00	-
6	0.04	8A
7	0.06	8A
8	0.00	-
9	0.02	8A
10	0.00	-
11	0.03	8A
12	0.00	-
13	0.01	8A
14	0.03	13C
15	0.00	-
16	0.00	-
17	0.00	12C
18	0.00	-
19	0.00	-
20	0.03	3
21	0.00	-
22	0.00	-
23	0.01	3
24	0.06	21
25	0.08	21
26	0.08	21
27	0.06	21
28	0.00	-
29	0.00	-
Subtotal	**0.74**	**-**
Business Park		
-	0.03	4
Total	**0.77**	**-**

TABLE C-3 TOTAL FLOWS TO MANHOLES	
Tributary MH	Avg. Flow (mgd)
3	0.10
4	0.03
7D	0.04
7E	0.04
8A	0.17
10	0.04
11	0.00
12C	0.07
13B	0.02
13C	0.27
15	0.02
16	0.05
17	0.05
18B	0.08
20	0.05
21	0.27
Total	**1.29**

TABLE C-4

DEEP SEWER ALTERNATIVE PUBLIC SEWER LINE SIZING (TENTATIVE MAP)

Line No.	From MH	To MH	Avg flow (mgd) In-Line	Avg flow (mgd) Total	Length (feet)	Peak Design Flow (mgd)	Peak Design Flow (cfs)	Line Size (inches)	Design Slope (%)	dn (feet)	dn/D	Velocity (fps)	Comments
P29	21	20	0.27	0.27	398	0.63	0.98	12	1.0	0.36	0.36	3.87	Future Planning Area POC
P28	20	19	0.05	0.32	398	0.73	1.13	12	1.0	0.39	0.39	4.03	
P27	19	18A	0.00	0.32	87	0.73	1.13	12	1.4	0.35	0.35	4.53	
P26	18A	18	0.00	0.32	86	0.73	1.13	12	1.2	0.37	0.37	4.31	
P25	18B	18	0.08	0.08	234	0.22	0.34	12	0.7	0.23	0.23	2.54	
P24	18	17	0.00	0.40	158	0.89	1.37	15	0.5	0.46	0.37	3.22	
P23	17	16	0.05	0.45	321	0.98	1.52	15	0.4	0.49	0.39	3.01	
P22	16	15	0.05	0.50	220	1.07	1.66	15	1.2	0.40	0.32	4.70	
P21	15	14	0.02	0.52	175	1.10	1.71	12	4.7	0.16	0.16	5.29	
P20	14	13A	0.00	0.52	59	1.10	1.71	12	5.0	0.16	0.16	5.45	
P19	Cap	13C	0.27	0.27	231	0.62	0.96	12	1.0	0.36	0.36	3.85	Future Planning Area POC
P18	13C	13B	0.00	0.27	196	0.62	0.96	12	1.0	0.36	0.36	3.85	
P17	13B	13A	0.02	0.29	204	0.67	1.03	12	1.0	0.37	0.37	3.93	
P16	13A	12	0.00	0.81	62	1.62	2.51	15	0.7	0.60	0.48	4.32	
P15	12C	12B	0.07	0.07	315	0.20	0.31	8	2.3	0.19	0.28	3.92	
P14	12B	12A	0.00	0.07	315	0.20	0.31	8	1.2	0.22	0.33	3.14	
P13	12A	12	0.00	0.07	62	0.20	0.31	8	5.0	0.15	0.23	5.17	
P12	12	11	0.00	0.88	130	1.75	2.70	15	0.7	0.63	0.50	4.40	
P11	11	10	0.00	0.88	260	1.75	2.70	15	0.7	0.63	0.50	4.40	
P10	10	9	0.04	0.92	247	1.82	2.81	15	0.7	0.64	0.51	4.45	
P9	9	8	0.00	0.92	227	1.82	2.81	15	0.7	0.64	0.51	4.45	
P8	8A	8	0.17	0.17	245	0.42	0.65	12	0.3	0.40	0.40	2.24	Future Planning Area POC
P7B	8	7A	0.00	1.09	152	2.10	3.25	18	0.3	0.81	0.54	3.35	
PS6	7G	7F	0.00	0.00	150	0.00	0.00	8	2.0	0.01	0.01	0.52	
PS5	7F	7E	0.00	0.00	216	0.00	0.00	8	2.0	0.01	0.01	0.52	
PS4	7E	7D	0.04	0.04	218	0.11	0.17	8	2.0	0.14	0.21	3.08	
PS3	7D	7C	0.04	0.08	134	0.21	0.32	8	2.2	0.19	0.29	3.89	
PS2	7C	7B	0.00	0.00	75	0.00	0.00	8	5.0	0.01	0.01	0.82	
PS1	7B	7A	0.00	0.08	10	0.21	0.32	8	8.0	0.14	0.21	6.15	
P7A	7A	7	0.00	1.16	135	2.23	3.45	18	0.3	0.84	0.56	3.40	
P6	7	6	0.00	1.16	218	2.23	3.45	18	0.3	0.84	0.56	3.39	
P5	6	5	0.00	1.16	252	2.23	3.45	18	0.3	0.83	0.56	3.41	
P4	5	4	0.00	1.16	290	2.23	3.45	18	0.3	0.84	0.56	3.40	
P3	4	3	0.03	1.19	380	2.28	3.52	18	2.2	0.49	0.32	7.08	Business Park Connection
P2	3	2	0.10	1.29	291	2.44	3.77	18	2.2	0.50	0.34	7.22	
P1	2	1	0.00	1.29	144	2.44	3.77	30	2.2	0.42	0.17	6.83	

Table C-5 Manhole Properties
(Deep Alternative)

MH#	Rim Elevation	Invert Elevation	Depth of Cover
MH2	474.80	446.84	27.96
MH3	479.56	453.14	26.42
MH4	492.35	461.35	31.00
MH5	488.80	462.22	26.58
MH6	486.82	462.98	23.84
MH7	485.10	463.63	21.47
MH7A	484.04	464.04	20.01
MH7B	482.72	464.84	17.89
MH7C	482.10	468.59	13.52
MH7D	484.15	471.53	12.62
MH7E	486.26	475.82	10.44
MH7F	488.30	480.05	8.25
MH7G	490.00	483.00	7.00
MH8	482.85	464.49	18.36
MH8A	483.59	465.23	18.36
MH9	483.57	466.08	17.49
MH10	485.55	467.81	17.74
MH11	487.67	469.63	18.04
MH12	488.75	470.54	18.21
MH12A	488.41	473.62	14.79
MH12B	491.21	477.53	13.68
MH12C	498.45	484.77	13.68
MH13A	488.44	470.97	17.47
MH13B	488.45	473.01	15.44
MH13C	492.30	474.97	17.33
CAP	498.00	477.28	20.72
MH14	488.45	473.91	14.55
MH15	488.94	482.14	6.80
MH16	492.36	484.86	7.50
MH17	495.55	486.17	9.38
MH18	498.66	486.96	11.70
MH18A	500.16	488.64	11.52
MH18B	499.70	488.00	11.70
MH19	500.96	489.84	11.12
MH20	504.98	493.82	11.16
MH21	510.86	497.80	13.06

Appendix D

Response to Comments (March 1, 2018)

ISSUE NUMBER	COMMENT	RESPONSE
PUD- Water and Sewer Dev.		
F.	The sewer study maps/exhibits are difficult to read. Please provide an enlarged (at the minimum 24" by 36") clear sewer study scaled map/exhibit similar to your conceptual sewer infrastructure map showing all phases of the project, ColRich, Davisson and other neighboring tentative sewer layout, distances and invert elevations and all future connections. (New Issue)	Revised and included with this submittal.
F-30	Show rim, invert elevations and depth of all proposed and existing manholes both on the plans and sewer study exhibit. (New Issue)	Revised and included with this submittal.
F-31	Show all manhole numbers both on plans and sewer study exhibit. (New Issue)	Revised and included with this submittal.
F-32	Sewer study page 4, please correct the table to reflect pipes larger than 15" can have a d/D of 75% not 12". Also Peak WWF used needs to be verified by our sewer modeling group. (New Issue)	Revised and included with this submittal.
F-33	Please provide three hard copies (one for the DPM, John Fisher and two for us) and a pdf of the sewer study. (New Issue)	Comment acknowledged
F-34	Please make sure that the sewer study information and maps are consistent with plans. (New Issue)	Revised and included with this submittal.
F-35	Is the proposed sewer in Airway 12" or 15"? Typical section shows it as 15" but plans show 12". Please make sure all pipe sizes are consistent with the cross sections and the sewer study. (New Issue)	Revised to 15-inch and included with this submittal.
F-36	There has been some discrepancies between the invert elevations and pipe slopes throughout the project between plans and sewer study. Please make sure that pipe slopes and sizes on plans match the sewer study and sewer exhibit. (New Issue)	Revised and included with this submittal.

ISSUE NUMBER	COMMENT	RESPONSE
F-37	Airway Street raised median, can the sewer be relocated so it does not fall under the median. It is short segment but operational approval may be required. (New Issue)	A portion of the west sewer main has been realigned to the north side of the median to avoid being under the median.
F-38	The peak wet weather flow used needs to be verified by our modeling group. (New Issue)	Wet weather peaking factor used was consistent with City design criteria.
F-39	Cactus Road, can you increase the separation between the existing and proposed forcemain to about 8' from center to center? (New Issue)	Utility constraints prevent increasing to 8 feet. However it was increased to 6 feet.
F-40	Roundabout at the intersection of the proposed Central Main Street and Village Way, in our meeting we discussed the potential of the public main being less than 5' from the face of curb for short segment in one or two location with the assumption that sewer was not going to be placed under the roundabout. Please provide a detail showing where the sewer is with respect to the roundabout. It appears that there is no landscaping proposed in the roundabout. Is the second circle painted or raised? Would the area be asphalt or decorative pavement? (New Issue)	Roundabouts constrain sewer alignments in complying with the City sewer design criteria. Some minor revisions were made and our noted on the plan. The second roundabout circle will likely be raised and would be asphalt or decorative concrete.
F-41	Cactus Road, please identify the end cap at the proposed forcemain for the future connection. (New Issue)	Revised and included with this submittal.
F-42	Please show a sewer lateral connection for each lot indicating that it is feasible to sewer the lot. It is understandable that the exact location may shift during the final design. (New Issue)	Revised and included with this submittal.
F-43	I will set up a meeting to discuss the sewer study and different alternatives for ColRich as well as neighboring project. We will also discuss the Pump Station 23 sewer basin study as well. (New Issue)	A City meeting was held on March 29, 2018 to discuss the sewer options Pump Station 23 sewer basin study being finalized once OIC provides updated information on entitled sewer capacity. See email summary of meeting below: *Hi Mark,* *Just a note to ask your team to please provide both shallow option and deeper*

ISSUE NUMBER	COMMENT	RESPONSE
		option in two different exhibits in the sewer study for the records. Please keep explaining pros and cons of both options. For the deeper option include language to the effect in order to eliminate any private pump stations for Davisson project the deeper option is preferred and it will be acceptable by City's operations providing that your project installs parallel shallow sewer to take care of the locally generated sewer and connect to the main or the trunk sewer through a manhole at strategic points. *Thanks,* *Mehdi*
Draft Permit Conditions		
F-44	The project drains to the existing temporary pump station 23 (PS 23T). In addition to the site specific sewer study, the Owner/Permittee is required to provide an accepted Pump Station 23 sewer basin study based upon proposed zoning designations, satisfactory to the Public Utilities Director and the City Engineer, for all proposed public sewer facilities associated with Pump Station 23 T upgrade in accordance with the City of San Diego's current Sewer Design Guide. (New Issue)	The proposed Condition of Approval is acknowledged and accepted as written.
F-45	Prior to the issuance of any building permit, Owner/Permittee shall: (1) install components of the Permanent Pump Station 23; (2) install components of the Permanent Pump Station 23 and contribute proportionately based on the project size and impact to upgrade the affiliated sewer infrastructure; or (3) contribute proportionately based on the project size and impact to upgrade the affiliated sewer infrastructure, all in a manner satisfactory to the Public	The proposed Condition of Approval is acknowledged and accepted as written.

ISSUE NUMBER	COMMENT	RESPONSE
	Utilities Director and the City Engineer. (New Issue)	
F-46	The components or contributions required shall be determined pursuant to the Permanent Pump Station 23 Sewer Basin Study in effect at the time of building permit application. (New Issue)	The proposed Condition of Approval is acknowledged and accepted as written.
F-47	The Owner/Permittee is required to install all facilities, as required by the accepted sewer studies, necessary to serve this development. (New Issue)	The proposed Condition of Approval is acknowledged and accepted as written.
F-48	Prior to the issuance of any building permit the Owner/Permittee shall provide evidence to the Public Utilities Director and the City Engineer indicating that all on-site sewer and off-site sewer basin requirements have been satisfied. (New Issue)	The proposed Condition of Approval is acknowledged and accepted as written.
F-49	The proposed development is currently subject to the following reimbursement fees: The Otay Mesa Sewer Surcharge fee of $1821.75 per living unit plus 6% simple interest from 3-12-08 (21351-D-O). (New Issue)	The proposed Condition of Approval is acknowledged and accepted as written.
F-50	All proposed sewer facilities, must be designed and constructed in accordance with established criteria in the most current edition of the City of San Diego Water and Sewer Facility Design Guidelines and City regulations, standards and practices pertaining thereto. (New Issue)	The proposed Condition of Approval is acknowledged and accepted as written.
F-51	All proposed private sewer facilities located within a single lot are to be designed to meet the requirements of the California Plumbing Code and will be reviewed as part of the building permit plan check. (New Issue)	The proposed Condition of Approval is acknowledged and accepted as written.
F-52	All on-site sewer facilities will be private. (New Issue)	The proposed Condition of Approval is acknowledged and accepted as written.
F-53	Prior to issuance of any engineering permits, the Owner/Permittee shall obtain Encroachment and Maintenance Removal Agreement (EMRA) for	The proposed Condition of Approval is acknowledged and accepted as written.

ISSUE NUMBER	COMMENT	RESPONSE
	connecting private utilities encroaching into the public right-of-way. (New Issue)	
F-54	No trees or shrubs exceeding three feet in height at maturity shall be installed within ten feet of any water and sewer facilities. (New Issue)	The proposed Condition of Approval is acknowledged and accepted as written.

Appendix E

Response to Comments (June 12, 2018)

H. PUD- Water and Sewer Dev.		
H-33	Sewer study page 4, please correct the table to reflect pipes larger than 15" can have a d/D of 75% not 12". Also Peak WWF used needs to be verified by our sewer modeling group. (From Cycle 10)	Revised and included with this submittal.
Draft Permit Conditions		
H-45	The project drains to the existing temporary pump station 23 (PS 23T). In addition to the site specific sewer study, the Owner/Pemittee is required to provide an accepted Pump Station 23 sewer basin study based upon proposed zoning designations, satisfactory to the Public Utilities Director and the City Engineer, for all proposed public sewer facilities associated with Pump Station 23 T upgrade in accordance with the City of San Diego's current Sewer Design Guide. (From Cycle 10)	The proposed Condition of Approval is acknowledged and accepted as written.
H-46	Prior to the issuance of any building permit, Owner/Permittee shall: (1) install components of the Permanent Pump Station 23; (2) install components of the Permanent Pump Station 23 and contribute proportionately based on the project size and impact to upgrade the affiliated sewer infrastructure; or (3) contribute proportionately based on the project size and impact to upgrade the affiliated sewer infrastructure, all in a manner satisfactory to the Public Utilities Director and the City Engineer. (From Cycle 10)	The proposed Condition of Approval is acknowledged and accepted as written.
H-47	The components or contributions required shall be determined pursuant to the Permanent Pump Station 23 Sewer Basin Study in effect at the time of building permit application. (From Cycle 10)	The proposed Condition of Approval is acknowledged and accepted as written.
H-48	The Owner/Permittee is required to install all facilities, as required by the accepted sewer studies, necessary to serve this development. (From Cycle 10)	The proposed Condition of Approval is acknowledged and accepted as written.
H-49	Prior to the issuance of any building permit the Owner/Permittee shall provide evidence to the Public Utilities Director and the City Engineer indicating that all on-site sewer	The proposed Condition of Approval is acknowledged and accepted as written.

	and off-site sewer basin requirements have been satisfied. (From Cycle 10)	
H-50	The proposed development is currently subject to the following reimbursement fees: The Otay Mesa Sewer Surcharge fee of $1821.75 per living unit plus 6% simple interest from 3-12-08 (21351-D-O). (From Cycle 10)	The proposed Condition of Approval is acknowledged and accepted as written.
H-51	All proposed sewer facilities, must be designed and constructed in accordance with established criteria in the most current edition of the City of San Diego Water and Sewer Facility Design Guidelines and City regulations, standards and practices pertaining thereto. (From Cycle 10)	The proposed Condition of Approval is acknowledged and accepted as written.
H-52	All proposed private sewer facilities located within a single lot are to be designed to meet the requirements of the California Plumbing Code and will be reviewed as part of the building permit plan check. (From Cycle 10)	The proposed Condition of Approval is acknowledged and accepted as written.
H-53	All on-site sewer facilities will be private. (From Cycle 10)	The proposed Condition of Approval is acknowledged and accepted as written.
H-54	Prior to issuance of any engineering permits, the Owner/Permittee shall obtain Encroachment and Maintenance Removal Agreement (EMRA) for connecting private utilities encroaching into the public right-of-way. (From Cycle 10)	The proposed Condition of Approval is acknowledged and accepted as written.
H-55	No trees or shrubs exceeding three feet in height at maturity shall be installed within ten feet of any water and sewer facilities. (From Cycle 10)	The proposed Condition of Approval is acknowledged and accepted as written.
4th Review Comments		
H-56	No approved improvements or landscaping, including private water facilities, grading and enhanced paving, shall be installed in or over any easement prior to the applicant obtaining an Encroachment Maintenance and Removal Agreement. (New Issue)	The proposed Condition of Approval is acknowledged and accepted as written.
H-57	Plans as proposed only addresses the shallow alternative which does not accommodate the project to the west. It appears that your client is requesting certain conditions and	Attended June 27, 2018 meeting, and deep sewer will be shown as the preferred option. Shallow options will remain in the study.

	deadlines to be met by the adjacent property before a deeper sewer option is being proposed. I will set up another meeting to discuss this. (New Issue)	
H-58	The proposed sewer laterals for each lot that are mostly located in private driveway should be private. Please refer to each private sewer lateral as a private sewer lateral not a sewer service. (New Issue)	The proposed Condition of Approval is acknowledged and accepted as written.
H-59	If the private sewer lateral is a main (meaning that it is 8" or larger) and connects to the main in the street, it can be connected to manhole as you shown. If the proposed sewer lateral is less than 8", it should be connected to the main not the manhole. (New Issue)	The proposed Condition of Approval is acknowledged and accepted as written.
H-60	The plans indicate the future force main in Cactus Road to be 20", however the sewer study calls it 16". Please make them consistent. (New Issue)	Force main size has been revised to 24 inch.
H-61	Please let us know where we stand with respect to receiving the first submittal for Pump Station 23 sewer basin study? (New Issue)	Anticipated late August 2018.
Sewer Study Comments		
H-62	I have sent a pdf copy of the study to modeling group and will forward you their comments if any) separately. (New Issue)	The proposed Condition of Approval is acknowledged and accepted as written.
H-63	Please add sheet numbers. (New Issue)	The proposed Condition of Approval is acknowledged and accepted as written.
H-64	Have you sent a copy of the sewer study to Mr. Michael White of Rick Engineering representing Davisson Enterprises and have you had any feedback? If not please send a pdf copy of the report to Mr. Michael White of Rick Engineering. (New Issue)	Study submitted to Rick Engineering for review
H-65	The sewer study only addresses the shallow alternative which does not accommodate the project to the west. It appears that your client is requesting certain conditions and deadlines to be met by the adjacent property before a deeper sewer option is being proposed. I will set up another meeting to discuss this. (New Issue)	See H-57 for response.

H-66	Please use a factor of 3.5 persons per household instead of 3.45. (New Issue)	CH2M (Mark-when making this revision please add a note indicating that the use of 3.5 persons per household is based on direction from City staff and represents a conservative "worst-case" scenario of Project-related sewer generation rates because the Project is tiering from the Otay Mesa Community Plan Update Sewer Study which had a population generation rate of 3.45 persons per household.) The proposed Condition of Approval is acknowledged and accepted as written.
H-67	Table 4, d/D of 75% is allowed for 15" and larger mains not 12", please revise the table and calculations accordingly when the 12" sewer is flowing at 60% full. If as result of modeling input the flow is reduced a change in pipe size may not be needed. (New Issue)	The proposed Condition of Approval is acknowledged and accepted as written.
H-68	Under Lumina Trunk Sewer Alternatives several refences has been made regarding the need for a public sewer pump station for the development to the southwest. Please change this reference to private pump station, it was never meant to be a public sewer pump station. (New Issue)	The shallow options may require a public pump station. The modified shallow upturn would require only private structures.
H-69	Under Summary of options, it appears that your client is requesting certain conditions and deadlines to be met by the adjacent property before a deeper sewer option is being proposed. The issues that are brought up are between two developers but to the extent we can assist we will facilitate this process. I will set up another meeting to discuss this. (New Issue)	Per the June 27, 2018 meeting, the revised report summarizes cost sharing options on implementation.
H-70	The plans indicate the future force main in Cactus Road to be 20", however the sewer study calls it 16". Please make them consistent. (New Issue)	See H-60 for response.

Appendix F

Response to Comments (January 17, 2019)

ISSUE NUMBER	COMMENT	RESPONSE
PUD- Water and Sewer Dev.		
1.	Add the Davidson Communities sewer study acceptance letter to the subject sewer study.	Revised and included with this submittal. Letter is included in Appendix F.
2.	Revise Tables A-4 and C-4 per the City's Sewer Design Guide, Figure 1-2. Perform the hydraulic calculations from upstream to downstream. D/d for sewers 15-inch and smaller shall not exceed 0.5 (Sewer Design Guide, Section 1.3.3.3). Proposed downstream sewers cannot be smaller than upstream sewers. The following is the web-link to the Sewer Design Guide: https://www.sandiego.gov/sites/default/files/legacy/mwwd/pdf/sewerdesign.pdf	This is a planning study. During design, the marginal d/D criteria exceedances will have slope adjustments to conform with the Design Manual.
3.	Add a cross-section or verbiage in the text of the sewer study stating that 10-foot clear separation between public water and public sewer is required.	Revised and included with this submittal. Note added to Table 4.
4.	Show the direction of flow on Figures A-1 and Figure A-2.	Revised and included with this submittal.
5.	Show the point of connection to the existing sewer system on Figures 1, A-1, and A-2.	Revised and included with this submittal.
6.	Show a typical cross-section of all utilities on Cactus Road between Street C and Siempre Viva Road.	Revised and included with this submittal. Typical cross sections are included in Appendix F.

RICK ENGINEERING COMPANY

October 12, 2018

Mr. Paul Godwin
City of San Diego
1222 First Avenue
San Diego, CA. 92101

SUBJECT: OTAY MESA CENTRAL VILLAGE; LUMINA TM NO. 1972222, PTS NO. 555609
(RICK ENGINEERING COMPANY JOB NO. 17720)

Dear Mr. Fisher:

On behalf Davisson Enterprises, Rick Engineering Company has reviewed the revised on-site sewer study prepared by CH2M (now Jacobs) for the Lumina Tentative Map. This is a follow up to our letter to John Fisher, dated January 22, 2018 regarding our review of the initial sewer design by Project Design Consultant and a subsequent meeting on June 27, 2018 between the City, ColRich and Davisson to discuss the design of the backbone sewer system for future upstream planning areas. As before, we compared the Lumina sewer layout to the policies established by the Central Village Specific Plan and analyzed the ability of upstream property to develop using a gravity sewer system. We concur with the design criteria, waste water calculations and conclusions with respect to the deep sewer design. We continue to fully support the deep sewer alternative, as the preferred option. We recognize that the City has given this alternative preliminary approval, provided that special design features are implemented, as outlined in the report. It is our opinion that the deep sewer design is the only alternative that complies fully with section 2.6.1.2 of the Central Village Specific Plan. The other alternatives, fail to conform to the Central Village Specific Plan because they will require public and/or private pump stations for future upstream development. We understand that the City requested other alternatives be studied. However, in order to confirm that the system will comply with existing approved policy, we request that the options that do not conform with the Central Village Specific Plan be removed as options, or that text be added to the report indicating that these other alternatives were rejected because they did not conform to the approved Specific Plan.

Rick Engineering Company will continue to provide the City with necessary technical information during the review of Lumina's final engineering documents. We would only ask that the City provide Rick Engineering Company and Davisson notification of when information is needed during the process and provide access to the final technical reports and drawings so we may have time to respond.

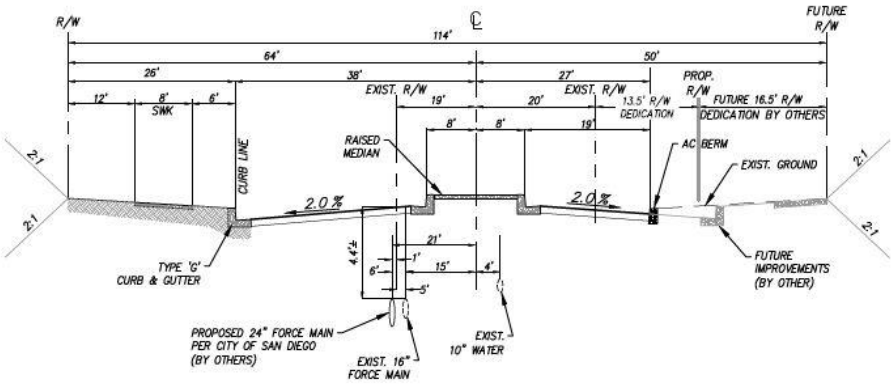
Finally, Rick Engineering Company will not be providing input on the funding options for the additional cost associated with the deep sewer alternative. However, we understand that Davisson and/or their counsel will follow up with input, regarding that topic. Rick will be available for confirming, or evaluating cost associated with the deep sewer option, when needed.

If you have any questions with the above review, please give me a call.

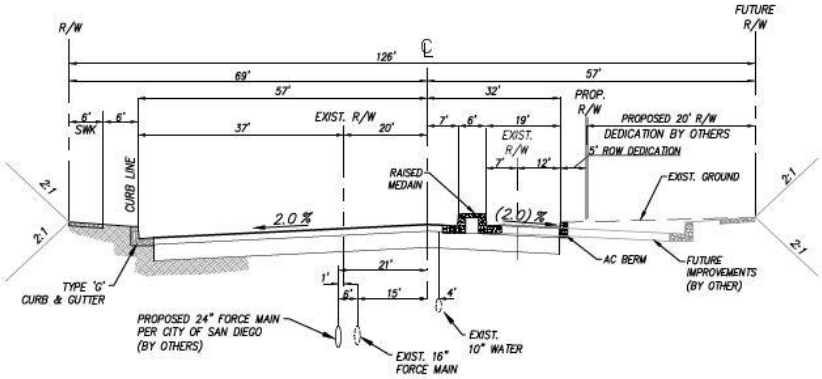
Sincerely,
RICK ENGINEERING COMPANY

Michael S. While, P.E., LEED AP
Associate Principal

Cc: Harold Ryan, Davisson Enterprises
Mark Freed, Davisson Enterprises
Ted Griswold, Procopio



CACTUS ROAD SECTION
STATION: 80+26.10
NOT TO SCALE



CACTUS ROAD SECTION
STATION: 72+78.48
NOT TO SCALE

CACTUS ROAD TYPICAL CROSS SECTION

Appendix G

Response to Comments (February 5, 2019)

ISSUE NUMBER	COMMENT	RESPONSE
PUD- Water and Sewer Dev. – February 5, 2019		
1.	On the sewer Exhibit Figures 1. A-1, and A-2 show and label the existing sewer mains with the size, material, and drawing number.	Figures revised and included with this submittal.
2.	The point of connections to the existing sewer system have to be shown and labeled at the existing sewer mains.	Figures revised and included with this submittal.
3.	Revise the provided hydraulic calculations from upstream to downstream, start from line P29 and complete the hydraulic at MH #1 line P1.	Hydraulic calculation tables presented in upstream to downstream segments.
4.	On the provided typical cross-section for Cactus Road, the existing 10” water mains and the existing 16” force main under the proposed raised median is not acceptable by Sewer and Water Design Guide.	10” water main is Otay Water District’s responsibility to maintain. Additional language regarding the median has been added to Page 5 of the Sewer Study.

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Anna L. McPherson, AICP
Senior Planner
City of San Diego
Environmental Analysis Section/Development Services Department
1222 First Avenue
San Diego, CA 92101

April 16, 2018

Subject: Lumina Development Tentative Map (PTS #555609) - Water Supply Assessment Review

Dear Ms. McPherson,

The purpose of this letter report is to document that the proposed Lumina development (Project) located within the 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. The District previously confirmed this inclusive approach based on consistency of the Central Village Specific Plan Area (SPA) (letter dated July 27, 2016) water demands with the adopted City of San Diego's (City) Otay Mesa Community Plan Update (OMCPU) (March 2014)

Background

The proposed Project includes approximately 93 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 1,868 multi-family (MF) residential units and 62,525 square feet of commercial development. In addition, the Project will include approximately 15.78 acres of park sites and 6.3 acres of a 15.5-acre school/recreation site. The Project is being planned in accordance with the OMCPU.

The Project will be supplied water by the District, which serves the City generally east of Heritage Road on Otay Mesa. Table 1 lists the proposed land uses for the Project broken down by Phase I and Phase II, as well as the remaining SPA planned for development (Phase III).

Table 1. Project and SPA Land Use Summary

Land Use	Net Acres (nac)	Max Commercial Square Footage (sq ft)	Residential Units (DUs)
Project (Phase I)			
Commercial		62,525	
Mixed Use Residential	32.58		1,129
Parks and Open Space	7.21		
Institutional			
Circulation	16.19		
Subtotal	55.98	62,525	1,129
Project (Phase II)			
Commercial			
Mixed Use Residential	22.58		739
Parks and Open Space	8.57		
Institutional	6.30		
Subtotal	37.44		739
Remaining SPA (Phase III)			
Commercial		77,175	
Mixed Use Residential	91.11*		2,617
Parks and Open Space	15.45		
Institutional	6.8		
Circulation	22.41		
Subtotal	135.77*	77,175	2,617
Total SPA	229.2	139,700	4,485

*TM Lot 21 Area has been subtracted from Mixed Use Residential Area since it has been already accounted in the Lumina Development Phase II

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.

District Water Supply Update

The expected potable water demand for the Project area served by the District is 0.53 million gallons per day (mgd) or about 604 acre-feet per year (AFY), as shown in Table 2. **The proposed Lumina tentative map is consistent with the WSA letter update dated July 27, 2016 prepared for the Central Village Specific Plan, of which the Project is a part**. The previously estimated 1,445 AFY demand (May 2013 WSA&V Report), includes the estimated 604 AFY and was accounted for in the District's 2015 Urban Water Management Plan (UWMP) and the Water Authority's 2015 UWMP.

Table 2. Projected Project Potable Water Annual Average Demands

TM Lot	Planning Area.	Land Use	Net Acres (nac)	Non-Residential Square Footage	Residential Units (DUs)	Unit Demand gpd/sf	Unit Demand gpd/DU	Total Demand (mgd)
Phase I (Project)								
1	9	Medium High Mixed Use	6.97	9,410	188	0.041	300	0.06
2	9	Medium High Mixed Use	4.19	15,352	115	0.041	300	0.04
3	4	Medium High Mixed Use	4.17	7,975	173	0.041	300	0.05
4	4	Medium High Mixed Use	3.93	7,700	167	0.041	300	0.04
5	4	Medium High Mixed Use	2.98	5,775	126	0.041	300	0.04
6	16	Park	3.39		0	0.050	-	0.01
7	4	Medium High Mixed Use	3.14	6,050	132	0.041	300	0.04
8	3	Medium High Mixed Use	1.90	3,284	73	0.041	300	0.02
9	3	Medium High Mixed Use	2.04	3,490	78	0.041	300	0.02
10	3	Medium High Mixed Use	2.49	3,489	77	0.041	300	0.02
22	8	Basin	1.04		0	0.050	-	0.00
23	20	Open Space	1.89		0	0.050	-	0.00
24	20	Open Space	0.89		0	0.050	-	0.00
25	5	Medium Density Multi Family (Developed as recreation area)	0.77		0	0.050	300	0.00
		Subtotal	**39.79**	**62,525**	**1,129**	**-**	**-**	**0.29**
Phase II (Project)								
11	5	Medium Density Multi Family	4.38		137	0.041	300	0.04
12	5	Medium Density Multi Family	3.06		94	0.041	300	0.03
13	5	Medium Density Multi Family	4.44		137	0.041	300	0.04
14	5	Medium Density Multi Family	5.03		158	0.041	300	0.05
15	14	Institutional	2.32		0	0.041	-	0.00
16	14	Institutional	1.53		0	0.041	-	0.00
17	14	Institutional	2.43		0	0.041	-	0.00
18	18	Park	3.50		0	0.050	-	0.01
19	8	Low Density Multi Family	5.68		213	0.041	300	0.06
20	8	Drainage Basin	2.64			0.041	-	0.00
21	8/18	Slope Area	2.43			0.041	-	0.00
-	**-**	**-**	**37.44**	**0.00**	**739**	**-**	**-**	**0.24**
		Total Ultimate	**77.23**	**62,525**	**1,868**			**0.53**

Unit demands for commercial square footage based on a water demand of 1785 gpd/acre from the OMCPU page 28 made by Atkins on May 2013.

The only notable change in water supply from the OMCPU WSA 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 therefore all future irrigation will be via the potable water system.

In summary, 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 (as noted below due to the elimination of recycled water irrigation) that could be supplied by the Water Authority's Accelerated Forecasted Growth supply.

Conclusion

The proposed Project within the District water service area has 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 Lumina tentative map.

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
Emilie Colwell, Turrni & Brink
Bob Kennedy, Otay Water District
Leanne Hammond, CH2M

PRELIMINARY
WASTE MANAGEMENT PLAN
FOR THE

LUMINA TENTATIVE MAP NO. 1972222

Lead Agency
City of San Diego
1222 First Avenue
San Diego, CA 92101

Prepared By:
T&B Planning, Inc.
3665 Ruffin Road, Suite 208
San Diego, CA 92123

January 12, 2018

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1.0 INTRODUCTION

The purpose of this Waste Management Plan (WMP) for the Lumina Tentative Map No. 197222 (TM No. 197222) Project (Project) in the City of San Diego (City) is to provide analysis of the solid waste impacts anticipated for the Project and how those impacts will be mitigated. The goal of this WMP is to identify potential impacts of the Project on solid waste services and if necessary, identify mitigation measures to reduce impacts to less-than-significant levels. This Project shall strive for a goal of 75 percent of waste reduction for construction and demolition debris, consistent with the requirements of Chapter 6, Article 6, Division 6 of the Municipal Code and City policies regarding waste reduction and recycling. The Project shall also divert waste generated during occupancy in accordance with City policies regarding waste reduction and recycling.

This WMP addresses site demolition, building construction, and occupancy of the proposed Project. The WMP addresses the projected amount of waste that could be generated by the Project based on current City generation rates and estimates; waste reduction goals; and recommended techniques to achieve the waste reduction goals, such as recycling.

The City has established a threshold of 40,000 square feet of development as generating sufficient waste (60 tons) to have a potentially cumulatively significant impact on solid waste services. The Project as proposed exceeds this threshold. The purpose of this WMP is to identify mitigation measures to reduce this potential impact to below a level of significance.

Because the Lumina development exceeds the threshold for solid waste generation, this WMP has been prepared to mitigate the direct impacts of this project by addressing the following elements for the demolition, construction, and occupancy phases of the project as applicable:

- Tons of waste anticipated to be generated;
- Material type of waste to be generated;
- Source separation techniques for waste generated;
- How materials will be reused on-site;
- Name and location of recycling, reuse, and landfill facilities where recyclables and waste will be taken if not reused on-site;
- A “buy recycled” program;
- How the project will aim to reduce the generation of construction/demolition debris;
- A plan of how waste reduction and recycling goals will be communicated to subcontractors; and
- A timeline for each of the three main phases of the project (demolition, construction, and occupancy).

2.0 PROJECT DESCRIPTION

The existing 93.43-acre Project site is located north of Siempre Viva Road and west of Cactus Road in the Otay Mesa Community Plan area of the City of San Diego within the Central Village Specific Plan (CVSP) area. The Project proposes to establish 25 lots designated for commercial and residential mixed-uses, multi-family residential uses, publics school facilities, recreation, and open space. The proposed land uses are consistent with the land use designations applied to the site by the CVSP. The TM proposes lots for the development of Medium High Density Mixed-Use, Medium Density Multi-Family, Low Density Multi-Family, Public School Facilities, Recreation, and Open Space land uses on a total of 25 lots. Table 1, *Development Summary*, provides a summary of the land uses proposed on-site. The Project currently proposes a Tentative Map, and a public right-of-way vacation, and will require a future Neighborhood Development Permit, which will be processed prior to construction. All improvements proposed by the Lumina TM Application are in conformance with the CVSP.

Table 1 Development Summary

Proposed Land Use	Tentative Map Lot Number	Corresponding CVSP Planning Area Numbers	Acres
Medium High Density Mixed Use	1-5	3, 4, 9	31.81
Medium Density Multi-Family	11-14	5	16.91
Low Density Multi-Family	19	8	5.68
School/Recreation	15-17	14	6.28
Recreation (Parks)	6, 18	16, 18	6.89
Open Space (Bio-Filtration Basins	20, 22	8-9	3.68
Open Space (Slope Areas)	21, 23	8, 20	4.32
Open Space	24	20	0.89
Recreation (Central Recreation Area)	25	5	0.77
Roadways	--	--	16.19
		TOTAL:	**93.43**

As shown in Table 1, the Project includes a School/Recreation lot in accordance with the land uses designated by the CVSP. Although the Project designates a lot for School/Recreation uses, the Project does not propose to construct a school in this area. The lot for the school site will be graded as part of the proposed Project, and will then be acquired by the San Ysidro School District at a future date. The San Ysidro School District will be responsible for construction of the school facility. Thus, this WMP does not account for waste that will be generated by the proposed school site, as these impacts will be evaluated as part of a future WMP when the San Ysidro School District brings forward construction plans for the proposed school site. This WMP evaluates the all other components of the Project, including waste that will be generated by demolition of existing structures throughout the Project site, and waste that will be generated with construction and occupancy of the proposed multi-family residential and commercial uses on-site.

Grading proposed as part of the TM will encompass approximately 86.3 acres of the site plus an additional 6.1 acres off site. A total of 431,000 cubic yards (c.y.) of cut and 431,000 c.y. of fill is anticipated, with no import or export of soil materials. The maximum depth of cut will be 15 feet, while the maximum depth of fill will be 60 feet. Fill slopes will consist of a maximum slope ratio of 2:1 with a maximum height of 68 feet. Proposed cut slopes also will have a maximum slope ratio of 2:1 with a maximum height of 10 feet.

Under existing conditions, the majority of the Project site is used for agricultural production, which has occurred on-site since at least the early 1990's (Google Earth, 2017). The majority of the Project site is used for crop production (oats). Along the Project's eastern boundary in the southern half of the site are greenhouses and goat husbandry operations. Along the south and northwestern boundaries of the site are open space areas and natural drainages that feed into Spring Canyon. Waste generated by existing on-site uses is considered negligible due to low waste production levels of agriculture, greenhouse, and goat husbandry operations. The Project will include demolition of approximately 56,800 s.f. of existing structures associated with the existing agriculture, greenhouse, and goat husbandry operations on-site. The Project also will include removal of landscape debris associated with approximately 2,460,000 s.f. of agriculture and greenhouse operations.

3.0 APPLICABLE REGULATORY REQUIREMENTS

The following is a brief description of the state and local environmental laws and related regulations related to solid waste.

3.1 State Regulations

3.1.1 California Solid Waste Integrated Waste Management Act (AB 939, 1989)

The Integrated Waste Management Act (IWMA) established an integrated waste management hierarchy to guide the California Integrated Waste Management Board (CIWMB) and local agencies in implementation, in order of priority: (1) source reduction, (2) recycling and composting, and (3) environmentally safe transformation and land disposal (it should be noted that the CIWMB no longer exists, and its duties have been assumed by CalRecycle). As part of the IWMA, the CIWMB was given a purpose to mandate the reduction of disposed waste. (CalRecycle, 1997a) The IWMA also required:

- the establishment of a task force to coordinate the development of city Source Reduction and Recycling Elements (SRREs) and a countywide siting element. (CalRecycle, 1997a)
- each city, by July 1, 1991, to prepare, adopt and submit a SRRE to the county which includes the following components: waste characterization; source reduction; recycling; composting; solid waste facility capacity; education and public information; funding; special waste (asbestos, sewage sludge, etc.); and household hazardous waste. (CalRecycle, 1997a)
- each county, by January 1, 1991, to prepare a SRRE for its unincorporated area, with the same components described above, and a countywide siting element, specifying areas for

transformation or disposal sites to provide capacity for solid waste generated in the jurisdiction which cannot be reduced or recycled for a 15-year period.

- each county to prepare, adopt, and submit to the Board an Integrated Waste Management Plan (IWMP), which includes all of the elements described above. (CalRecycle, 1997a)
- each city or county plan to include an implementation schedule which shows: diversion of 25 percent of all solid waste from landfill or transformation facilities by January 1, 1995 through source reduction, recycling, and composting activities; and, diversion of 50 percent of all solid waste by January 1, 2000 through source reduction, recycling, and composting activities. (CalRecycle, 1997a)
- the CIWMB to review the implementation of each SRRE at least once every two years. (CalRecycle, 1997a)
- The IWMA required the CIWMB, in conjunction with an inspection conducted by a Lead Enforcement Agency (LEA), to conduct at least one inspection per year of each solid waste facility in the state. (CalRecycle, 1997a)
- Additionally, the IWMA established a comprehensive statewide system of permitting, inspections, enforcement, and maintenance for solid waste facilities. (CalRecycle, 1997a)

3.1.2 Waste Reuse and Recycling Act (AB 1327)

The Waste Reuse and Recycling Act (WRRA) required the CIWMB to approve a model ordinance for adoption by any local government for the transfer, receipt, storage, and loading of recyclable materials in development projects by March 1, 1993. The WRRA also required local agencies to adopt a local ordinance by September 1, 1993 or allow the model ordinance to take effect. The WRRA requires all development projects that are commercial, industrial, institutional, or marina in nature and where solid waste is collected and loaded, to provide an adequate area for collecting and loading recyclable materials over the lifetime of the project. The area is required to be provided before building permits are issued. (CalRecycle, 1997b)

3.1.3 Mandatory Commercial Recycling Program (AB 341)

Assembly Bill (AB) 341 (Chapter 476, Statutes of 2011 [Chesbro, AB 341]) directed CalRecycle to develop and adopt regulations for mandatory commercial recycling. CalRecycle initiated formal rulemaking with a 45-day comment period beginning Oct. 28, 2011. The final regulation was approved by the Office of Administrative Law on May 7, 2012. AB-341 was designed to help meet California's recycling goal of 75% by the year 2020. AB 341 requires all commercial businesses and public entities that generate 4 cubic yards or more of waste per week to have a recycling program in place. In addition, multi-family apartments with five or more units are also required to form a recycling program. (CalRecycle, 2017)

3.1.4 2016 California Green Building Standards Code

CALGreen became effective January 1, 2017, and is applicable to the planning, design, operation, construction, use, and occupancy of every newly constructed building or structure throughout the State

of California (including residential structures and elementary schools). § 5.408.3 of CALGreen requires that 100 percent of trees, stumps, rocks, and associated vegetation and soils resulting from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on-site until the storage site is developed.

3.2 Local Regulations

3.2.1 City of San Diego Ordinance No. O-19420 & O-19694

Starting on July 1, 2008, all new construction projects are required to pay a refundable solid waste deposit on construction waste. This ordinance requires the applicant to do the following:

- All applicants for a Building Permit or a Demolition/Removal Permit shall submit a properly completed Waste Management Form Part I with the Building Permit or Demolition/Removal Permit application, in accordance with the requirements set forth in the Land Development Manual.
- All applicants shall pay a refundable deposit at the time the Building Permit or Demolition/Removal Permit is issued.
- No Building Permit or Demolition/Removal Permit shall be issued unless the applicant has submitted a properly completed Waste Management Form Part I and paid the required deposit.

3.2.2 City of San Diego Ordinance No. O-19678

For multi-family residential facilities which receive solid waste collection service from a Franchisee shall participate in a recycling program by separating recyclable materials from other solid waste and depositing the recyclable materials in the recycling container provider by the Franchisee or Recyclable Materials Collector. The recycling services required by section §66.0706 of the San Diego Municipal code shall include, at a minimum, all of the following:

1) collection of recyclable materials at least two times per month;

2) collection of plastic bottles and jars, paper, newspaper, metal containers, cardboard, and glass containers;

3) utilization of recycling receptacles which comply with the standards in the Container and Signage Guidelines established by the Department;

4) designated recycling collection and storage areas; and

5) signage on all recycling receptacles, containers, shuts, and/or enclosures which complies with the standards described in the Container and Signage Guidelines by the Department.

Additionally, for multi-family residential facilities, the responsible person shall ensure that occupants are educated about recycling services as follows:

1) Information, including the types of recyclable materials accepted, the location of recycling containers, and the occupants responsibility to recycle pursuant to Chapter 6, Article 6 Division 7 of the San Diego Municipal Code, shall be distributed to all occupants annually;

2) all new occupants shall be given information and instructions upon occupancy; and

3) all occupants shall be given information and instructions upon any change in recycling service to the facility.

Occupants of commercial facilities which receive solid waste collection service from a Franchisee shall participate in a recycling program by separating recyclable materials from other solid waste and depositing the recyclable materials in the recycling container provider by the Franchisee or Recyclable Materials Collector. The recycling services required by sections §66.0707 if the San Diego Municipal code shall include, at a minimum, all of the following:

1) collection of recyclable materials as frequently as necessary to meet demand;

2) collection of plastic bottles and jars, paper, newspaper, metal containers, cardboard, and glass containers;

3) collection of other recycling materials for which markets exist, such as scrap metal, wood pallets, and food waste, as determined by the Director, with collection of such recyclable materials required beginning on the 181st day after the City gives public notice thereof by placing a display advertisement of at least one-eighth page in a newspaper of general daily circulation within the City and positing a notice including such recyclable materials on a list maintained on the Department's website;

4) utilization of recycling receptacles which comply with the standards in the Container and Signage Guidelines established by the Department;

5) designated recycling collection and storage areas; and

6) signage on all recycling receptacles, containers, shuts, and/or enclosures which complies with the standards described in the Container and Signage Guidelines by the Department.

Additionally, for commercial facilities, the responsible person shall ensure that occupants are educated about recycling services as follows:

1) Information, including the types of recyclable materials accepted, the location of recycling containers, and the occupants responsibility to recycle pursuant to Chapter 6, Article 6 Division 7 of the San Diego Municipal Code, shall be distributed to all occupants annually;

2) all new occupants shall be given information and instructions upon occupancy; and

3) all occupants shall be given information and instructions upon any change in recycling service to the commercial facility.

3.2.3 Municipal Code Chapter 14, Article 2, Division 8

Municipal Code Chapter 14 Article 2 Division 8 sets forth the general regulations for refuse and recyclable materials storage for residential and commercial development. These sections include guidelines for the size of material storage areas based on the number of residential dwelling units and non-residential commercial square footage; location of material storages areas; and screening of material storage areas. (City of San Diego, 2017a)

3.2.4 Municipal Code Chapter 6, Article 6, Division 6

Municipal Code Chapter 6, Article 6, Division 6 includes the guidelines for the Construction and Demolition (C&D) Debris Diversion Deposit Program as stated by City of San Diego Ordinance No. O-19678, described above. (City of San Diego, 2017a)

3.2.5 Municipal Code Chapter 6, Article 6, Division 7

Municipal Code Chapter 6, Article 6, Division 7 sets forth the requirements for recycling requirements for residential and non-residential developments. The Municipal Code Chapter includes provisions for mandatory recycling services, frequency of service, recycling bins and storage areas, recycling materials to be collected, and occupant education requirements. (City of San Diego, 2017a)

4.0 DEMOLITION WASTE

As part of the conversion of the Project site from agricultural, greenhouse, and goat husbandry operations to a mixed-use residential and commercial developments, all existing structures on-site will need to be demolished to accommodate the proposed Project. Exhibit A, *Demolition Summary*, shows the total approximate area of structures to be demolished by the proposed Project, as well as areas that will be cleared of landscaping debris.

Although specific statistical information is not currently available regarding the generation of waste associated with the demolition of the 56,800 s.f. of structures and 2,460,000 s.f. of landscape debris identified in Exhibit A, it is estimated that three or more pounds per square foot of waste will be generated during the demolition phase. Based on these factors, the calculation of the Project's estimated demolition waste is provided below.

Mixed Demolition Debris:[1]

$$56{,}800\ sf \quad \text{x} \quad \frac{3lbs}{sf} \quad \text{x} \quad \frac{.0005\ tons}{lb} \quad = \quad 85.2 \text{ tons of Mixed Demolition Debris}$$

Landscaping Demolition Debris:[1]

$$2{,}460{,}000\ sf \quad \text{x} \quad \frac{3lbs}{sf} \quad \text{x} \quad \frac{.0005\ tons}{lb} \quad = \quad 3{,}690 \text{ tons of Landscaping Demolition Debris}$$

As shown above, demolition of the existing approximately 56,800 square feet structures on site will yield an estimated 85.2 tons of mixed demolition debris. The existing agriculture and landscaping to be removed total approximately 2,460,000 s.f. and will yield an estimated 3,690 tons of demolition

debris. Thus, the Project will yield an estimated total of 3,775 tons of demolition debris. This is only an estimate based on the above methodology. Actual tonnage shall be determined by the contractor at the time of removal. Table 2, *Estimated Demolition Waste – Quantities and Percent Diverted*, shows the estimated demolition waste separated by material, and the percentage of each materials that will be diverted from the landfill through salvage or recycling.

Table 2 Estimated Demolition Waste – Quantities and Percent Diverted

Material	Estimated Waste Quantity (tons)	Handling[1]	Diversion Rate (%)	Estimated Diversion (tons)	Estimated Disposal (tons)
Asphalt, Concrete, Stone, and Masonry	70.0	Otay Valley Rock, LLC	100	70.0	0.0
Ceiling Tiles	0.1	AMS San Diego	100	0.1	0.0
Ceramic/Porcelain	0.1	Enniss Incorporated	100	0.1	0.0
Doors	0.1	Habitat for Humanity ReStore	100	0.1	0.0
Landscape Debris	3,690	Miramar Greenery	100	3,690	0.0
Metal Waste	6.4	Cactus Recycling	100	6.4	0.0
Mixed Debris	8.5	Otay C&D/Inert Debris Processing Facility	75	6.375	2.125
TOTAL:	**3,775**	**--**	**99**	**3,773.075**	**2.125**

1. Handling Facilities were selected from the City of San Diego "*2017 Certified Construction and Demolition Recycling Facility Directory*" (City of San Diego, 2017b)

4.1 Salvage

The proposed Project anticipates using 100% of the asphalt, stone, and concrete demolition waste by grinding it up and reusing it on-site during construction as:

- "shading" of pipe trenches
- Base or sub-base for paving or hardscape
- Backfill or flat work

To accomplish this, concrete waste, masonry, stone, and asphalt will be collected and isolated in segregated piles so that it can be ground up and reused. Should there end up being more material than can be used on-site, the excess materials will be source separated, collected in separate bins and taken to an appropriate facility for recycling.

The Project site currently includes agriculture and greenhouse uses. All of the green waste materials will be sent to Miramar Greenery located at 5180 Convoy Street for 100% diversion.

In addition to the salvage for reuse described above, three additional materials will be segregated from the mixed debris for recycling at a recycling facility achieving 100% diversion:

- Metal waste
- Ceramic tiles
- Porcelain waste

It is anticipated that approximately 99% of the waste materials generated during the demolition phase of the Project will be reused or diverted by salvaging or source separating the materials as described in Table 2 above. Therefore, the Project will exceed the 75% waste reduction requirement for construction and demolition debris as required by the City's Municipal Code. Tonnage for each material is subject to change based on actual data and will be documented by the contractor. The facilities identified above in Table 2 are subject to change based on their availability at the time demolition operations commence. Each year, the City of San Diego updates and maintains a directory of approved demolition recycling facilities, which should be consulted by the contractor prior to the start of demolition (City of San Diego, 2017b). The contractor may elect to utilize one of the equally appropriate facilities listed in this directory.

5.0 CONSTRUCTION WASTE

During construction of the proposed Project, solid waste requiring landfill disposal will be required. The solid waste generated will primarily consist of discarded materials and packaging generated by the construction process. Construction debris will be separated on-site into material-specific containers to facilitate reuse and recycling and to increase the efficiency of waste reclamation and/or will be collected by a contracted waste hauler and separated at an off-site waste collection facility. Separation of materials at the construction site is necessary in order to ensure appropriate waste diversion rate, minimize costs associated with transportation and disposal, and facilitate compliance with the C&D ordinance. The types of construction waste anticipated to be generated include:

- Asphalt and concrete
- Brick/Masonry/Tile
- Cabinets/Doors/Fixtures
- Cardboard
- Carpet, padding/foam
- Ceiling Tile
- Drywall
- Landscape debris
- Mixed C&D material
- Roofing Materials

- Scrap metal
- Stucco
- Unpainted wood and pallets
- Garbage/Trash

Materials to be salvaged and/or recycled will be used on-site or redirected to appropriate recipients selected from the City of San Diego Environmental Services Department's directory of facilities that recycle construction materials, scrap metal, and yard waste.

5.1 On-Site Grading

The proposed Project anticipates 431,000 c.y. of cut and 431,000 c.y. of fill will be required on-site. Grading will be balanced on-site. Consequently, there will be no export of dirt from the Project site during the grading phase of the Project, and therefore the grading phase of the Project will not generate waste.

Existing vegetation will be removed as part of the grading process (clearing and grubbing) and will be processed and recycled 100% at a suitable green waste recycling facility. No vegetation will be sent to the landfill.

Other anticipated waste associated with grading operations includes negligible amounts of trash generated by contractors working on-site.

5.2 Building Construction

Construction of the proposed Project will likely occur across two phases over several years. The City of San Diego Environmental Services Department (ESD) requires projects to estimate tonnage of expected construction waste. It is estimated that three or more pounds per square foot of waste will be generated during the construction phase. At this time, plans depicting the square footage of the site-specific structures is not available. Thus, in order to provide a "worst-case" analysis, this WMP will utilize the maximum floor area ratio (FAR) allowed on the Project site as required by the CVSP in order to calculation the Project's maximum residential square footage. Based on Table 3-2 of the CVSP, *Central Village Supplemental Development Regulations*, Medium High Density Mixed Use areas have an allowed FAR of 2.5, and Medium Density Multi-Family and Low Density Multi-Family areas have an allowed FAR of 1.5 (T&B Planning, 2017, Table 3-2). Based on the calculations shown below, under the "worst-case" scenario, the Project will result in a maximum total of 4,940,140 s.f. of building area on-site. Note that this value includes the square footage for all potential structures on-site, and thus, includes the 62,525 s.f. of commercial uses proposed by the Project. As shown, development of 4,940,140 s.f. of building area would result in the generation of approximately 7,536 tons of building construction waste.

Medium High Density Mixed Use:	32.58 *ac* x 43,560 *sf* x 2.5 FAR = 3,547,962 *sf*
Medium Density and Low Density Multi-Family:	22.59 *ac* x 43,560 *sf* x 1.5 FAR = 1,476,031 *sf*

Construction Waste Calculation:[1]

$$5{,}023{,}993\ sf \quad \text{x} \quad \frac{3lbs}{sf} \quad \text{x} \quad \frac{.0005\ tons}{lb} \quad = \quad 7{,}536 \text{ tons of Building Construction Waste}$$

The 7,536 tons of construction waste is the initial estimate that will be used for planning purposes until construction documents has been prepared and a contractor has been hired who can more accurately compute the expected waste in total quantity and by type. For planning purposes, the contractors shall source separate the waste materials generated according to what is shown in Table 3, *Project Waste Generation - Construction*, below. Based on the information shown in Table 3, the Project will divert approximately 76.8% of construction-related waste from the landfill, which exceeds the 75% waste reduction requirement for construction and demolition debris as required by the City's Municipal Code.

Table 3 Project Waste Generation - Construction

Material Type	Estimated Waste Quantity (tons)	Handling	Estimated Diversion (tons)	Estimated Disposal (tons)
Clean Wood (forming and framing lumber)	391	Inland Pacific or Miramar Greenery	391	0
Metals (pipes, rebar, finishing, steel, aluminum, copper, brass, stainless steel)	163	Cactus Recycling	163	0
Polystyrene	20	Cactus Recycling	20	0
Blocks, Bricks	402	Vulcan Carol Canyon Landfill and Recycle Site	402	0
Asphalt, Concrete	407	Otay Valley Rock, LLC	407	0
Trash (treated wood)	407	Miramar Landfill	0	407
Mixed Debris (insulation, vinyl, doors, floor tile, plastic pipes, film, broken glass, drywall)	5,361	Otay C&D/Inert Debris Processing Facility	4,021	1,340
Cardboard	239	Cactus Recycling	239	0
Carpet/Carpet Padding	146	DSF Flooring	146	0
TOTAL	**7,536**		**5,789**	**1,747**

5.2.1 Solid Waste Management Coordinator

To facilitate management of construction materials, the construction contractor shall identify one person or agency connected with the Project to act as Solid Waste Management Coordinator, whose responsibility it becomes to work with all contractors and subcontractors to ensure material separation and coordination proper disposal and diversion of waste generated. The Solid Waste Management Coordinator will help ensure all diversion practices outlined in this Waste Management Plan are upheld and communicate goals to all contractors involved efficiently.

The responsibilities of the Solid Waste Management Coordinator, include, but are not limited to, the following:

- Review the Solid Waste Management Plan;
- Coordinate and oversee salvage operations;
- Review and update procedures as needed for material separation and verify availability of containers and bins needed to avoid delays;
- Review and update procedures for periodic solid waste collection and transportation to recycling and disposing facilities; and
- The authority to stop work orders if proper procedures aren't being followed.

The contractors shall perform daily inspections of the construction site to ensure compliance with the requirements of the WMP and all other applicable laws and ordinances and report directly to the Solid Waste Management Coordinator. Daily inspections shall include verifying the availability and number of dumpsters based on the amount of debris being generated, correct labeling of dumpsters, proper sorting and segregation materials, and salvaging of excess materials. Additionally, the following shall apply:

- Solid waste management coordinator will be responsible for educating contractors and subcontractors regarding waste management plan requirements and ensuring that contractors and subcontractors carry out the measures described in the WMP.
- Solid waste management coordinator will ensure ESD attendance at a Preconstruction Meeting and ensure compliance with segregation requirements, and verification of recycled content in base materials.
- Recycling areas shall be clearly identified with large signs, approved by ESD, and sufficient amounts of material-specific bins shall be provided for necessary segregation.
- Recycling bins shall be placed in areas that are readily accessible to contractors/subcontractors and in areas that will minimize misuse or contamination by employees and the public.
- Solid waste management coordinator will be responsible for ensuring that contamination rates in bins remain below 5 percent by weight of the bin.

5.2.2 Source Separation

During the construction of the Lumina Project, separate bins will be designated for the collection of the following construction materials:

- Drywall
- Concrete
- Clean Wood
- Scrap Metal
- Polystyrene

- Roofing
- Cardboard
- Trash

These bins shall be clearly labeled, located in areas to avoid contamination, and regularly inspected by the Solid Waste Management Coordinator to remove contaminates. These materials will be either reused in the building construction process, or taken to designated recycling facilities which have been certified by the City of San Diego and have a diversion rate of 100%.

5.2.3 Construction Report

A Construction Report will be required following the construction of the Project to summarize implementation of the WMP. The Construction Report will be subject to review and approval by the Mitigation Monitoring Coordinator (MMC) and ESD. The Construction Report will be required to include the following information:

- The actual waste generated and diverted from the Project;
- The waste reduction percentage achieved; and
- How the waste reduction percentage goal was achieved.

Prior to the sign off of a Construction Permit, the Project Applicant shall be required to submit written evidence to the Assistant Deputy Director (ADD) of the Entitlements Division that the final Construction Report has been approved by the MMC and ESD.

6.0 OPERATIONAL WASTE

Demolition of existing structures and construction of new structures occurs as a one-time waste generation event. Tenant/owner occupancy requires an ongoing plan to manage waste disposal to meet the waste reduction goals established by the City and State.

6.1 Solid Waste Storage Areas

Table 4, *Minimum Exterior and Recyclable Material Storage Areas for the Project*, shows the anticipated refuse and recyclable storage requirement based on the requirements of the City's Municipal Code. As shown below in Table 4, the Project will require a minimum of 3,729 square feet (s.f.) of refuse storage, 3,729 s.f. of recyclable material storage, and a total of 7,458 s.f. of refuse and recyclable storage areas.

6.2 Operational Solid Waste

The Project will include construction and operation of 1,868 multi-family residential dwelling units, and 62,525 s.f. of commercial space. The Project is located within the Otay Mesa Community Plan area. The Otay Mesa Community Plan Update Environmental Impact Report (EIR) utilized a generation rate of 7.8 pounds/unit/day for residential uses, and 13 pounds/1,000 sf/day for commercial

Table 4 Minimum Exterior and Recyclable Material Storage Areas for the Project

Land Use	Dwelling Units/Gross Floor Area	Minimum Refuse Storage Area (square feet)	Minimum Recyclable Material Storage Area (square feet)	Total Minimum Storage Area (square feet)
Residential	1,868 DU	3,585	3,585	7,170
Commercial/Retail	62,525 s.f.	144	144	288
	TOTAL:	**3,729**	**3,729**	**7,458**

DU = Dwelling Units; s.f. = square feet

1. Minimum refuse and recyclables storage rates obtained from City of San Diego Municipal Code Table 142-08B, which requires the provision of 384 s.f. of refuse and recyclable storage areas plus 48 s.f. for every 25 dwelling units above 201.
2. Minimum refuse and recyclables storage rates obtained from City of San Diego Municipal Code Table 142-08C, which requires the provision of 144 s.f. of refuse and recycling areas for buildings between 50,001 s.f. and 75,000 s.f.

uses (City of San Diego, 2014, Table 5.14-2). Approximately 2,807 tons of waste will be generated per year by the Project under operational conditions, as calculated below, and summarized on Table 5, *Project Operational Solid Waste Generation.*

Residential Waste Calculation:

$$1{,}868\ \textit{units} \times \frac{7.8\textit{lbs/unit}}{\textit{day}} \times \frac{365\ \textit{days}}{\textit{year}} \times \frac{.0005\ \textit{tons}}{\textit{lb}} = 2{,}659 \text{ tons per year}$$

Commercial Waste Calculation:

$$62{,}525\ \textit{sf} \div 1{,}000\ \textit{sf} \times \frac{13\textit{lbs/}}{\textit{day}} \times \frac{365\ \textit{days}}{\textit{year}} \times \frac{.0005\ \textit{tons}}{\textit{lb}} = 148 \text{ tons per year}$$

Table 5 Project Operational Solid Waste Generation

Land Use	Intensity/Size	Waste Generation Rate[1]	Estimated Waste Generated (tons/year)
Residential	1,868 DU	7.8 pounds/unit/day	2,659
Commercial/Retail	62,525 s.f.	13 pounds/1,000 s.f./day	148
		TOTAL:	**2,807**

DU = Dwelling Units; s.f. = square feet

1. Waste Generation Rates Obtained from the Otay Mesa Community Plan Update EIR (City of San Diego, 2014, Table 5.14-2)

On-site recycling services shall be provided to the Project. Residents and commercial tenants of the Project that receive solid waste collection service shall participate in a recycling program by separating recyclable materials from other solid waste and depositing the recyclable materials in the recycling container provided for each resident/tenant. Recycling services are required by Chapter 6, Article 6,

Division 7 of the City of San Diego Municipal Code. Based on current requirements, these services shall include the following:

- Collection of recyclable materials as frequently as necessary to meet demand;
- Collection of plastic bottles and jars, paper, newspaper, metal containers, cardboard, and glass containers;
- Collection of other recyclable materials for which markets exist, such as scrap metal, wood pallets;
- Collection of food waste for recycling by composting, where available (prior to issuance of building and occupancy permits, the Project proponent will meet with representatives from ESD to ensure that their educational materials and haulers can comply with the requirements for this service);
- Use of recycling receptacles or containers that comply with the standards in the Container and Signage Guidelines established by ESD;
- Designated recycling collection and storage areas;
- Signage on all recycling receptacles, containers, chutes, and/or enclosures in compliance with the standards described in the Container and Signage Guidelines established by ESD.

As required by Sections 66.0706 and 66.0707 of the City's Municipal Code, the building management or other designated personnel shall ensure that occupants are educated about the recycling services as follows:

- Information, including the types of recyclable materials accepted, the location of recycling containers, and the occupants' responsibility to recycle shall be distributed to all occupants annually;
- All tenants shall be given information and instructions upon occupancy; and
- All tenants shall be given information and instructions upon any change in recycling service to the Project area.

6.3 Landscaping and Green Waste Recycling

Plant material selection shall be guided by the Landscape Design Standards and Policies contained in Section 2.5.3 of the CVSP, which is applicable to the Project site. Plant materials including in the CVSP's plant palette were selected to encourage long-term sustainability without the use of excessive water or pesticides and fertilizers. Irrigation of these areas shall be guided by the Irrigation and Water Conservation Policies contained in Section 2.5.3.8 of the CVSP. Irrigation, where practical, shall utilize reclaimed water applied via drip, bubblers, and spray irrigation to avoid overwatering in all planting areas. Landscape maintenance shall include the collection of green waste and disposal of green waste at recycling centers that accept green waste. This will help further reduce the waste generated by developments within the Project during the occupancy phase.

7.0 CONCLUSION

The City of San Diego Development Services Department is requiring that this preliminary WMP be prepared and submitted to the City of San Diego's ESD because the Project exceeds the significance thresholds for solid waste disposal. Because the Project is in the Tentative Map phase, this is only a preliminary plan, which specifies the intent to meet the requirements and goals of the Public Resources Code and City plans and ordinances.

To assure impacts are mitigated to below a level of significance, the Project Applicant has prepared this WMP which explains are provides directions as to how to appropriately implement salvage and recycling activities for the Project. This WMP shall be implemented to the fullest degree of accuracy and efficiency. Additionally, the Project will be required to adhere to City ordinances, including the Construction and Demolition Debris Diversion Deposit Program, the City's Recycling Ordinance, and the Refuse and Recyclable Materials Storages Regulations. The WMP for the Project is designed to implement and adhere to all City ordinances and regulation with regard to waste management. The measures in the WMP will ensure that impacts are mitigated to below a level of significance.

- Prior to the issuance of any construction permits, the Solid Waste Coordinator shall ensure ESD's attendance at a pre-construction meeting. The Solid Waste Coordinator shall ensure that (1) the proposed approach to contractor education is approved, (2) the written specifications for base materials, concrete pavers, decomposed granite, and mulch are approved, (3) the C&D Ordinance deposit has been paid, (4) an appropriate diversion rate (from the Waste Management Plan) has been included on all construction permits and documents, including the C&D deposit form, and (5) that the ESD inspector approves the separate waste containers, signage, and hauling contract(s) for the following materials:
    - Drywall
    - Concrete
    - Clean Wood
    - Scrap Metal
    - Polystyrene
    - Roofing
    - Cardboard
    - Trash

The Project shall be designed to achieve 75 percent of construction waste to be diverted and/or recycled. The Project shall implement environmentally sound waste management by salvaging material such as steep, copper, other metals, and equipment; and reusing material such as concrete, steel, and asphalt. To the extent feasible, the Project shall recycle, salvage, and reuse materials and then divert materials to a landfill.

The following standard mitigation measures apply to the Project to reduce cumulative impacts on solid waste to below a level of significance:

- Prior to the issuance of any building permit, the Assistant Deputy Director Environmental Designee shall verify that all of the requirements of the Refuse and Recyclable Materials Storage Regulations and all of the requirements of the Waste Management Plan are shown and noted on the appropriate construction documents. All requirements, notes, and graphics shall be in substantial conformance with the conditions and exhibits of the associated discretionary approval.
    - The construction documents shall include a waste management plan. Notification shall be sent to the following:

        MMC Environmental Review Specialist Development Services Department

        9601 Ridgehaven Court

        Suite 220, MS 1102 B

        San Diego, CA 92123

        (619) 980-1236

        Environmental Services Department (ESD)

        9601 Ridgehaven Court

        Suite 210, MS 1102 A

        San Diego, CA 92123

        (858) 573-1236

- Prior to the issuance of any certificate of occupancy/tentative certificate of occupancy, the Project Applicant shall be required to submit written evidence to the Assistant Deputy Director (ADD) of the Entitlements Division that the final Construction Report has been approved by Mitigation Monitoring Coordinator (MMC) and the Environmental Services Department (ESD). The Construction Report will be required to include the following information:
    - The actual waste generated and diverted from the Project;
    - The waste reduction percentage achieved; and
    - How the waste reduction percentage goal was achieved.

- Prior to the issuance of any certificate of occupancy/tentative certificate of occupancy the Project Applicant shall invite a representative of the City's ESD to inspect the following measures as described in this report have been successfully implemented:

- Adequate storage area has been provided as consistent with the City's Storage Ordinance,
- Hauler(s) has been retained to provide recyclable materials collection, and
- Education materials for building tenants/owners have been prepared as required per the City's Recycling Ordinance.

The following Table 6, *Calculated Diversion Rate*, summarizes the waste impacts and the waste reduction goals for each project phase.

Table 6 Calculated Diversion Rate

Phase/Type	Est. Tons Generated	Handling	Diversion Rate	Est. Tons Diverted	Est. Tons Disposed
Demolition:					
Mixed Demolition Waste Per Table 2	3,775	Facilities Identified Per Material in Table 2	99%	3,773.075	2.125
Construction:					
New Construction Per Table 3	7,536	Source Separation/Recycling as Identified per Material in Table 3	76.8%	5,789	1,747
Total For Demolition/Construction Phases:	**11,311**		**87.9%**	**9,562.075**	**1,749.125**
Occupancy:					
Multi-Family Residential	2,659	Compliance with Recycling Ordinance	40%	1,064	1,595
Commercial	148	Compliance with Recycling Ordinance	60%	89	59
Total For Occupancy Phase:	**2,807**		**50%**	**1,153**	**1,654**

8.0 REFERENCES

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(CalRecycle, 2017)	CalRecycle, 2017. *Mandatory Commercial Recycling (website)*. March 20, 2017. Accessed January 11, 2018. Available online: http://www.calrecycle.ca.gov/Recycle/Commercial/.
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(T&B Planning, 2017)	T&B Planning, Inc., 2017. *Central Village Specific Plan*. April 4, 2017. Accessed: January 11, 2018. Available online: https://www.sandiego.gov/planning/community/profiles/otaymesa/omcvsp.

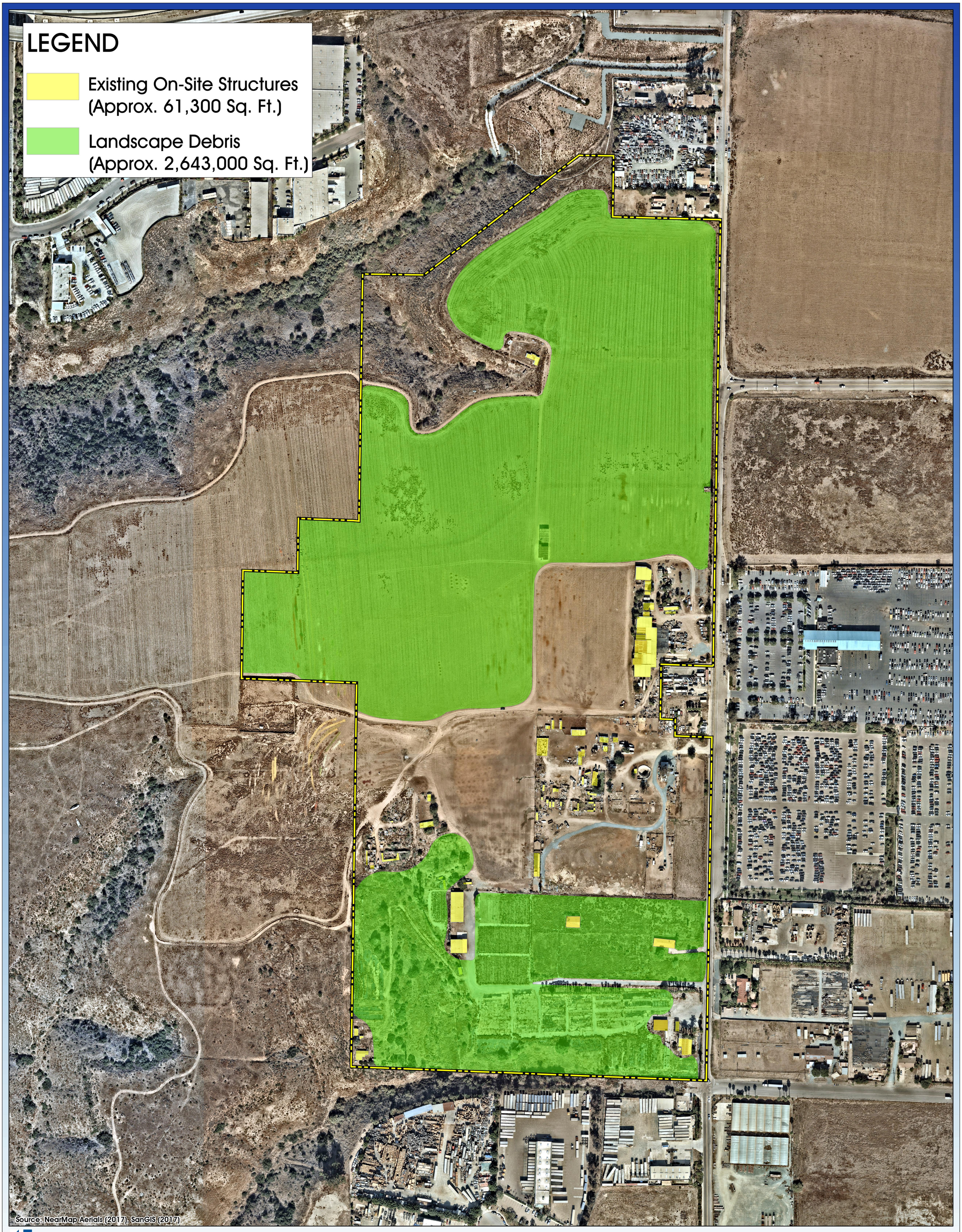

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EXHIBIT A - DEMOLITION SUMMARY