

# **Southwest Neighborhood Park**

## **Local Mobility Analysis**

**#654348**

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Final: August 2020



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## EXECUTIVE SUMMARY

Otay Mesa-Nestor is a community located in the southern region of the City of San Diego, in what is generally referred to as the South Bay. The project proposes to build a neighborhood park located just east of Interstate 5 between 25<sup>th</sup> Street and 27<sup>th</sup> Street between Coronado Avenue and Iris Avenue. The park will be approximately 11.5 acres with facilities including two multi-use fields, shade structures, basketball courts, a children's play area, a turf area and a dog park. The following sections summarize the site access and analysis results.

Pedestrian and bicycle access via existing striped roadway network to the park will be provided on 25th Street, 27th Street and Grove Avenue. Vehicular access points will be provided at two locations on 25th Street and one on 27th Street.

The amount of parking provided on-site as well as on the improved project frontages, is based on the City of San Diego's Consultants Guide to Park Design and Development (2019). The project includes frontage improvements to Grove Avenue, 25<sup>th</sup> Street and 27<sup>th</sup> Street. On-street parking already happens on Grove Avenue and 27<sup>th</sup> Street adjacent to the project site on the dirt shoulder. The improvements to the east side of 25<sup>th</sup> Street will accommodate an additional 20 parking spaces. Off-site parallel parking also includes 29 parking spaces on Grove Avenue adjacent to the project site and 10 parking spaces on 27<sup>th</sup> Street adjacent to the project site for a total of 59 off-site parallel parking spaces will be no less than 21-feet long and 8-feet wide. The project also provides 53 on-site parking spaces (approximately 4.6 spaces per acre) for a total of 112 parking spaces provided (approximately 9.7 spaces per acre). Parks and Recreation Department parking requires a minimum of 100 parking spaces for this project.

The project is forecast to generate approximately 575 weekday trips per day, which includes approximately 23 AM peak hour trips (12 inbound and 12 outbound) and approximately 46 PM peak hour trips (23 inbound and 23 outbound). All study intersections operate at LOS B in both the AM and PM peak hour under existing conditions.

The study roadway segments operate at acceptable LOS B or better with the exception of Coronado Avenue between 25<sup>th</sup> Street and 27<sup>th</sup> Street which operates at LOS E under existing conditions.

Analysis was conducted to forecast Opening Year 2021 conditions. The analysis includes trips associated with approved or pending cumulative projects and with ambient traffic growth rate of 1%. The cumulative projects are forecast to generate approximately 180 weekday trips per day, which includes approximately 14 AM peak hour trips and approximately 18 PM peak hour trips.

The Opening Year 2021 without project conditions results show all study intersections operate at LOS B in the AM and PM peak hours. The study roadway segments operate at acceptable LOS B, with the exception of Coronado Avenue between 25<sup>th</sup> Street and 27<sup>th</sup> Street, which operates at LOS E under 2021 without project conditions.



The opening year 2021 with project conditions analysis show all study intersections continue to operate at LOS B or better. The study roadway segments continue to operate at acceptable LOS D or better with the exception of Coronado Avenue between 25<sup>th</sup> Street and 27<sup>th</sup> Street, which operates at LOS E.

The addition of project traffic to the existing roadway network creates no project effect on roadway segments and intersections.



## 1 INTRODUCTION

This Local Mobility Analysis (LMA) assesses the level of service (LOS) project effect on transportation facilities within the vicinity of the project site.

### 1.1 PROJECT DESCRIPTION

This Local Mobility Analysis (LMA) evaluates the traffic conditions associated with the proposed Southwest Neighborhood Park project (herein referred to as “the project”) located in the Otay Mesa-Nestor community of San Diego. The project is located on approximately 11.5 acres of vacant land east of Interstate 5 between 27th Street and 25th Street, and south of Grove Avenue. **Figure 1-1** illustrates the regional project location. The proposed park features include two multi-use fields, shade structures, basketball courts, children’s play area, a turf area and a dog park.

Vehicular access will be provided on 25<sup>th</sup> Street and 27<sup>th</sup> Street via either Coronado Avenue to the north or Iris Avenue to the south. Two driveways will be provided on 25<sup>th</sup> Street and one on 27<sup>th</sup> Street with a parking area on each side of the project and connected via a drive aisle onsite.

Unsurfaced parkways exist on the project frontages and informal parking occurs on these areas. The project proposes to improve the frontages on 25<sup>th</sup> Street, 27<sup>th</sup> Street and Grove Avenue to accommodate delineated on-street parking. **Figure 1-2** shows the conceptual site plan.

### 1.2 STUDY AREA

The study area includes intersections and roadway segments that could be impacted by project traffic. In coordination with City staff, the following six (6) intersections and four (4) roadway segments were included in the study. **Figure 1-3** shows the project study area.

#### Intersections

1. Coronado Avenue/ 25<sup>th</sup> Street/ gas station driveway
2. Coronado Avenue/ 27<sup>th</sup> Street (signalized)
3. 25<sup>th</sup> Street/ Grove Avenue
4. 27<sup>th</sup> Street/ Grove Avenue
5. Iris Avenue/ 25<sup>th</sup> Street (signalized)
6. Iris Avenue/ 27<sup>th</sup> Street (signalized)

#### Roadway Segments

1. Coronado Avenue between 25<sup>th</sup> Street and 27<sup>th</sup> Street
2. Grove Avenue between Caminito Avellano and 27th Street
3. 25th Street between Grove Avenue and Iris Avenue
4. 27th Street between Iris Avenue and Creekside Village Way

## Southwest Neighborhood Park

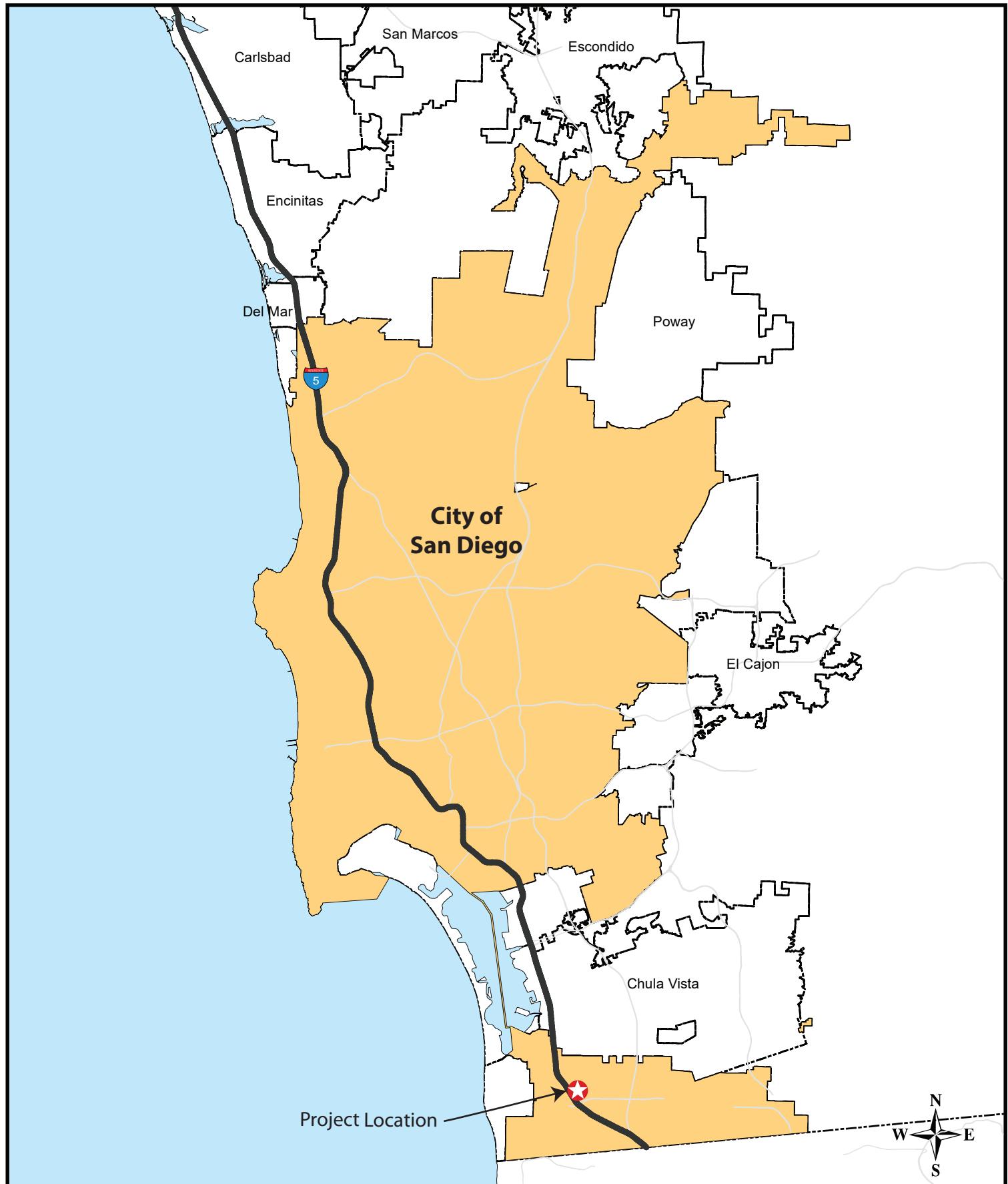


Figure 1-1  
Regional Project Location

# Southwest Neighbourhood Park

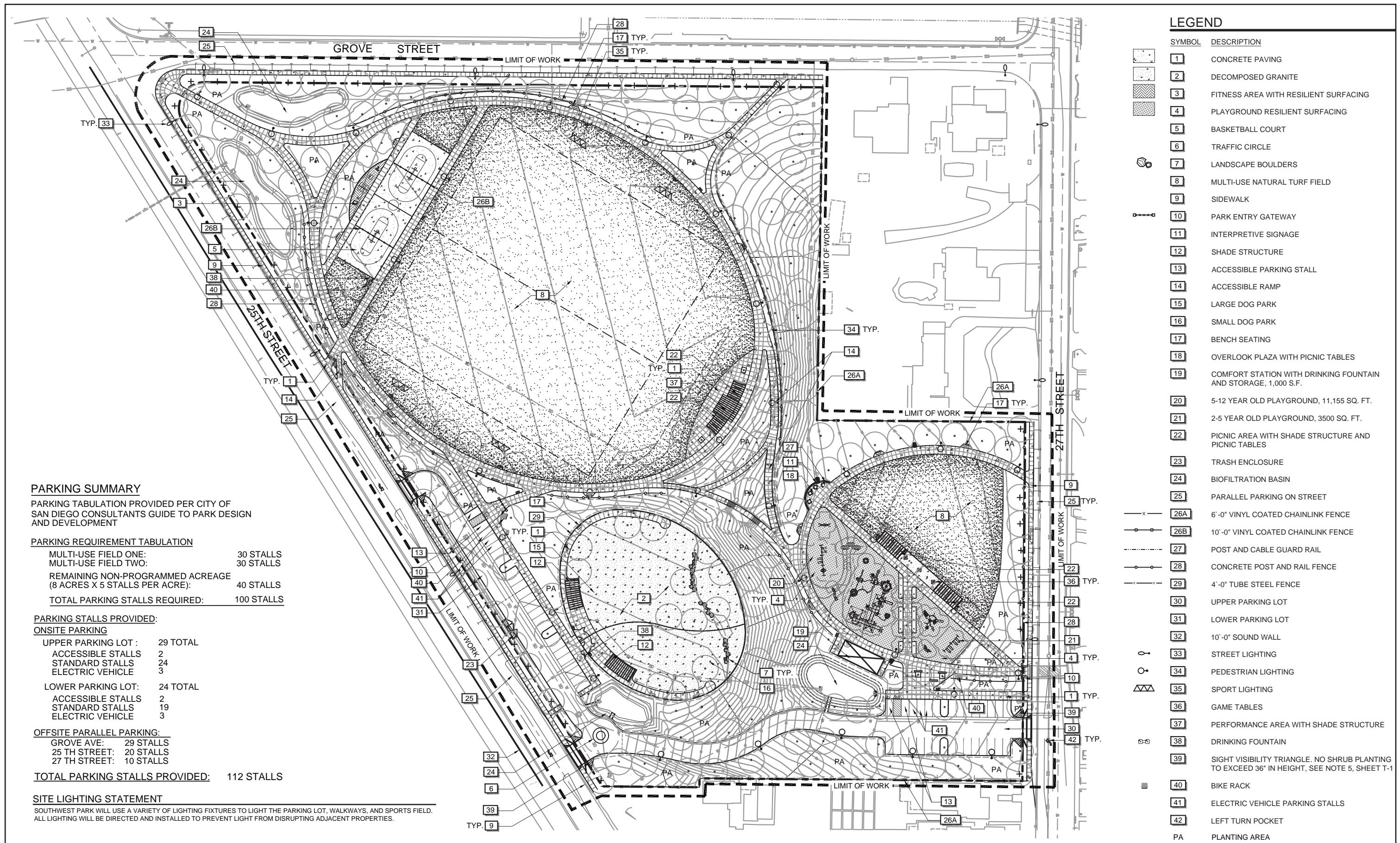


Figure 1-2  
Preliminary Site Plan

## Southwest Neighborhood Park

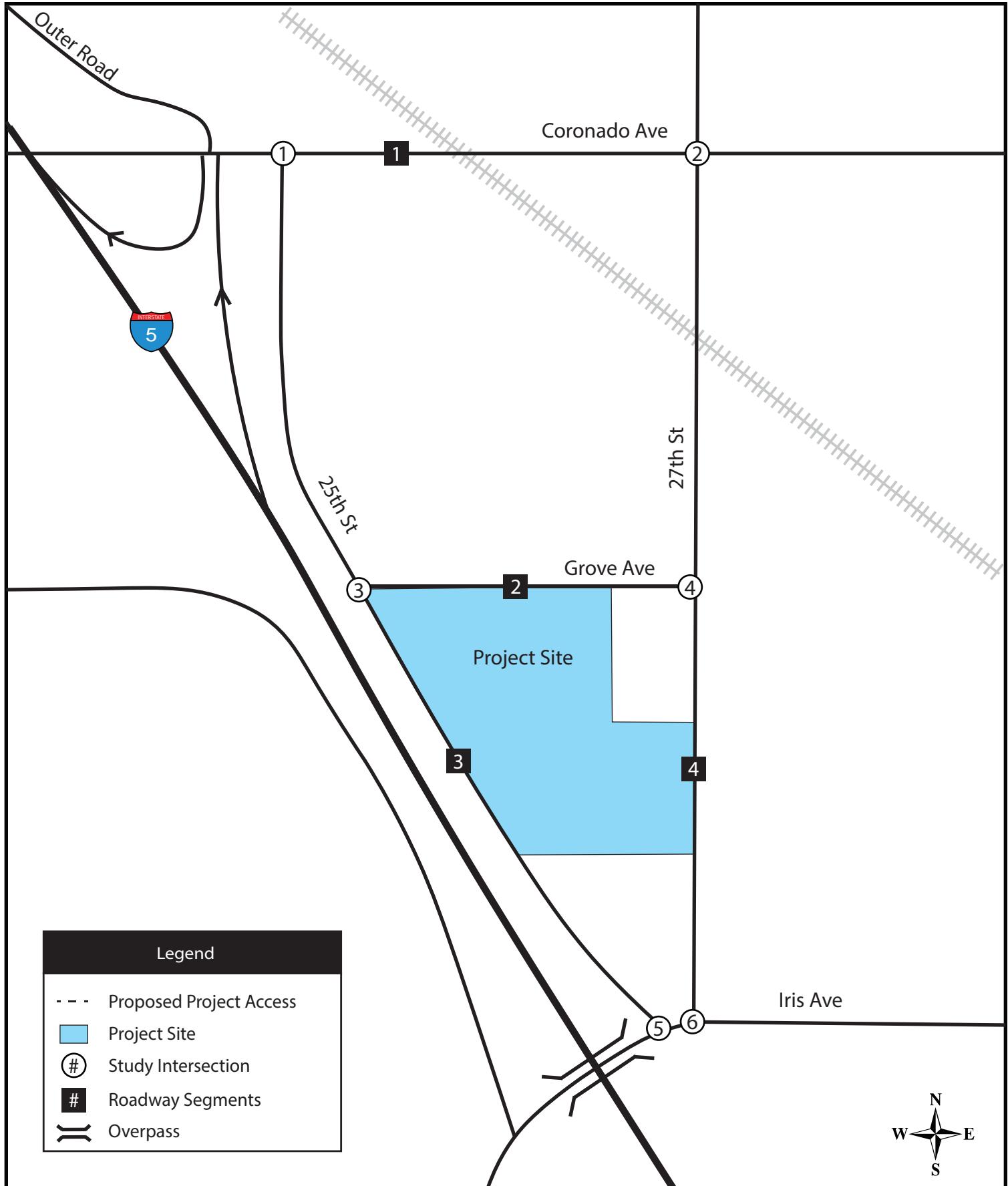


Figure 1-3  
Proposed Study Area



## 2 ANALYSIS APPROACH AND METHODOLOGY

This section summarizes the analysis approach and methodology used to evaluate the study intersections and roadway segments. The analysis is consistent with the City of San Diego's Draft Transportation Study Manual (TSM, June 2020).

### 2.1 ANALYSIS SCENARIOS

The following scenarios were evaluated in this study:

- **Existing Conditions (2019):** This scenario reflects the network conditions at the time the traffic volume data was collected (Thursday April 4, 2019 and Thursday October 17, 2019). The raw volume data is presented in **Appendix A**.
- **Opening Year 2021 Without Project:** This scenario reflects the anticipated roadway conditions of the project opening year 2021. Based on historical traffic count data published by the City, a 1% ambient growth factor was applied to existing traffic volumes and added to traffic from approved and pending projects in the vicinity of the project. This scenario does not include the proposed project traffic. The existing roadway network is unchanged for the opening year 2021 conditions.
- **Opening Year 2021 With Project:** This scenario reflects the Opening Year 2021 conditions with the addition of project traffic.

### 2.2 METHODOLOGY

#### 2.2.1 *Intersection Analysis*

Levels of service (LOS) were determined at the study area intersections for the AM and PM weekday network peak hours. This was chosen rather than the expected highest use of park times/days to ensure the surrounding intersections and roadway segments were analyzed during their busiest periods and to maintain consistency with the Study Periods section in the City's TSM. The AM intersection analysis evaluates LOS during the hour with the highest vehicular traffic between 7:00 AM and 9:00 AM. The PM intersection analysis evaluates LOS during the hour with the highest vehicular traffic between 4:00 PM and 6:00 PM.

The study area was modeled in Synchro 10 software, which is based on HCM methodology, to calculate delays and levels of service. The HCM 6<sup>th</sup> and 2010 editions do not support clustered intersections and HCM 2000 methodology was used for the 25<sup>th</sup> Street and 27<sup>th</sup> Street signalized intersections at Iris Avenue. These intersections are operated by one controller. All other existing and proposed intersections were analyzed using the HCM 6<sup>th</sup> Edition methodology.

The eastbound left turn movements at the 25th and 27th intersections on Iris Avenue were modeled with separate left turn lanes to account for vehicles staged in the wide intersection area waiting for gaps in westbound traffic before turning. This allows the eastbound through traffic to freely pass left turners. This operation was confirmed during field visits.

Signal timing data and parameters such as cycle lengths, splits, clearance intervals, etc. were obtained from the signal timing sheets provided by the City with the exception of Coronado Avenue/ 27<sup>th</sup> Street.



The timing plans for this intersection were pulled from the controller and verified on site. The timing plans were calibrated into the Synchro model. The signal timing sheets are included in **Appendix B**.

Synchro reports delays which correspond to a particular LOS to describe the overall operation of a signalized intersection. The criteria for the LOS grade designations are provided in Error! Reference source not found. **3-1.** LOS provides a quick overview of how an intersection is performing. The City of San Diego Significance Determination Thresholds (2016) establishes LOS D as the minimum acceptable peak hour intersection performance.

**Table 2-1**  
**LOS Criteria for Intersections**

LOS	Control Delay (sec/veh)		Description
	Signalized Intersections	Unsignalized Intersections	
A	$\leq 10$	$\leq 10$	Operations with very low delay and most vehicles do not stop.
B	$>10$ and $\leq 20$	$>10$ and $\leq 15$	Operations with good progression but with some restricted movements.
C	$>20$ and $\leq 35$	$>15$ and $\leq 25$	Operations where a significant number of vehicles are stopping with some backup and light congestion.
D	$>35$ and $\leq 55$	$>25$ and $\leq 35$	Operations where congestion is noticeable, longer delays occur, and many vehicles stop. The proportion of vehicles not stopping declines.
E	$>55$ and $\leq 80$	$>35$ and $\leq 50$	Operations where there is significant delay, extensive queuing, and poor progression.
F	$>80$	$>50$	Operations that are unacceptable to most drivers, when the arrival rates exceed the capacity of the intersection.

Source: Highway Capacity Manual (HCM).

### **2.2.2 Roadway Segment Capacity Analysis**

The basis for roadway segment analysis is the ratio of daily volumes to LOS thresholds according to roadway classifications. **Table 2-2** presents the City of San Diego roadway segment capacity and LOS standards.



**Table 2-2**  
**LOS Criteria for Roadway Segments**

Street Classification	Level of Service (LOS)				
	A	B	C	D	E
Expressway (6-lane)	< 30,000	< 42,000	< 60,000	< 70,000	< 80,000
Prime Arterial (6-lane)	< 25,000	< 35,000	< 50,000	< 55,000	< 60,000
Major Arterial (6-lane, divided)	< 20,000	< 28,000	< 40,000	< 45,000	< 50,000
Major Arterial (4-lane, divided)	< 15,000	< 21,000	< 30,000	< 35,000	< 40,000
Collector (4-lane)	< 10,000	< 14,000	< 20,000	< 25,000	< 30,000
Collector (4-lane, no center lane continuous left-turn lane)	< 5,000	< 7,000	< 10,000	< 13,000	< 15,000
Collector (2-lane, 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, commercial/industrial fronting property)	< 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, Table 2, Page 8, July 1998.

**Notes:** The volumes and the average daily level of service listed above are intended as a general planning guideline. Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic.

### 2.3 PROJECT EFFECT CRITERIA

The City of San Diego's Significance Determination Thresholds document (2016) Section II, O establishes the following thresholds to determine if there is project effect for intersections and roadway segments.

- If any intersection, roadway segment, or freeway segment affected by a project would operate at LOS E or F under either direct or cumulative conditions.
- If a project would increase traffic hazards to motor vehicles, bicyclists or pedestrians due to proposed non-standard design features (e.g., poor sight distance, proposed driveway onto an access-restricted roadway), the impact would be significant. Note: analysts should refer readers to a discussion of this issue in the Health and Safety section of the environmental document.
- If a project would result in the construction of a roadway which is inconsistent with the General Plan and/or a community plan, the impact would be significant if the proposed roadway would not properly align with other existing or planned roadways.
- If a project would result in a substantial restriction in access to publicly or privately owned land, the impact would be significant.



### 3 EXISTING CONDITIONS

This section summarizes the existing roadway network, peak hour and daily traffic volumes, and operations at the study area intersections and roadway segments. **Figure 3-1** shows the existing intersection geometries within the study area. For reference the Otay Mesa-Nestor Community Plan Transportation Facilities and Transit Oriented Development sections are provided in **Appendix C**.

#### 3.1 EXISTING ROADWAY NETWORK

**27<sup>th</sup> Street** within the study area functions as a two-lane collector (multi-family). The ultimate classification per the Otay Mesa-Nestor Community Plan (adopted in 1996) is a two-lane collector. The posted speed is 25mph. Contiguous sidewalk is provided on the east side of the street. Sidewalk is also provided on the west side of the street for 190 feet immediately north of Iris Avenue. Curb to curb width on this section is 40 feet. Parallel parking is permitted on both sides. There is currently no bike facility on 27<sup>th</sup> Street.

Parking on the east side of 27<sup>th</sup> Street adjacent to Southwest Middle School at northwest corner of Iris Avenue/27<sup>th</sup> Street, is restricted to 3-minute passenger loading between 7am and 4pm on school days. The roadway width is approximately 48 feet on this section with a drop-off and pick-up zone during school peak hours. This section also includes a 30 feet/ 30-minute parking section (green curb), and 40 feet/ 20-minute loading section (yellow curb). The roadway width narrows to 30 feet north of the school drop-off/pick-up zone.

Parallel parking is allowed on both sides of 27<sup>th</sup> street including the dirt shoulder immediately adjacent to the project site. There is a marked crosswalk near the pedestrian entrance of the former Stephen W. Hawking II Charter School at 1411 27<sup>th</sup> Street which has now moved to 1275 30<sup>th</sup> Street.

**25<sup>th</sup> Street** functions as a two-lane collector with no fronting property and the ultimate classification in the Otay Mesa-Nestor Community Plan is a two-lane collector. The posted speed limit is 30mph. The segment adjacent to the site is bounded by Grove Avenue on the north and Iris Ave on the south. A 250 feet section immediately north of Iris Avenue is 50 ft wide and has sidewalk and on-street parking on the east side. There is no on-street parking on the remainder of the street adjacent to the site and the roadway width ranges from 36 to 40 feet. Continuous edge lines provide delineation on both sides, except in the area of on-street parking. North of Grove Avenue to Coronado Avenue continuous sidewalk is provided on the east side of the street and parking is permitted on both sides. There is currently no bike facility on 25<sup>th</sup> Street.

**Grove Avenue** is a two-lane collector (multi-family) road that traverses the northern boundary of the project site between 25<sup>th</sup> Street and 27<sup>th</sup> Street. The ultimate classification is a local street. Grove Ave is 25 feet wide with contiguous sidewalk on the north side of the street. There is no sidewalk on the south side. Parallel parking is allowed on both sides including the dirt shoulder adjacent to the site. There is currently no bike facility on Grove Avenue and no posted speed limit.



**Iris Avenue** functions as a two-lane collector road this is the ultimate classification in the Otay Mesa-Nestor Community Plan and currently a Class III bike route with permitted parallel parking sections on both sides of the street, predominantly on the south side. The proposed Border to Bayshore Bikeway project has provided recent curb extensions and improved pedestrian facilities at the Iris Avenue, 25<sup>th</sup> Street and 27<sup>th</sup> Street signalized intersection. The posted speed limit is 30mph in both directions and 25mph during school times.

### **3.2 SYSTEMIC SAFETY REVIEW**

The City's Draft Transportation Study Manual (TSM, June 2020) requires LMA's to compare study intersections to the City of San Diego Systemic Safety Hot Spot map. Extracts from the Vision Zero: High Crash Analysis & Improvements (since 2015) map are provided in **Appendix E**.

The map shows that the study intersections are not considered hot spots and that the Saturn Boulevard and Palm Avenue intersection is the closest intersection to the project site that has a high crash pattern. This is approximately 2 miles from the project site and not considered to be within the project study area.

## Southwest Neighborhood Park

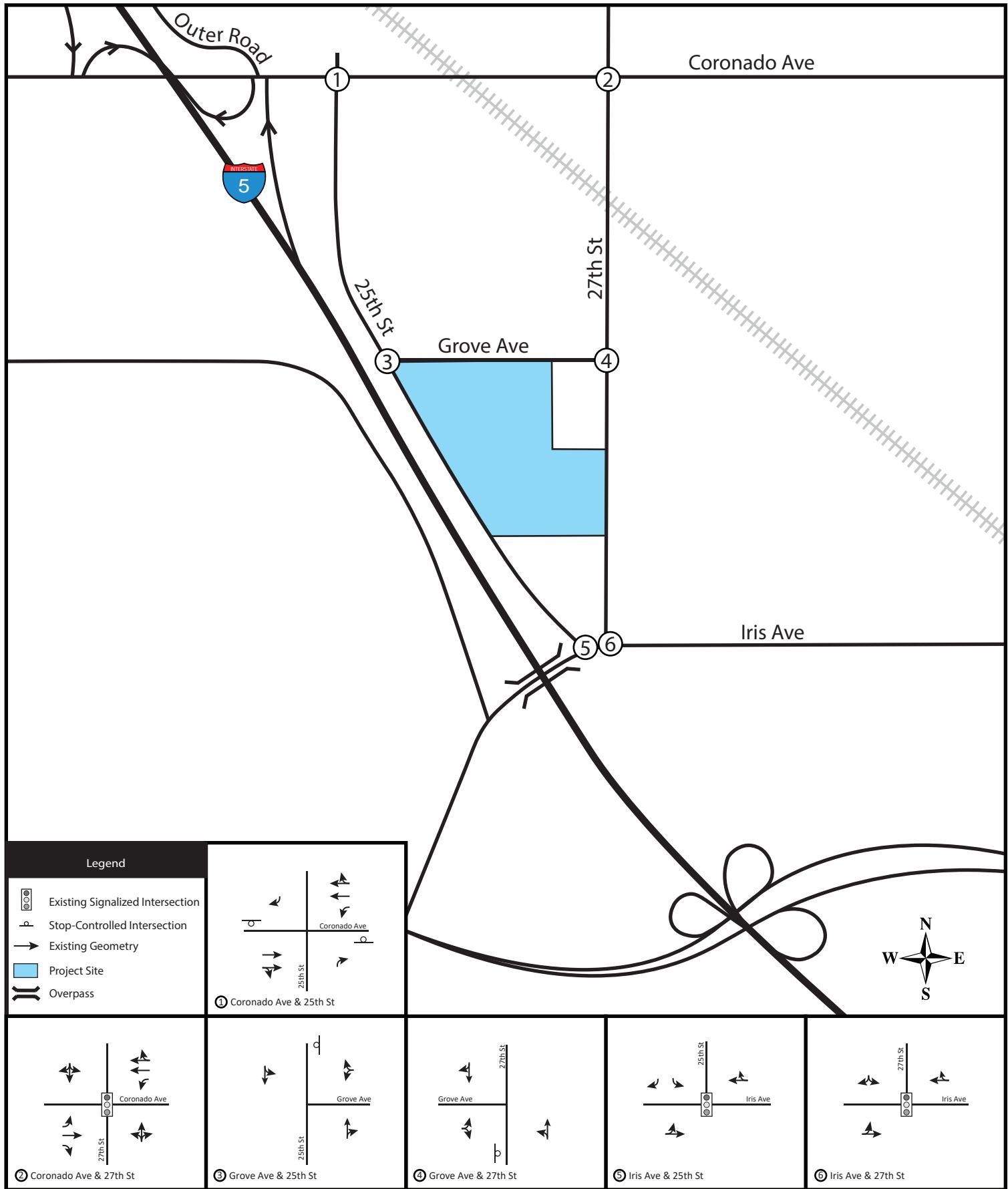


Figure 3-1  
Existing (2019) Intersection Geometries





### 3.3 OTHER MODES OF TRAVEL

In addition to the vehicular roadway network, other modes of travel are provided within the study area and described below.

#### 3.3.1 *Transit Service*

The Iris Avenue Transit Center is located approximately 1-mile walking distance east of the proposed project site. The San Diego Metropolitan Transit System (MTS) operates the local transit service in the City. The Transit Center includes the Blue Line trolley station and has a park and ride facility with parking capacity for 192 cars. Northbound services to Downtown San Diego and southbound to San Ysidro depart every 7 to 8 minutes during peak hours.

The closest bus stops to the site are located approximately 100 feet east of the Iris Avenue, 25<sup>th</sup> Street and 27<sup>th</sup> Street signalized intersection and provide access to the 933 and 934 bus services. Both services operate 7 days a week between Iris Avenue Transit Center, Palm Promenade Walmart, Palm City and Imperial Beach. Both services have a 60-minute headway. **Figure 3-2** illustrates the existing transit routes and stops in the vicinity of the project site.

#### 3.3.2 *Pedestrian and Bicycle Access*

A Class III bike facility is currently provided on Iris Avenue and the same designation is proposed for 27<sup>th</sup> Street as part of the City's Bicycle Master Plan (2013). This will allow the Class III routes to connect to the Class II routes north of the project site along Coronado Avenue. The Bike Route sign (D11-1), found in the California Manual on Uniform Traffic Control Devices (CA MUTCD), is being used to facilitate the presence of bike facilities around the project site.

The proposed Border to Bayshore Bikeway project will provide a shared bike route on Iris Avenue between the Transit Center and 25<sup>th</sup> Street and west of this buffered bike lanes on the I-5 overcrossing. The project is currently in the final design phase, construction is expected to begin in 2021. Sidewalks are provided on both sides of the roadway on Iris Avenue and both sides of 27<sup>th</sup> Street north of Grove Avenue. South of Grove Avenue, sidewalk is provided on the east side of 27<sup>th</sup> Street. There is also sidewalk on the north side of Grove Avenue providing a pedestrian connection between 25<sup>th</sup> and 27<sup>th</sup> Street.

A gap in the sidewalk is present on the east side of 25<sup>th</sup> Street south of Grove Avenue to a point approximately 260 feet north of Iris Avenue. **Figure 3-3** illustrates existing pedestrian and bicycle facilities in the vicinity of the project site.

## Southwest Neighborhood Park

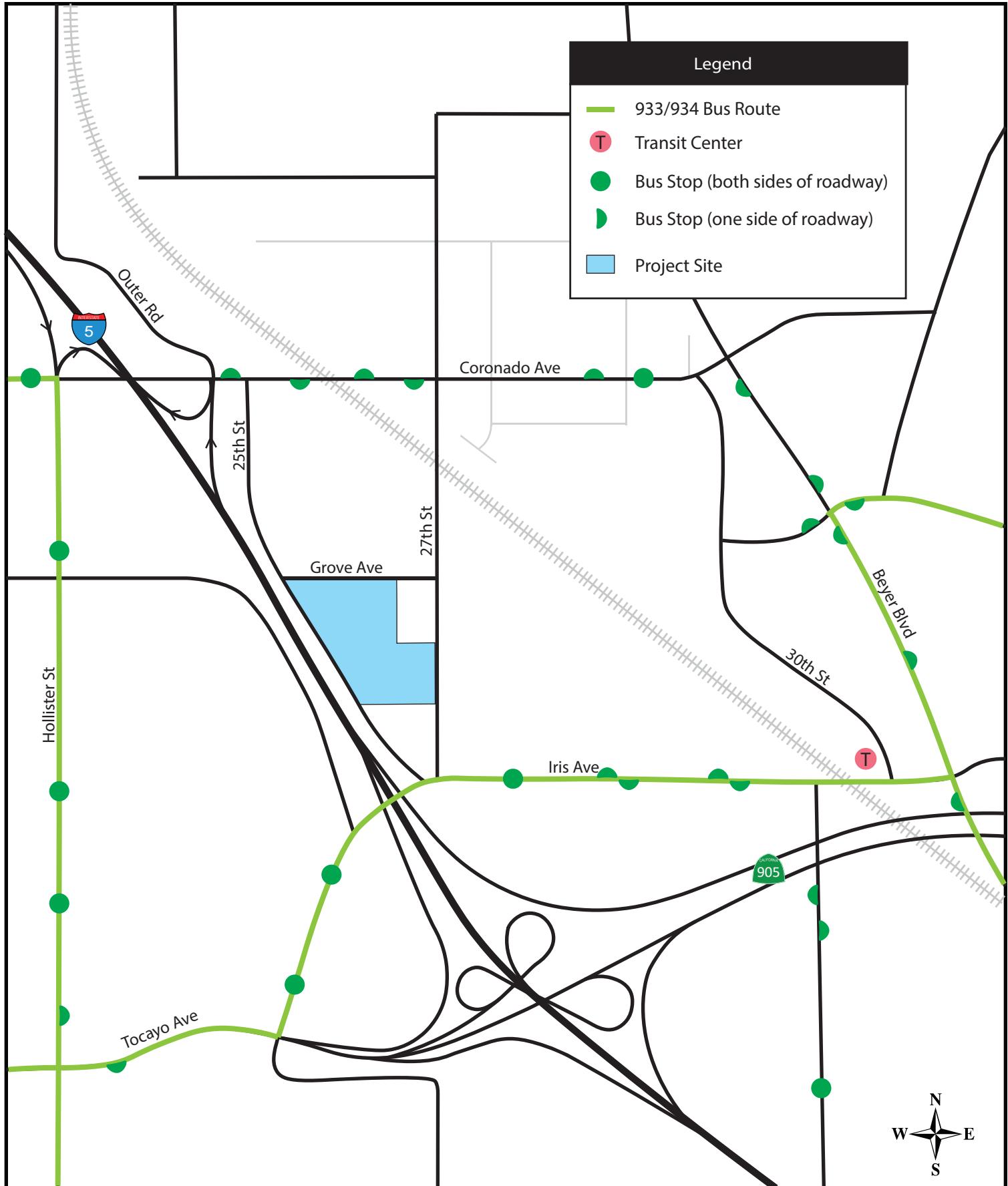


Figure 3-2  
Transit Routes and Stops

## Southwest Neighborhood Park

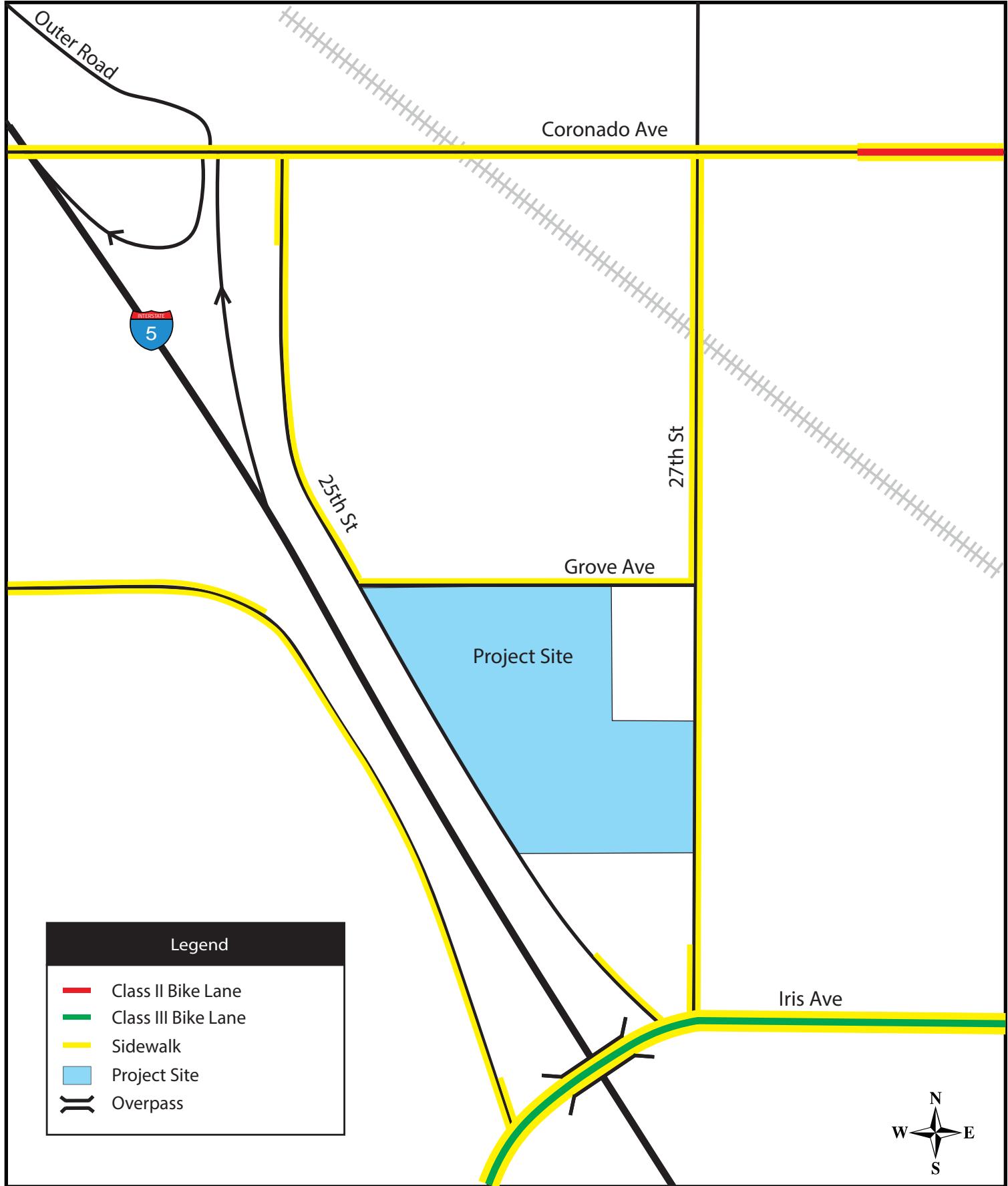


Figure 3-3  
Existing Pedestrian and Bike Facilities





### 3.4 TRAFFIC VOLUMES

Traffic volumes at the study area intersections were collected on Thursday, April 11, 2019 for the AM peak period (7:00 AM to 9:00 AM) and PM peak period (4:00 PM to 6:00 PM) during typical weekday conditions with schools in session. Daily volumes on the study area roadway segments were also collected on Thursday, April 11, 2019 over a 24-hour period in both directions of travel. The Coronado Avenue segment data was collected on Thursday, October 17, 2019.

**Figure 3-4** illustrates the existing conditions peak hour intersection traffic volumes and daily roadway segment traffic volumes. Appendix A contains the traffic count data sheets.

## Southwest Neighborhood Park

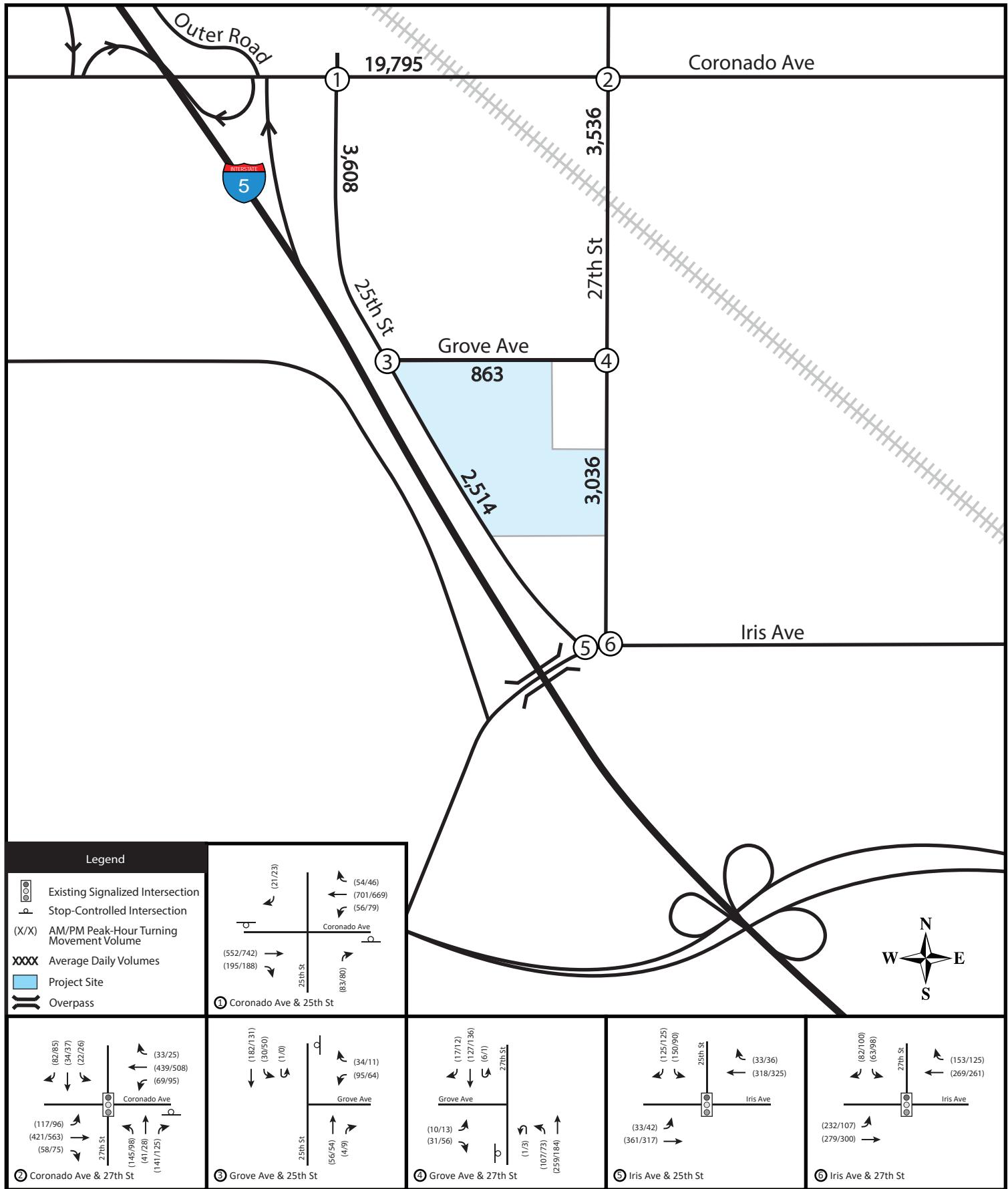


Figure 3-4  
Existing (2019) Traffic Volumes



### 3.5 INTERSECTION ANALYSIS

**Table 3-1** displays the LOS analysis results for the study intersections under existing conditions. **Appendix C** contains the intersection LOS worksheets.

**Table 3-1**  
**Existing Peak Hour Intersection LOS Summary**

Intersection		Control	Peak Hour	Existing Conditions	
				Delay <sup>(a)</sup>	LOS
1	Coronado Avenue/ 25 <sup>th</sup> Street/ Gas Station	Side Street Stop	AM	12.1	B
			PM	13.5	B
2	Coronado Avenue/ 27 <sup>th</sup> Street	Signal	AM	18.5	B
			PM	18.3	B
3	Grove Avenue/ 25 <sup>th</sup> Street	Side Street Stop	AM	14.4	B
			PM	12.7	B
4	Grove Avenue/ 27 <sup>th</sup> Street	Side Street Stop	AM	11.6	B
			PM	11.2	B
5	Iris Avenue/ 25 <sup>th</sup> Street	Signal	AM	15.0	B
			PM	13.0	B
6	Iris Avenue/ 27 <sup>th</sup> Street	Signal	AM	11.9	B
			PM	12.5	B

(a) Seconds of delay are reported as the average control delay for the entire intersection at signalized intersections. The side street stop results show the approach with the highest delay.

As shown in Table 3-1, the study intersections currently operate at LOS B during both the AM and PM peak hours.

### 3.6 ROADWAY SEGMENT ANALYSIS

**Table 3-2** summarizes the daily operations of the study area roadway segments under existing conditions.

**Table 3-2**  
**Existing Daily Roadway Segment LOS Summary**

Roadway Segment	Classification	LOS E Capacity	ADT	v/c Ratio	LOS
Coronado Avenue between 25 <sup>th</sup> Street and 27 <sup>th</sup> Street	Four-Lane Urban Collector with Two-Way Left-Turn Lane	15,000	19,795	1.32	E
Grove Avenue between Caminito Avellano and 27 <sup>th</sup> Street	Two-Lane Collector (multifamily)	8,000	863	0.11	A
25 <sup>th</sup> Street between Grove Avenue and Iris Avenue	Two-lane Collector (no fronting property)	9,000	2,514	0.25	A
27 <sup>th</sup> Street between Iris Avenue and Creekside Village Way	Two-Lane Collector (multifamily)	8,000	3,036	0.38	B

V/C = Volume to Capacity



As shown in Table 3-2 the study roadway segments currently operate at an acceptable LOS B or better during both the AM and PM peak hours with the exception of Coronado Avenue between 25<sup>th</sup> Street and 27<sup>th</sup> Street which operates at LOS E.



## 4 PROJECT TRAFFIC

This section describes the proposed project access, forecast trip generation, trip distribution, and assignment of trips on the adjacent roadway network.

### 4.1 PROJECT ACCESS

Vehicular access to the project will be from 25<sup>th</sup> Street and 27<sup>th</sup> Street via Iris Avenue and Coronado Avenue. Two access points are proposed on 25<sup>th</sup> Street and one on 27<sup>th</sup> Street, connected by parking areas. Left-turn pockets will be striped onto 25<sup>th</sup> Street and 27<sup>th</sup> Street at the project driveways to prevent rear-end accidents. The project intersection geometries are shown on **Figure 4-1**. The park driveway intersections were assessed in Synchro as combined left-through movements for the southbound left turns on 27<sup>th</sup> Street and the northbound left turn on 25<sup>th</sup> Street for a conservative assessment.

### 4.2 PROJECT TRIP GENERATION

City of San Diego Trip Generation Manual (May 2003) trip generation rates were utilized to determine the proposed project trip generation. **Table 4-1** summarizes the trip generation rates and proposed project trips.

**Table 4-1**  
Trip Generation Summary

Land Use	Unit	Daily (per unit)	AM Peak Hour			PM Peak Hour		
			Total (of daily)	Inbound (% AM)	Outbound (% AM)	Total (of daily)	Inbound (% PM)	Outbound (% PM)
<b>Trip Generation Rates</b>								
Park (Developed)	Acre	50	4%	50%	50%	8%	50%	50%
<b>Forecast Project Generated Trips</b>								
Land Use	Size	Unit	Daily Trips	AM Peak Hour			PM Peak Hour	
				Total	Inbound	Outbound	Total	Inbound
<b>Proposed Uses</b>								
Southwest Park (Developed)	11.50	Acre	575	23	12	12	46	23
<b>Total Trips</b>			<b>575</b>		<b>12</b>	<b>12</b>	<b>46</b>	<b>23</b>

Source: *City of San Diego Trip Generation Manual, May 2003*

Note: Inbound and Outbound splits were obtained from SANDAG (Not So Brief) Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002.

As shown in Table 4-1, the proposed project is estimated to generate approximately 575 trips per weekday, which includes approximately 23 AM peak hour trips (12 inbound and 12 outbound) and approximately 46 PM peak hour trips (23 inbound and 23 outbound).

### 4.3 PROJECT TRIP DISTRIBUTION

The project trip distribution was developed based on existing residential concentrations, the location of existing parks near the project site and access to the major road network in the study area. **Figure 4-2** and **Figure 4-3** illustrate the trip distribution for the proposed project at the study intersections.

## Southwest Neighborhood Park

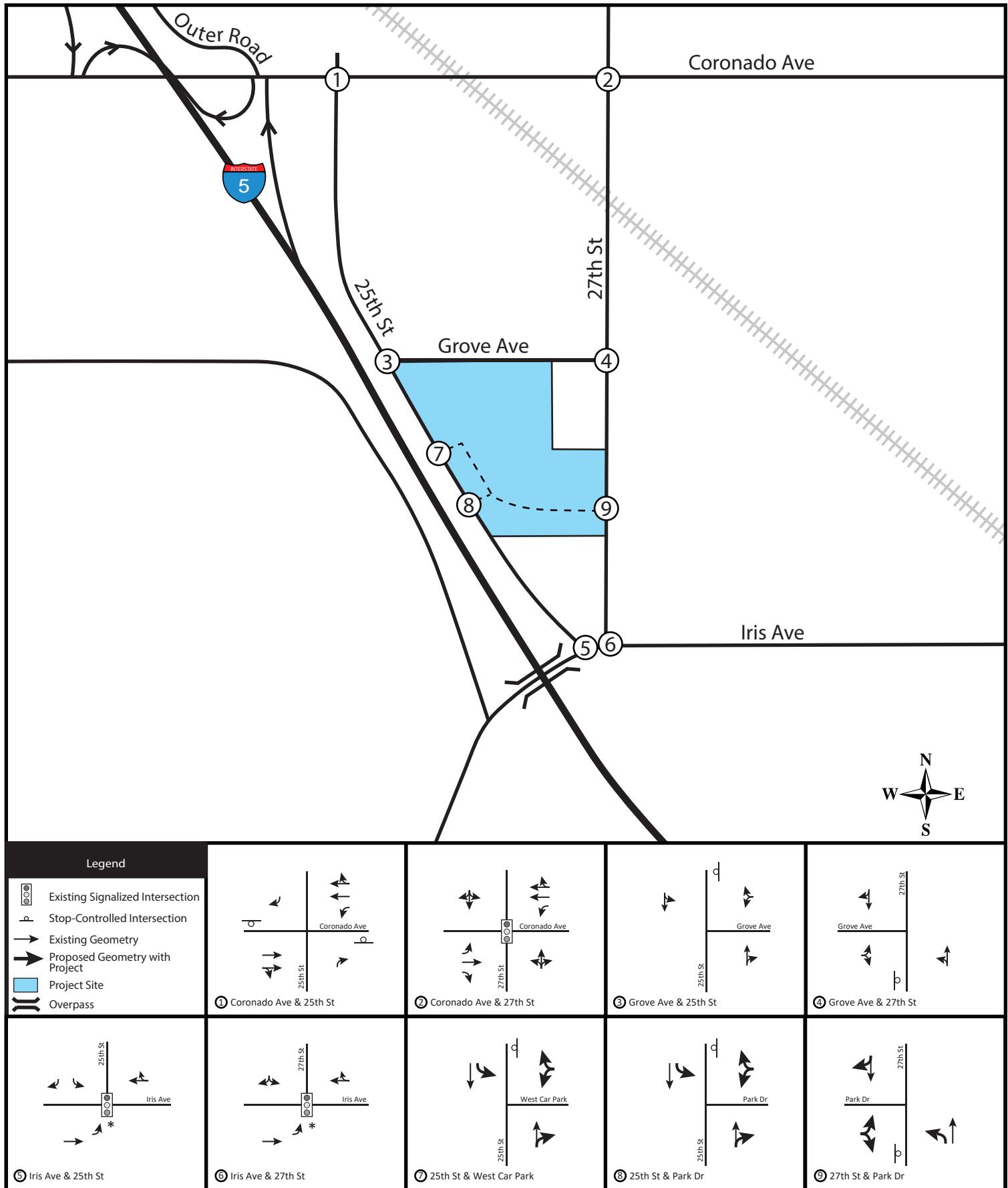


Figure 4-1  
With Project Intersection Geometries

## Southwest Neighborhood Park

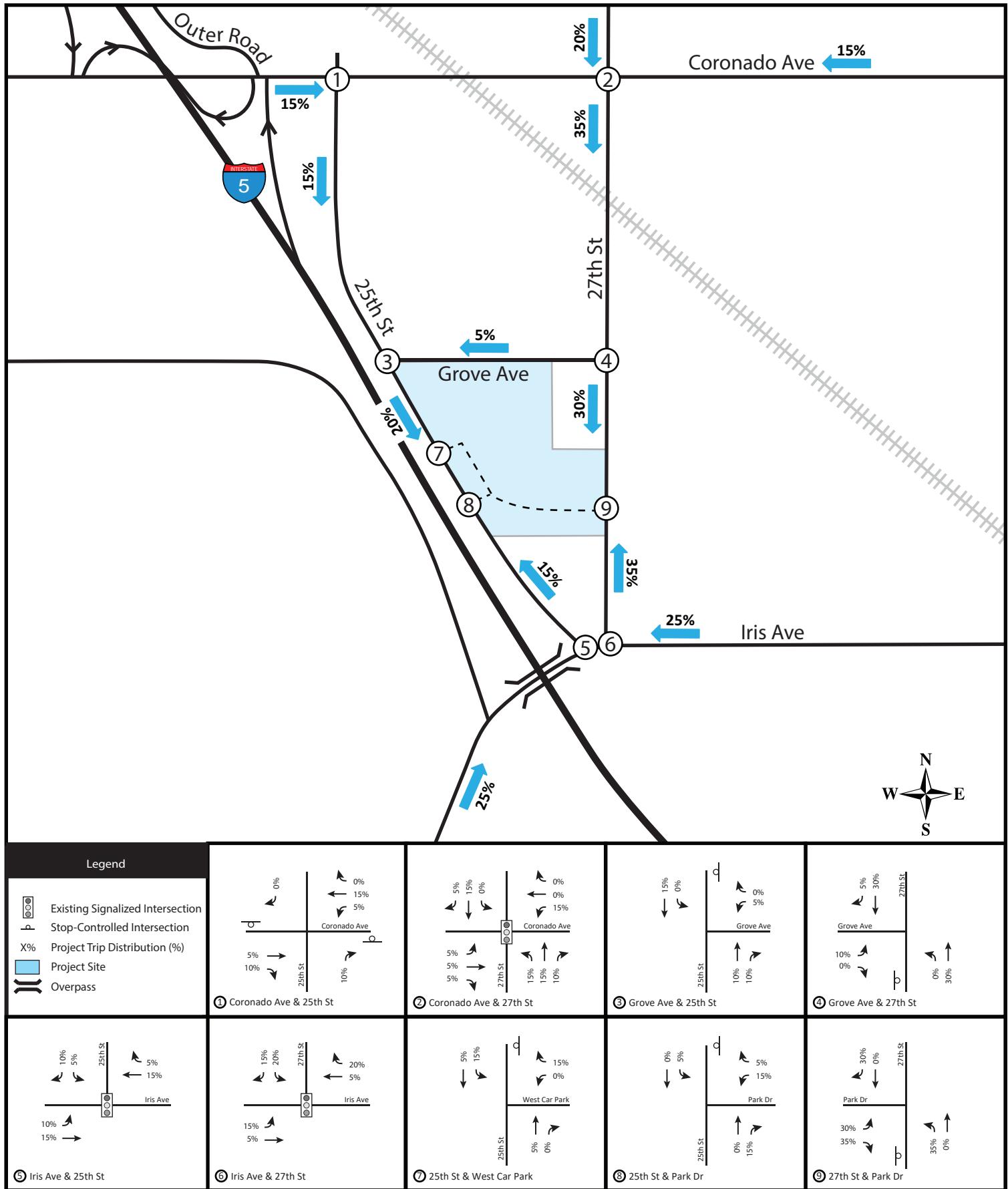


Figure 4-2  
Project Trip Distribution Inbound

## Southwest Neighborhood Park

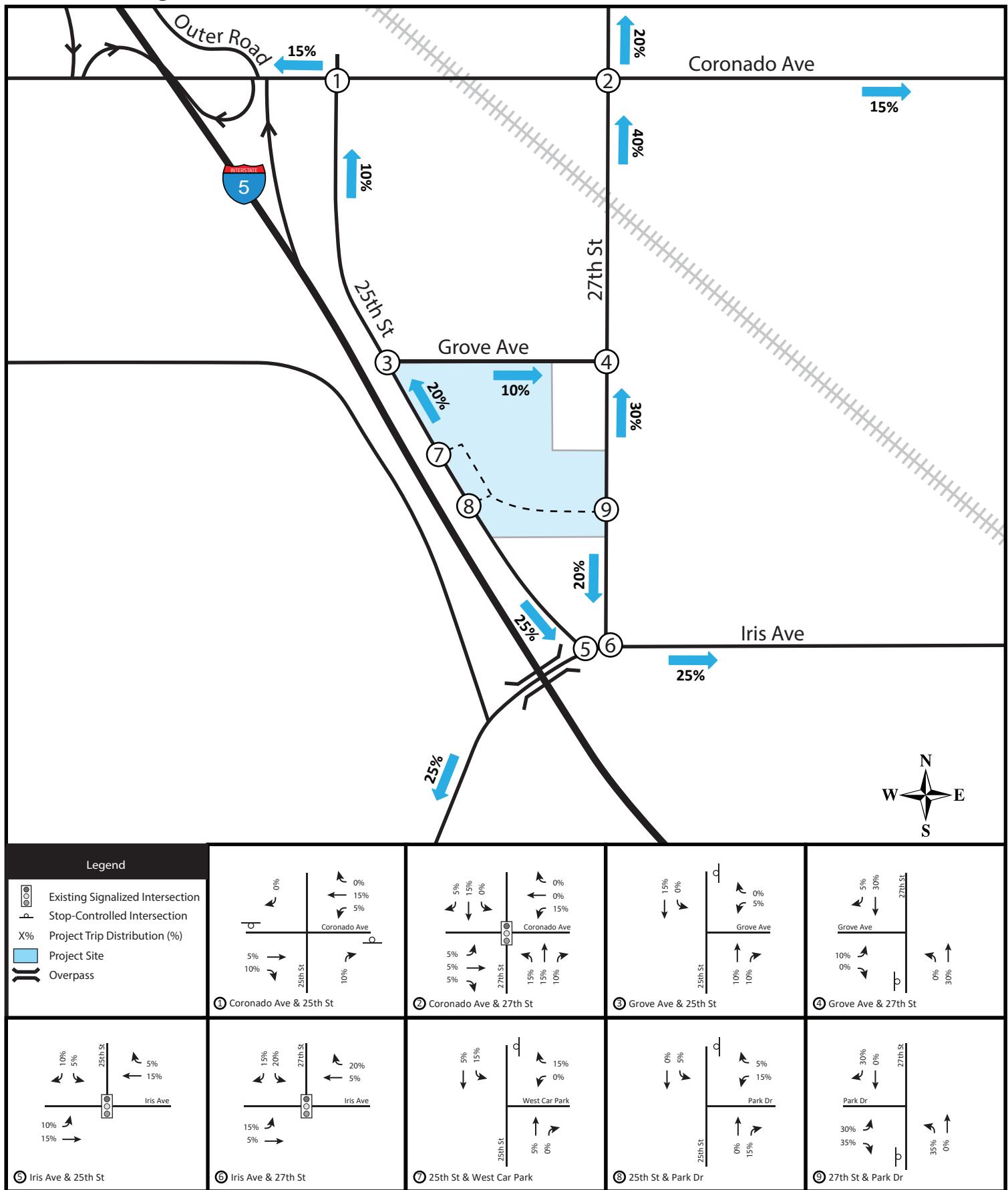


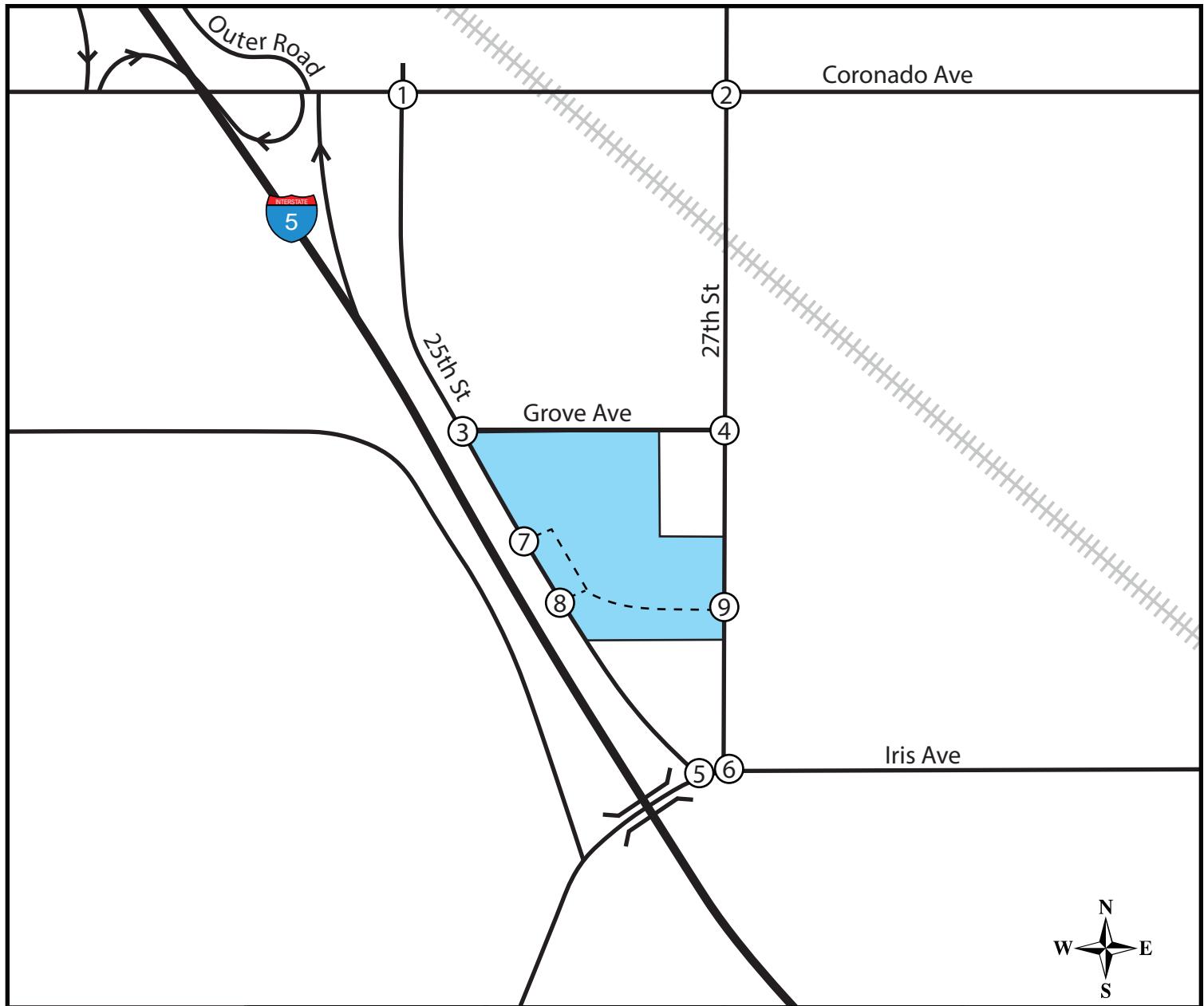
Figure 4-3  
Project Trip Distribution Outbound



#### 4.4 PROJECT TRIP ASSIGNMENT

Project trips were assigned to the study area roadway network based on the trip distribution shown in Figure 4-2 and Figure 4-3. **Figure 4-4** illustrates the AM/PM peak hour project trip assignment at the study intersections and the daily trip assignment on the roadway segments.

## Southwest Neighborhood Park



### Legend

- Existing Signalized Intersection
- Stop-Controlled Intersection
- (X/X) AM/PM Peak-Hour Project Trips
- Project Site
- Overpass

	① Coronado Ave & 25th St	② Coronado Ave & 27th St	③ Grove Ave & 25th St	④ Grove Ave & 27th St
⑤ Iris Ave & 25th St	(1/2) (2/3) → ← (2/3) (1/1)	(2/3) (2/5) → ← (1/1) (2/5)	(1/1) ↓ (2/3) ← (2/3) (0/0)	(2/3) ↓ (0/0) (1/1) → (1/1) ← (1/1)
⑥ Iris Ave & 27th St	(2/3) (1/1) → ← (1/1) (2/3)	(2/3) (2/5) → ← (1/1) (2/5)	(1/1) ↑ (2/3) ← (2/3) (0/0)	(3/7) (4/8) → ← (4/8) ↑ (4/8)
⑦ 25th St & West Car Park			(1/1) ↑ (2/3) ← (2/3) (0/0)	(0/0) ↑ (1/1) → (1/1) ← (1/1)
⑧ 25th St & Park Dr			(1/1) ↑ (2/3) ← (2/3) (0/0)	(0/0) ↑ (1/1) → (1/1) ← (1/1)
⑨ 27th St & Park Dr				(0/0) ↑ (1/1) → (1/1) ← (1/1)



Figure 4-4  
Project Trip Assignment



## 5 OPENING YEAR 2021 CONDITIONS

### 5.1 CUMULATIVE PROJECTS

Project traffic associated with approved or pending “cumulative” projects was added to existing traffic volumes to determine the opening year 2021 conditions in the study area. The City of San Diego’s ‘OpenDSD’ (Development Services Department) online database was examined to determine which projects would add traffic on the intersections and roadway segments in this project’s study area. The location of the cumulative projects is shown in **Appendix G**.

A list of six potential cumulative projects were presented to the City in scoping discussions and shown in **Table 5-1** below.

**Table 5-1**  
Cumulative Project List

Project ID	Project Description	Size	Info	Status
566657	1695 Saturn Boulevard	3.6 acres	18 single family dwelling units	Approved not yet constructed
591594	Stephen W. Hawking II School CUP	2.02 acres	Proposed school at 1275 30 <sup>th</sup> Street, relocated from 2710 Iris Avenue	Open for admission 2019/2020

Refer to Table 5-2 for cumulative project ADT

Two projects on Table 5-1 were determined to influence traffic volumes in the study area for the 2021 opening year. The Saturn Boulevard residential project was examined and trip distributions were estimated based on the future occupant’s access to the road network.

The other cumulative project identified in Table 5-1 is the relocation of the Stephen W. Hawking II Charter School. The school was originally located opposite the project site on 27<sup>th</sup> Street and was open at the time traffic counts were conducted for this study. Since then the school relocated to 1275 30<sup>th</sup> Street. Traffic volumes on 27<sup>th</sup> Street were not reduced to reflect the school relocation for a conservative analysis.

In addition to the cumulative projects shown in Table 5-1, City staff requested that the Mariam Catholic Housing project be investigated to determine if the project was completed prior to the traffic counts that were carried out for the purpose of this LMA. The Mariam project was completed in 2018 and the traffic counts were carried out in April 2019.

**Table 5-2** shows the trip generation for the Saturn Boulevard project. The trip rate and AM and PM inbound and outbound splits are references from the City of San Diego Trip Generation Manual (2003).



**Table 5-2**  
**Cumulative Project Trip Generation**

Land Use		Unit	Daily Trips per Unit	Trip Generation Rates			AM Peak hour			PM Peak Hour		
				Total (% of daily)	Inbound (% AM)	Outbound (%PM)	Total (% of daily)	Inbound (% AM)	Outbound (%PM)	Total (% of daily)	Inbound (% AM)	Outbound (%PM)
Single Family Dwelling Unit		DU	10	8%	20%	80%	10%	70%	30%			
<b>Cumulative Project Trips</b>												
Project Name	Type	Size / Unit	Daily Trips	AM Peak hour			PM Peak Hour					
1695 Saturn Boulevard	Single Family dwelling units	18 DU	180	14	3	11	18	13	5			

Table 5-2 shows that the Saturn Boulevard cumulative project is forecast to generate 14 trips in the AM peak hour (3 inbound and 11 outbound) and 18 trips in the PM peak hour (13 inbound and 5 outbound).

The trip distribution for the Saturn Boulevard cumulative project is provided in Appendix G. It was estimated that 5% of trips would use the Iris Avenue Transit Center as a park and ride facility for onward trips to/from work on public transit. The car trips to the transit center were distributed via the 25th Street and 27th Street intersections on Iris Avenue. **Figure 5-1** shows the cumulative project traffic.

## 5.2 AMBIENT TRAFFIC GROWTH

Average Daily Traffic (ADT) counts for 25th Street between Coronado Avenue and Caminito Hiedra were published by the City and were recorded as 3,390 ADT in 2011<sup>1</sup>. This compares with 3,608 ADT observed at the same location in 2019, as shown in the traffic count data in Appendix A. Therefore, existing traffic volumes were increased by a factor of 1% to account for ambient traffic growth on the roadway network.

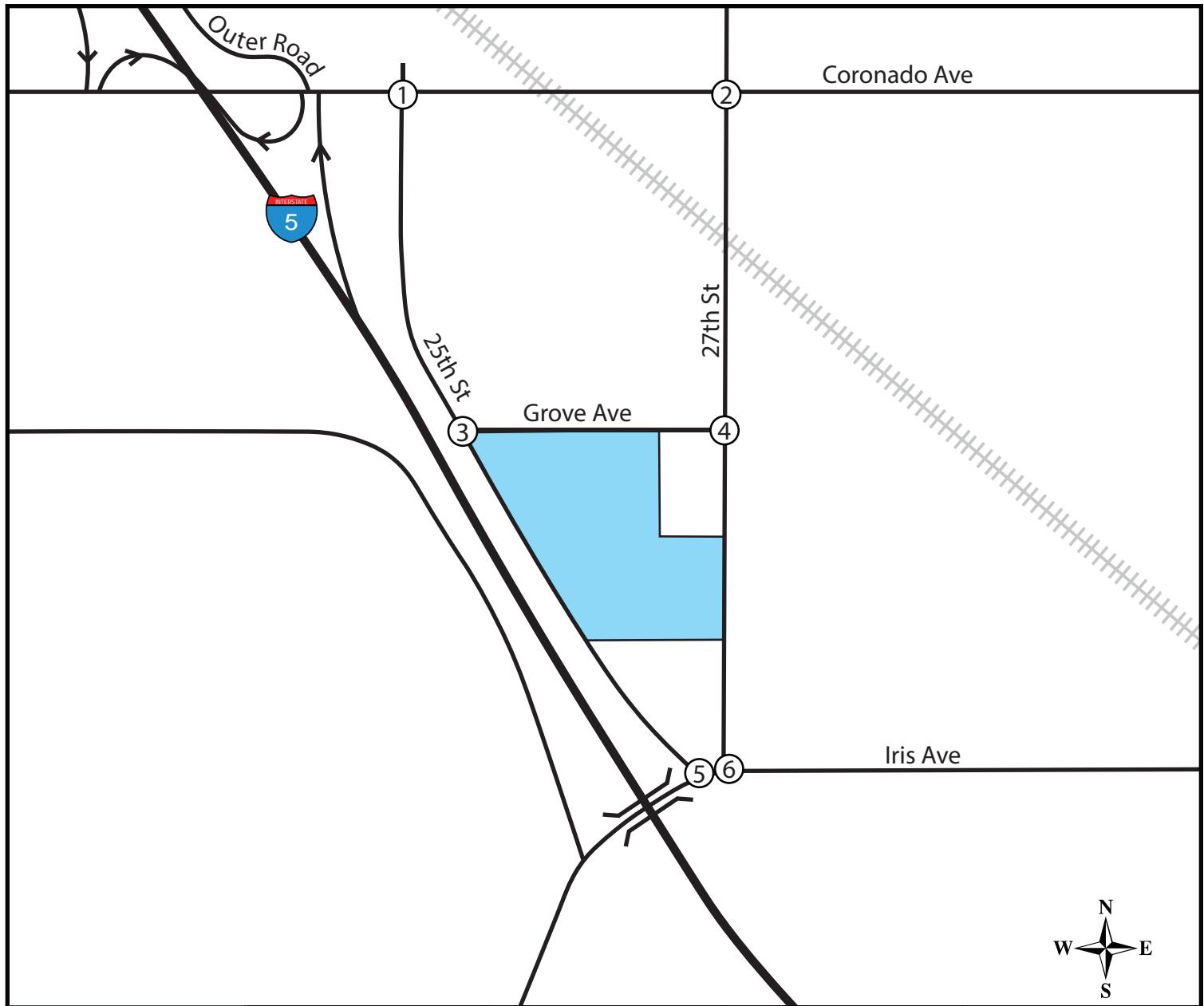
## 5.3 TRAFFIC VOLUMES

The cumulative project trips were added to the existing plus ambient growth traffic volumes to determine the opening year 2021 without project study intersection and roadway segment traffic volumes. **Figure 5-2** illustrates the peak hour intersection and daily roadway segment traffic volumes for opening year 2021 without project conditions.

The project trips were added to the opening year 2021 without project volumes to determine the opening year 2021 with project volumes. **Figure 5-3** illustrates the opening year 2021 with project conditions peak hour intersection and daily roadway segment traffic volumes.

<sup>1</sup> <https://data.sandiego.gov/datasets/traffic-volumes/>

## Southwest Neighborhood Park

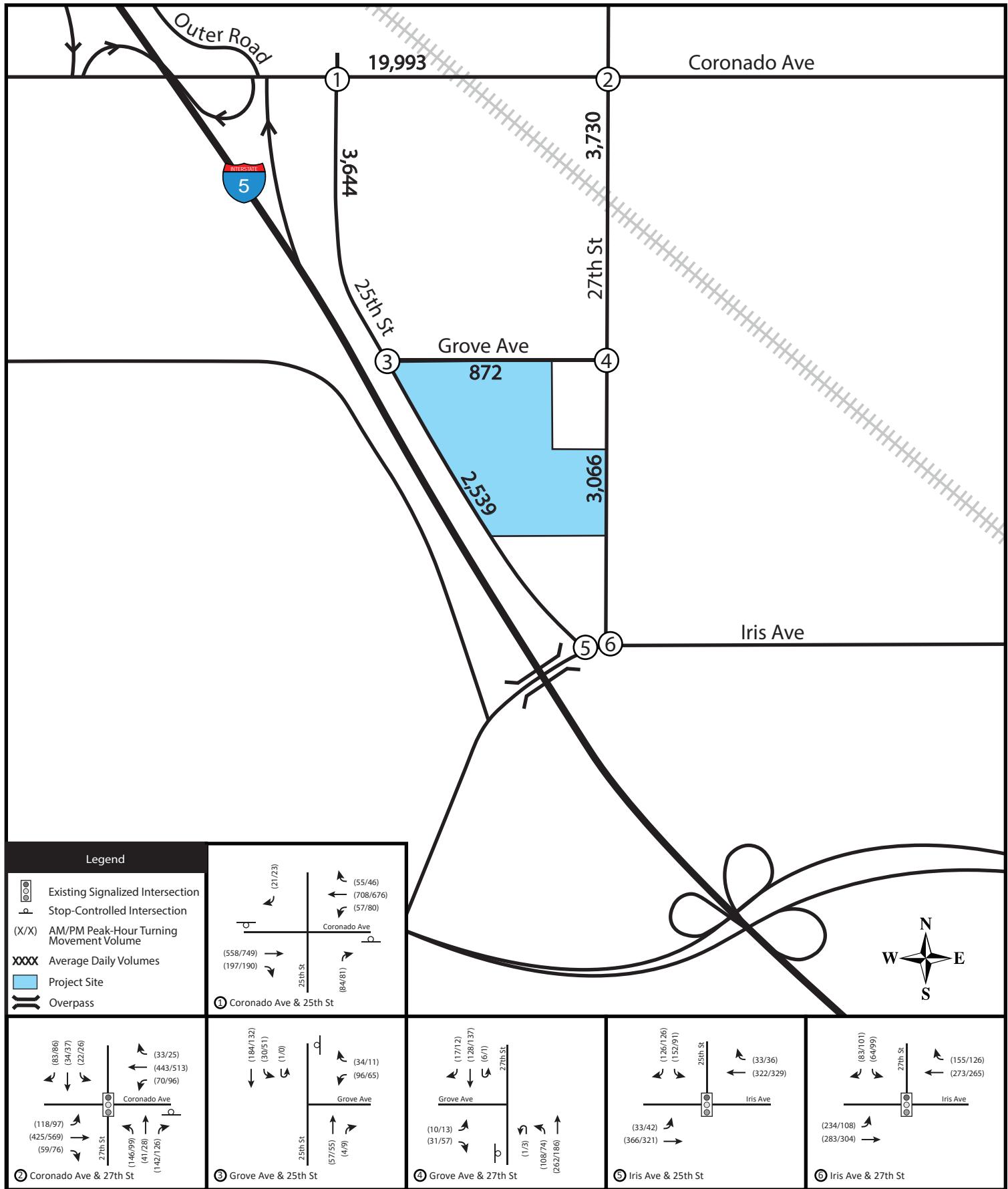


Legend		① Coronado Ave & 25th St	② Coronado Ave & 27th St	③ Grove Ave & 25th St	④ Grove Ave & 27th St
Existing Signalized Intersection	(○)				
Stop-Controlled Intersection	(—)				
(X/X) AM/PM Peak-Hour Project Trips	(X/X)				
Project Site	(Light Blue)				
Overpass	(Black Line)				
⑤ Iris Ave & 25th St		⑥ Iris Ave & 27th St	⑦ 25th St & West Car Park	⑧ 25th St & Park Dr	⑨ 27th St & Park Dr



Figure 5-1  
Cumulative Traffic

## Southwest Neighborhood Park



## Southwest Neighborhood Park

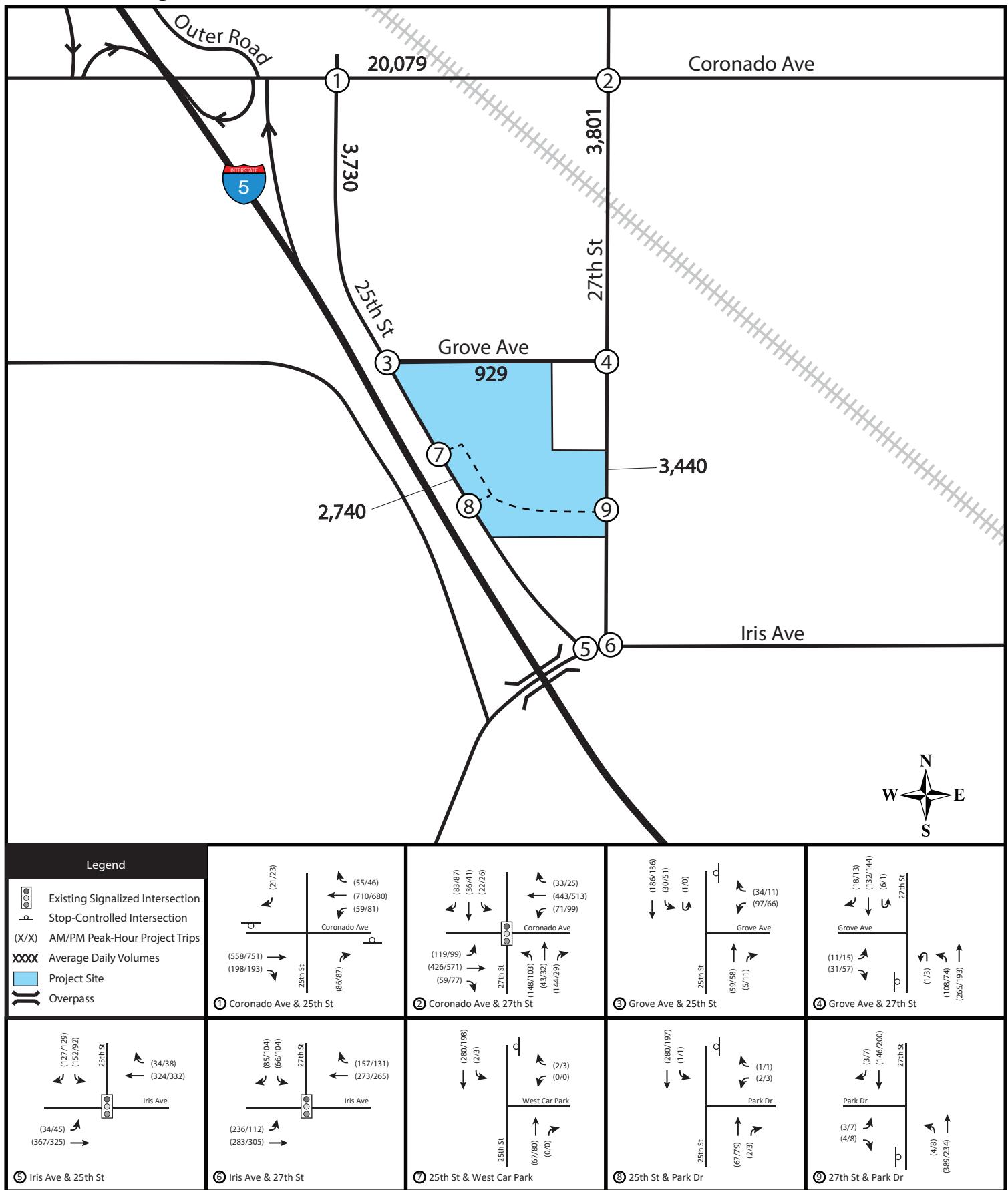


Figure 5-3  
Opening Year (2021) Plus Cumulative Plus Project Volumes





#### 5.4 INTERSECTION ANALYSIS

**Table 5-3** shows the LOS analysis results for study intersections under opening year conditions with and without the project. **Appendix H** contains the intersection LOS worksheets for opening year 2021 conditions without the project and Error! Reference source not found. contains the opening year 2021 with project LOS worksheets.

**Table 5-3**  
**Opening Year 2021 Without and With Project Intersection LOS Summary**

Intersection		Control	Peak Hour	Opening Year 2021				Change in Delay	
				Without Project		With Project			
				Delay <sup>(a)</sup>	LOS	Delay <sup>(a)</sup>	LOS		
1	Coronado Avenue/ 25 <sup>th</sup> Street/ Gas Station	Side Street Stop	AM	12.2	B	12.2	B	0.0	
			PM	13.6	B	13.7	B	0.1	
2	Coronado Avenue/ 27 <sup>th</sup> Street	Signal	AM	18.6	B	18.6	B	0.0	
			PM	18.4	B	19.0	B	0.6	
3	Grove Avenue/ 25 <sup>th</sup> Street	Side Street Stop	AM	14.5	B	14.6	B	0.1	
			PM	12.8	B	13.0	B	0.2	
4	Grove Avenue/ 27 <sup>th</sup> Street	Side Street Stop	AM	11.6	B	11.9	B	0.3	
			PM	11.2	B	11.5	B	0.3	
5	Iris Avenue/ 25 <sup>th</sup> Street	Signal	AM	15.1	B	15.3	B	0.2	
			PM	12.5	B	13.0	B	0.5	
6	Iris Avenue/ 27 <sup>th</sup> Street	Signal	AM	12.1	B	12.2	B	0.1	
			PM	11.7	B	12.3	B	0.6	
7	25 <sup>th</sup> Street/ West parking lot	Side Street Stop	AM	With project intersections only		8.6	A	N/a Project Intersections	
			PM			8.7	A		
8	25 <sup>th</sup> Street/ Park Drive	Side Street Stop	AM			10.1	B		
			PM			9.9	A		
9	27 <sup>th</sup> Street Park Drive	Side Street Stop	AM			10.7	B		
			PM			10.6	B		

<sup>(a)</sup> Seconds of delay are reported as the average control delay for the entire intersection at signalized intersections. The side street stop results show the approach with the highest delay.

Table 5-3 shows that the intersections will continue to operate at LOS B under Opening year 2021 conditions.



## 5.5 ROADWAY SEGMENT ANALYSIS

**Table 5-4** summarizes the daily operations of the study area roadway segments under Opening Year 2021 conditions without and with the proposed project. As shown all study roadway segments will continue to operate at acceptable LOS D or better under opening year plus project conditions with the exception of Coronado Avenue between 25th Street and 27th Street which is forecast to operate at LOS E and volume/capacity ratio of 1.34. This is not a project effect as it does not cause an increase in the volume to capacity ratio in comparison to the 2021 without project conditions.

**Table 5-4**  
**Opening Year 2021 Without and With Project Roadway Segment LOS Summary**

Roadway Segment	Functional Classification	LOS E Capacity	Opening Year 2021 Without Project			Opening Year 2021 With Project			Change in V/C
			ADT	v/c Ratio	LOS	ADT	v/c Ratio	LOS	
Coronado Avenue between 25 <sup>th</sup> Street and 27 <sup>th</sup> Street	Four-Lane Urban Collector with TWLTL	15,000	19,993	1.33	E	20,079	1.34	E	0.01
Grove Avenue between Caminito Avellano and 27th Street	Two-Lane Collector (multifamily)	8,000	872	0.11	A	929	0.12	A	0.01
25th Street between Grove Avenue and Iris Avenue	Two-lane Collector (no fronting property)	10,000	2,539	0.25	A	2,740	0.27	A	0.02
27th Street between Iris Avenue and Creekside Village Way	Two-Lane Collector (multifamily)	8,000	3,066	0.38	B	3,440	0.43	B	0.05



## 6 SITE ACCESS EVALUATION

Vehicular access to the project will be provided at 25<sup>th</sup> Street and 27<sup>th</sup> Street which both function as two-lane collector streets. The project proposes to construct curb, gutter and sidewalk on the east side of 25<sup>th</sup> Street; the west side of 27<sup>th</sup> Street; and the south side of Grove Avenue along sections immediately adjacent to the site and allows for approximately 59 parallel parking spaces. Footpaths through the project site are also proposed, which will enhance area pedestrian connectivity. Left turn pockets will be provided on 25<sup>th</sup> and 27<sup>th</sup> Streets at the project driveways to prevent rear-end accidents.

### 6.1 PARKING

Parking provision for the project is based on City of San Diego's Consultants Guide to Park Design and Development (2019) the relevant section has been provided for reference in **Appendix I**. The two multi-use fields require 30 spaces each and the remaining 8 acres of non-programmed parkland requires 40 spaces for a total requirement of 100 spaces. There will be 53 dedicated on-site parking spaces (approximately 4.6 spaces per acre) and approximately 59 on-street parallel parking spaces adjacent to the project site on 25th Street (20 spaces), Grove Avenue (29 spaces), and 27<sup>th</sup> Street (10 spaces). The on-street parallel parking spaces will be no less than 21-feet long and 8-feet wide. This provides a project total of 112 on-site and off-site parking spaces (approximately 9.7 spaces per acre). The proposed parking provision for the project is shown on Figure 1-2.



## 7 SUMMARY AND CONCLUSIONS

The Local Mobility Analysis evaluates the traffic conditions associated with the proposed Southwest Neighborhood Park located within the Otay Mesa-Nestor community of San Diego. The park will consist of a turf area, children's play area, shade structures, basketball courts and a dog park. The following list summarizes the site access and analysis results:

- Pedestrian and bicycle access to the park will be provided on 25th Street, 27th Street and Grove Avenue. Vehicular access will be provided.
- Vehicular access points will be provided at two locations one on 25th Street and one on 27th Street.
- Parking provision for the project is based on City of San Diego's Consultants Guide to Park Design and Development (2019) which require a total of 100 spaces for this project. There will be 53 dedicated on-site parking spaces (approximately 4.6 spaces per acre) and approximately 59 on-street parallel parking spaces adjacent to the project site on 25th Street (20 spaces), Grove Avenue (29 spaces), and 27<sup>th</sup> Street (10 spaces). This provides a project total of 112 on-site and on-street parking spaces (approximately 9.7 spaces per acre).
- The project is forecast to generate approximately 575 weekday trips per day, which includes approximately 23 AM peak hour trips and approximately 46 PM peak hour trips.
- All of the study intersections operate at LOS B in both the AM and PM peak hour under existing conditions.
- The study roadway segments operate at acceptable LOS B or better with the exception of Coronado Avenue between 25th Street and 27th Street which operates at LOS E under existing conditions
- Analysis was conducted to forecast opening year 2021 conditions. The analysis includes trips associated with approved or pending cumulative projects and with ambient traffic growth. The cumulative projects are forecast to generate approximately 180 trips per day, which includes approximately 14 AM peak hour trips and approximately 18 PM peak hour trips.
- The opening year 2021 without project conditions results show all study intersections operate at LOS B in the AM and PM peak hours. The study roadway segments operate at acceptable LOS B, with the exception of Coronado Avenue between 25th Street and 27th Street, which operates at LOS E under 2021 without project conditions.
- The opening year 2021 with project conditions analysis show all study intersections continue to operate at LOS B or better.
- The study roadway segments continue to operate at acceptable LOS B or better with the exception of Coronado Avenue between 25th Street and 27th Street, which operates at LOS E.

The addition of project traffic to the existing roadway network, will not significantly impact the study area roadway segments and intersections levels of service.



## Appendix A Traffic Count Data

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27th/25th St & Iris Ave

# Peak Hour Turning Movement Count

**ID:** 19-04158-002  
**City:** San Diego

**Day:** Thursday  
**Date:** 04/11/2019

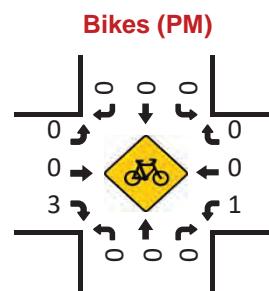
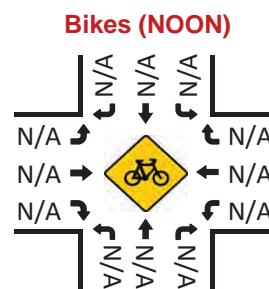
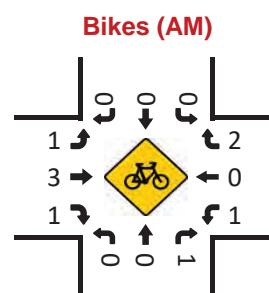
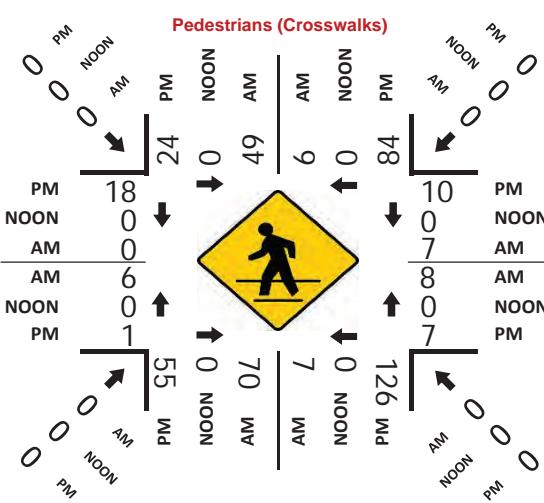
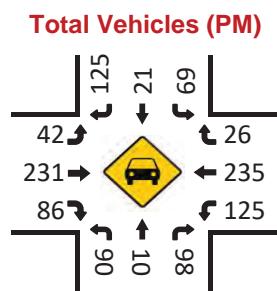
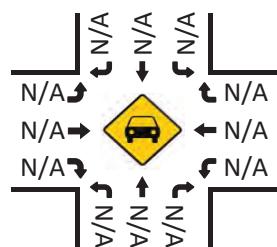
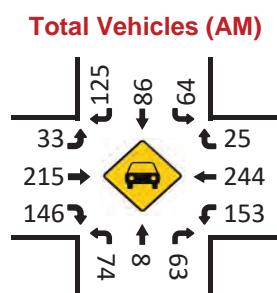
PEAK HOURS			COUNT PERIODS		
07:15 AM - 08:15 AM			AM	125	86
NONE			NOON	0	64
02:30 PM - 03:30 PM			PM	125	21
				69	0
				78	66
			AM	0	0
			NOON	0	0
			PM	0	0
				0	0
06:45 AM - 08:45 AM					
NONE					
01:45 PM - 05:45 PM					

EASTBOUND			WESTBOUND		
AM	NOON	PM	PM	NOON	AM
443	0	450	26	0	25
0	0	0	1	235	0
33	0	42	1	0	244
215	0	231	0	125	0
146	0	86	0	0	153
900			0	0	0
AM	NOON	PM	PM	NOON	AM
398	0	342			

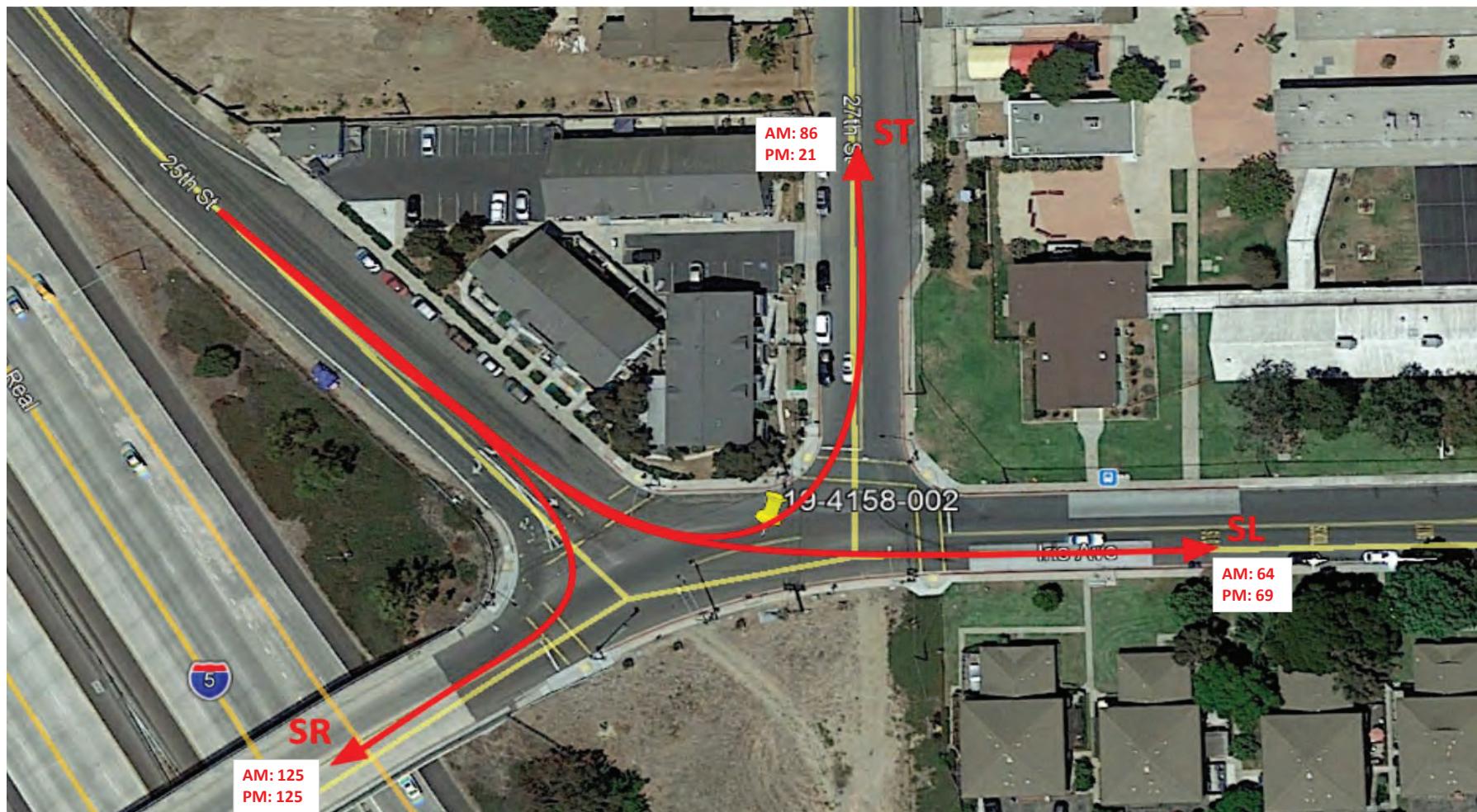
**CONTROL**

**Signalized**

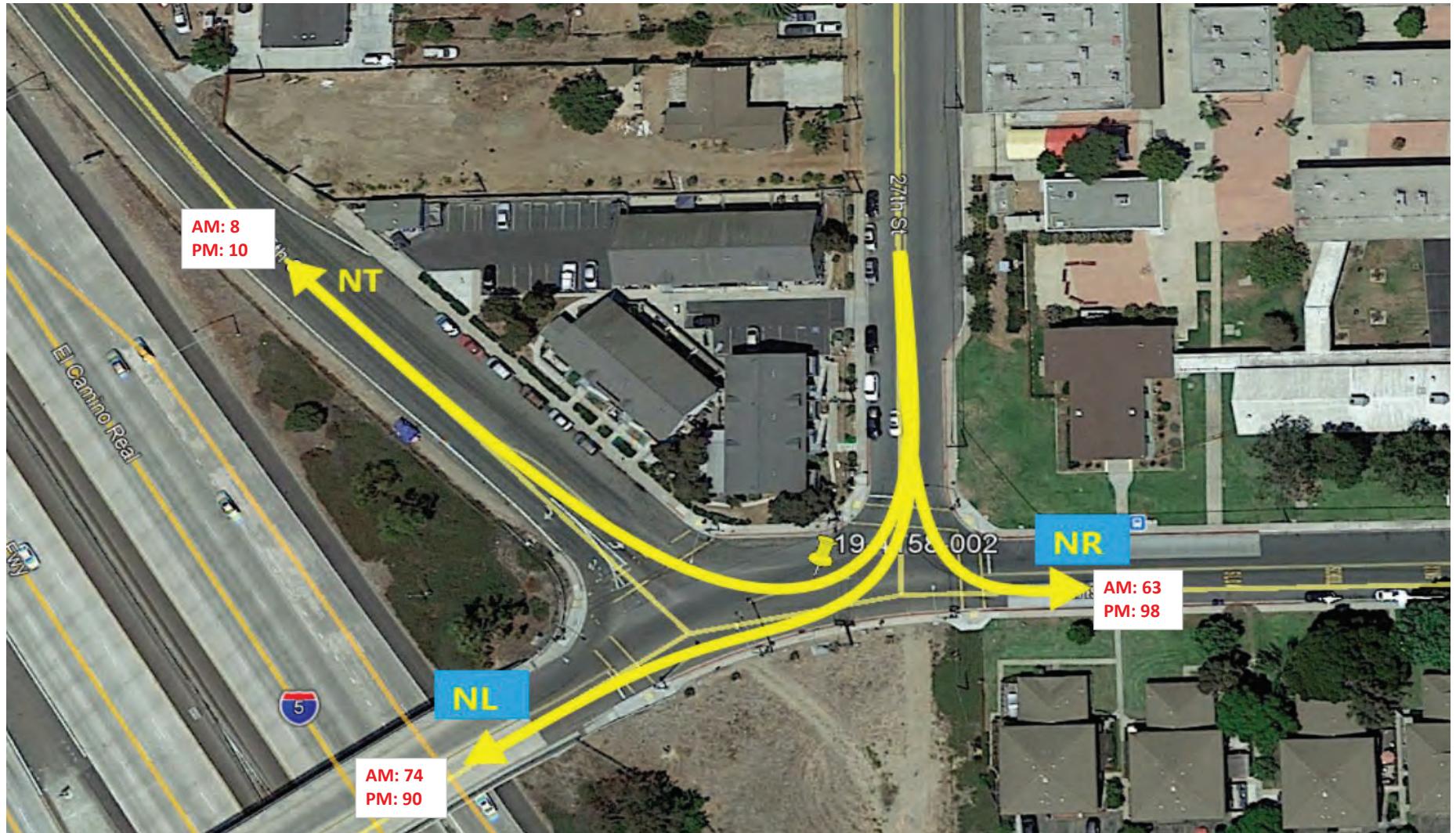
TEV 1236 AM 0.78  
PHF 0.87



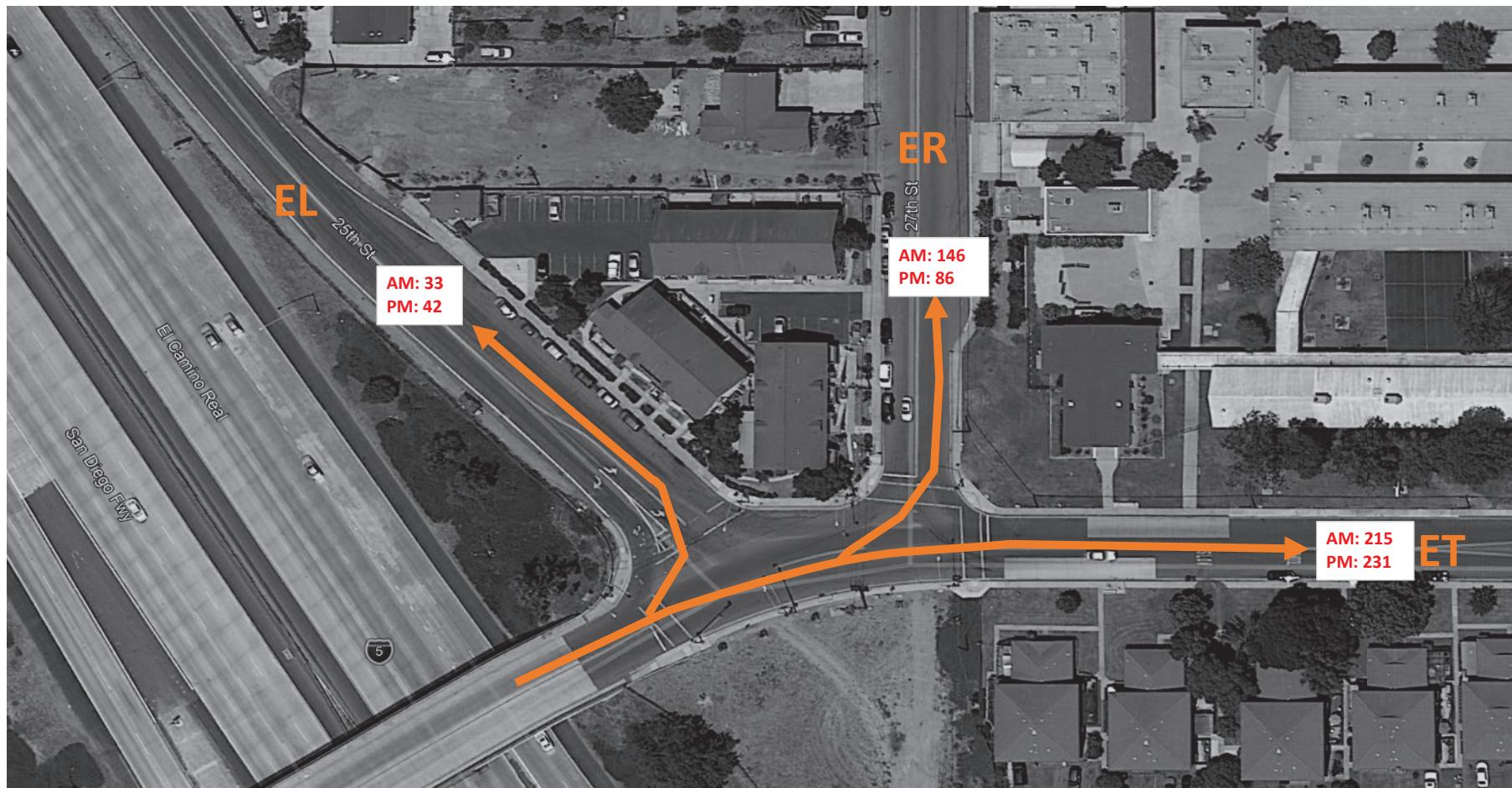
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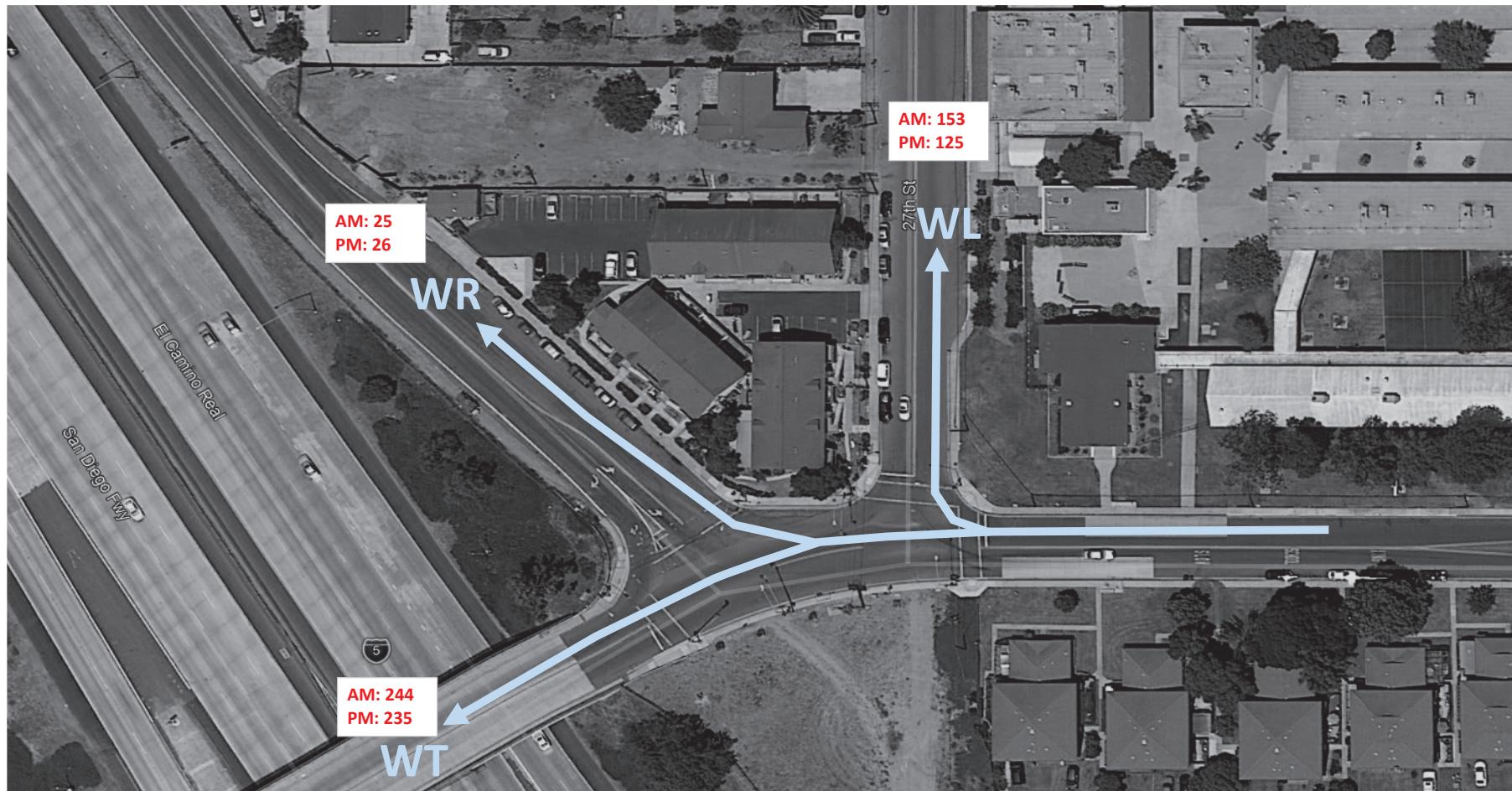
## 27th Street Existing Traffic Movements



## Iris Avenue Eastbound Existing Traffic Movements



### Iris Avenue Westbound Existing Traffic Movements

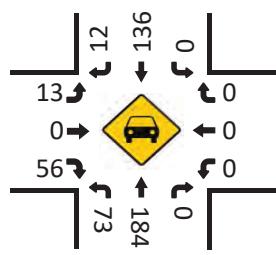
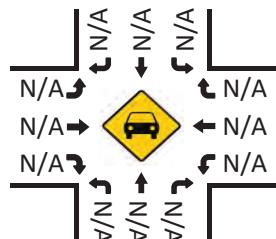
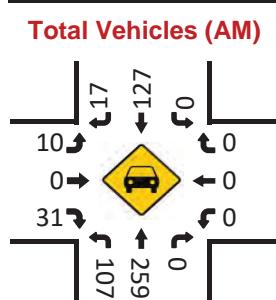


## 27thSt & Grove Ave

## Peak Hour Turning Movement Count

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**City:** San Diego

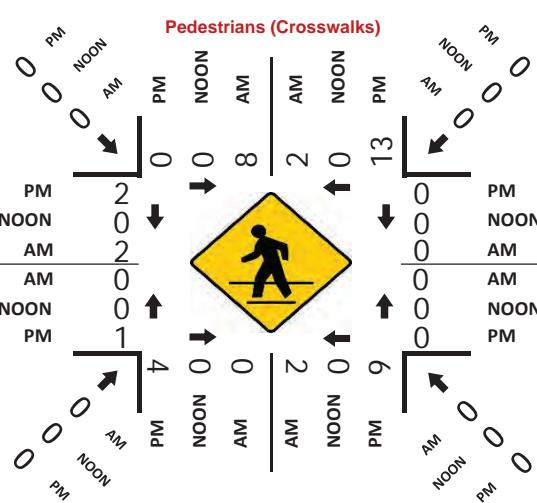
PEAK HOURS	07:30 AM - 08:30 AM		
	NONE		
EASTBOUND	02:30 PM - 03:30 PM		
	AM	NOON	PM
rove Ave	124	0	85
	0	0	0
	10	0	13
	0	0	0
	31	0	56
	AM	NOON	PM



SOUTHBOUND						27thSt	
AM	17	127	0	6		275	AM
NOON	0	0	0	0		0	NOON
PM	12	136	0	1		198	PM
							



		↓	↙	↖	↑	↗
PM	195	3	73	184	0	PM
NOON	0	0	0	0	0	NOON
AM	159	1	107	259	0	AM

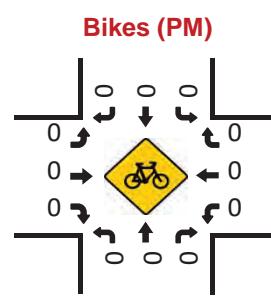
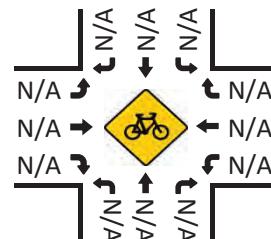
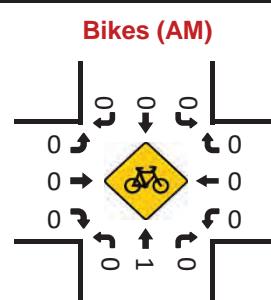


**Day:** Thursday  
**Date:** 04/11/2019

07:00 AM - 09:00 AM

PM	NOON	AM
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
PM	NOON	AM

**WESTBOUND**

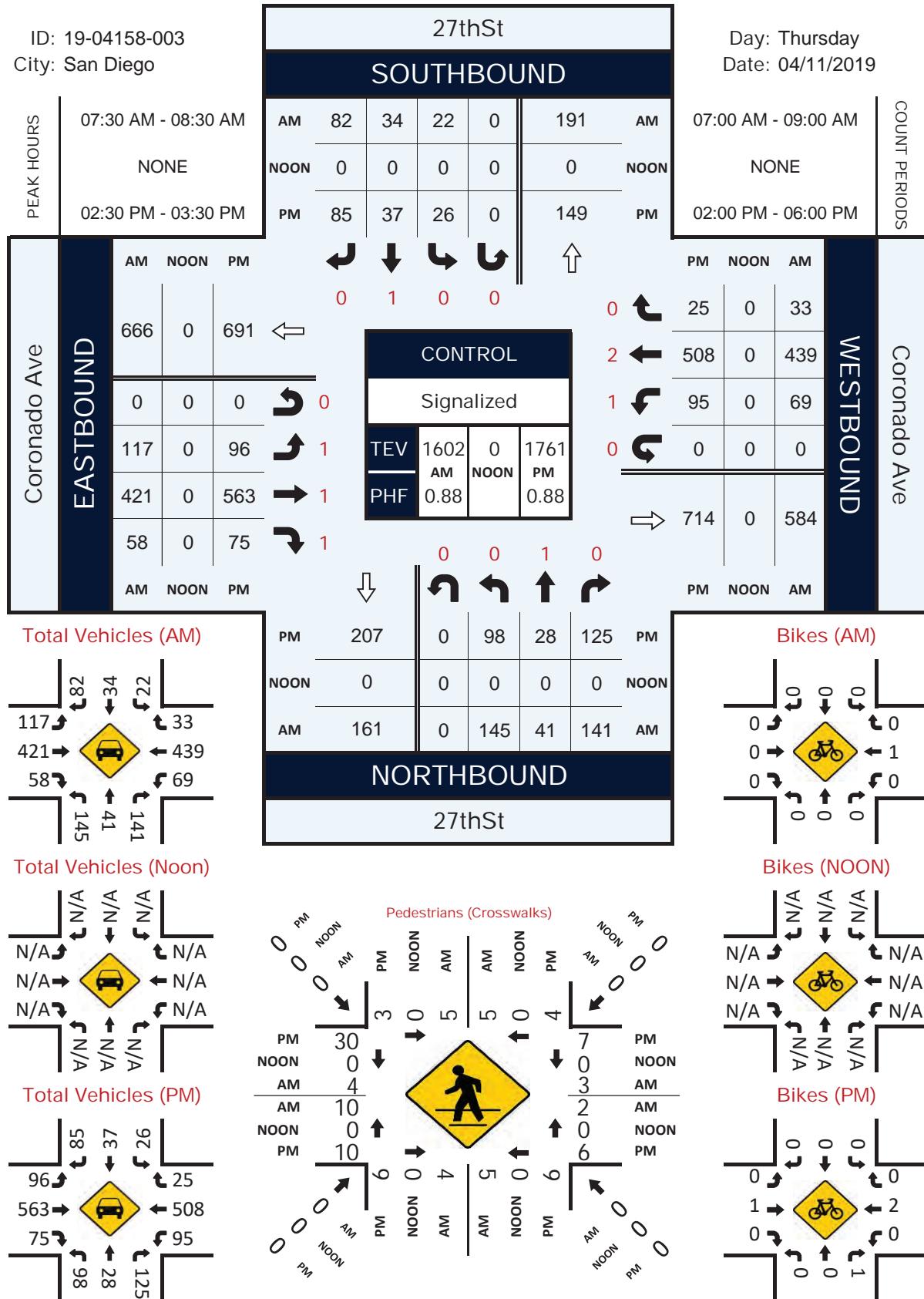


# 27thSt & Coronado Ave

## Peak Hour Turning Movement Count

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City: San Diego

Day: Thursday  
Date: 04/11/2019

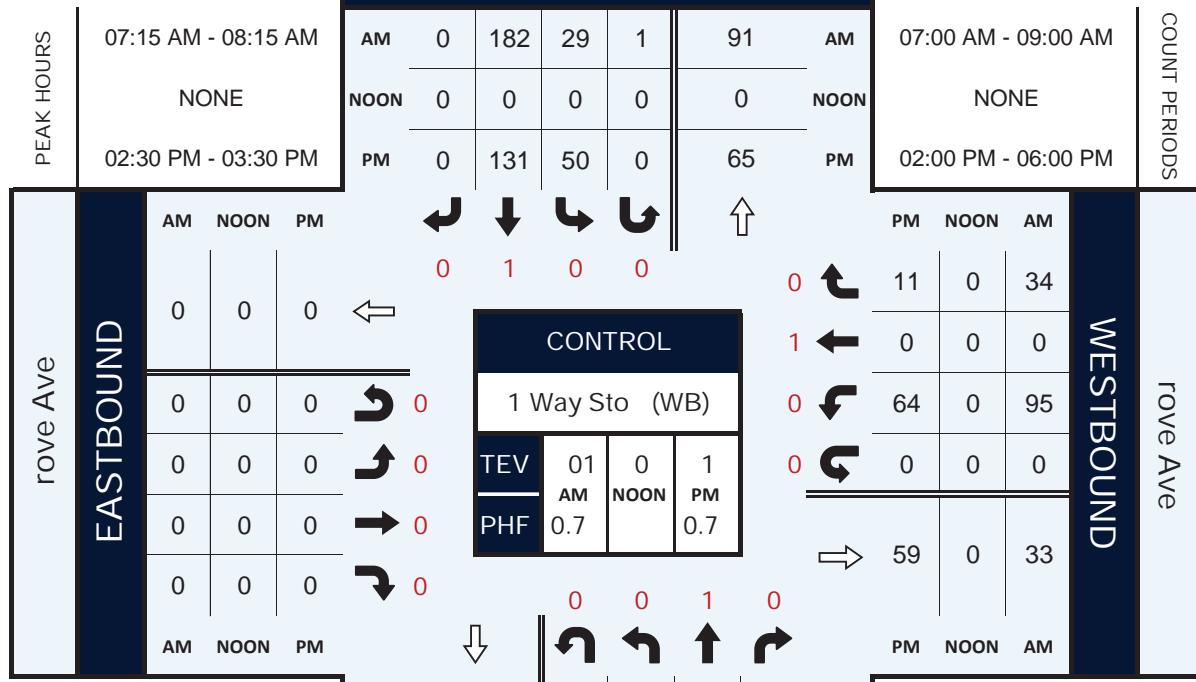


## 25th St &amp; Grove Ave

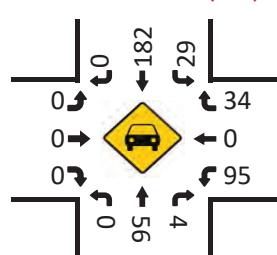
## Peak Hour Turning Movement Count

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City: San Diego

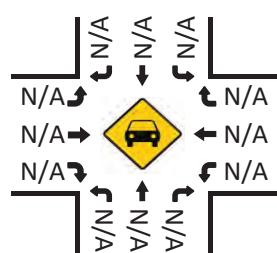
Day: Thursday  
Date: 04/11/2019



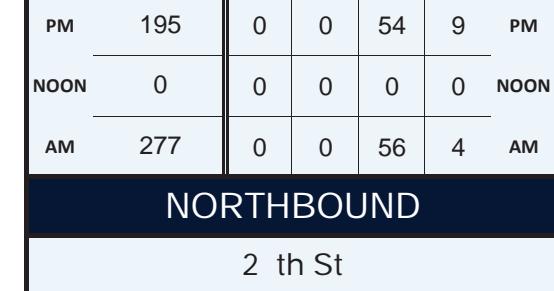
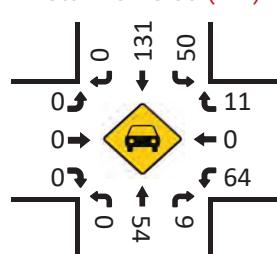
Total Vehicles (AM)



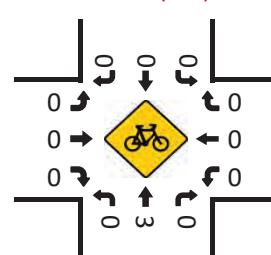
Total Vehicles (Noon)



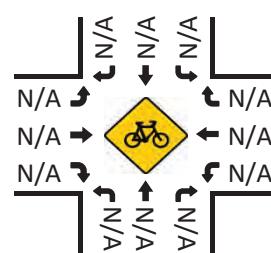
Total Vehicles (PM)



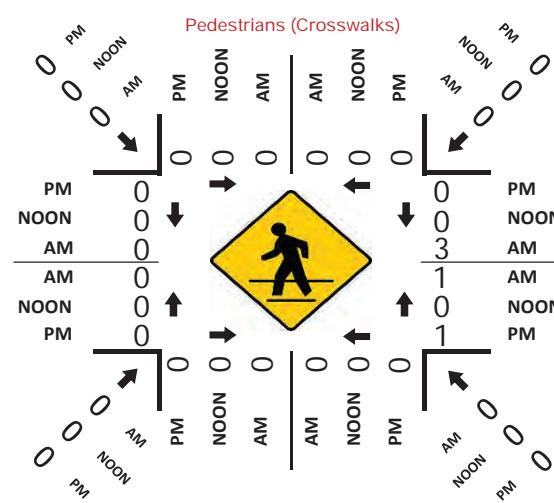
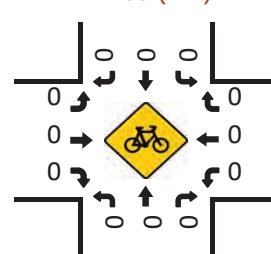
Bikes (AM)



Bikes (NOON)



Bikes (PM)

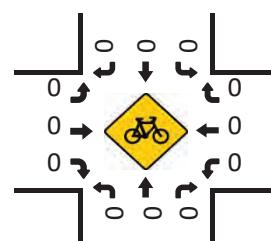
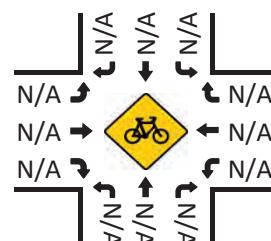
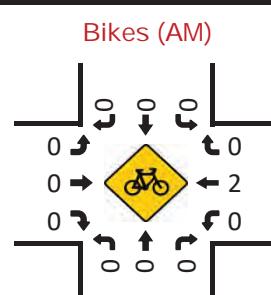
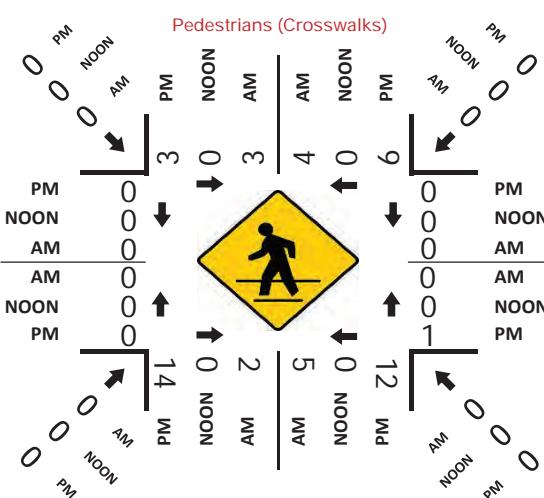
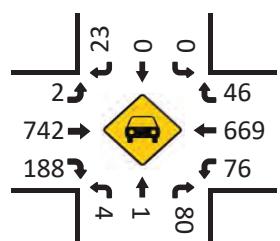
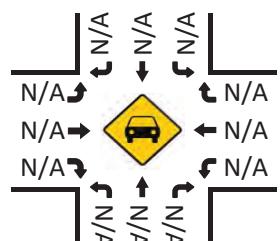
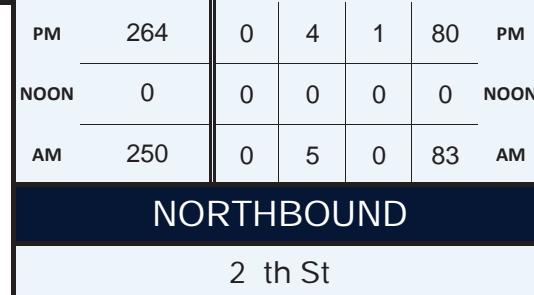
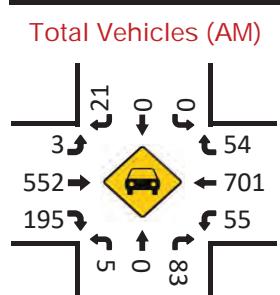
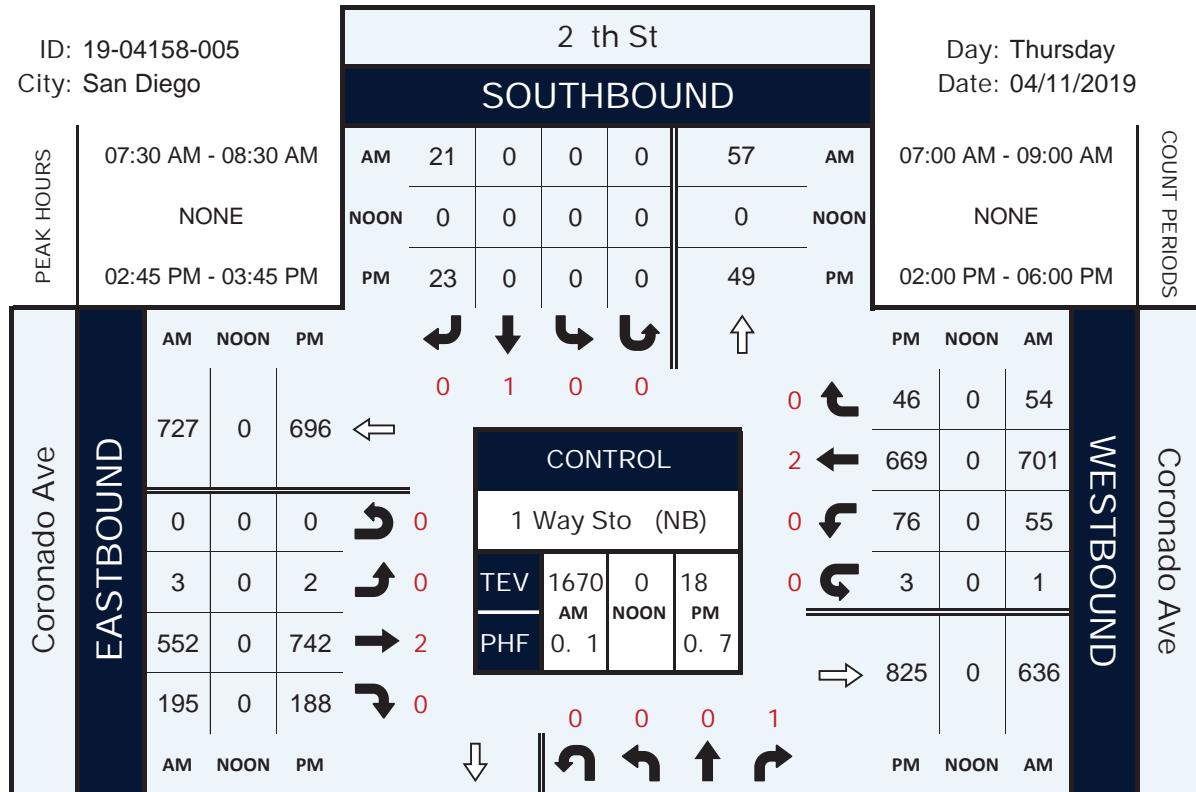


## **25th St & Coronado Ave**

# Peak Hour Turning Movement Count

ID: 19-04158-005  
City: San Diego

Day: Thursday  
Date: 04/11/2019



## VOLUME

Coronado Ave E/O 25th St

**Day:** Thursday  
**Date:** 10/17/2019

**City:** San Diego  
**Project #:** CA19 4398 001

DAILY TOTALS		NB		SB		EB		WB				Total	
		0	0	9,959	9,836							19,795	
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL		
00:00	25 24 18 25	95 14 9 6	28	25	53	12:00	512 129 124 120	139	149	288	1092 256 280 268		
00:15			24	14	38	12:15		129	127	256			
00:30			18	9	27	12:30		124	156	280			
00:45			25	95	54	12:45		120	512	148	580		
01:00	10 17 12 10	49 5 15 7	10	11	21	13:00	635 147 184 168	136	150	286	1215 291 330 308		
01:15			17	5	22	13:15		147	144	291			
01:30			12	15	27	13:30		184	146	330			
01:45			10	49	38	13:45		168	635	140	580		
02:00	10 7 12 12	41 13 8 8	10	5	15	14:00	737 193 197 180	193	157	350	1338 312 340 336		
02:15			7	13	20	14:15		167	145	312			
02:30			12	8	20	14:30		197	143	340			
02:45			12	41	34	14:45		180	737	156	601		
03:00	7 16 18 12	53 16 26 22	7	9	16	15:00	126 178 205 177	178	173	351	1439 366 384 338		
03:15			16	16	32	15:15		205	161	366			
03:30			18	26	44	15:30		200	184	384			
03:45			12	53	73	15:45		177	760	161	679		
04:00	15 22 28 36	29 39 56 101	15	29	44	16:00	301 112 84 76	157	135	292	1376 358 376 350		
04:15			22	39	61	16:15		192	166	358			
04:30			28	56	84	16:30		210	166	376			
04:45			36	101	200	16:45		200	759	150	617		
05:00	27 41 66 65	75 113 126 199	27	75	102	17:00	625 154 192 426	175	155	330	1456 359 394 373		
05:15			41	113	154	17:15		189	170	359			
05:30			66	126	192	17:30		234	160	394			
05:45			65	199	426	17:45		183	781	190	675		
06:00	52 71 92 87	130 130 144 302	52	130	182	18:00	301 201 236 161	197	143	340	1253 330 295 288		
06:15			71	130	201	18:15		186	144	330			
06:30			92	144	236	18:30		136	159	295			
06:45			87	302	161	18:45		161	680	127	573		
07:00	128 130 146 199	163 172 185 603	128	163	291	19:00	1361 302 331 758	147	117	264	989 260 234 231		
07:15			130	172	302	19:15		147	113	260			
07:30			146	185	331	19:30		136	98	234			
07:45			199	603	758	19:45		125	555	106	434		
08:00	171 175 142 116	172 174 161 604	171	172	343	20:00	1251 349 303 647	113	74	187	740 206 181 166		
08:15			175	174	349	20:15		121	85	206			
08:30			142	161	303	20:30		86	95	181			
08:45			116	604	647	20:45		115	435	51	305		
09:00	95 104 133 109	133 137 142 441	95	133	228	21:00	961 241 275 208	73	60	133	523 145 130 115		
09:15			104	137	241	21:15		89	56	145			
09:30			133	142	275	21:30		82	48	130			
09:45			109	441	208	21:45		65	309	50	214		
10:00	109 97 119 123	145 133 118 448	109	145	254	22:00	954 230 237 506	62	44	106	341 83 78 74		
10:15			97	133	230	22:15		54	29	83			
10:30			119	118	237	22:30		43	35	78			
10:45			123	448	506	22:45		43	202	31	139		
11:00	108 133 150 132	117 125 128 523	108	117	225	23:00	1029 258 278 506	46	42	88	247 63 51 45		
11:15			133	125	258	23:15		35	28	63			
11:30			150	128	278	23:30		31	20	51			
11:45			132	523	136	23:45		23	135	22	112		
TOTALS	3459				4327	TOTALS	7786				6500	5509	12009

<b>AM Peak Hour</b>		07:30	07:30	<b>07:30</b>	<b>PM Peak Hour</b>		17:15	15:00	<b>17:15</b>		
<b>AM Pk Volume</b>		691	769	<b>1460</b>	<b>PM Pk Volume</b>		803	679	<b>1466</b>		
<b>Pk Hr Factor</b>		0.868	0.808	<b>0.835</b>	<b>Pk Hr Factor</b>		0.858	0.923	<b>0.930</b>		
<b>7 - 9 Volume</b>	<b>0</b>	<b>0</b>	1207	1405	<b>2612</b>	<b>4 - 6 Volume</b>	<b>0</b>	<b>0</b>	1540	1292	<b>2832</b>
<b>7 - 9 Peak Hour</b>			07:30	07:30	<b>07:30</b>	<b>4 - 6 Peak Hour</b>			16:45	17:00	<b>17:00</b>
<b>7 - 9 Pk Volume</b>	<b>0</b>	<b>0</b>	691	769	<b>1460</b>	<b>4 - 6 Pk Volume</b>	<b>0</b>	<b>0</b>	798	675	<b>1456</b>
<b>Pk Hr Factor</b>	<b>0.000</b>	<b>0.000</b>	0.868	0.808	<b>0.835</b>	<b>Pk Hr Factor</b>	<b>0.000</b>	<b>0.000</b>	0.853	0.888	<b>0.924</b>

**VOLUME**

27th St Bet. Iris Ave &amp; Creekside Village Way

Day: Thursday

Date: 4/11/2019

City: San Diego

Project #: CA19\_4159\_001

DAILY TOTALS				NB 1,717	SB 1,319	EB 0	WB 0			Total 3,036	
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL
00:00	0	0			0	12:00	7	15			22
00:15	0	0			0	12:15	10	18			28
00:30	0	0			0	12:30	23	22			45
00:45	0	0			0	12:45	23	63	12	67	35 130
01:00	0	0			0	13:00	20	15			35
01:15	0	0			0	13:15	15	23			38
01:30	0	0			0	13:30	19	16			35
01:45	0	0			0	13:45	26	80	17	71	43 151
02:00	1	0			1	14:00	14	21			35
02:15	1	0			1	14:15	22	39			61
02:30	0	2			2	14:30	42	27			69
02:45	4	6	1	3	5 9	14:45	93	171	44	131	137 302
03:00	2	0			2	15:00	50	44			94
03:15	2	0			2	15:15	40	32			72
03:30	3	0			3	15:30	30	29			59
03:45	1	8	0		1 8	15:45	32	152	23	128	55 280
04:00	2	3			5	16:00	39	22			61
04:15	4	2			6	16:15	24	29			53
04:30	6	3			9	16:30	40	30			70
04:45	8	20	1	9	9 29	16:45	29	132	26	107	55 239
05:00	9	5			14	17:00	23	31			54
05:15	9	2			11	17:15	32	14			46
05:30	8	1			9	17:30	39	32			71
05:45	7	33	7	15	14 48	17:45	23	117	26	103	49 220
06:00	10	3			13	18:00	26	24			50
06:15	16	9			25	18:15	17	29			46
06:30	15	13			28	18:30	21	20			41
06:45	16	57	22	47	38 104	18:45	21	85	13	86	34 171
07:00	38	17			55	19:00	18	12			30
07:15	47	35			82	19:15	20	21			41
07:30	57	46			103	19:30	17	13			30
07:45	96	238	42	140	138 378	19:45	21	76	10	56	31 132
08:00	125	41			166	20:00	12	16			28
08:15	28	26			54	20:15	8	13			21
08:30	19	16			35	20:30	8	16			24
08:45	15	187	9	92	24 279	20:45	14	42	9	54	23 96
09:00	18	14			32	21:00	13	12			25
09:15	18	8			26	21:15	10	7			17
09:30	10	9			19	21:30	11	11			22
09:45	16	62	14	45	30 107	21:45	8	42	9	39	17 81
10:00	18	10			28	22:00	2	7			9
10:15	16	12			28	22:15	10	11			21
10:30	12	11			23	22:30	2	4			6
10:45	16	62	13	46	29 108	22:45	2	16	4	26	6 42
11:00	17	12			29	23:00	6	4			10
11:15	12	13			25	23:15	3	2			5
11:30	14	9			23	23:30	1	0			1
11:45	15	58	14	48	29 106	23:45	0	10	0	6	0 16
TOTALS	731	445			1176	TOTALS	986	874			1860
SPLIT %	62.2%	37.8%			38.7%	SPLIT %	53.0%	47.0%			61.3%

DAILY TOTALS				NB 1,717	SB 1,319	EB 0	WB 0			Total 3,036
AM Peak Hour	07:15	07:15		07:15	PM Peak Hour	14:30	14:15			14:30
AM Pk Volume	325	164		489	PM Pk Volume	225	154			372
Pk Hr Factor	0.650	0.891		0.736	Pk Hr Factor	0.605	0.875			0.679

7 - 9 Volume	425	232	0	0	657	4 - 6 Volume	249	210	0	0	459
7 - 9 Peak Hour	07:15	07:15			07:15	4 - 6 Peak Hour	16:00	16:15			16:00
7 - 9 Pk Volume	325	164	0	0	489	4 - 6 Pk Volume	132	116	0	0	239
Pk Hr Factor	0.650	0.891	0.000	0.000	0.736	Pk Hr Factor	0.825	0.935	0.000	0.000	0.854

**VOLUME**

25th St Bet. Caminito Espino &amp; Caminito Hiedra

Day: Thursday

Date: 4/11/2019

City: San Diego

Project #: CA19\_4159\_002

DAILY TOTALS				NB 1,255	SB 2,353	EB 0	WB 0			Total 3,608	
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL
00:00	5	10			15	12:00	16	29			45
00:15	3	8			11	12:15	11	24			35
00:30	4	5			9	12:30	14	18			32
00:45	1	13	4	27	5 40	12:45	17	58	29	100	46 158
01:00	4	11			15	13:00	11	16			27
01:15	1	5			6	13:15	15	30			45
01:30	0	2			2	13:30	24	21			45
01:45	0	5	7	25	7 30	13:45	11	61	24	91	35 152
02:00	0	1			1	14:00	10	34			44
02:15	1	3			4	14:15	19	44			63
02:30	0	2			2	14:30	22	55			77
02:45	1	2	2	8	3 10	14:45	27	78	50	183	77 261
03:00	0	2			2	15:00	18	58			76
03:15	2	1			3	15:15	23	50			73
03:30	3	2			5	15:30	19	47			66
03:45	2	7	2	7	4 14	15:45	27	87	49	204	76 291
04:00	4	4			8	16:00	25	39			64
04:15	5	5			10	16:15	15	58			73
04:30	3	2			5	16:30	21	54			75
04:45	4	16	2	13	6 29	16:45	17	78	39	190	56 268
05:00	9	5			14	17:00	11	49			60
05:15	14	4			18	17:15	26	59			85
05:30	15	6			21	17:30	23	47			70
05:45	7	45	3	18	10 63	17:45	21	81	62	217	83 298
06:00	17	9			26	18:00	28	56			84
06:15	11	7			18	18:15	24	49			73
06:30	13	13			26	18:30	10	39			49
06:45	17	58	33	62	50 120	18:45	14	76	46	190	60 266
07:00	25	23			48	19:00	17	33			50
07:15	27	29			56	19:15	12	35			47
07:30	18	46			64	19:30	16	31			47
07:45	35	105	77	175	112 280	19:45	14	59	30	129	44 188
08:00	40	52			92	20:00	14	25			39
08:15	29	26			55	20:15	6	30			36
08:30	31	29			60	20:30	13	37			50
08:45	16	116	14	121	30 237	20:45	10	43	36	128	46 171
09:00	11	17			28	21:00	7	36			43
09:15	13	14			27	21:15	6	26			32
09:30	13	17			30	21:30	12	24			36
09:45	11	48	16	64	27 112	21:45	11	36	24	110	35 146
10:00	20	21			41	22:00	7	11			18
10:15	15	15			30	22:15	8	19			27
10:30	10	15			25	22:30	10	23			33
10:45	16	61	20	71	36 132	22:45	13	38	24	77	37 115
11:00	12	22			34	23:00	9	20			29
11:15	15	26			41	23:15	5	16			21
11:30	23	15			38	23:30	2	10			12
11:45	17	67	28	91	45 158	23:45	1	17	6	52	7 69
TOTALS	543	682			1225	TOTALS	712	1671			2383
SPLIT %	44.3%	55.7%			34.0%	SPLIT %	29.9%	70.1%			66.0%

DAILY TOTALS				NB 1,255	SB 2,353	EB 0	WB 0			Total 3,608
AM Peak Hour	07:45	07:15		07:15	PM Peak Hour	17:15	17:15			17:15
AM Pk Volume	135	204		324	PM Pk Volume	98	224			322
Pk Hr Factor	0.844	0.662		0.723	Pk Hr Factor	0.875	0.903			0.947

7 - 9 Volume	221	296	0	0	517	4 - 6 Volume	159	407	0	0	566
7 - 9 Peak Hour	07:45	07:15			07:15	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	135	204	0	0	324	4 - 6 Pk Volume	81	217	0	0	298
Pk Hr Factor	0.844	0.662	0.000	0.000	0.723	Pk Hr Factor	0.779	0.875	0.000	0.000	0.876

**VOLUME**

Grove Ave Bet. Caminito Avellano &amp; 27th St

Day: Thursday

Date: 4/11/2019

City: San Diego

Project #: CA19\_4159\_003

DAILY TOTALS				NB 0	SB 0	EB 436	WB 427					Total 863
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL	
00:00			2	0	2	12:00			8	1	9	
00:15			0	1	1	12:15			1	2	3	
00:30			1	0	1	12:30			5	7	12	
00:45			0	3	1	12:45			6	20	11	
01:00			0	0	0	13:00			1	4	5	
01:15			1	2	3	13:15			2	3	5	
01:30			0	0	0	13:30			3	4	7	
01:45			0	1	1	13:45			5	11	12	
02:00			0	0	0	14:00			10	4	14	
02:15			2	0	2	14:15			12	6	18	
02:30			1	0	1	14:30			17	18	35	
02:45			1	4	1	14:45			23	62	74	
03:00			1	0	1	15:00			15	12	27	
03:15			1	1	2	15:15			12	5	17	
03:30			0	1	1	15:30			11	6	17	
03:45			0	2	1	15:45			7	45	31	
04:00			0	0	0	16:00			10	12	22	
04:15			4	0	4	16:15			10	9	19	
04:30			0	0	0	16:30			9	4	13	
04:45			0	4	1	16:45			2	31	31	
05:00			1	1	2	17:00			8	4	12	
05:15			2	5	7	17:15			8	4	12	
05:30			1	1	2	17:30			9	9	18	
05:45			0	4	0	17:45			7	32	24	
06:00			1	2	3	18:00			10	3	13	
06:15			1	4	5	18:15			8	2	10	
06:30			4	6	10	18:30			6	1	7	
06:45			5	11	3	18:45			2	26	35	
07:00			8	6	14	19:00			6	1	7	
07:15			11	9	20	19:15			3	3	6	
07:30			12	14	26	19:30			6	5	11	
07:45			13	44	48	19:45			5	20	32	
08:00			9	52	61	20:00			1	2	3	
08:15			7	4	11	20:15			2	1	3	
08:30			2	8	10	20:30			10	7	17	
08:45			3	21	2	20:45			8	21	11	
09:00			5	0	5	21:00			8	0	8	
09:15			2	1	3	21:15			2	1	3	
09:30			2	2	4	21:30			7	3	10	
09:45			3	12	1	21:45			5	22	32	
10:00			1	1	2	22:00			2	2	4	
10:15			1	0	1	22:15			6	3	9	
10:30			4	0	4	22:30			7	2	9	
10:45			4	10	1	22:45			3	18	7	
11:00			1	1	2	23:00			1	2	3	
11:15			3	3	6	23:15			0	0	0	
11:30			2	4	6	23:30			2	1	3	
11:45			3	9	3	23:45			0	3	0	
TOTALS			125	192	317	TOTALS			311	235	546	
SPLIT %			39.4%	60.6%	36.7%	SPLIT %			57.0%	43.0%	63.3%	

DAILY TOTALS				NB 0	SB 0	EB 436	WB 427					Total 863
AM Peak Hour		07:15	07:15	07:15		PM Peak Hour			14:15	14:15	14:15	
AM Pk Volume		45	123	168		PM Pk Volume			67	82	149	
Pk Hr Factor		0.865	0.591	0.689		Pk Hr Factor			0.728	0.446	0.540	
7 - 9 Volume	0	0	65	143	208	4 - 6 Volume	0	0	63	55	118	
7 - 9 Peak Hour			07:15	07:15	07:15	4 - 6 Peak Hour			17:00	16:00	16:00	
7 - 9 Pk Volume	0	0	45	123	168	4 - 6 Pk Volume	0	0	32	31	62	
Pk Hr Factor	0.000	0.000	0.865	0.591	0.689	Pk Hr Factor	0.000	0.000	0.889	0.646	0.705	

**VOLUME**

25th St Bet. Grove Ave &amp; Iris Ave

Day: Thursday

Date: 4/11/2019

City: San Diego

Project #: CA19\_4159\_004

DAILY TOTALS				NB 655	SB 1,859	EB 0	WB 0			Total 2,514	
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL
00:00	7	12			19	12:00	10	16			26
00:15	5	5			10	12:15	6	18			24
00:30	2	4			6	12:30	8	18			26
00:45	1	15	2	23	38	12:45	5	29	16	68	97
01:00	1	4			5	13:00	7	13			20
01:15	1	3			4	13:15	7	24			31
01:30	1	1			2	13:30	7	14			21
01:45	0	3	8	16	19	13:45	4	25	15	66	91
02:00	0	1			1	14:00	5	28			33
02:15	0	0			0	14:15	12	29			41
02:30	1	1			2	14:30	12	40			52
02:45	1	2	2	4	6	14:45	27	56	68	165	221
03:00	0	1			1	15:00	11	55			66
03:15	1	0			1	15:15	13	35			48
03:30	3	3			6	15:30	12	34			46
03:45	1	5	1	5	10	15:45	14	50	34	158	208
04:00	3	3			6	16:00	6	24			30
04:15	3	2			5	16:15	5	34			39
04:30	2	3			5	16:30	11	34			45
04:45	1	9	2	10	19	16:45	10	32	34	126	158
05:00	8	5			13	17:00	11	39			50
05:15	3	2			5	17:15	15	42			57
05:30	9	7			16	17:30	11	32			43
05:45	2	22	2	16	38	17:45	10	47	42	155	202
06:00	3	8			11	18:00	15	41			56
06:15	5	6			11	18:15	9	25			34
06:30	4	14			18	18:30	11	22			33
06:45	5	17	38	66	83	18:45	11	46	28	116	162
07:00	14	23			37	19:00	8	21			29
07:15	13	28			41	19:15	5	26			31
07:30	10	51			61	19:30	5	23			28
07:45	17	54	105	207	261	19:45	10	28	19	89	117
08:00	16	90			106	20:00	7	15			22
08:15	18	27			45	20:15	5	25			30
08:30	12	29			41	20:30	5	24			29
08:45	7	53	13	159	212	20:45	1	18	18	82	100
09:00	5	15			20	21:00	7	18			25
09:15	7	15			22	21:15	4	20			24
09:30	9	9			18	21:30	10	13			23
09:45	8	29	13	52	81	21:45	6	27	21	72	99
10:00	5	10			15	22:00	4	5			9
10:15	12	11			23	22:15	5	7			12
10:30	5	11			16	22:30	7	15			22
10:45	9	31	21	53	84	22:45	4	20	18	45	65
11:00	5	18			23	23:00	1	11			12
11:15	10	23			33	23:15	2	9			11
11:30	12	15			27	23:30	1	7			8
11:45	5	32	15	71	103	23:45	1	5	8	35	40
TOTALS	272	682			954	TOTALS	383	1177			1560
SPLIT %	28.5%	71.5%			37.9%	SPLIT %	24.6%	75.4%			62.1%

DAILY TOTALS				NB 655	SB 1,859	EB 0	WB 0			Total 2,514
AM Peak Hour	07:45	07:15		07:30	PM Peak Hour	14:30	14:30			14:30
AM Pk Volume	63	274		334	PM Pk Volume	63	198			261
Pk Hr Factor	0.875	0.652		0.684	Pk Hr Factor	0.583	0.728			0.687
7 - 9 Volume	107	366	0	473	4 - 6 Volume	79	281	0	0	360
7 - 9 Peak Hour	07:45	07:15		07:30	4 - 6 Peak Hour	16:30	17:00			17:00
7 - 9 Pk Volume	63	274	0	334	4 - 6 Pk Volume	47	155	0	0	202
Pk Hr Factor	0.875	0.652	0.000	0.684	Pk Hr Factor	0.783	0.923	0.000	0.000	0.886

**VOLUME**

27th St Bet. Caminito Espino &amp; Caminito Secoya

Day: Thursday

Date: 4/11/2019

City: San Diego

Project #: CA19\_4159\_005

DAILY TOTALS				NB 2,066	SB 1,470	EB 0	WB 0			Total 3,536	
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL
00:00	0	0			0	12:00	18	15			33
00:15	1	0			1	12:15	15	15			30
00:30	0	1			1	12:30	30	31			61
00:45	2	3	1	2	3	12:45	32	95	12	73	44 168
01:00	1	0			1	13:00	19	20			39
01:15	0	1			1	13:15	20	20			40
01:30	1	0			1	13:30	22	22			44
01:45	0	2	1	2	1	13:45	26	87	15	77	41 164
02:00	1	0			1	14:00	27	26			53
02:15	2	0			2	14:15	30	39			69
02:30	0	1			1	14:30	42	26			68
02:45	7	10	0	1	7	14:45	67	166	40	131	107 297
03:00	3	0			3	15:00	46	58			104
03:15	5	0			5	15:15	38	34			72
03:30	6	1			7	15:30	31	28			59
03:45	3	17	0	1	3	15:45	37	152	25	145	62 297
04:00	7	1			8	16:00	30	28			58
04:15	6	1			7	16:15	26	25			51
04:30	9	1			10	16:30	43	30			73
04:45	12	34	2	5	14	16:45	37	136	32	115	69 251
05:00	19	3			22	17:00	24	41			65
05:15	18	3			21	17:15	32	29			61
05:30	23	3			26	17:30	34	37			71
05:45	22	82	6	15	28	17:45	32	122	27	134	59 256
06:00	20	5			25	18:00	41	37			78
06:15	26	9			35	18:15	24	27			51
06:30	23	11			34	18:30	28	25			53
06:45	32	101	16	41	48	18:45	29	122	23	112	52 234
07:00	42	11			53	19:00	27	24			51
07:15	48	29			77	19:15	28	26			54
07:30	54	39			93	19:30	26	21			47
07:45	77	221	37	116	114	19:45	25	106	10	81	35 187
08:00	79	30			109	20:00	15	19			34
08:15	58	23			81	20:15	10	19			29
08:30	26	19			45	20:30	19	18			37
08:45	20	183	18	90	38	20:45	13	57	17	73	30 130
09:00	33	15			48	21:00	16	17			33
09:15	24	10			34	21:15	9	11			20
09:30	21	12			33	21:30	11	20			31
09:45	24	102	11	48	35	21:45	6	42	14	62	20 104
10:00	25	13			38	22:00	5	9			14
10:15	26	11			37	22:15	13	12			25
10:30	22	12			34	22:30	8	7			15
10:45	19	92	12	48	31	22:45	2	28	3	31	5 59
11:00	25	12			37	23:00	7	5			12
11:15	18	13			31	23:15	5	3			8
11:30	23	13			36	23:30	3	1			4
11:45	24	90	18	56	42	23:45	1	16	2	11	3 27
TOTALS	937	425			1362	TOTALS	1129	1045			2174
SPLIT %	68.8%	31.2%			38.5%	SPLIT %	51.9%	48.1%			61.5%

DAILY TOTALS				NB 2,066	SB 1,470	EB 0	WB 0			Total 3,536
AM Peak Hour	07:30	07:15		07:30	PM Peak Hour	14:30	14:15			14:30
AM Pk Volume	268	135		397	PM Pk Volume	193	163			351
Pk Hr Factor	0.848	0.865		0.871	Pk Hr Factor	0.720	0.703			0.820

7 - 9 Volume	404	206	0	0	610	4 - 6 Volume	258	249	0	0	507
7 - 9 Peak Hour	07:30	07:15			07:30	4 - 6 Peak Hour	16:00	16:45			16:30
7 - 9 Pk Volume	268	135	0	0	397	4 - 6 Pk Volume	136	139	0	0	268
Pk Hr Factor	0.848	0.865	0.000	0.000	0.871	Pk Hr Factor	0.791	0.848	0.000	0.000	0.918



## Appendix B Signal Timing Sheets

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# SECTION: 25 ST / 27 ST @ IRIS AV

223 Program

Group Assignment:  
Field Master Assignment: None

N/S Street Name: 25 / 27 St  
E/W Street Name: Iris Av

Last Change: Drawing Number: 28926-1-D  
Timing Sheet By: REJ System Ref. Number:  
Approved By: DWD Timing implemented on: Sep 09 2000

A  
N

	Iris Av	25 St	27 St		Iris Av				
Row	Column # -->	Phase # -->	2	3	4	5	6	7	8
0	Ped Walk			7	7		7		
1	Ped FDW			11	17		11		
2	Min Green		7	4	4		7		
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn		2.6	2.0	2.0		2.6		
6	Max Gap		2.6	2.0	2.0		2.6		
7	Min Gap		0.2	2.0	2.0		0.2		
8	Max Limit		50	30	50		50		
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1				0.1		
D	Every		1.2				1.2		
E	Yellow		3.6	3.0	3.0		3.6		
F	Red Clear		1.0	1.0	1.0		1.0		

Phase Timing - Bank 1

F + Phase + Row

<F Page>

Preempt Timing

F + E + Row

Phase Functions

<F Page>

F + F + Row

Max Initial	
Red Revert	5.0
All Red Start	0.0
<b>Start / Revert Times</b>	
Drop Number	
Zone Number	
Area Number	
Area Address	
QuicNet Channel	

F + 0 + E

F + 0 + F

F + C + O

Row		0	0	0	0
		Green	Yellow	Red	Load-Switch #
A	Overlap A	2.0	3.6	1.0	7
B	Overlap B	2.0	3.6	1.0	8
C	Overlap C				
D	Overlap D				

Overlap Timing

<F Page>

<D Page>

F + COLOR +

D + 0 + OVERLAP

Communication Addresses	
C + F + O	
Free Lag	

F	Row
2 4 6	0

Lag Phases <C Page>

Downtime Flash 240 (minutes)

Downtime Before Auto Manual Flash

F + 0 + 8

Disable Ports 234

Disable Communications Ports

D + D + 9

E	
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

F	
Permit	234_6
Red Lock	
Yellow Lock	
Min Recall	
Ped Recall	
Peds (View)	
Rest In Walk	
Red Rest	
Dbl Entry	2_6
Max Recall	
Soft Recall	2_6
Max 2	
Cond Serv	
Ped Lock	
Yellow Start	2_6
1st Phases	4

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

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

INTERSECTION: 25 ST / 27 ST @ IRIS AV

223 Program

Row	Column F			
	Time	Function	Day of Week	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
6	Ped 6P
7	Ped 4P
8	Ped 8P
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

Row	E	
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2
B	EV-B Phases	4
C	EV-C Phases	6
D	EV-D Phases	3
E	Extra 1 Config. Bits	1_345
F	IC Select (Interconnect)	2

Configuration

For s, set F + 9 + E = 1

E + E + ROW

Extra 1 Flags  
 1 = TBC Type 1  
 2 = NEMA Ext. Coord  
 3 = Auto Daylight Savings  
 4 = EV Advance  
 5 = Remote Download  
 6 = Special Event  
 7 = Pretimed Operation  
 8 = Split Ring Operation

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

Day of Week  
 1 = Sunday  
 2 = Monday  
 3 = Tuesday  
 4 = Wednesday  
 5 = Thursday  
 6 = Friday  
 7 = Saturday

Assign 5 Outputs  
 1 = Right Turn Overlap  
 2 = TOD Outputs  
 3 = EV Beacon - Steady  
 4 = EV Beacon - Flashing  
 5 = Special Event Outputs  
 6 = Phase 3 & 7 Ped  
 7 = Advanced Warning Sign  
 8 =

Time and Date  
 8-0 Hour, Minute, Day-of-Week  
 8-1 Day-of-Month, Year, Month  
 8-F Seconds

Disable Parity  0 D+B+0

Dial-Up Telephone Communications

(If set to a non-zero value, parity will be disabled)

(This parameter is NOT downloaded)

Program Information  
 C + C + 0 = program  
 C + C + F = version

Remote Download

C + 0 + 4 = 1 - 255

w/ E + E + E bit 5 on

	1	3
Row	Delay	Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D	12.0	
E		---
F	---	---

	2	4
Row	Delay	Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Delay &amp; Carryover &lt;D Page&gt;

D + X (across) + ROW

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	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 &lt;D Page&gt;

Row	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 &lt;D Page&gt;

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

## Detector Failure Monitor

Phase Number	0	F+C+1
Time Before Yellow	0.0	F+C+3

## Advance Warning Beacon - Sign 1

Phase Number	0	F+D+1
Time Before Yellow	0.0	F+D+3

## Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

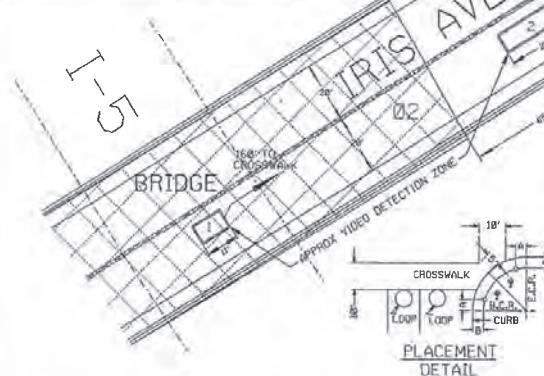
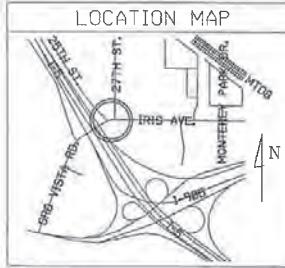
## Power Cycle Correction (Default = 0.5)

(These parameters are NOT downloaded.)

## CONSTRUCTION NOTES

- PULL BOXES ARE NO. 6 AND CONDUIT IS 2" UNLESS NOTED OTHERWISE.
- ALL CONDUIT DEPTH MUST BE A MINIMUM OF 18" BELOW THE GROUND SURFACE OR 3' BELOW THE BOTTOM OF PAVEMENT, WHICHEVER IS GREATER.
  - LOCATIONS OF ALL UNDERGROUND UTILITIES ARE APPROXIMATE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS AND VERIFY ALL CONDITIONS ON SITE.
  - THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO TRAFFIC ENGINEER (5) FIVE DAYS PRIOR TO START OF WORK.
  - ALL TRAFFIC SIGNAL POLE FOUNDATIONS SHALL HAVE A 3" CONDUIT INSTALLED TO THE ADJACENT PULL BOX AND THE CONDUIT SHALL BE TIED TO THE ADJACENT PULL BOX FOR FUTURE USE.
  - THE CONTRACTOR IS RESPONSIBLE FOR THE LAYOUT AND INSTALLATION OF LOOP DETECTORS, TRAFFIC STRIPPING, PAINTED ARROWS, PARKING REMOVAL AND TRAFFIC SIGNING EXCEPT "D" SERIES STREET NAME SIGNS AS SHOWN ON THESE PLANS. REMOVE STOP SIGN WHEN DIRECTED BY TRAFFIC ENGINEER.
  - THE CONTRACTOR SHALL OBTAIN THE APPROVAL OF THE TRAFFIC ENGINEERING DIVISION ON LOOP LOCATIONS PRIOR TO CONCRETE POUR. PAINT MARKINGS AND SIGN LOCATIONS PRIOR TO PAINTING AND INSTALLATION.
  - THE CONTRACTOR SHALL NOT INSTALL ANY PARKING REMOVAL, A MINIMUM OF 15 WORKING DAYS AFTER LOCATION APPROVAL, SO THAT VARIOUS PARKING REMOVAL AND PAINTING WORKERS CAN BE MADE BY THE TRAFFIC ENGINEERING DIVISION.
  - THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL OF ALL UNNECESSARY STRIPING AND PAVEMENT MARKING BY SCHEDULED ASTHENES.
  - CONTRACTOR SHALL NOT ERECT ANY SIGNAL STANDARDS MORE THAN THREE (3) WEEKS PRIOR TO SCHEDULED TRAFFIC SIGNAL TURN ON.

- INSTALL TYPE III SIGNAL AND LIGHTING SERVICE PER STATE STANDARD PLAN ES-20. PROVIDE 50A-1P CIRCUIT BREAKER FOR USE SPECIAL PROVISIONS.
- 2' C.O. PER SIDE REQUIREMENTS. 16' FROM EX. PB'S
- CONSTRUCT FOUNDATION PER STATE STANDARD PLAN ES-4B.
- INSTALL CITY FURNISHED EMERGENCY VEHICLE PRE-EMPTION EQUIPMENT (SEE SPECIAL PROVISIONS). MOUNTING HARDWARE AND CABLES SHALL BE FURNISHED BY THE CONTRACTOR.
- REMOVE EXISTING "T" STOP SIGN WHEN DIRECTED BY THE CITY TRAFFIC ENGINEER.
- REMOVE "STOP" LEGEND AND CONFLICTING STRIPING BY SANDBLASTING.
- PAINT RED CURB FROM DRIVEWAY TO EX. RED CURB AT CORNER.
- INSTALL R-34 SIGN ON MAST ARM.
- INSTALL PEDESTRIAN RAMP.
- INSTALL PEDESTRIAN BARRIER AS PER CITY OF SAN DIEGO STANDARD DRAWING SD-143, MODIFIED. (SEE SPECIAL PROVISIONS).
- PLACE 12" CROSSWALK STRIPE.
- PAINT DOUBLE YELLOW STRIPE PER CAL TRANS DETAIL 22.
- APPROX 142 FEET TOTAL THIS PAGE.
- PAINT ARROWS PER CALTRANS STD. PLAN 424A.
- PAINT 8" SOLID WHITE STRIPE PER CALTRANS STD. PLAN.
- APPROX 68 FEET TOTAL THIS PAGE.
- INSTALL VIDEO DETECTOR ON LUMINAIRE MAST ARM.

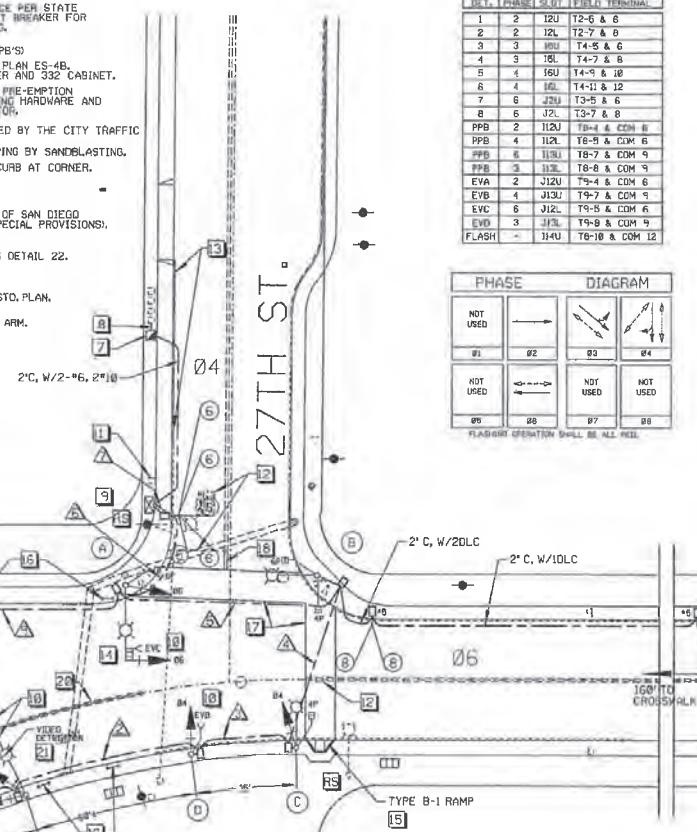


POLE SCHEDULE									
No.	STANDARD	LUMINAIRE	PLACEMENT	SIGNAL MOUNTING			PEDESTRIAN	PB	REMARKS
				A	B	C			
(A)	19-2-70	30	25	15	250W	10	3 MAS	•V-1-T SP-1-T → 6	EVC
(B)	TYPE 15	30	-	15	250W	15	6 -	SP-2-T → 4,6 → -	-
(C)	TYPE 15	30	-	15	250W	-	3 -	SV-1-T SP-1-T → 4 → -	-
(D)	TYPE 1-A	10	-	-	-	3 -	IV-1-T -	-	EVB
(E)	19-4-70	30	25	15	250W	-	3 MAS	SV-2-TB -	EVA, EVD, VIDEO HEAD, [2]
(F)	19-2-70	17	25	-	-	3 MAS	•V-1-T SP-1-T → 3	• 4-12IR,Y,G,GA	-
(G)	TYPE 15	30	-	15	250W	3 -	-	SP-2-T → 3,4 → -	-
(H)	TYPE 15	30	-	15	250W	3 -	-	SP-1-T → 4 → -	-

ALL VEHICLE SIGNAL HEADS SHALL BE 12" WITH BACKPLATES AND GLASS LENSES.  
ANCHOR BOLT NUT COVERS SHALL BE PROVIDED.

DETECTOR ASSIGNMENT	
DET.	PHASE/SLOT FIELD TERMINAL
1	2 IZU 12-2 & 6
2	2 IZL 12-7 & 8
3	3 IZU T4-5 & 6
4	3 IZL T4-7 & 8
5	4 IZU T4-5 & 10
6	4 IZL T4-1 & 12
7	6 JZU T3-5 & 6
8	6 JZL T3-7 & 8
PPB	2 IIZU TB-4 & COM 8
PPB	2 IIZL TB-9 & COM 6
PPB	6 IIZU TB-7 & COM 9
PPB	6 IIZL TB-8 & COM 4
EVA	2 JIZU T9-4 & COM 6
EVB	4 JIZU T9-7 & COM 5
EVC	6 JIZL T9-5 & COM 6
EVD	3 JIZL T9-8 & COM 9
EVD	3 IIZU TB-10 & COM 12

PHASE		DIAGRAM	
NOT USED	→	→	↓
①	②	③	④
NOT USED	↔	NOT USED	NOT USED
⑤	⑥	⑦	⑧
FLASH	OPERATOR SHALL BE ALL FREE		



## WORK TO BE DONE

THE IMPROVEMENTS CONSIST OF THE FOLLOWING WORK TO BE DONE ACCORDING TO THESE PLANS AND THE SPECIFICATIONS AND STANDARD DRAWINGS OF THE CITY OF SAN DIEGO.

## STANDARD SPECIFICATIONS

STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION 0594 EDITION, INCLUDING THE REGIONAL AND CITY OF SAN DIEGO STANDARD SPECIAL PROVISIONS DOCUMENT NO. 76933J, FILED MAY 2, 1997.

CALIFORNIA DEPARTMENT OF TRANSPORTATION, MANUAL OF TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE WORK ZONES, 1990 EDITION, DOCUMENT NO. 76974J, FILED NOV. 7, 1990.

CITY OF SAN DIEGO, STANDARD SPECIAL PROVISIONS FOR STREET LIGHTING AND TRAFFIC SIGNAL SYSTEMS, DOCUMENT NO. 76981J, FILED OCT 21, 1993.

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS (JULY 1992), DOCUMENT NO. 76980J, FILED JULY 9, 1992.

## STANDARD DRAWINGS

CITY OF SAN DIEGO STANDARD DRAWINGS, DOCUMENT NO. 76933J, FILED MAY 2, 1997.

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION STANDARD PLANS (JULY 1992), DOCUMENT NO. 76980J, FILED JULY 9, 1992.

CONDUCTOR TABLE			
AWG SIZE OR CABLE TYPE	PHASE	POLE OR CIRCUIT	CONDUIT SIZE & RUN
3	1	POLE - A	3"
3	2	POLE - B	3"
3	3	POLE - C	3"
3	4	POLE - D	3"
3	5	POLE - E	3"
3	6	POLE - F	3"
3	7	POLE - G	3"
3	8	POLE - H	3"
12	1	POLE - A	2-3"
12	2	POLE - B	2-3"
12	3	POLE - C	2-3"
12	4	POLE - D	2-3"
12	5	POLE - E	2-3"
12	6	POLE - F	2-3"
12	7	POLE - G	2-3"
12	8	POLE - H	2-3"
TOTAL CABLES 3 CONDUCTORS/12 CONDUCTORS			2-3" 2-3" 2-3" 2-3" 2-3" 2-3" 2-3" 2-3"
NO. 6	SIGNAL SERVICE	2	2 2 2 2 2 2 2 2
10	LIGHTING	2	2 2 2 2 2 2 2 2
6 PAIR NO. 22	REED INTERCONNECT CABLE	2	1 1 1 1 1 1 1 1
	2 LOOP DETECTOR	3	*
	4	*	*
	6	*	*
	DLC	2	2 2 2 2 2 2 2 2
	EMERGENCY VEHICLE DETECTOR (EV-DLC)	2	3 3 3 3 4 4

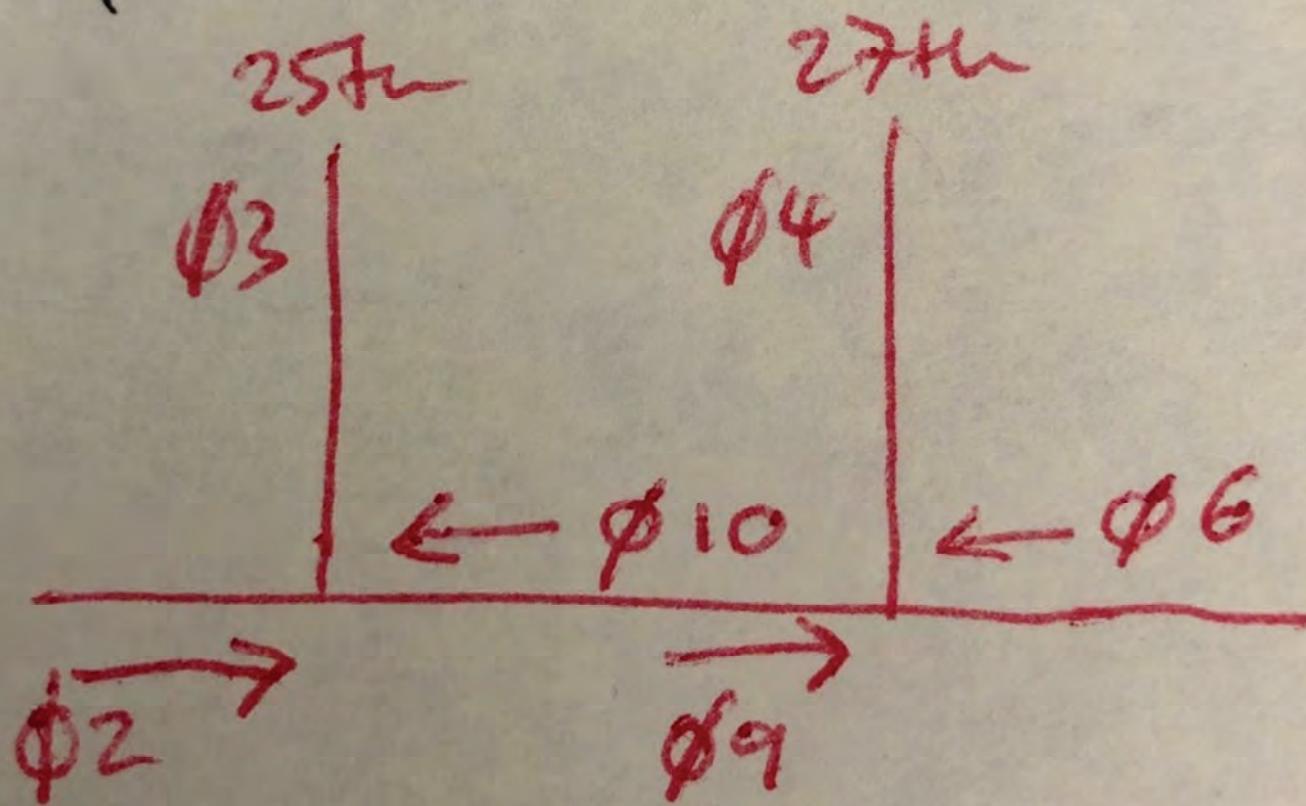
SPECIFICATION NO. 6948  
CITY CONTRACT, CIP NO. 68-010.

PLANS FOR THE CONSTRUCTION	
TRAFFIC SIGNAL 25TH ST. / 27TH ST. AND IRIS AVE.	
 CITY OF SAN DIEGO, CALIFORNIA ENGINEERING DEPARTMENT SHEET 1 OF 1 SHEET DATE 11/10/98 SECTION NO. 68010 DEPARTMENT OF GENERAL SERVICES DIVISION OF CONSTRUCTION 147-17 LAMBERT LOGOS 28926	
CONTRACTOR MUST NOTIFY THE BELOW LISTED AGENCY AT LEAST TWO (2) WORKING DAYS PRIOR TO COMMENCEMENT OF EXCAVATION:	
UNDERGROUND SERVICE ALERT USA 1-800-422-4193	

$\phi 9$

Drawing i/s

$\phi 10$



INTERSECTION: 27TH ST @ CORONADO AVE (SB)

NPA 1/15/19

3 Program

Group Assignment:  
Field Master Assignment:

N/S Street Name: 27TH ST  
E/W Street Name: CORONADO AVE (SB)

Last Database Change:  
System Ref. Number:

	CORONADO AV		27TH ST		CORONADO AV		27TH ST	
	Phase							
	1	2	3	4	5	6	7	8
Row		PPLT			PPLT			
C	Ped Walk		7		7		7	7
1	Ped FDW		11		17		11	17
2	Min Green	6 4	14 10		8 4	6 4 14 10		15 4
3	Type 3 Limit							
4	Add/Veh	4						
5	Veh-Extn	2.0	3.0		2.0	2.0	3.0	2.0
6	Max Gap	2.0	3.0		2.0	2.0	3.0	2.0
7	Min Gap	2.0	0.2		2.0	2.0	0.2	2.0
8	Max Limit	30	50	15 40	6 30	50	4 38 40	
9	Max Limit 2						15	
A	Bus Adv							
B	Call to Phs	4			8			
C	Reduce By	0.1				0.1		
D	Every	1.1				1.1		
E	Yellow	3.4	3.9		3.9	3.4	4.0	3.4
F	Red Clear	1.0	1.0		1.0	1.0	1.0	1.0

Phase Timing - Bank 1

F + Phase + Row

<F Page>

Preempt Timing

F + E + Row

Phase Functions <F Page>

F + F + Row

Max Initial	0
Red Revert	5.0
All Red Start	0.0

Start / Revert Times

Drop Number	6
Zone Number	3
Area Number	7
Area Address	11
QuicNet Channel	COM67

Communication Addresses

C + F + O	F	Row
Free Lag	2 4 6 8	0

Lag Phases <C Page>

Overlap A	Row	9	C	D	0
		Green Clear	Yellow Change	Red Clear	Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page>

F + COLOR +

<D Page>

D + 0 + OVERLAP

Downtime Flash 255 (minutes)  
Downtime Before Auto Manual Flash

F + 0 + 8

Disable Ports 234  
Disable Communication Ports

D + D + 9

	E	F	Row
RR-1 Delay			0
RR-1 Clear			1
EV-A Delay	0		2
EV-A Clear	0		3
EV-B Delay			4
EV-B Clear	0		5
EV-C Delay	0		6
EV-C Clear			7
EV-D Delay			8
EV-D Clear			9
RR-2 Delay			A
RR-2 Clear			B
View EV Delay	---		C
View EV Clear	---		D
View RR Delay	---		E
View RR Clear	---		F

Timing Sheet By: KT  
Approved By: FLG  
Drawing Number: 29374-6  
Timing Implemented On:

**INTERSECTION: 27TH ST @ CORONADO AVE (SB)**

**223 Program**

Row	Column F			
	Time	Function	Day of Week	Phases/Bits
0	07:30	9	23456	4 8
1	08:45	9	22456	
2	15:00	9	23456	4 8
3	15:25	9	23456	
4	:			
5	:			
6	:			
7	:			
8	:			
9	:			
A	:			
B	:			
C	:			
D	:			
E	:			
F	:			

**TOD Function**

7 + ROW

<D.Page>

D + F + ROW

**T.O.D. Functions**  
 0 = Permitted Phases  
 1 = Red Lock  
 2 = Yellow Lock  
 3 = Veh Min Recall  
 4 = Ped Recall  
 5 =  
 6 = Rest In Walk  
 7 = Red Rest  
 8 = Double Entry  
 9 = Veh Max Recall  
 A = Veh Soft Recall  
 B = Maximum 2  
 C = Conditional Service  
 D = Free Lag Phases  
 E = Bit 1 - Local Override  
 Bit 2 - Phase Bank 2  
 Bit 3 - Phase Bank 3  
 Bit 4 - Disable Detector  
 OFF Monitor  
 Bit 7 - Detector Count Monitor  
 Bit 8 - Real Time Split Monitor  
 F = Output Bits 1 thru 4

Row	F
0	
1	RR Overlap A - Phases
2	RR Overlap B - Phases
3	RR Overlap C - Phases
4	RR Overlap D - Phases
5	Ped 2P
6	Ped 6P
7	Ped 4P
8	Ped 8P
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

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
B	EV-B Phases
C	EV-C Phases
D	EV-D Phases
E	Extra 1 Config. Bits
F	IC Select (Interconnect)

**Configuration**

For access, set F + 9 + E = 1

E + E + ROW

**Extra 1 Flags**  
 1 = TBC Type 1  
 2 = NEMA Ext. Coord  
 3 = Auto Daylight Savings  
 4 = EV Advance  
 5 = Remote Download  
 6 = Special Event  
 7 = Pretimed Operation  
 8 = Split Ring Operation

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

**Day of Week**

1 = Sunday  
 2 = Monday  
 3 = Tuesday  
 4 = Wednesday  
 5 = Thursday  
 6 = Friday  
 7 = Saturday

**Assign 5 Outputs**  
 1 = Right Turn Overlap  
 2 = TOD Outputs  
 3 = EV Beacon - Steady  
 4 = EV Beacon - Flashing  
 5 = Special Event Outputs  
 6 = Phase 3 & 7 Ped  
 7 = Advanced Warning Sign  
 8 =

**Time and Date**

8-0 Hour, Minute, Day-of-Week  
 8-1 Day-of-Month, Year, Month  
 8-F Seconds

Disable Parity  0 D+510

Dial-Up Telephone Communications  
 (If set to a non-zero value, parity will be disabled)

**Program Information**      **Remote Download**

C + C + 0 = program  
 C + C + F = version  
 w/ E + E + E bit 5 on

INTERSECTION: 27TH ST @ CORONADO AVE (SB)

223 Program

Row	1	3
Delay	Carry-over	
0		
1		1.8
2		
3		
4		
5		
6		
7		
8		10.0
9		
A		
B		
C		
D		
E		
F		

Row	2	4
Delay	Carry-over	
0		
1		1.8
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Delay & Carryover <D Page>

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
A
B
C
D
E
F

Detector Numbers	E
1 2 3 4 5 6 7 8	12345678
9 10 11 12 - - -	1234
13 14 15 16 17 18 19 20	12345678
- - - 21 22 23 24	5678
- - - - - - -	1234
- - 25 26 27 28 - -	2345

Active Detectors <D Page>

Row
0
1
2
3
4
5
6
7
8

0	Detector #
System Det. # 1	
System Det. # 2	
System Det. # 3	
System Det. # 4	
System Det. # 5	
System Det. # 6	
System Det. # 7	
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)

**INTERSECTION: 27TH ST @ CORONADO AVE (SB)**

**223 Program**

Row	Column # → Plan Name →	Plan								
		1	2	3	4	5	6	7	8	9
0	Cycle Length				108	98	108			
1	Phase 1 - ForceOff				53	48	49			
2	Phase 2 - ForceOff				0	0	0			
3	Phase 3 - ForceOff									
4	Phase 4 - ForceOff				38	32	35			
5	Phase 5 - ForceOff									
6	Phase 6 - ForceOff				53	48	49			
7	Phase 7 - ForceOff				0	0	0			
8	Phase 8 - ForceOff									
9	Ring Offset				38	32	35			
A	Offset A				16	66	12			
B	Offset B									
C	Offset C									
D	Permissive				10	10	10			
E	Hold Release				255	255	255			
F	Ped Shift				0	0	0			

Coordination

<C Page>

C + Plan + ROW

Row	Time	Plan	Offset	Day of Week
0	14 : 00	6	A	23456
1	18 : 00	E	A	1234567
2	22 : 00	F	A	6
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination

<9 Key with C+0+9=1>

Plan Select

1 thru 9 = Coordination

Plan 1 thru 9

14 or E = Free

15 or F = Flash

E	Row	F
	0	Free Lag
Plan 1	1	Plan 1 - Lag
Plan 2	2	Plan 2 - Lag
Plan 3	3	Plan 3 - Lag
Plan 4	4	Plan 4 - Lag
Plan 5	5	Plan 5 - Lag
Plan 6	6	Plan 6 - Lag
Plan 7	7	Plan 7 - Lag
Plan 8	8	Plan 8 - Lag
Plan 9	9	Plan 9 - Lag
Coord Ped*	A	Coord Max *
NEMA Hold	B	Coord Lag *
	C	
	D	
	E	
	F	

Sync Phases

C + E + FUNCTION #

Lag Phases <C Page>

C + F + FUNCTION #

Transition Type	0
TBC Transition	C + D + D

Transition Type

0 = Shortway

Non-zero = Lengthen



# Appendix C Otay Mesa-Nestor Community Plan

## (Appendix 6) Transportation Facilities and

## (Appendix A) Transit Oriented Development

---

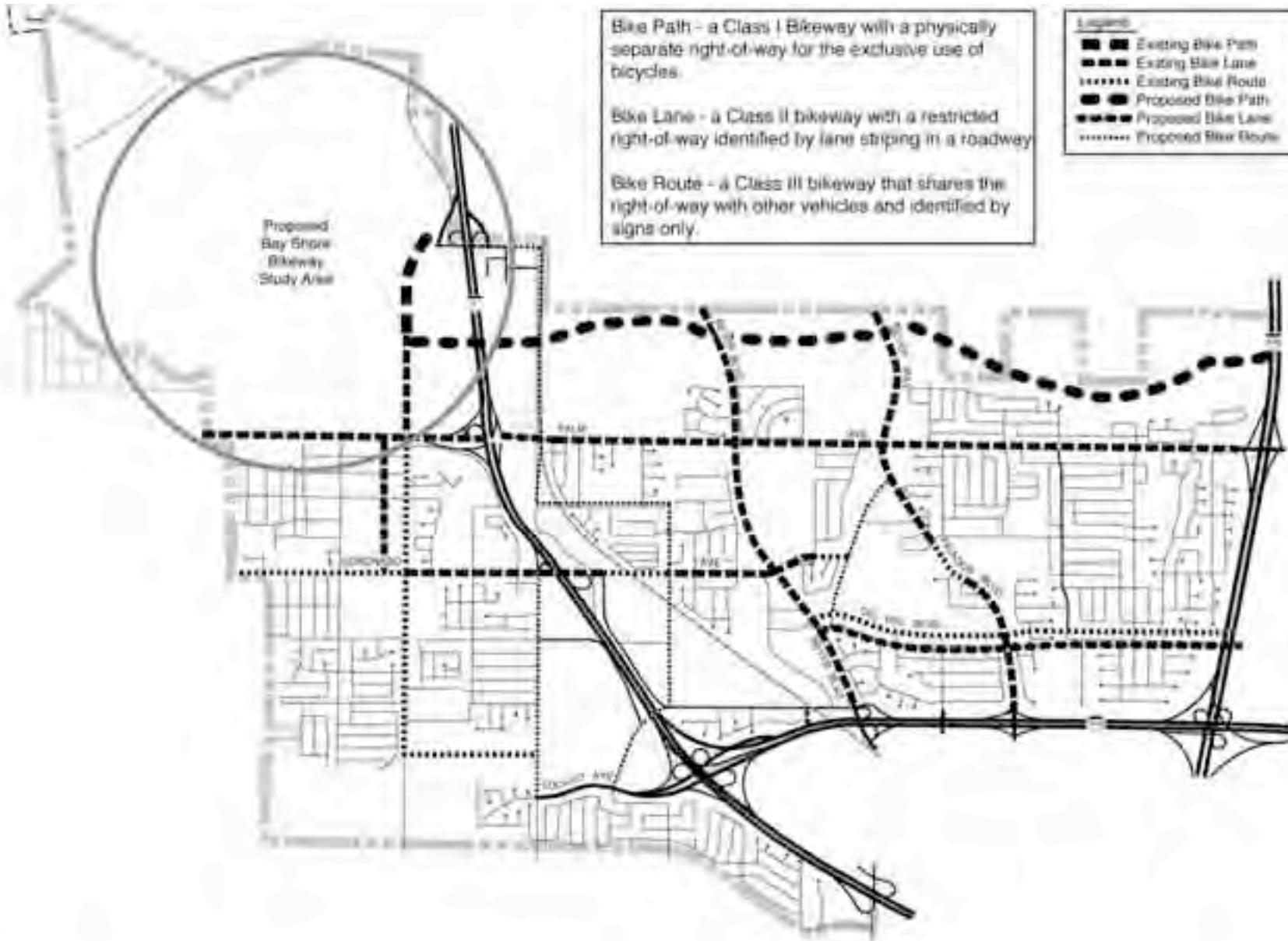
## APPENDIX 6 TRANSPORTATION FACILITIES



Street Classification with Future Traffic Volumes  
Otay Mesa-Nestor Community Plan



Intersection Level of Service  
Otay Mesa-Nestor Community Plan





## APPENDIX A TRANSIT-ORIENTED DEVELOPMENT

---

### DEFINITION

For the purposes of this community plan, a Transit-Oriented Development (TOD) is a compact pattern of development which includes commercial, residential and civic land uses, is located adjacent to the public transit system, reinforces transit use, and is pedestrian oriented.

### PERMITTED/RECOMMENDED USES

The Mixed-Use designated areas of Otay Mesa-Nestor shall be developed as TODs. A wide range of uses are permitted in these areas. Land uses which are encouraged include the following:

- Medium-Density Residential development (maximum 29 du/ac). Residential development shall only be permitted as an element of a commercial project. Senior housing opportunities are encouraged.
- Typical land uses that serve transit commuters and pedestrians are recommended within these areas, and include: day care center, news stand, record and video sales/rental, bakery and donut shops, butcher, produce, florist, shoe repair, dry cleaning, drug store, convenience/sundries, photocopying/printing, a post office or mailing service, and banks or automated teller machines (ATMs).
- Additional permitted uses that will add variety and vitality to the TODs include: Restaurants, drinking establishments, coffee houses, sidewalk cafes, artists studios and galleries, public buildings and parks.

### DESIGN STANDARDS AND CRITERIA

Proposed developments shall comply with the City of San Diego's Transit-Oriented Development Design Guidelines (Approved by the City Council on August 4, 1992). The following criteria is presented to provide the reader with a basic understanding of design intent and philosophy within a TOD:

- Minimize building setbacks, bringing buildings close to sidewalks and streets; locate parking to the rear of lots. Front and street side yard setbacks shall be a minimum of zero (0) feet and a maximum of ten (10) feet.
- Articulate building facades, particularly shop fronts, through the use of arcades, porches, bays, balconies, and display windows, which provide variety, add architectural interest, and create a pedestrian-friendly environment. Promote outdoor display and dining areas.



- Orient primary building entrances to the pedestrian-oriented street, as opposed to parking lots.
- Develop a coordinated streetscape which sets the character of the TOD and ties the varied uses together. The streetscape shall include public and private theme street trees, street furniture, and areas of enhanced paving.
- Provide bus shelters at established bus stops.
- Encourage bicycling; provide bicycle racks in areas that are visible and easily accessible from identified bicycle routes.
- Provide public plazas or courtyards along pedestrian-oriented streets.
- Incorporate public art throughout TODs, and particularly in public and public-oriented spaces.
- Utilize parking structures instead of surface parking for larger developments. Locate useable building spaces on the street level and street facades of parking structures.

## **PLANNED DEVELOPMENT PERMITS AND REZONES**

A Planned Commercial Development Permit (PCD) shall be required for all sites developed within the Mixed-Use designated areas. All sites proposed for development within these areas shall be rezoned to a zone that implements the TOD intent, permitted uses, and design standards and criteria described in this Appendix. The rezones shall be conditioned upon approval of a PCD.



## Appendix D Vision Zero: High Crash Analysis & Improvements (since 2015) Map

---

# Vision Zero: High Crash Analysis & Improvements (since 2015)

Analysis

Improvements



Find address or place



South San  
Diego



Coronado Ave

Nestor

Coronado Ave

Hollister St

Southwest Park

Tocayo Ave

905

5

0.3mi

-117.072 32.587 Degrees



## Appendix E Existing Intersection LOS Worksheets

---

## Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	552	195	56	701	54	0	0	83	0	0	21
Future Vol, veh/h	0	552	195	56	701	54	0	0	83	0	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	400	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	600	212	61	762	59	0	0	90	0	0	23

Major/Minor	Major1	Major2		Minor1		Minor2	
Conflicting Flow All	-	0	0	812	0	0	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	810	-	0	594
Stage 1	0	-	-	-	-	0	0
Stage 2	0	-	-	-	-	0	0
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	810	-	-	594
Mov Cap-2 Maneuver	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-

Approach	EB	WB		NB	SB		
HCM Control Delay, s	0	0.7		12.1	11.3		
HCM LOS		B		B	B		
<hr/>							
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	594	-	-	810	-	-	590
HCM Lane V/C Ratio	0.152	-	-	0.075	-	-	0.039
HCM Control Delay (s)	12.1	-	-	9.8	-	-	11.3
HCM Lane LOS	B	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-	-	0.1

## HCM 6th Signalized Intersection Summary

2: 27th Street &amp; Coronado Ave

11/07/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑↑			↔			↔	
Traffic Volume (veh/h)	117	421	58	69	439	33	145	41	141	22	34	82
Future Volume (veh/h)	117	421	58	69	439	33	145	41	141	22	34	82
Initial Q (Q <sub>b</sub> ), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945
Adj Flow Rate, veh/h	127	458	63	75	477	36	158	45	153	24	37	89
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	463	581	493	366	1041	78	313	107	254	128	200	383
Arrive On Green	0.09	0.30	0.30	0.09	0.30	0.30	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	1853	1945	1648	1853	3484	262	608	281	670	164	527	1007
Grp Volume(v), veh/h	127	458	63	75	252	261	356	0	0	150	0	0
Grp Sat Flow(s), veh/h/ln	1853	1945	1648	1853	1848	1898	1558	0	0	1698	0	0
Q Serve(g_s), s	2.8	13.6	1.8	1.6	7.0	7.1	7.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.8	13.6	1.8	1.6	7.0	7.1	11.1	0.0	0.0	3.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.14	0.44		0.43	0.16		0.59
Lane Grp Cap(c), veh/h	463	581	493	366	552	567	674	0	0	711	0	0
V/C Ratio(X)	0.27	0.79	0.13	0.20	0.46	0.46	0.53	0.00	0.00	0.21	0.00	0.00
Avail Cap(c_a), veh/h	463	1262	1070	1070	1199	1232	674	0	0	711	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.9	20.3	16.1	13.7	18.0	18.0	15.4	0.0	0.0	13.3	0.0	0.0
Incr Delay (d2), s/veh	0.1	2.4	0.1	0.1	0.6	0.6	2.9	0.0	0.0	0.7	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.1	6.0	0.6	0.6	2.8	2.9	4.2	0.0	0.0	1.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	13.0	22.7	16.3	13.8	18.6	18.6	18.3	0.0	0.0	14.0	0.0	0.0
LnGrp LOS	B	C	B	B	B	B	B	A	A	B	A	A
Approach Vol, veh/h		648			588			356			150	
Approach Delay, s/veh		20.2			18.0			18.3			14.0	
Approach LOS		C			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.4	23.9		28.9	10.4	23.9		28.9				
Change Period (Y+Rc), s	4.4	* 5		4.9	4.4	5.0		* 4.9				
Max Green Setting (Gmax), s	30.0	* 41		24.0	6.0	41.0		* 24				
Max Q Clear Time (g_c+l1), s	3.6	15.6		5.7	4.8	9.1		13.1				
Green Ext Time (p_c), s	0.1	3.2		0.5	0.0	3.3		1.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			18.5									
HCM 6th LOS			B									

## Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Int Delay, s/veh 6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑			↑
Traffic Vol, veh/h	95	34	56	4	30	182
Future Vol, veh/h	95	34	56	4	30	182
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	53	53	75	75	67	67
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	179	64	75	5	45	272

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	440	78	0	0	80
Stage 1	78	-	-	-	-
Stage 2	362	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	574	983	-	-	1518
Stage 1	945	-	-	-	-
Stage 2	704	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	554	983	-	-	1518
Mov Cap-2 Maneuver	554	-	-	-	-
Stage 1	945	-	-	-	-
Stage 2	679	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.4	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	626	1518	-
HCM Lane V/C Ratio	-	-	0.389	0.029	-
HCM Control Delay (s)	-	-	14.4	7.4	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	1.8	0.1	-

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	31	107	259	127	17
Future Vol, veh/h	10	31	107	259	127	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	76	76	74	74
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	36	141	341	172	23
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	807	184	195	0	-	0
Stage 1	184	-	-	-	-	-
Stage 2	623	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	351	858	1378	-	-	-
Stage 1	848	-	-	-	-	-
Stage 2	535	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	307	858	1378	-	-	-
Mov Cap-2 Maneuver	307	-	-	-	-	-
Stage 1	741	-	-	-	-	-
Stage 2	535	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.6	2.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1378	-	597	-	-	
HCM Lane V/C Ratio	0.102	-	0.081	-	-	
HCM Control Delay (s)	7.9	0	11.6	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.3	-	0.3	-	-	

# HCM Signalized Intersection Capacity Analysis

5: Iris Avenue & 25th Street

11/26/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗
Traffic Volume (vph)	33	361	318	33	150	125
Future Volume (vph)	33	361	318	33	150	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	2006	2111	2111	1794	2006	1794
Flt Permitted	0.14	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	305	2111	2111	1794	2006	1794
Peak-hour factor, PHF	0.79	0.79	0.87	0.87	0.66	0.66
Adj. Flow (vph)	42	457	366	38	227	189
RTOR Reduction (vph)	0	0	0	14	0	145
Lane Group Flow (vph)	42	457	366	24	227	44
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	10 6		3 9	
Permitted Phases	2			10 6		3
Actuated Green, G (s)	27.7	27.7	46.9	46.9	17.2	17.2
Effective Green, g (s)	27.7	27.7	46.9	46.9	17.2	17.2
Actuated g/C Ratio	0.37	0.37	0.63	0.63	0.23	0.23
Clearance Time (s)	4.9	4.9			4.9	
Vehicle Extension (s)	2.6	2.6			2.0	
Lane Grp Cap (vph)	114	791	1339	1138	466	417
v/s Ratio Prot		c0.22	c0.17		c0.11	
v/s Ratio Perm	0.14			0.01		0.02
v/c Ratio	0.37	0.58	0.27	0.02	0.49	0.11
Uniform Delay, d1	16.8	18.4	6.0	5.0	24.5	22.3
Progression Factor	1.00	1.00	0.13	0.00	1.00	1.00
Incremental Delay, d2	1.6	0.9	0.1	0.0	0.3	0.0
Delay (s)	18.3	19.3	0.9	0.0	24.8	22.3
Level of Service	B	B	A	A	C	C
Approach Delay (s)		19.2	0.8		23.7	
Approach LOS		B	A		C	
Intersection Summary						
HCM 2000 Control Delay			15.0	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.49			
Actuated Cycle Length (s)			73.9	Sum of lost time (s)		14.7
Intersection Capacity Utilization			43.1%	ICU Level of Service		A
Analysis Period (min)			15			

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

6: Iris Avenue & 27th Street

11/26/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	232	279	269	153	63	82
Future Volume (vph)	232	279	269	153	63	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9	4.9		
Lane Util. Factor	1.00	1.00	1.00	1.00		
Frt	1.00	1.00	0.95	0.92		
Flt Protected	0.95	1.00	1.00	0.98		
Satd. Flow (prot)	2006	2111	2008	1909		
Flt Permitted	0.37	1.00	1.00	0.98		
Satd. Flow (perm)	777	2111	2008	1909		
Peak-hour factor, PHF	0.79	0.79	0.87	0.87	0.79	0.79
Adj. Flow (vph)	294	353	309	176	80	104
RTOR Reduction (vph)	0	0	15	0	0	0
Lane Group Flow (vph)	294	353	470	0	184	0
Turn Type	Perm	NA	NA		Prot	
Protected Phases		9 2	6		4 10	
Permitted Phases		9 2				
Actuated Green, G (s)	49.8	49.8	27.7		14.3	
Effective Green, g (s)	49.8	49.8	27.7		14.3	
Actuated g/C Ratio	0.67	0.67	0.37		0.19	
Clearance Time (s)				4.9		
Vehicle Extension (s)				2.6		
Lane Grp Cap (vph)	523	1422	752		369	
v/s Ratio Prot		0.17	c0.23		c0.10	
v/s Ratio Perm		c0.38				
v/c Ratio	0.56	0.25	0.62		0.50	
Uniform Delay, d1	6.3	4.7	18.9		26.6	
Progression Factor	0.18	0.05	1.00		1.00	
Incremental Delay, d2	1.1	0.1	1.5		0.4	
Delay (s)	2.3	0.3	20.3		27.0	
Level of Service	A	A	C		C	
Approach Delay (s)		1.2	20.3		27.0	
Approach LOS		A	C		C	
Intersection Summary						
HCM 2000 Control Delay			11.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.60			
Actuated Cycle Length (s)			73.9	Sum of lost time (s)	14.7	
Intersection Capacity Utilization			57.1%	ICU Level of Service	B	
Analysis Period (min)			15			

c = Critical Lane Group

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	742	188	79	669	46	0	0	80	0	0	23
Future Vol, veh/h	0	742	188	79	669	46	0	0	80	0	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	400	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	807	204	86	727	50	0	0	87	0	0	25
Major/Minor	Major1	Major2		Minor1		Minor2						
Conflicting Flow All	-	0	0	1011	0	0	-	-	506	-	-	389
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.14	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.22	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	681	-	-	0	0	512	0	0	610
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	681	-	-	-	-	512	-	-	610
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB	WB		NB		SB						
HCM Control Delay, s	0	1.1		13.5		11.2						
HCM LOS				B		B						
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1					
Capacity (veh/h)	512	-	-	681	-	-	610					
HCM Lane V/C Ratio	0.17	-	-	0.126	-	-	0.041					
HCM Control Delay (s)	13.5	-	-	11	-	-	11.2					
HCM Lane LOS	B	-	-	B	-	-	B					
HCM 95th %tile Q(veh)	0.6	-	-	0.4	-	-	0.1					

## HCM 6th Signalized Intersection Summary

2: 27th Street &amp; Coronado Ave

11/07/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘	↗ ↙	↑ ↗	↑ ↘	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	96	563	75	95	508	25	98	28	125	26	37	85
Future Volume (veh/h)	96	563	75	95	508	25	98	28	125	26	37	85
Initial Q (Q <sub>b</sub> ), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00		1.00	1.00		1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945
Adj Flow Rate, veh/h	104	612	82	103	552	27	107	30	136	28	40	92
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	640	1191	1009	508	2196	107	156	44	152	76	107	195
Arrive On Green	0.06	0.61	0.61	0.06	0.61	0.61	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1853	1945	1648	1853	3586	175	546	220	760	182	538	974
Grp Volume(v), veh/h	104	612	82	103	284	295	273	0	0	160	0	0
Grp Sat Flow(s), veh/h/ln	1853	1945	1648	1853	1848	1914	1526	0	0	1694	0	0
Q Serve(g_s), s	2.1	19.2	2.2	2.1	7.6	7.6	10.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.1	19.2	2.2	2.1	7.6	7.6	18.8	0.0	0.0	8.7	0.0	0.0
Prop In Lane	1.00			1.00		0.09	0.39		0.50	0.17		0.57
Lane Grp Cap(c), veh/h	640	1191	1009	508	1131	1172	351	0	0	378	0	0
V/C Ratio(X)	0.16	0.51	0.08	0.20	0.25	0.25	0.78	0.00	0.00	0.42	0.00	0.00
Avail Cap(c_a), veh/h	693	1191	1009	562	1131	1172	470	0	0	504	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.6	11.8	8.5	8.3	9.6	9.6	42.0	0.0	0.0	38.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.6	0.2	0.1	0.5	0.5	3.9	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.8	8.3	0.8	0.8	3.1	3.2	7.4	0.0	0.0	3.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	6.7	13.4	8.7	8.4	10.1	10.1	46.0	0.0	0.0	38.3	0.0	0.0
LnGrp LOS	A	B	A	A	B	B	D	A	A	D	A	A
Approach Vol, veh/h		798			682			273			160	
Approach Delay, s/veh		12.1			9.9			46.0			38.3	
Approach LOS		B			A			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+R <sub>c</sub> ), s	10.4	71.1		26.5	10.4	71.1		26.5				
Change Period (Y+R <sub>c</sub> ), s	4.4	* 5		4.9	4.4	5.0		* 4.9				
Max Green Setting (Gmax), s	9.1	* 55		30.0	9.1	54.6		* 30				
Max Q Clear Time (g_c+l1), s	4.1	21.2		10.7	4.1	9.6		20.8				
Green Ext Time (p_c), s	0.0	5.0		0.6	0.0	4.0		0.8				

## Intersection Summary

HCM 6th Ctrl Delay 18.3

HCM 6th LOS B

## Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	5.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑			↑
Traffic Vol, veh/h	64	11	54	9	50	131
Future Vol, veh/h	64	11	54	9	50	131
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	42	42	63	63	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	152	26	86	14	57	151
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	358	93	0	0	100	0
Stage 1	93	-	-	-	-	-
Stage 2	265	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	640	964	-	-	1493	-
Stage 1	931	-	-	-	-	-
Stage 2	779	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	613	964	-	-	1493	-
Mov Cap-2 Maneuver	613	-	-	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	746	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	12.7	0		2.1		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	648	1493	-	
HCM Lane V/C Ratio	-	-	0.276	0.038	-	
HCM Control Delay (s)	-	-	12.7	7.5	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	1.1	0.1	-	

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	56	73	184	136	12
Future Vol, veh/h	13	56	73	184	136	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	72	72	66	66	73	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	78	111	279	186	16
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	695	194	202	0	-	0
Stage 1	194	-	-	-	-	-
Stage 2	501	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	408	847	1370	-	-	-
Stage 1	839	-	-	-	-	-
Stage 2	609	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	369	847	1370	-	-	-
Mov Cap-2 Maneuver	369	-	-	-	-	-
Stage 1	758	-	-	-	-	-
Stage 2	609	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	11.2	2.2	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1370	-	681	-	-	
HCM Lane V/C Ratio	0.081	-	0.141	-	-	
HCM Control Delay (s)	7.9	0	11.2	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.3	-	0.5	-	-	

# HCM Signalized Intersection Capacity Analysis

5: Iris Avenue & 25th Street

11/26/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗
Traffic Volume (vph)	42	317	325	36	90	125
Future Volume (vph)	42	317	325	36	90	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	2006	2111	2111	1794	2006	1794
Flt Permitted	0.11	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	235	2111	2111	1794	2006	1794
Peak-hour factor, PHF	0.90	0.90	0.94	0.94	0.79	0.79
Adj. Flow (vph)	47	352	346	38	114	158
RTOR Reduction (vph)	0	0	0	10	0	136
Lane Group Flow (vph)	47	352	346	28	114	22
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	10 6		3 9	
Permitted Phases	2			10 6		3
Actuated Green, G (s)	35.9	35.9	56.6	56.6	10.9	10.9
Effective Green, g (s)	35.9	35.9	56.6	56.6	10.9	10.9
Actuated g/C Ratio	0.46	0.46	0.73	0.73	0.14	0.14
Clearance Time (s)	4.9	4.9			4.9	
Vehicle Extension (s)	2.6	2.6			2.0	
Lane Grp Cap (vph)	109	980	1545	1313	282	252
v/s Ratio Prot		0.17	c0.16		c0.06	
v/s Ratio Perm	c0.20			0.02		0.01
v/c Ratio	0.43	0.36	0.22	0.02	0.40	0.09
Uniform Delay, d1	13.9	13.3	3.3	2.8	30.2	28.9
Progression Factor	1.00	1.00	0.15	0.00	1.00	1.00
Incremental Delay, d2	2.1	0.2	0.0	0.0	0.3	0.1
Delay (s)	16.0	13.5	0.5	0.0	30.6	28.9
Level of Service	B	B	A	A	C	C
Approach Delay (s)		13.8	0.5		29.6	
Approach LOS		B	A		C	
Intersection Summary						
HCM 2000 Control Delay			13.0	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.38			
Actuated Cycle Length (s)			77.3	Sum of lost time (s)		14.7
Intersection Capacity Utilization			40.2%	ICU Level of Service		A
Analysis Period (min)			15			

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

6: Iris Avenue & 27th Street

11/26/2019



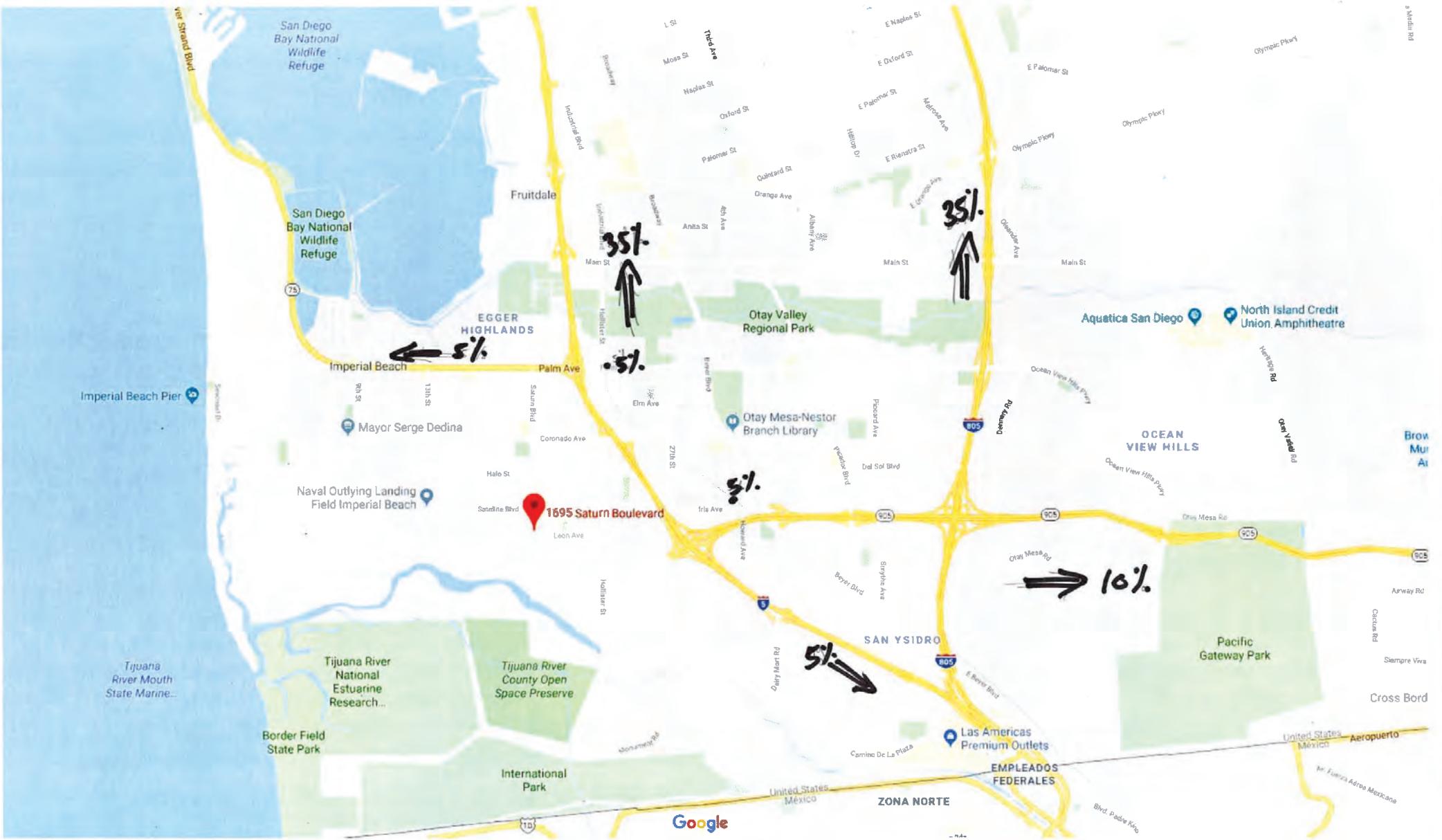
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑ ↗	↑ ↗	↑ ↘	↑ ↘	↑ ↗	↑ ↗
Traffic Volume (vph)	107	300	261	125	98	100
Future Volume (vph)	107	300	261	125	98	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9	4.9		
Lane Util. Factor	1.00	1.00	1.00	1.00		
Frt	1.00	1.00	0.96	0.93		
Flt Protected	0.95	1.00	1.00	0.98		
Satd. Flow (prot)	2006	2111	2019	1920		
Flt Permitted	0.45	1.00	1.00	0.98		
Satd. Flow (perm)	944	2111	2019	1920		
Peak-hour factor, PHF	0.90	0.90	0.94	0.94	0.77	0.77
Adj. Flow (vph)	119	333	278	133	127	130
RTOR Reduction (vph)	0	0	10	0	0	0
Lane Group Flow (vph)	119	333	401	0	257	0
Turn Type	Perm	NA	NA		Prot	
Protected Phases	9 2		6		4 10	
Permitted Phases	9 2					
Actuated Green, G (s)	51.7	51.7	35.9		15.8	
Effective Green, g (s)	51.7	51.7	35.9		15.8	
Actuated g/C Ratio	0.67	0.67	0.46		0.20	
Clearance Time (s)				4.9		
Vehicle Extension (s)				2.6		
Lane Grp Cap (vph)	631	1411	937		392	
v/s Ratio Prot		c0.16	c0.20		c0.13	
v/s Ratio Perm	0.13					
v/c Ratio	0.19	0.24	0.43		0.66	
Uniform Delay, d1	4.9	5.0	13.8		28.3	
Progression Factor	0.04	0.05	1.00		1.00	
Incremental Delay, d2	0.1	0.1	0.2		3.0	
Delay (s)	0.3	0.3	14.1		31.3	
Level of Service	A	A	B		C	
Approach Delay (s)		0.3	14.1		31.3	
Approach LOS		A	B		C	
Intersection Summary						
HCM 2000 Control Delay			12.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.46			
Actuated Cycle Length (s)			77.3	Sum of lost time (s)	14.7	
Intersection Capacity Utilization			51.1%	ICU Level of Service	A	
Analysis Period (min)			15			

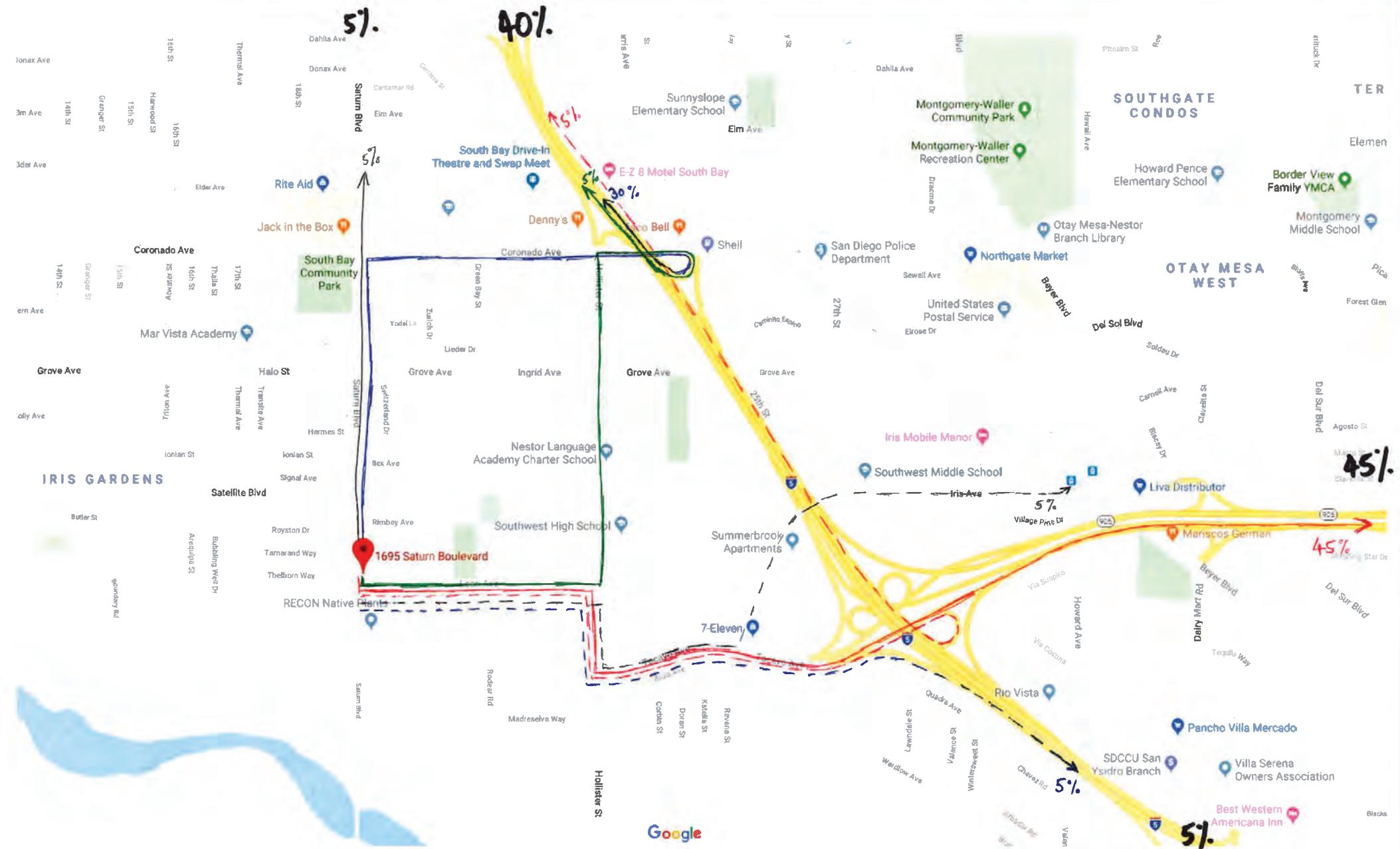
c Critical Lane Group



## Appendix F Cumulative Project Information

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## Appendix G Intersection LOS Worksheets Opening Year 2021 Without Project

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## Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↓		↖	↑↓				↖			↖
Traffic Vol, veh/h	0	558	197	57	708	55	0	0	84	0	0	21
Future Vol, veh/h	0	558	197	57	708	55	0	0	84	0	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	400	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	607	214	62	770	60	0	0	91	0	0	23

Major/Minor	Major1	Major2		Minor1		Minor2	
Conflicting Flow All	-	0	0	821	0	0	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	804	-	0	590
Stage 1	0	-	-	-	-	0	0
Stage 2	0	-	-	-	-	0	0
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	804	-	-	590
Mov Cap-2 Maneuver	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-

Approach	EB	WB		NB	SB		
HCM Control Delay, s	0	0.7		12.2	11.4		
HCM LOS				B	B		
<hr/>							
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	590	-	-	804	-	-	586
HCM Lane V/C Ratio	0.155	-	-	0.077	-	-	0.039
HCM Control Delay (s)	12.2	-	-	9.9	-	-	11.4
HCM Lane LOS	B	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-	-	0.1

# HCM 6th Signalized Intersection Summary

2: 27th Street & Coronado Ave

11/07/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑↑			↔			↔	
Traffic Volume (veh/h)	118	425	59	70	443	33	146	41	142	22	34	83
Future Volume (veh/h)	118	425	59	70	443	33	146	41	142	22	34	83
Initial Q (Q <sub>b</sub> ), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945
Adj Flow Rate, veh/h	128	462	64	76	482	36	159	45	154	24	37	90
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	462	585	496	365	1049	78	312	106	254	127	198	383
Arrive On Green	0.09	0.30	0.30	0.09	0.30	0.30	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	1853	1945	1648	1853	3487	260	608	279	670	162	524	1012
Grp Volume(v), veh/h	128	462	64	76	255	263	358	0	0	151	0	0
Grp Sat Flow(s), veh/h/ln	1853	1945	1648	1853	1848	1898	1558	0	0	1699	0	0
Q Serve(g_s), s	2.8	13.8	1.8	1.6	7.1	7.1	7.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.8	13.8	1.8	1.6	7.1	7.1	11.2	0.0	0.0	3.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.14	0.44		0.43	0.16		0.60
Lane Grp Cap(c), veh/h	462	585	496	365	556	571	672	0	0	709	0	0
V/C Ratio(X)	0.28	0.79	0.13	0.21	0.46	0.46	0.53	0.00	0.00	0.21	0.00	0.00
Avail Cap(c_a), veh/h	462	1258	1066	1066	1196	1228	672	0	0	709	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.9	20.3	16.1	13.7	18.0	18.0	15.5	0.0	0.0	13.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	2.4	0.1	0.1	0.6	0.6	3.0	0.0	0.0	0.7	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.1	6.1	0.6	0.6	2.9	3.0	4.2	0.0	0.0	1.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	13.0	22.7	16.2	13.8	18.6	18.6	18.5	0.0	0.0	14.1	0.0	0.0
LnGrp LOS	B	C	B	B	B	B	B	A	A	B	A	A
Approach Vol, veh/h		654			594			358			151	
Approach Delay, s/veh		20.2			17.9			18.5			14.1	
Approach LOS		C			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+R <sub>c</sub> ), s	10.4	24.1		28.9	10.4	24.1		28.9				
Change Period (Y+R <sub>c</sub> ), s	4.4	* 5		4.9	4.4	5.0		* 4.9				
Max Green Setting (Gmax), s	30.0	* 41		24.0	6.0	41.0		* 24				
Max Q Clear Time (g_c+l1), s	3.6	15.8		5.7	4.8	9.1		13.2				
Green Ext Time (p_c), s	0.1	3.3		0.5	0.0	3.4		1.2				
Intersection Summary												
HCM 6th Ctrl Delay			18.6									
HCM 6th LOS			B									

## Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

## Intersection

Int Delay, s/veh

6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑			↑
Traffic Vol, veh/h	96	34	57	4	30	184
Future Vol, veh/h	96	34	57	4	30	184
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	53	53	75	75	67	67
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	181	64	76	5	45	275

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	444	79	0	0	81
Stage 1	79	-	-	-	-
Stage 2	365	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	571	981	-	-	1517
Stage 1	944	-	-	-	-
Stage 2	702	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	551	981	-	-	1517
Mov Cap-2 Maneuver	551	-	-	-	-
Stage 1	944	-	-	-	-
Stage 2	677	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.5	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	622	1517	-
HCM Lane V/C Ratio	-	-	0.394	0.03	-
HCM Control Delay (s)	-	-	14.5	7.4	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	1.9	0.1	-

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	31	108	262	128	17
Future Vol, veh/h	10	31	108	262	128	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	76	76	74	74
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	36	142	345	173	23
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	814	185	196	0	-	0
Stage 1	185	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	347	857	1377	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	531	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	303	857	1377	-	-	-
Mov Cap-2 Maneuver	303	-	-	-	-	-
Stage 1	739	-	-	-	-	-
Stage 2	531	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.6	2.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1377	-	593	-	-	
HCM Lane V/C Ratio	0.103	-	0.081	-	-	
HCM Control Delay (s)	7.9	0	11.6	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.3	-	0.3	-	-	

# HCM Signalized Intersection Capacity Analysis

5: Iris Avenue & 25th Street

11/26/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗
Traffic Volume (vph)	33	366	322	33	152	126
Future Volume (vph)	33	366	322	33	152	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	2006	2111	2111	1794	2006	1794
Flt Permitted	0.14	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	296	2111	2111	1794	2006	1794
Peak-hour factor, PHF	0.79	0.79	0.87	0.87	0.66	0.66
Adj. Flow (vph)	42	463	370	38	230	191
RTOR Reduction (vph)	0	0	0	14	0	146
Lane Group Flow (vph)	42	463	370	24	230	45
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	10 6		3 9	
Permitted Phases	2			10 6		3
Actuated Green, G (s)	28.5	28.5	47.6	47.6	17.8	17.8
Effective Green, g (s)	28.5	28.5	47.6	47.6	17.8	17.8
Actuated g/C Ratio	0.38	0.38	0.63	0.63	0.24	0.24
Clearance Time (s)	4.9	4.9			4.9	
Vehicle Extension (s)	2.6	2.6			2.0	
Lane Grp Cap (vph)	112	800	1336	1135	474	424
v/s Ratio Prot		c0.22	c0.18		c0.11	
v/s Ratio Perm	0.14			0.01		0.03
v/c Ratio	0.38	0.58	0.28	0.02	0.49	0.11
Uniform Delay, d1	16.9	18.6	6.1	5.1	24.7	22.5
Progression Factor	1.00	1.00	0.13	0.00	1.00	1.00
Incremental Delay, d2	1.6	0.9	0.0	0.0	0.3	0.0
Delay (s)	18.6	19.4	0.8	0.0	25.0	22.5
Level of Service	B	B	A	A	C	C
Approach Delay (s)		19.4	0.8		23.9	
Approach LOS		B	A		C	
Intersection Summary						
HCM 2000 Control Delay			15.1	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.49			
Actuated Cycle Length (s)			75.2	Sum of lost time (s)		14.7
Intersection Capacity Utilization			43.5%	ICU Level of Service		A
Analysis Period (min)			15			

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

6: Iris Avenue & 27th Street

11/26/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑ ↗	↑ ↗	↑ ↘		↑ ↗	
Traffic Volume (vph)	234	283	273	155	64	83
Future Volume (vph)	234	283	273	155	64	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9		4.9	
Lane Util. Factor	1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.95		0.92	
Flt Protected	0.95	1.00	1.00		0.98	
Satd. Flow (prot)	2006	2111	2008		1909	
Flt Permitted	0.36	1.00	1.00		0.98	
Satd. Flow (perm)	769	2111	2008		1909	
Peak-hour factor, PHF	0.79	0.79	0.87	0.87	0.79	0.79
Adj. Flow (vph)	296	358	314	178	81	105
RTOR Reduction (vph)	0	0	15	0	0	0
Lane Group Flow (vph)	296	358	477	0	186	0
Turn Type	Perm	NA	NA		Prot	
Protected Phases		9 2	6		4 10	
Permitted Phases		9 2				
Actuated Green, G (s)	51.2	51.2	28.5		14.2	
Effective Green, g (s)	51.2	51.2	28.5		14.2	
Actuated g/C Ratio	0.68	0.68	0.38		0.19	
Clearance Time (s)				4.9		
Vehicle Extension (s)				2.6		
Lane Grp Cap (vph)	523	1437	761		360	
v/s Ratio Prot		0.17	c0.24		c0.10	
v/s Ratio Perm		c0.39				
v/c Ratio	0.57	0.25	0.63		0.52	
Uniform Delay, d1	6.2	4.6	19.0		27.4	
Progression Factor	0.19	0.05	1.00		1.00	
Incremental Delay, d2	1.1	0.1	1.4		0.5	
Delay (s)	2.3	0.3	20.5		27.9	
Level of Service	A	A	C		C	
Approach Delay (s)		1.2	20.5		27.9	
Approach LOS		A	C		C	
Intersection Summary						
HCM 2000 Control Delay			12.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.61			
Actuated Cycle Length (s)			75.2	Sum of lost time (s)	14.7	
Intersection Capacity Utilization			57.7%	ICU Level of Service	B	
Analysis Period (min)			15			

c Critical Lane Group

## Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
<b>Lane Configurations</b>												
Traffic Vol, veh/h	0	749	190	80	676	46	0	0	81	0	0	23
Future Vol, veh/h	0	749	190	80	676	46	0	0	81	0	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	400	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	814	207	87	735	50	0	0	88	0	0	25

Major/Minor	Major1	Major2		Minor1		Minor2	
Conflicting Flow All	-	0	0	1021	0	0	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	675	-	0	508
Stage 1	0	-	-	-	-	0	0
Stage 2	0	-	-	-	-	0	0
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	675	-	-	508
Mov Cap-2 Maneuver	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-

Approach	EB	WB		NB		SB
HCM Control Delay, s	0	1.1		13.6		11.2
HCM LOS				B		B
<hr/>						
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR SBLn1
Capacity (veh/h)	508	-	-	675	-	- 606
HCM Lane V/C Ratio	0.173	-	-	0.129	-	- 0.041
HCM Control Delay (s)	13.6	-	-	11.1	-	- 11.2
HCM Lane LOS	B	-	-	B	-	- B
HCM 95th %tile Q(veh)	0.6	-	-	0.4	-	- 0.1

## HCM 6th Signalized Intersection Summary

2: 27th Street &amp; Coronado Ave

11/07/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘	↑ ↙	↑ ↖	↑ ↗ ↖			↔			↔	
Traffic Volume (veh/h)	97	569	76	96	513	25	99	28	126	26	37	86
Future Volume (veh/h)	97	569	76	96	513	25	99	28	126	26	37	86
Initial Q (Q <sub>b</sub> ), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00		1.00	1.00		1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945
Adj Flow Rate, veh/h	105	618	83	104	558	27	108	30	137	28	40	93
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	635	1188	1007	502	2191	106	157	44	153	76	108	197
Arrive On Green	0.06	0.61	0.61	0.06	0.61	0.61	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1853	1945	1648	1853	3588	173	547	217	759	181	534	978
Grp Volume(v), veh/h	105	618	83	104	287	298	275	0	0	161	0	0
Grp Sat Flow(s), veh/h/ln	1853	1945	1648	1853	1848	1914	1524	0	0	1694	0	0
Q Serve(g_s), s	2.2	19.6	2.2	2.1	7.7	7.8	10.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.2	19.6	2.2	2.1	7.7	7.8	19.0	0.0	0.0	8.7	0.0	0.0
Prop In Lane	1.00			1.00		0.09	0.39		0.50	0.17		0.58
Lane Grp Cap(c), veh/h	635	1188	1007	502	1128	1169	353	0	0	380	0	0
V/C Ratio(X)	0.17	0.52	0.08	0.21	0.25	0.25	0.78	0.00	0.00	0.42	0.00	0.00
Avail Cap(c_a), veh/h	688	1188	1007	556	1128	1169	469	0	0	504	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.7	12.0	8.6	8.4	9.7	9.7	41.9	0.0	0.0	37.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.6	0.2	0.1	0.5	0.5	4.1	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.8	8.5	0.8	0.8	3.2	3.3	7.5	0.0	0.0	3.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	6.7	13.6	8.8	8.5	10.2	10.2	46.0	0.0	0.0	38.2	0.0	0.0
LnGrp LOS	A	B	A	A	B	B	D	A	A	D	A	A
Approach Vol, veh/h		806			689			275			161	
Approach Delay, s/veh		12.2			10.0			46.0			38.2	
Approach LOS		B			A			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+R <sub>c</sub> ), s	10.4	70.9		26.7	10.4	70.9		26.7				
Change Period (Y+R <sub>c</sub> ), s	4.4	* 5		4.9	4.4	5.0		* 4.9				
Max Green Setting (Gmax), s	9.1	* 55		30.0	9.1	54.6		* 30				
Max Q Clear Time (g_c+l1), s	4.1	21.6		10.7	4.2	9.8		21.0				
Green Ext Time (p_c), s	0.0	5.0		0.6	0.0	4.0		0.8				

## Intersection Summary

HCM 6th Ctrl Delay 18.4

HCM 6th LOS B

## Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	5.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑			↑
Traffic Vol, veh/h	65	11	55	9	51	132
Future Vol, veh/h	65	11	55	9	51	132
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	42	42	63	63	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	155	26	87	14	59	152
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	364	94	0	0	101	0
Stage 1	94	-	-	-	-	-
Stage 2	270	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	635	963	-	-	1491	-
Stage 1	930	-	-	-	-	-
Stage 2	775	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	608	963	-	-	1491	-
Mov Cap-2 Maneuver	608	-	-	-	-	-
Stage 1	930	-	-	-	-	-
Stage 2	742	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	12.8	0		2.1		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	642	1491	-	
HCM Lane V/C Ratio	-	-	0.282	0.039	-	
HCM Control Delay (s)	-	-	12.8	7.5	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	1.2	0.1	-	

Intersection

Int Delay, s/veh 2.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	57	74	186	137	12
Future Vol, veh/h	13	57	74	186	137	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	72	72	66	66	73	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	79	112	282	188	16

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	702	196	204	0	-	0
Stage 1	196	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	404	845	1368	-	-	-
Stage 1	837	-	-	-	-	-
Stage 2	606	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	365	845	1368	-	-	-
Mov Cap-2 Maneuver	365	-	-	-	-	-
Stage 1	756	-	-	-	-	-
Stage 2	606	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	2.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1368	-	679	-	-
HCM Lane V/C Ratio	0.082	-	0.143	-	-
HCM Control Delay (s)	7.9	0	11.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.5	-	-

# HCM Signalized Intersection Capacity Analysis

5: Iris Avenue & 25th Street

11/26/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗
Traffic Volume (vph)	42	321	329	36	91	126
Future Volume (vph)	42	321	329	36	91	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	2006	2111	2111	1794	2006	1794
Flt Permitted	0.14	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	303	2111	2111	1794	2006	1794
Peak-hour factor, PHF	0.90	0.90	0.94	0.94	0.79	0.79
Adj. Flow (vph)	47	357	350	38	115	159
RTOR Reduction (vph)	0	0	0	11	0	134
Lane Group Flow (vph)	47	357	350	27	115	25
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	10 6		3 9	
Permitted Phases	2			10 6		3
Actuated Green, G (s)	27.9	27.9	48.5	48.5	10.9	10.9
Effective Green, g (s)	27.9	27.9	48.5	48.5	10.9	10.9
Actuated g/C Ratio	0.40	0.40	0.70	0.70	0.16	0.16
Clearance Time (s)	4.9	4.9			4.9	
Vehicle Extension (s)	2.6	2.6			2.0	
Lane Grp Cap (vph)	122	851	1479	1257	315	282
v/s Ratio Prot		c0.17	c0.17		c0.06	
v/s Ratio Perm	0.16			0.01		0.01
v/c Ratio	0.39	0.42	0.24	0.02	0.37	0.09
Uniform Delay, d1	14.6	14.8	3.7	3.1	26.1	24.9
Progression Factor	1.00	1.00	0.15	0.00	1.00	1.00
Incremental Delay, d2	1.6	0.3	0.0	0.0	0.3	0.0
Delay (s)	16.2	15.1	0.6	0.0	26.3	25.0
Level of Service	B	B	A	A	C	C
Approach Delay (s)		15.2	0.5		25.5	
Approach LOS		B	A		C	
Intersection Summary						
HCM 2000 Control Delay			12.5	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.37			
Actuated Cycle Length (s)			69.2	Sum of lost time (s)		14.7
Intersection Capacity Utilization			40.4%	ICU Level of Service		A
Analysis Period (min)			15			

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

6: Iris Avenue & 27th Street

11/26/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑ ↗	↑ ↗	↑ ↘	↑ ↘	↑ ↗	↑ ↗
Traffic Volume (vph)	108	304	265	126	99	101
Future Volume (vph)	108	304	265	126	99	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9	4.9		
Lane Util. Factor	1.00	1.00	1.00	1.00		
Frt	1.00	1.00	0.96	0.93		
Flt Protected	0.95	1.00	1.00	0.98		
Satd. Flow (prot)	2006	2111	2019	1920		
Flt Permitted	0.43	1.00	1.00	0.98		
Satd. Flow (perm)	907	2111	2019	1920		
Peak-hour factor, PHF	0.90	0.90	0.94	0.94	0.77	0.77
Adj. Flow (vph)	120	338	282	134	129	131
RTOR Reduction (vph)	0	0	12	0	0	0
Lane Group Flow (vph)	120	338	404	0	260	0
Turn Type	Perm	NA	NA		Prot	
Protected Phases		9 2	6		4 10	
Permitted Phases		9 2				
Actuated Green, G (s)	43.7	43.7	27.9		15.7	
Effective Green, g (s)	43.7	43.7	27.9		15.7	
Actuated g/C Ratio	0.63	0.63	0.40		0.23	
Clearance Time (s)				4.9		
Vehicle Extension (s)				2.6		
Lane Grp Cap (vph)	572	1333	814		435	
v/s Ratio Prot		c0.16	c0.20		c0.14	
v/s Ratio Perm		0.13				
v/c Ratio	0.21	0.25	0.50		0.60	
Uniform Delay, d1	5.4	5.6	15.4		23.9	
Progression Factor	0.03	0.04	1.00		1.00	
Incremental Delay, d2	0.1	0.1	0.4		1.5	
Delay (s)	0.3	0.3	15.8		25.4	
Level of Service	A	A	B		C	
Approach Delay (s)		0.3	15.8		25.4	
Approach LOS		A	B		C	
Intersection Summary						
HCM 2000 Control Delay			11.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.49			
Actuated Cycle Length (s)			69.2	Sum of lost time (s)	14.7	
Intersection Capacity Utilization			51.5%	ICU Level of Service	A	
Analysis Period (min)			15			

c Critical Lane Group



## Appendix H Intersection LOS Worksheets Opening Year 2021 With Project

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## Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑				↑			↑
Traffic Vol, veh/h	0	558	198	59	710	55	0	0	86	0	0	21
Future Vol, veh/h	0	558	198	59	710	55	0	0	86	0	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	400	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	607	215	64	772	60	0	0	93	0	0	23

Major/Minor	Major1	Major2		Minor1		Minor2						
Conflicting Flow All	-	0	0	822	0	0	-	-	411	-	-	416
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.14	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.22	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	803	-	-	0	0	590	0	0	585
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	803	-	-	-	-	590	-	-	585
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB		NB		SB	
HCM Control Delay, s	0	0.7		12.2		11.4	
HCM LOS				B		B	
<hr/>							
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	590	-	-	803	-	-	585
HCM Lane V/C Ratio	0.158	-	-	0.08	-	-	0.039
HCM Control Delay (s)	12.2	-	-	9.9	-	-	11.4
HCM Lane LOS	B	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.6	-	-	0.3	-	-	0.1

# HCM 6th Signalized Intersection Summary

2: 27th Street & Coronado Ave

11/07/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘	↑ ↙	↑ ↖	↑ ↗ ↖			↔			↔	↔
Traffic Volume (veh/h)	119	426	59	71	443	33	148	43	144	22	36	83
Future Volume (veh/h)	119	426	59	71	443	33	148	43	144	22	36	83
Initial Q (Q <sub>b</sub> ), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945
Adj Flow Rate, veh/h	129	463	64	77	482	36	161	47	157	24	39	90
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	462	586	497	365	1051	78	310	108	254	126	205	379
Arrive On Green	0.09	0.30	0.30	0.09	0.30	0.30	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	1853	1945	1648	1853	3487	260	604	285	671	160	542	1002
Grp Volume(v), veh/h	129	463	64	77	255	263	365	0	0	153	0	0
Grp Sat Flow(s), veh/h/ln	1853	1945	1648	1853	1848	1898	1559	0	0	1704	0	0
Q Serve(g_s), s	2.9	13.8	1.8	1.7	7.1	7.1	7.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.9	13.8	1.8	1.7	7.1	7.1	11.5	0.0	0.0	3.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.14	0.44		0.43	0.16		0.59
Lane Grp Cap(c), veh/h	462	586	497	365	557	572	672	0	0	710	0	0
V/C Ratio(X)	0.28	0.79	0.13	0.21	0.46	0.46	0.54	0.00	0.00	0.22	0.00	0.00
Avail Cap(c_a), veh/h	462	1258	1066	1066	1195	1227	672	0	0	710	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.9	20.3	16.1	13.7	17.9	18.0	15.6	0.0	0.0	13.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	2.4	0.1	0.1	0.6	0.6	3.1	0.0	0.0	0.7	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.1	6.1	0.6	0.6	2.9	3.0	4.4	0.0	0.0	1.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	13.0	22.7	16.2	13.8	18.5	18.5	18.8	0.0	0.0	14.1	0.0	0.0
LnGrp LOS	B	C	B	B	B	B	B	A	A	B	A	A
Approach Vol, veh/h		656			595			365			153	
Approach Delay, s/veh		20.2			17.9			18.8			14.1	
Approach LOS		C			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+R <sub>c</sub> ), s	10.4	24.1		28.9	10.4	24.1		28.9				
Change Period (Y+R <sub>c</sub> ), s	4.4	* 5		4.9	4.4	5.0		* 4.9				
Max Green Setting (Gmax), s	30.0	* 41		24.0	6.0	41.0		* 24				
Max Q Clear Time (g_c+l1), s	3.7	15.8		5.8	4.9	9.1		13.5				
Green Ext Time (p_c), s	0.1	3.3		0.5	0.0	3.4		1.2				
Intersection Summary												
HCM 6th Ctrl Delay			18.6									
HCM 6th LOS			B									

## Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑			↑
Traffic Vol, veh/h	97	34	58	5	30	186
Future Vol, veh/h	97	34	58	5	30	186
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	53	53	75	75	67	67
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	183	64	77	7	45	278
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	449	81	0	0	84	0
Stage 1	81	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	568	979	-	-	1513	-
Stage 1	942	-	-	-	-	-
Stage 2	700	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	548	979	-	-	1513	-
Mov Cap-2 Maneuver	548	-	-	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	676	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	14.6	0	1			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	619	1513	-	
HCM Lane V/C Ratio	-	-	0.399	0.03	-	
HCM Control Delay (s)	-	-	14.6	7.5	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	1.9	0.1	-	

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	31	108	265	132	18
Future Vol, veh/h	11	31	108	265	132	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	76	76	74	74
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	36	142	349	178	24
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	823	190	202	0	-	0
Stage 1	190	-	-	-	-	-
Stage 2	633	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	343	852	1370	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	299	852	1370	-	-	-
Mov Cap-2 Maneuver	299	-	-	-	-	-
Stage 1	733	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.9	2.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1370	-	574	-	-	
HCM Lane V/C Ratio	0.104	-	0.086	-	-	
HCM Control Delay (s)	7.9	0	11.9	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.3	-	0.3	-	-	

# HCM Signalized Intersection Capacity Analysis

5: Iris Avenue & 25th Street

11/26/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗
Traffic Volume (vph)	34	367	324	34	152	127
Future Volume (vph)	34	367	324	34	152	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	2006	2111	2111	1794	2006	1794
Flt Permitted	0.14	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	285	2111	2111	1794	2006	1794
Peak-hour factor, PHF	0.79	0.79	0.87	0.87	0.66	0.66
Adj. Flow (vph)	43	465	372	39	230	192
RTOR Reduction (vph)	0	0	0	14	0	147
Lane Group Flow (vph)	43	465	372	25	230	45
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	10 6		3 9	
Permitted Phases	2			10 6		3
Actuated Green, G (s)	29.6	29.6	49.1	49.1	17.9	17.9
Effective Green, g (s)	29.6	29.6	49.1	49.1	17.9	17.9
Actuated g/C Ratio	0.39	0.39	0.64	0.64	0.23	0.23
Clearance Time (s)	4.9	4.9			4.9	
Vehicle Extension (s)	2.6	2.6			2.0	
Lane Grp Cap (vph)	109	813	1349	1146	467	418
v/s Ratio Prot		c0.22	c0.18		c0.11	
v/s Ratio Perm	0.15			0.01		0.02
v/c Ratio	0.39	0.57	0.28	0.02	0.49	0.11
Uniform Delay, d1	17.1	18.6	6.1	5.1	25.5	23.2
Progression Factor	1.00	1.00	0.13	0.00	1.00	1.00
Incremental Delay, d2	1.8	0.8	0.1	0.0	0.3	0.0
Delay (s)	18.9	19.4	0.9	0.0	25.8	23.2
Level of Service	B	B	A	A	C	C
Approach Delay (s)		19.4	0.8		24.6	
Approach LOS		B	A		C	
Intersection Summary						
HCM 2000 Control Delay			15.3	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.49			
Actuated Cycle Length (s)			76.8	Sum of lost time (s)		14.7
Intersection Capacity Utilization			43.6%	ICU Level of Service		A
Analysis Period (min)			15			

c = Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

6: Iris Avenue & 27th Street

11/26/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	236	283	273	157	66	85
Future Volume (vph)	236	283	273	157	66	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9	4.9		
Lane Util. Factor	1.00	1.00	1.00	1.00		
Frt	1.00	1.00	0.95	0.92		
Flt Protected	0.95	1.00	1.00	0.98		
Satd. Flow (prot)	2006	2111	2007	1909		
Flt Permitted	0.36	1.00	1.00	0.98		
Satd. Flow (perm)	767	2111	2007	1909		
Peak-hour factor, PHF	0.79	0.79	0.87	0.87	0.79	0.79
Adj. Flow (vph)	299	358	314	180	84	108
RTOR Reduction (vph)	0	0	15	0	0	0
Lane Group Flow (vph)	299	358	479	0	192	0
Turn Type	Perm	NA	NA		Prot	
Protected Phases		9 2	6		4 10	
Permitted Phases		9 2				
Actuated Green, G (s)	52.4	52.4	29.6		14.6	
Effective Green, g (s)	52.4	52.4	29.6		14.6	
Actuated g/C Ratio	0.68	0.68	0.39		0.19	
Clearance Time (s)				4.9		
Vehicle Extension (s)				2.6		
Lane Grp Cap (vph)	523	1440	773		362	
v/s Ratio Prot		0.17	c0.24		c0.10	
v/s Ratio Perm		c0.39				
v/c Ratio	0.57	0.25	0.62		0.53	
Uniform Delay, d1	6.4	4.7	19.1		28.0	
Progression Factor	0.20	0.05	1.00		1.00	
Incremental Delay, d2	1.2	0.1	1.3		0.7	
Delay (s)	2.5	0.3	20.4		28.8	
Level of Service	A	A	C		C	
Approach Delay (s)		1.3	20.4		28.8	
Approach LOS		A	C		C	
Intersection Summary						
HCM 2000 Control Delay		12.2		HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio		0.61				
Actuated Cycle Length (s)		76.8		Sum of lost time (s)	14.7	
Intersection Capacity Utilization		58.1%		ICU Level of Service	B	
Analysis Period (min)		15				

c = Critical Lane Group

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		P		A	
Traffic Vol, veh/h	0	2	67	0	2	280
Future Vol, veh/h	0	2	67	0	2	280
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	73	0	2	304
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	381	73	0	0	73	0
Stage 1	73	-	-	-	-	-
Stage 2	308	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	621	989	-	-	1527	-
Stage 1	950	-	-	-	-	-
Stage 2	745	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	620	989	-	-	1527	-
Mov Cap-2 Maneuver	620	-	-	-	-	-
Stage 1	950	-	-	-	-	-
Stage 2	744	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	8.6	0		0.1		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	989	1527	-	
HCM Lane V/C Ratio	-	-	0.002	0.001	-	
HCM Control Delay (s)	-	-	8.6	7.4	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	1	67	2	1	280
Future Vol, veh/h	2	1	67	2	1	280
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	1	73	2	1	304
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	380	74	0	0	75	0
Stage 1	74	-	-	-	-	-
Stage 2	306	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	622	988	-	-	1524	-
Stage 1	949	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	621	988	-	-	1524	-
Mov Cap-2 Maneuver	621	-	-	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	746	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.1	0	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	709	1524	-	
HCM Lane V/C Ratio	-	-	0.005	0.001	-	
HCM Control Delay (s)	-	-	10.1	7.4	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W		A	B		
Traffic Vol, veh/h	3	4	4	389	146	3
Future Vol, veh/h	3	4	4	389	146	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	4	4	423	159	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	592	161	162	0	-	0
Stage 1	161	-	-	-	-	-
Stage 2	431	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	469	884	1417	-	-	-
Stage 1	868	-	-	-	-	-
Stage 2	655	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	467	884	1417	-	-	-
Mov Cap-2 Maneuver	467	-	-	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	655	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	10.7	0.1	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1417	-	639	-	-	
HCM Lane V/C Ratio	0.003	-	0.012	-	-	
HCM Control Delay (s)	7.5	0	10.7	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

## Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
<b>Lane Configurations</b>												
Traffic Vol, veh/h	0	751	193	81	680	46	0	0	87	0	0	23
Future Vol, veh/h	0	751	193	81	680	46	0	0	87	0	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	400	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	816	210	88	739	50	0	0	95	0	0	25

Major/Minor	Major1	Major2		Minor1		Minor2	
Conflicting Flow All	-	0	0	1026	0	0	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	673	-	0	506
Stage 1	0	-	-	-	-	0	0
Stage 2	0	-	-	-	-	0	0
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	673	-	-	506
Mov Cap-2 Maneuver	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-

Approach	EB	WB		NB		SB
HCM Control Delay, s	0	1.1		13.7		11.2
HCM LOS				B		B
<hr/>						
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR SBLn1
Capacity (veh/h)	506	-	-	673	-	- 604
HCM Lane V/C Ratio	0.187	-	-	0.131	-	- 0.041
HCM Control Delay (s)	13.7	-	-	11.2	-	- 11.2
HCM Lane LOS	B	-	-	B	-	- B
HCM 95th %tile Q(veh)	0.7	-	-	0.4	-	- 0.1

## HCM 6th Signalized Intersection Summary

2: 27th Street &amp; Coronado Ave

11/07/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘	↑ ↙	↑ ↖	↑ ↗ ↖			↔			↔	
Traffic Volume (veh/h)	99	571	77	99	513	25	103	32	129	26	41	87
Future Volume (veh/h)	99	571	77	99	513	25	103	32	129	26	41	87
Initial Q (Q <sub>b</sub> ), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00		1.00	1.00		1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945	1945
Adj Flow Rate, veh/h	108	621	84	108	558	27	112	35	140	28	45	95
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	626	1170	992	490	2159	104	160	49	155	75	119	202
Arrive On Green	0.06	0.60	0.60	0.06	0.60	0.60	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1853	1945	1648	1853	3588	173	542	234	739	172	565	959
Grp Volume(v), veh/h	108	621	84	108	287	298	287	0	0	168	0	0
Grp Sat Flow(s), veh/h/ln	1853	1945	1648	1853	1848	1914	1514	0	0	1696	0	0
Q Serve(g_s), s	2.3	20.2	2.3	2.3	7.9	7.9	11.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.3	20.2	2.3	2.3	7.9	7.9	20.0	0.0	0.0	9.0	0.0	0.0
Prop In Lane	1.00			1.00		0.09	0.39		0.49	0.17		0.57
Lane Grp Cap(c), veh/h	626	1170	992	490	1112	1152	365	0	0	396	0	0
V/C Ratio(X)	0.17	0.53	0.08	0.22	0.26	0.26	0.79	0.00	0.00	0.42	0.00	0.00
Avail Cap(c_a), veh/h	679	1170	992	543	1112	1152	467	0	0	506	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.1	12.6	9.0	8.9	10.1	10.1	41.5	0.0	0.0	37.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.7	0.2	0.1	0.6	0.5	5.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.9	8.8	0.8	0.9	3.3	3.4	7.9	0.0	0.0	3.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	7.1	14.3	9.2	9.0	10.7	10.7	46.5	0.0	0.0	37.5	0.0	0.0
LnGrp LOS	A	B	A	A	B	B	D	A	A	D	A	A
Approach Vol, veh/h		813			693			287			168	
Approach Delay, s/veh		12.8			10.4			46.5			37.5	
Approach LOS		B			B			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+R <sub>c</sub> ), s	10.4	70.0		27.6	10.4	70.0		27.6				
Change Period (Y+R <sub>c</sub> ), s	4.4	* 5		4.9	4.4	5.0		* 4.9				
Max Green Setting (Gmax), s	9.1	* 55		30.0	9.1	54.6		* 30				
Max Q Clear Time (g_c+l1), s	4.3	22.2		11.0	4.3	9.9		22.0				
Green Ext Time (p_c), s	0.0	5.1		0.6	0.0	4.0		0.8				

## Intersection Summary

HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

## Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	5.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑			↑
Traffic Vol, veh/h	66	11	58	11	51	136
Future Vol, veh/h	66	11	58	11	51	136
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	42	42	63	63	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	157	26	92	17	59	156
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	375	101	0	0	109	0
Stage 1	101	-	-	-	-	-
Stage 2	274	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	626	954	-	-	1481	-
Stage 1	923	-	-	-	-	-
Stage 2	772	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	598	954	-	-	1481	-
Mov Cap-2 Maneuver	598	-	-	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13	0		2.1		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	632	1481	-	
HCM Lane V/C Ratio	-	-	0.29	0.04	-	
HCM Control Delay (s)	-	-	13	7.5	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	1.2	0.1	-	

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	57	74	193	144	13
Future Vol, veh/h	15	57	74	193	144	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	72	72	66	66	73	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	79	112	292	197	18
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	722	206	215	0	-	0
Stage 1	206	-	-	-	-	-
Stage 2	516	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	394	835	1355	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	355	835	1355	-	-	-
Mov Cap-2 Maneuver	355	-	-	-	-	-
Stage 1	747	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.5	2.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1355	-	651	-	-	
HCM Lane V/C Ratio	0.083	-	0.154	-	-	
HCM Control Delay (s)	7.9	0	11.5	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.3	-	0.5	-	-	

# HCM Signalized Intersection Capacity Analysis

## 5: Iris Avenue & 25th Street

11/26/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗
Traffic Volume (vph)	45	325	332	38	92	129
Future Volume (vph)	45	325	332	38	92	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	2006	2111	2111	1794	2006	1794
Flt Permitted	0.13	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	271	2111	2111	1794	2006	1794
Peak-hour factor, PHF	0.90	0.90	0.94	0.94	0.79	0.79
Adj. Flow (vph)	50	361	353	40	116	163
RTOR Reduction (vph)	0	0	0	11	0	139
Lane Group Flow (vph)	50	361	353	29	116	24
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	10 6		3 9	
Permitted Phases	2			10 6		3
Actuated Green, G (s)	31.2	31.2	52.5	52.5	11.0	11.0
Effective Green, g (s)	31.2	31.2	52.5	52.5	11.0	11.0
Actuated g/C Ratio	0.43	0.43	0.72	0.72	0.15	0.15
Clearance Time (s)	4.9	4.9			4.9	
Vehicle Extension (s)	2.6	2.6			2.0	
Lane Grp Cap (vph)	115	898	1511	1284	301	269
v/s Ratio Prot		0.17	c0.17		c0.06	
v/s Ratio Perm	c0.18			0.02		0.01
v/c Ratio	0.43	0.40	0.23	0.02	0.39	0.09
Uniform Delay, d1	14.8	14.6	3.5	3.0	28.1	26.8
Progression Factor	1.00	1.00	0.15	0.00	1.00	1.00
Incremental Delay, d2	2.1	0.2	0.0	0.0	0.3	0.1
Delay (s)	16.9	14.8	0.5	0.0	28.4	26.9
Level of Service	B	B	A	A	C	C
Approach Delay (s)		15.1	0.5		27.5	
Approach LOS		B	A		C	
Intersection Summary						
HCM 2000 Control Delay			13.0	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.38			
Actuated Cycle Length (s)			73.3	Sum of lost time (s)		14.7
Intersection Capacity Utilization			40.7%	ICU Level of Service		A
Analysis Period (min)			15			

c = Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

6: Iris Avenue & 27th Street

11/26/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑ ↗	↑ ↗	↑ ↘	↑ ↘	↗ ↗	↗ ↗
Traffic Volume (vph)	112	305	265	131	104	104
Future Volume (vph)	112	305	265	131	104	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9	4.9	4.9		
Lane Util. Factor	1.00	1.00	1.00	1.00		
Frt	1.00	1.00	0.96	0.93		
Flt Protected	0.95	1.00	1.00	0.98		
Satd. Flow (prot)	2006	2111	2017	1921		
Flt Permitted	0.43	1.00	1.00	0.98		
Satd. Flow (perm)	906	2111	2017	1921		
Peak-hour factor, PHF	0.90	0.90	0.94	0.94	0.77	0.77
Adj. Flow (vph)	124	339	282	139	135	135
RTOR Reduction (vph)	0	0	12	0	0	0
Lane Group Flow (vph)	124	339	409	0	270	0
Turn Type	Perm	NA	NA		Prot	
Protected Phases		9 2	6		4 10	
Permitted Phases		9 2				
Actuated Green, G (s)	47.1	47.1	31.2		16.4	
Effective Green, g (s)	47.1	47.1	31.2		16.4	
Actuated g/C Ratio	0.64	0.64	0.43		0.22	
Clearance Time (s)				4.9		
Vehicle Extension (s)				2.6		
Lane Grp Cap (vph)	582	1356	858		429	
v/s Ratio Prot		c0.16	c0.20		c0.14	
v/s Ratio Perm		0.14				
v/c Ratio	0.21	0.25	0.48		0.63	
Uniform Delay, d1	5.4	5.6	15.2		25.7	
Progression Factor	0.03	0.04	1.00		1.00	
Incremental Delay, d2	0.1	0.1	0.3		2.1	
Delay (s)	0.3	0.3	15.5		27.8	
Level of Service	A	A	B		C	
Approach Delay (s)		0.3	15.5		27.8	
Approach LOS		A	B		C	
Intersection Summary						
HCM 2000 Control Delay			12.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.49			
Actuated Cycle Length (s)			73.3	Sum of lost time (s)	14.7	
Intersection Capacity Utilization			52.5%	ICU Level of Service	A	
Analysis Period (min)			15			

c Critical Lane Group

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y		Y	
Traffic Vol, veh/h	0	3	80	0	3	198
Future Vol, veh/h	0	3	80	0	3	198
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	3	87	0	3	215
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	308	87	0	0	87	0
Stage 1	87	-	-	-	-	-
Stage 2	221	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	684	971	-	-	1509	-
Stage 1	936	-	-	-	-	-
Stage 2	816	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	683	971	-	-	1509	-
Mov Cap-2 Maneuver	683	-	-	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	814	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	8.7	0	0.1			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	971	1509	-	
HCM Lane V/C Ratio	-	-	0.003	0.002	-	
HCM Control Delay (s)	-	-	8.7	7.4	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	0	0	-	

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		P		A	
Traffic Vol, veh/h	3	1	79	3	1	197
Future Vol, veh/h	3	1	79	3	1	197
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	1	86	3	1	214
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	304	88	0	0	89	0
Stage 1	88	-	-	-	-	-
Stage 2	216	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	688	970	-	-	1506	-
Stage 1	935	-	-	-	-	-
Stage 2	820	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	687	970	-	-	1506	-
Mov Cap-2 Maneuver	687	-	-	-	-	-
Stage 1	935	-	-	-	-	-
Stage 2	819	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9.9	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	741	1506	-	
HCM Lane V/C Ratio	-	-	0.006	0.001	-	
HCM Control Delay (s)	-	-	9.9	7.4	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	8	8	234	200	7
Future Vol, veh/h	7	8	8	234	200	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	9	9	254	217	8
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	493	221	225	0	-	0
Stage 1	221	-	-	-	-	-
Stage 2	272	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	535	819	1344	-	-	-
Stage 1	816	-	-	-	-	-
Stage 2	774	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	531	819	1344	-	-	-
Mov Cap-2 Maneuver	531	-	-	-	-	-
Stage 1	809	-	-	-	-	-
Stage 2	774	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.6	0.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1344	-	654	-	-	
HCM Lane V/C Ratio	0.006	-	0.025	-	-	
HCM Control Delay (s)	7.7	0	10.6	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	



## Appendix I City of San Diego Consultant's Guide to Park Design & Development (Section 2.7)

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- (7) Walls adjacent to turf shall have a mow curb per Section 2.4, Paving, Walkways and Mow Curbs.

## **2.7 PARKING AREAS**

Parking areas shall meet the City's Parking Regulations (Municipal Code § 142.0500), California Building Code Title 24, Americans with Disabilities Act, San Diego Standard Drawings, and the parking ratios listed below. Non-programmed parkland includes passive recreation areas and picnic areas that are not scheduled for regular activities. Unusable park land such as steep slopes or natural areas should not be used in calculating parking space requirements. See 2.17.1 for planting requirements in parking areas.

### **2.7.1 Parking Ratio for Neighborhood Parks**

- (1) Provide five (5) parking spaces per acre of non-programmed parkland.
- (2) Multi-Purpose Fields: When a neighborhood park has softball fields, provide an additional thirty (30) parking spaces per backstop.
- (3) Parking may be provided by on-site parking facilities or on adjacent streets. If parking is provided on adjacent streets, only those spaces immediately adjacent to the park may be included; parking spaces located across the street or on non-adjacent streets will not be included.

### **2.7.2 Parking Ratio for Community Parks**

- (1) Provide five parking spaces per acre of non-programmed parkland.
- (2) Recreation Centers: One (1) parking space per 200 square feet of building.
- (2) Swimming Pool Facility: One (1) parking space per 175 square feet of pool surface area, in addition to the parking spaces required for the recreation center.
- (3) Multi-Purpose Fields: Thirty (30) parking spaces per backstop, in addition to the parking spaces required for the recreation center or swimming pool facility.
- (4) Tennis Courts: Twelve (12) parking spaces per six courts, in addition to the parking spaces required for the recreation center. If less than six courts are provided, no additional parking is required.

- 2.7.3** **Parking Area Paving:** Geotechnical testing shall be conducted to provide a paving section design for the parking lot and all vehicular access paths. Parking lot paving shall be constructed with asphaltic concrete (AC) pavement on cement treated base (CTB). Provide a pavement section on the construction plans based on R-values and Schedule 'J' pavement recommendations of the San Diego Standard Drawings, Cul-de-sac Criteria and CBR's for parking lots. Specify AR 8000 oil.
- 2.7.4** **Dimensions:** Dimensions for parking spaces and drive aisles shall meet or exceed the Land Development Code, Parking Regulations, Municipal Code §142.0500.
- 2.7.5** **Striping:** The paint utilized for striping and mark-outs shall be based on the Greenbook specifications.
- 2.7.6** **Parking Areas Adjacent to Turf:** To compensate for vehicular over-hang adjacent to turf areas, provide a minimum four foot wide concrete strip to allow operation of mowers when vehicles are parked. Where a walkway is required, see Section 2.4, Paving Walkways and Mow Curbs.
- 2.7.7** **Maintenance/Access Strip:** Where parking spaces are adjacent to landscaped areas, provide a twelve inch wide concrete strip of paving for user and maintenance access.

## **2.8      TRASH ENCLOSURES**

Trash enclosures shall be constructed with concrete masonry block. Trash enclosures shall be located within parking lot areas where feasible. Trash enclosures shall be sized to house a minimum of two dumpsters; one for trash and one for recycling. A heavy vehicle load paving section for the drive lane and the concrete apron shall be provided at the head of the enclosure. Minimum size of the concrete apron shall be sufficient to allow refuse vehicle access to the trash receptacles. Specific dimensions, location and design shall be reviewed and approved by the Park and Recreation Department. The walls of the trash enclosure shall be treated with anti-graffiti coating inside and out. The enclosures shall have solid steel doors or chain link doors with screening slats with locking ability.

## **2.9      SITE FURNITURE**

- 2.9.1** **General:** All parks shall have picnic tables, benches, drinking fountains, barbecues, bicycle racks, trash receptacles and other site furnishings as necessary. Types of site furniture selected shall be based on the type of park, design character, durability and maintenance. Precast concrete furniture with anti-graffiti coating is preferred for durability. Site furnishings shall complement each other in color, materials and form. Site furniture shall be permanently secured to the paving per the manufacturer's recommendations. Site furniture that bolts together is not permitted. Site furniture shall be selected from the Approved Manufacturers and Products List in Appendix E.