FINAL
Transportation Impact Study
Veterans Memorial Park

PREPARED FOR

City of Carlsbad

September 2021

Balancing the Natural and Built Environment

PSOMAS

TRANSPORTATION IMPACT STUDY
VETERANS MEMORIAL PARK
CARLSBAD, CA

Prepared For

Prepared By

PSOMAS

Psomas Project No. 1RJM010100

September 2021

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

The proposed Veterans Memorial Park is located on 91.5 acres of existing open space in Carlsbad, California. Approximately 43.5 acres of the project site are located within a habitat preserve area. The remaining 48 acres are considered to be developable and will include a variety of publicly-accessible uses. The project is expected to include:

- 2.4 acres of playgrounds
- A 4-acre bike park with spectator seating
- 1.6 acres of formal picnic areas
- 0.8 acres of organized outdoor recreation areas
- 0.7 acres of organized outdoor education
- 5 acres of open turf/meadows

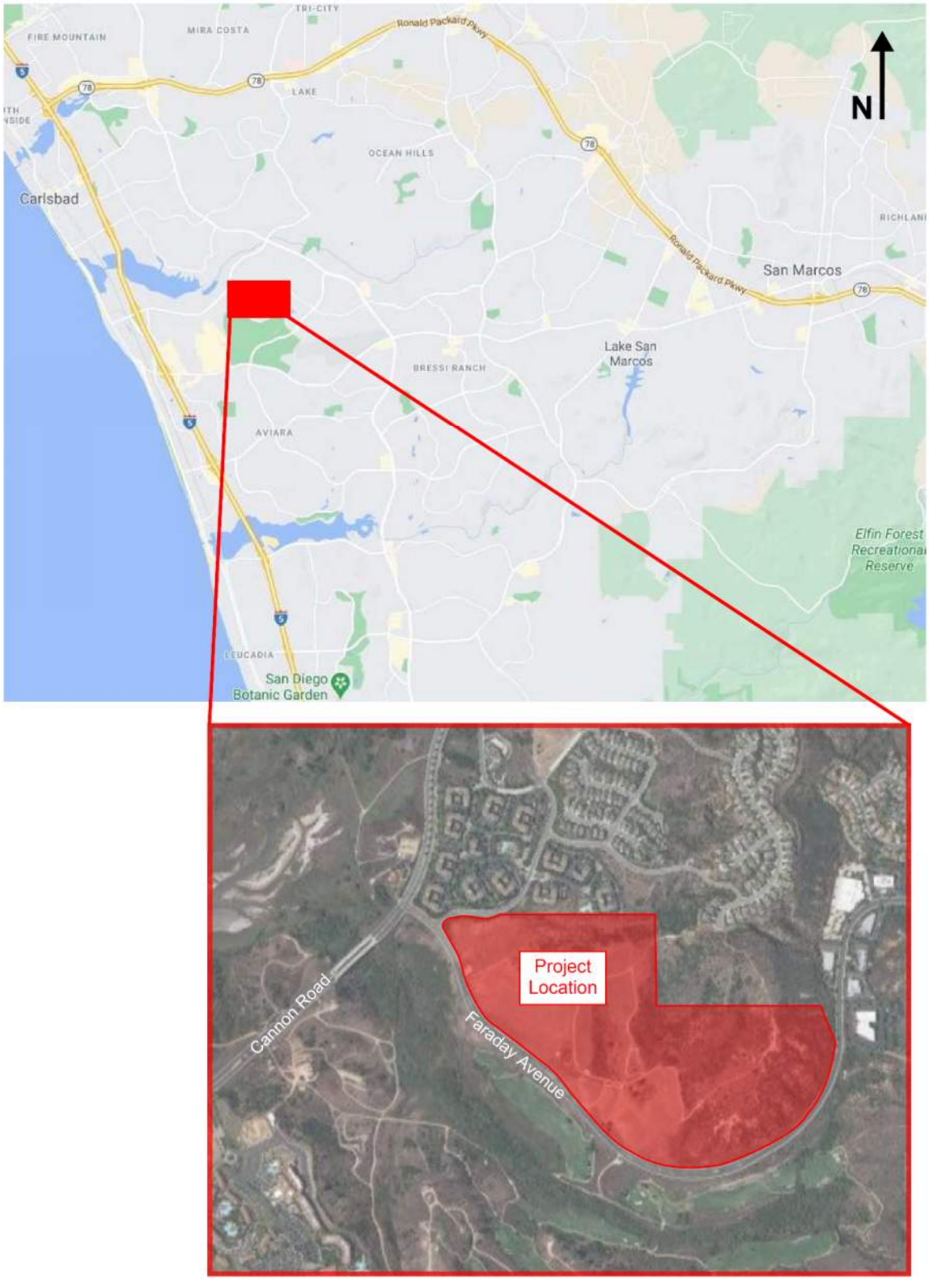
In addition, the park will include an extensive network of multi-use trails, a veteran's memorial plaza and public art feature, a 2,000 square foot building with storage, restrooms, a catering support room, and a shaded pavilion, a second small building (near the southern access) with restrooms and storage, and an outdoor fitness area with an obstacle course and exercise stations. Figure 1 shows the project location and Figure 2 shows the site plan. This study provides an operational analysis of the Project; the CEQA-required Vehicle Miles Traveled analysis is detailed in a separate report.

1.1. STUDY FACILITIES

Per the scoping agreement, included in Appendix A, the study area includes the following:

- Cannon Road and Faraday Avenue
    - Signalized intersection
- Cannon Road, Faraday Avenue to El Camino Real
    - Roadway segment, vehicle and transit LOS only
- Faraday Avenue, Cannon Road to Camino Hills Drive
    - Pedestrian analysis for east side of Faraday Avenue
    - Bicycle analysis for both sides of Faraday Avenue
- Faraday Avenue, Project Access to approximately 0.5 miles south/east
    - Transit only – from project access to nearest bus stops

Figure 1. Site Location



Transportation Impact Study Veterans Memorial Park	*Figure 2.* *Site Plan*	**PSOMAS** September 2021

In addition, this report will provide operational and queuing analysis at the two proposed project access points, as well as a determination of appropriate traffic control. The driveway analysis will also include turn lane warrant analysis.

1.2. ANALYSIS METHODOLOGY

The City of Carlsbad provides various analysis methodologies to evaluate intersections, roadway segments, and multi-modal facilities[1]. The various methodologies are listed below for reference:

- Signalized Intersections
    - Queue and storage analysis
        - Includes a left turn queue assessment and turn lane warrant evaluations
- Unsignalized Intersections
    - Traffic signal warrant analysis for intersections which provide direct access to the project site
        - Considering the available data, the traffic signal warrant analysis will be conducted using the peak hour signal warrant
- Arterial and Local Street Segments
    - Level of Service (LOS) will be determined using the Highway Capacity Manual urban street methodology
        - Level of Service (LOS) is the typical measure used to characterize the quality of traffic operations at an intersection or roadway segment. LOS A represents relatively free operating conditions, whereas LOS F has unstable flow and congestion with volumes at or near the capacity of the facility. Excessive delays and queues can occur when the LOS is not acceptable.
    - Roadway capacities provided in the *City of Carlsbad Roadway Capacity Tables Report*[2] will be used to evaluate the study segments. The capacity at LOS D for Cannon Road between Faraday Avenue and El Camino Real is 1,620 vehicles per hour in the peak direction. The threshold for LOS C is 1,280 vehicles per hour in the peak direction; thresholds for LOS A and LOS B are not provided.

- Pedestrians, Bicycles, and Transit
    - The City-provided multi-modal level of service (MMLOS) will be used and the results will be compared to the MMLOS thresholds in the City guidelines.

The City of Carlsbad Growth Management Program[3] establishes LOS D as the minimum operating condition. For a roadway segment, if the segment is projected to exceed the LOS D standard and the project adds at least one trip to the segment, project mitigation will be required. In addition, if the segment is expected to operate below LOS D without the project and the project will add any trips to that segment, mitigation may be required.

Operational analyses at signalized and unsignalized intersections are evaluated as discussed above. Operations at the two proposed Project driveways were evaluated using the *Highway Capacity Manual (HCM)*[4] methodology in *Synchro*.

Impacts on the pedestrian, bicycle, and transit systems are identified is any facility is currently operating below LOS D and/or if there are any gaps in the pedestrian or bicycle networks in the study area. In addition, if the project causes a facility to become substandard, the project is considered to have an impact. Project impacts on existing deficient facilities are assumed to exist regardless of the number of trips the project is expected to add to the network. Table 1 shows the MMLOS Thresholds.

Table 1. City of Carlsbad MMLOS Thresholds

Point Score	LOS
90-100	A
80-89	B
70-79	C
60-69	D
50-59	E
0-49	F

2. EXISTING STUDY AREA CONDITIONS

2.1. ROADWAY NETWORK

The project study locations include the following:

Cannon Road is four-lane divided roadway classified as an arterial street by the City of Carlsbad[5]. Arterial streets serve as primary vehicle routes through the City for both local and regional trips. There are sidewalks and bike lanes along both sides of the roadway in the project area, but there is no existing transit service along the study segment between Faraday Avenue and El Camino Real. The posted speed limit is 50 mph.

Faraday Avenue is a two-lane roadway in the project area and is classified as an employment/transit connector street by the City of Carlsbad. The primary purpose of employment/transit connector streets is to connect people to and from the employment areas of the City as well as other important destinations and major transit facilities. Portions of the roadway are physically divided with a raised and vegetated median, including the area generally between the two proposed project driveways. There are sidewalks along both sides of the roadway, and the North County Transit District Line 444 operates along the study segment. On the west side of the roadway is a buffered bike lane, which transitions from a standard bike lane approximately 1/8 miles south of Cannon Road. The buffered bike lane carries through the remainder of the study segment to Camino Hills Drive and beyond. On the east side of the roadway, there is a bike lane and on-street parking along the project frontage. The bike lane transitions from a buffered bike lane at Camino Hills Drive to a bike lane with parking approximately ¼ mile north of Camino Hills Drive. The parking ends approximately 450 feet south of Cannon Road. The posted speed limit is 40 mph.

The ***Cannon Road/Faraday Avenue*** intersection is an existing signalized intersection north of the project area. There are two through lanes and a single exclusive left turn lane on both approaches of Cannon Road at the intersection. In addition, the bike lane striping on Cannon Road changes to dashed striping approximately 100 feet before the intersection to allow for right turning vehicles to move out of the through lane.

The south leg of Faraday Avenue includes a single left turn lane and a shared left turn-through-right turn lane. The bike lane striping is also dashed on approach to the intersection, allowing right turning vehicles to move out of the shared lane before making their movement. The north leg has a single approach lane.

2.2. TRAFFIC VOLUMES

Traffic volumes were collected for Cannon Road between Faraday Avenue and El Camino Real and for the intersection of Cannon Road and Faraday Avenue in January 2021. However, due to the ongoing COVID-19 pandemic, the collected data needed to be adjusted to better reflect pre-pandemic (and future post-pandemic) conditions. The City provided 24-hour volume data for Cannon Road from 2019 and intersection turning movement counts for Cannon Road and Faraday Avenue from 2015. The new and historic traffic volume data is provided in Appendix B.

The 2019 Cannon Road volumes were increased using a 0.5% per year growth rate to approximate the 2021 volumes without the pandemic. That volume was used to adjust the 2015 intersection counts; assuming 19% of the total daily traffic occurs in the two peak hours (based on the 24-hour counts), the daily volume on Cannon Road was estimated from the intersection turning movement counts. An adjustment factor was then applied to estimate 2021 intersection volumes without the pandemic.

An adjustment factor for the collected data was developed based on the total peak hour volume entering the intersection for the adjusted historic volumes and the 2021 field data. The adjustment factors were different for the AM and PM peak hours. The resulting estimated 2021 volumes are shown in Figure 3. Note that the adjusted 2021 volumes were used instead of the historic adjusted volumes to ensure that current travel patterns and turning movement splits were best represented.

As seen in the figure, the estimated 2021 volume on Cannon Road is approximately 16,165 vehicles per day, including 1,160 vehicles in the peak hour in the peak direction. At the Cannon Road/Faraday Avenue intersection, the heaviest turning movements are the eastbound right turns (in the AM peak) and the northbound left turns (in the PM peak).

LEGEND	
xx	AM Peak Hour Traffic Volume (veh/hr)
(xx)	PM Peak Hour Traffic Volume (veh/hr)
xx,xxx	Daily Traffic Volume (veh/day)

Transportation Impact Study Veterans Memorial Park	*Figure 3.* *Existing (2021 Adjusted) Traffic Volumes*	PSOMAS September 2021

3. PROJECTED TRAFFIC VOLUMES

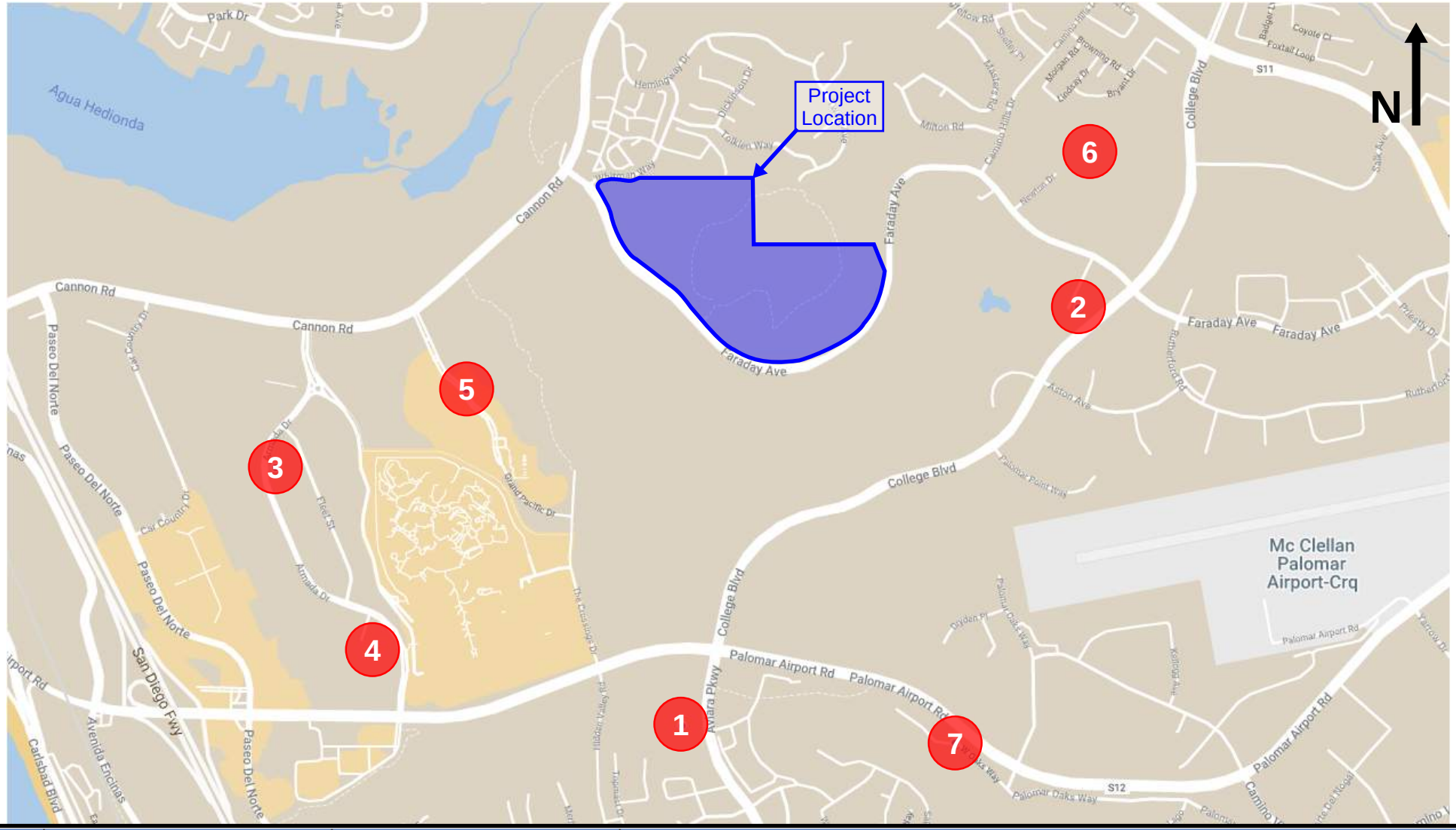
3.1. CUMULATIVE GROWTH AND TRAFFIC VOLUMES

The cumulative traffic volumes are the anticipated traffic volumes in a future year without the project traffic. The anticipated annual growth agreed upon with the City is 0.5% per year.

In addition to the growth rate, the estimated traffic from nearby development projects (cumulative projects) was incorporated. The City of Carlsbad provided a list of projects which are in the permitting process, either in the planning stage or for construction, in the general area of the Project. Psomas further refined the list to include projects within approximately one mile which were expected to add traffic to the study intersections, with two exceptions; two projects which each consist of adding a second dwelling unit on an existing property (i.e. guest house) were excluded because of the minimal trip generation expected from each.

For each cumulative project, the trip generation was estimated using trip generation rates in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*[6]. The cumulative project volumes were added to the grown volumes to provide an estimate of opening year traffic volumes.

The location of each cumulative project is shown in Figure 4. Figure 5 shows the cumulative project volumes, and Figure 6 shows the anticipated traffic volumes for the opening year (2024) without the Project.



ID #	Project Name	Address	Description
1	Aviara Apartments	1205 Aviara Parkway	247 market rate units and 82 affordable units
2	Dr. Winkler	5814 Van Allen Way, # 225	2,538 SF office becoming medical office
3	Drawbridge Realty	5759 Fleet Street, # 100	10,000 SF office becoming fitness center
4	Grand Pacific Palisades Resort	5803 Armada Drive	Hotel - 29 rooms
5	Sheraton Hotel	5410 Grand Pacific Drive	Hotel - 33 rooms
6	Thermo-Newton	5823 Newton Drive	Existing 175,872 sf warehouse - 54,645 sf converted to office, 8,787 sf converted to lecture hall
7	West Oaks	1600-1899 West Oaks Way	150 market rate apartments and 42 affordable units

LEGEND	
xx	AM Peak Hour Traffic Volume (veh/hr)
(xx)	PM Peak Hour Traffic Volume (veh/hr)
xx,xxx	Daily Traffic Volume (veh/day)

Transportation Impact Study Veterans Memorial Park	*Figure 5.* *Cumulative Project Traffic Volumes*	PSOMAS September 2021

LEGEND	
xx	AM Peak Hour Traffic Volume (veh/hr)
(xx)	PM Peak Hour Traffic Volume (veh/hr)
xx,xxx	Daily Traffic Volume (veh/day)

Transportation Impact Study Veterans Memorial Park	*Figure 6.* *2024 Cumulative Traffic Volumes*	PSOMAS September 2021

3.2. PROJECT TRAFFIC VOLUMES

3.2.1. Project Trip Generation

Because the park is expected to consist of both passive and active uses, the trip generation was estimated using multiple sources. Table 2 shows the estimated trip generation for the park when starting from the original peak usage estimation provided by the City. The table provides sources (where available); note that the percentage of people assumed to be arriving at or leaving the park in the peak hour is a conservative assumption. As seen in Table 2, the assumed weekday trip generation for the project based on the peak person usage is 838 trips per day.

Table 2. Project Assumptions

	Weekday	Saturday	Notes
Peak Usage (people)	305	800	Provided/approved by City based on park uses
Average vehicle occupancy	2.1	2.8	Weekday capacity taken from National Household Travel Survey; weekend assumed to be 33% higher
Parked vehicles in peak	145	286	
% inbound during peak hour	50%	50%	From SANDAG
% outbound during peak hour	50%	50%	
% arrive/leave during peak	75%	50%	
Vehicles arrive in peak	54	71	
Vehicles leave in peak	54	71	
Peak Hour Volume (vehicles)	**109**	**143**	
Daily Volume (vehicles)	**838**	**1,099**	Assuming 13% of daily is in peak hour (SANDAG)

Project trip generation was also estimated using the San Diego Association of Governments (SANDAG) trip generation rates[7]. SANDAG includes rates for both city parks (which are assumed to be more developed) and county parks (which are generally less developed and consist of mostly open space and outdoor facilities). Because of the unique uses expected to be included in the proposed park, namely the veteran's memorial aspects and the bike park, the trip generation was estimated using a combination of the two trip generation rates.

Of the total 48 acres, 14.5 acres are assumed to generate trips at the higher city park rate (50 daily trips per acre) and the remaining 33.5 acres are expected to generate trips at the lower county park rate (5 daily trips per acre). The total trip generation for the park using the SANDAG rates is shown in Table 3. As shown, the park is expected to generate 893 daily weekday trips, including 116 in the AM peak hour and 80 in the PM peak hour.

Table 3. Project Trip Generation

SANDAG Land Use	Trip Rate	Acres	Daily Trips	AM Peak			PM Peak		
				Total	In	Out	Total	In	Out
City Park	50 trips/acre	14.5	725	94	47	47	65	33	33
County Park	5 trips/acre	33.5	168	22	11	11	15	8	8
TOTAL (Weekday)			**893**	**116**	**58**	**58**	**80**	**40**	**40**

Lastly, the *Veterans Memorial Park Parking Assessment*[8] provided an estimate of the peak parking demand. The peak demand was determined to be 66 vehicles; therefore, to be conservative, it was assumed for the analyses in this report that the AM peak trip generation would be 132 vehicles (66 inbound and 66 outbound).

3.2.2. Project Trip Distribution

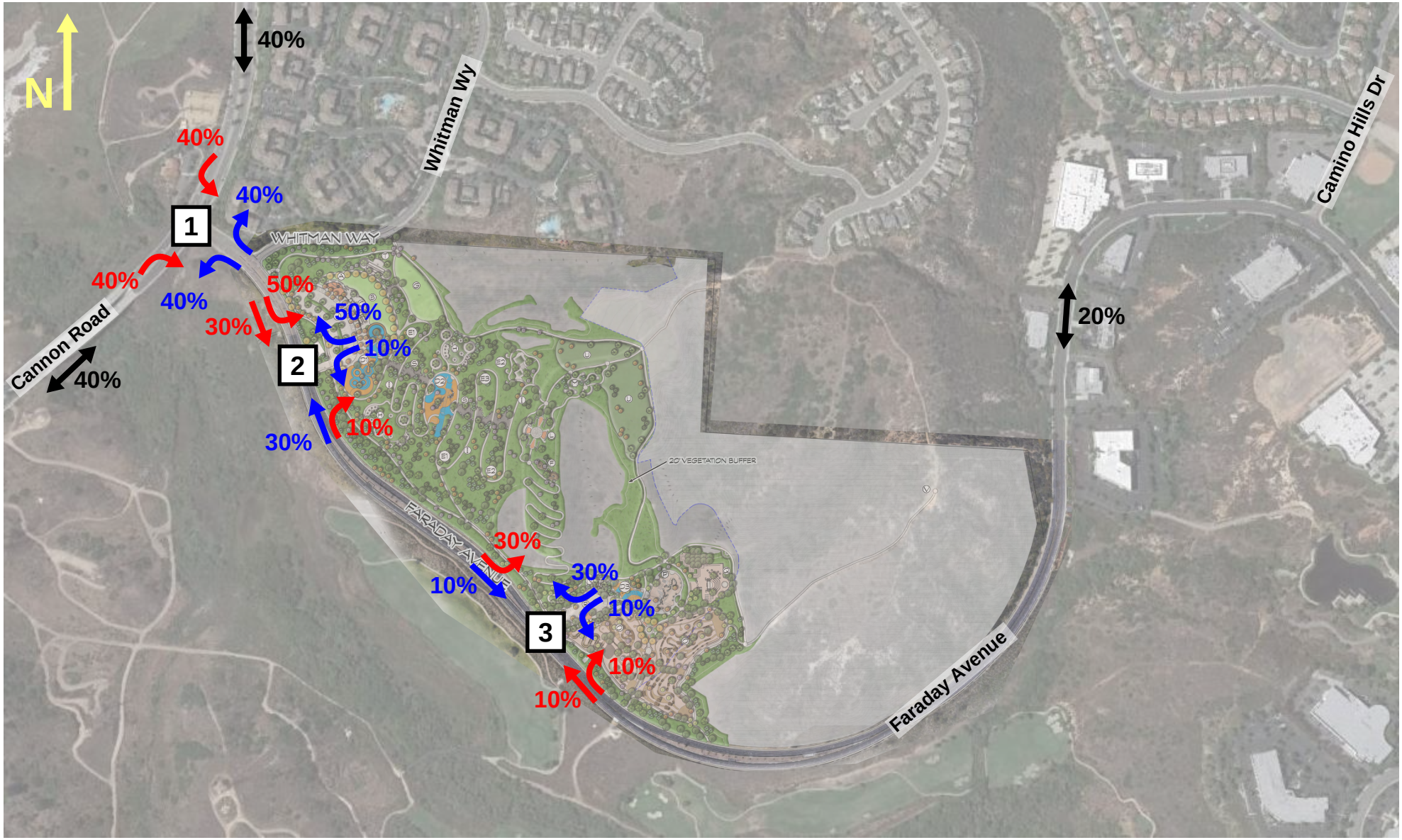
The project trip distribution is shown in Figure 7. The distribution for a larger area is included in Appendix C; the larger area distribution was developed to identify the study locations in this report. As seen in Figure 7, a majority of traffic is expected to travel to/from the north when accessing the park.

3.2.3. Project Traffic Volumes

Using the Project trip generation and trip distribution, the Project traffic volumes were calculated and are shown in Figure 8.

3.3. EXISTING + CUMULATIVE + PROJECT TRAFFIC VOLUMES

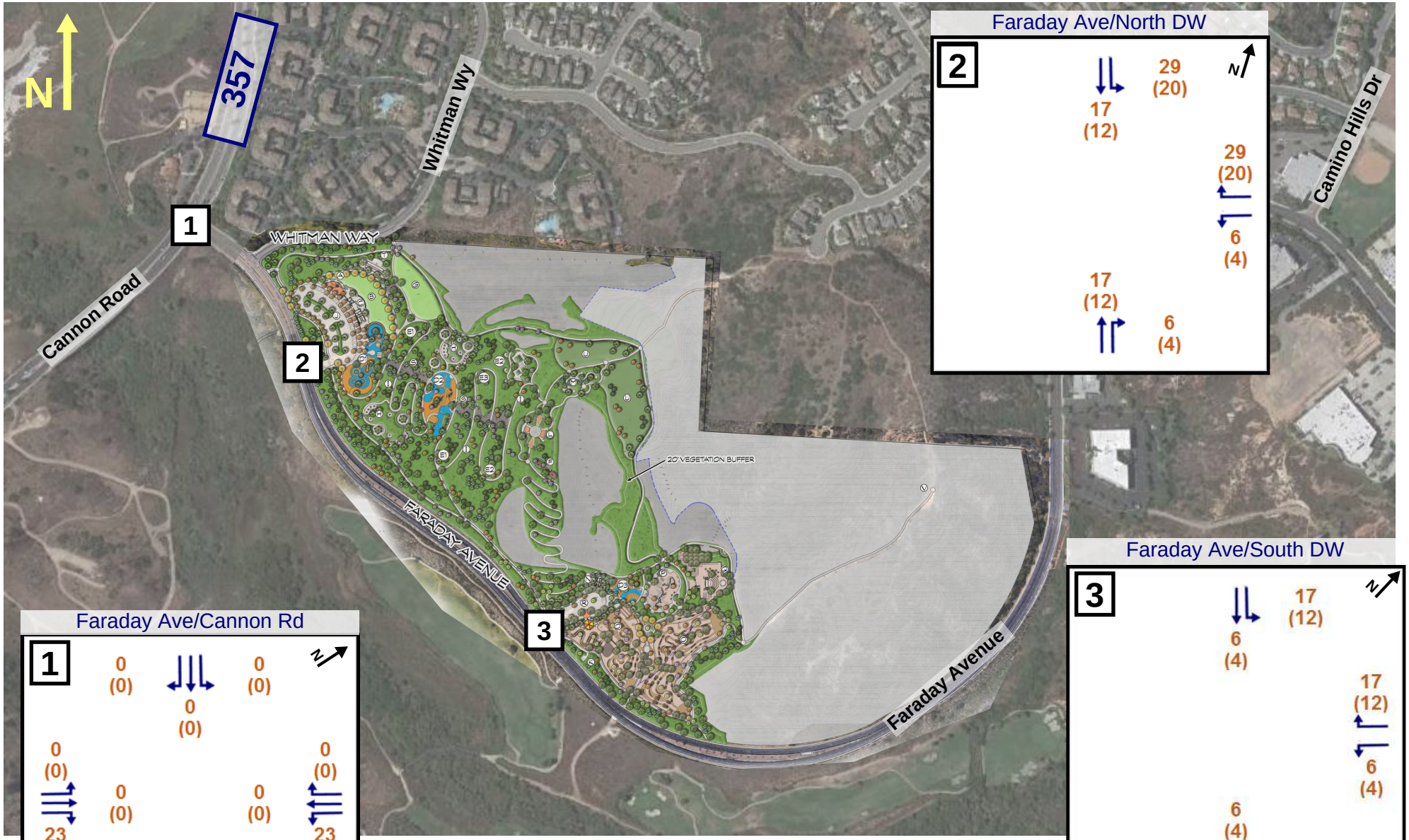
To estimate traffic volumes in a future year, traffic generated by cumulative growth and by the project must be considered. Future volumes with the project were calculated by adding the cumulative growth and project traffic volumes. Figure 9 shows the projected traffic volumes in 2024 considering both cumulative growth and the Project.



LEGEND

xx%	Percentage of Total Project Trips
xx%	Percentage of Inbound Project Trips
xx%	Percentage of Outbound Project Trips

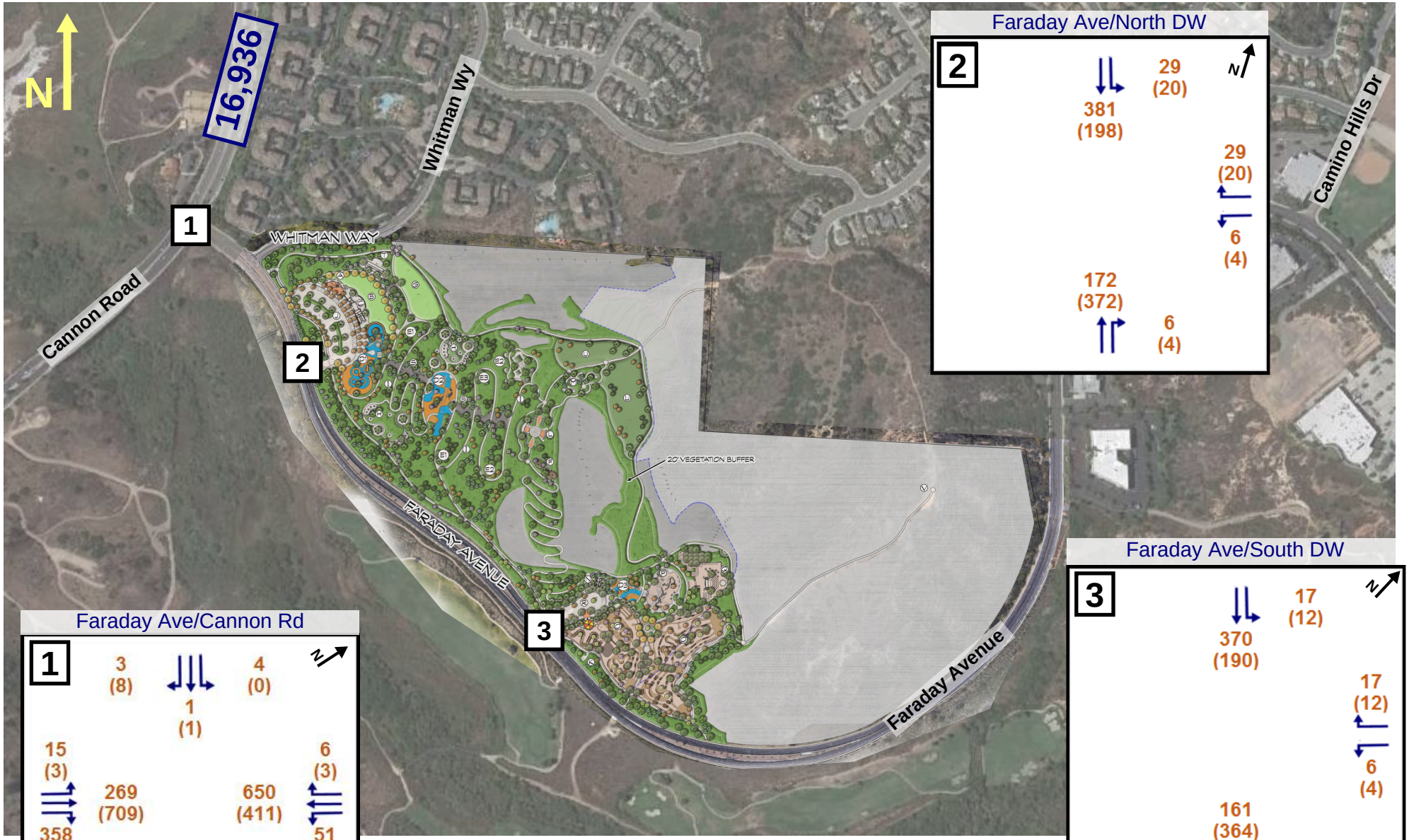
Transportation Impact Study Veterans Memorial Park	*Figure 7.* *Project Trip Distribution*	PSOMAS September 2021



LEGEND

xx	AM Peak Hour Traffic Volume (veh/hr)
(xx)	PM Peak Hour Traffic Volume (veh/hr)
xx,xxx	Daily Traffic Volume (veh/day)

Transportation Impact Study Veterans Memorial Park	*Figure 8.* *Project Traffic Volumes*	PSOMAS September 2021



LEGEND

xx	AM Peak Hour Traffic Volume (veh/hr)
(xx)	PM Peak Hour Traffic Volume (veh/hr)
xx,xxx	Daily Traffic Volume (veh/day)

Transportation Impact Study Veterans Memorial Park	*Figure 9.* *Existing + Cumulative + Project Traffic Volumes (2024)*	PSOMAS September 2021

4. SITE OPERATIONS

4.1. DRIVEWAY TRAFFIC CONTROL

Per City guidelines, signal warrant analyses were conducted the two new intersections providing access to the park. The applicable warrants were evaluated, and the signal warrant worksheets are included in Appendix D. None of the signal warrants are met for either intersection. Therefore, it is recommended that both driveways operate with stop control. Traffic on Faraday Avenue should continue to be uncontrolled at both locations.

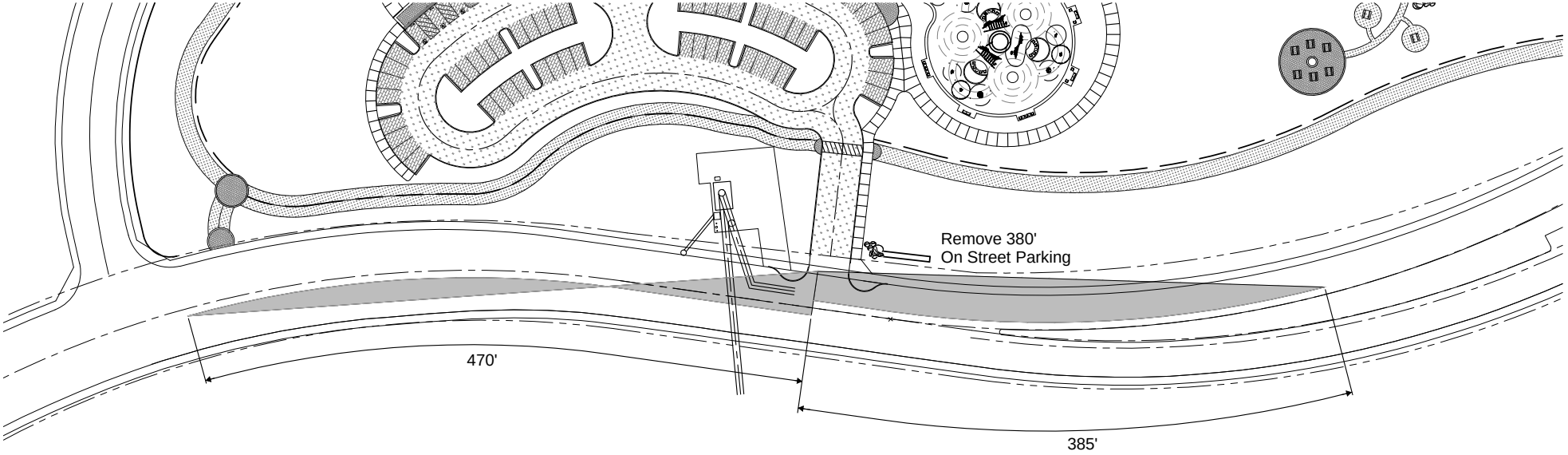
4.2. DRIVEWAY GEOMETRY

A preliminary sight distance evaluation was conducted for each driveway using the requirements in the California *Highway Design Manual*[9] to help determine if left turn movements would be feasible for vehicles exiting the proposed park. Per direction provided by the City, the evaluation was conducted based on the posted speed of 40 mph on Faraday Avenue. In addition, to help reduce the amount of on-street parking that would potentially be eliminated to provide the proper sight distance for each driveway, it was assumed that curb extensions would be constructed to extend each driveway to the edge of the existing on-street parking. Figure 10 shows the sight visibility triangles for the northern and southern parking lot driveways.

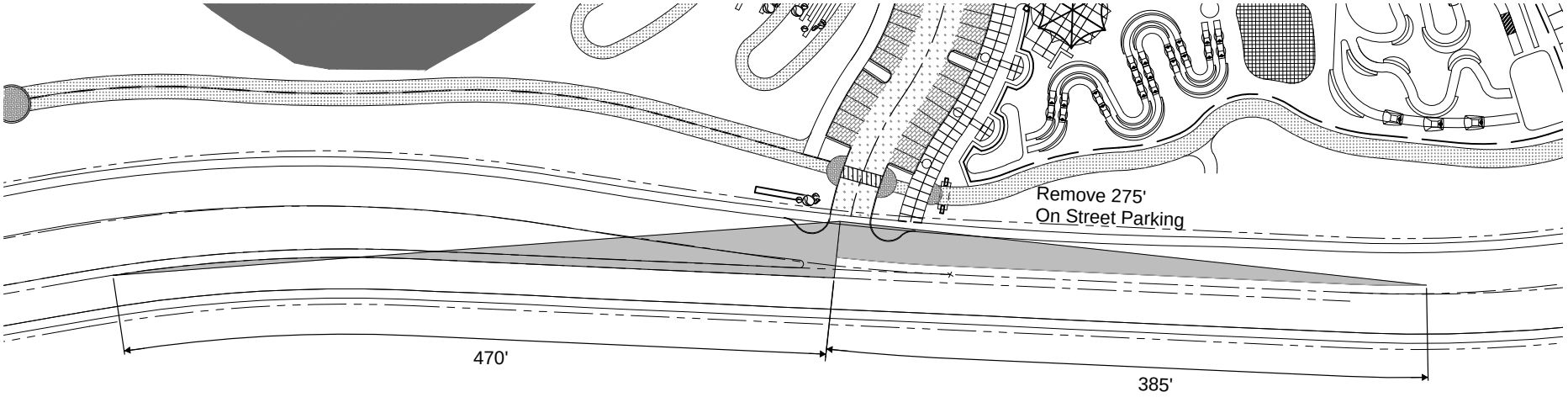
As seen in the figures, some on-street parking will have to be eliminated south of each driveway to provide sufficient sight distance. Note that the curb extensions are schematic only and the amount of on-street parking is an estimate. The sight visibility presented in this report is conceptual and will be reevaluated with the final design of the park driveways and the design of improvements along Faraday Avenue.

Figure 11 is a conceptual design of the north project driveway at Faraday, including proposed left turn access from Faraday Avenue, curb extensions, and a short two-way left turn lane segment south of each driveway. Right turn lanes are not expected to be needed at either driveway due to the existing traffic volume on Faraday Avenue and the anticipated project traffic. The two-way left turn lane segment was recommended by the City to allow drivers exiting the site to make a two-stage left turn onto Faraday Avenue.

North Driveway



South Driveway



Transportation Impact Study Veterans Memorial Park	*Figure 10.* *Sight Visibility Triangles - Proposed Site Driveways*	PSOMAS September 2021

Figure 11. Project Driveway Schematic

The intersection of the south project driveway with Faraday Avenue would be similarly designed, including a short two-way left turn lane extending south of the driveway and curb extensions at the driveway. The striping shown in Figure 11 is consistent with areas further south/east on Faraday Avenue; however, a dedicated left turn could be provided at each driveway instead of two-way left turn lane striping. The driveway location shown is arbitrary and should not be considered to be a proposed driveway location.

4.3. VEHICLE ACCESS

As previously discussed, the proposed project will include two access points for vehicular traffic. Left turn lanes will be provided on Faraday Avenue at both access points, and all movements will be allowed into and out of the site. Each driveway will include a single exiting lane and a single entrance lane. The two parking areas will not be connected internally for vehicular circulation. Based on the assumed park uses, it is assumed that 60% of park traffic will use the northern parking lot and 40% will use the southern parking lot. The projected traffic volumes are shown in the previous section.

To evaluate anticipated operations at both driveways, the two intersections were evaluated per the *Highway Capacity Manual*[10] methodology using *Synchro*. Because the two driveways do not exist, conditions were only evaluated in the opening year (2024) with the project. The *Synchro* models provide both Level of Service (LOS) and queuing for movements, as applicable. The *Synchro* reports are included in Appendix E.

The Level of Service (LOS) for the movements which experience delay at the two Project driveways is shown in Table 4. Because the driveways are expected to operate with stop control and traffic on Faraday Avenue will continue to be free-flowing, through traffic and right turns on Faraday Avenue do not have any defined delay at the driveways. As shown in the table, the driveways and left turns into each driveway are expected to operate with acceptable delays in both peak hours.

In addition to the minimal delays, the *HCM* reports show that the 95th percentile queues (those which are only exceeded 5% of the time) on each driveway and for the left turns from Faraday Avenue at each driveway are expected to be minimal (less than one vehicle). Table 5 shows the queues and volumes for both of the left turn movements at each driveway. Note that the westbound left turn volumes and queues include the westbound right turn movements because each park exit is assumed to include one shared lane.

Because of the relatively low volumes expected to access the Project, and because the delays and queues are expected to be minimal, traffic signals are not expected to be needed at either driveway.

Table 4. Project Driveway Level of Service (LOS) With Project

		North Driveway				*Faraday Avenue*				
		Eastbound			Westbound	Northbound		Southbound		
		LT	TH	RT	LT-RT	LT	TH-RT	LT	TH	RT
AM	LOS				B		A	A	A	
	Delay				10.4			7.7		
PM	LOS				B		A	A	A	
	Delay				11.4			8.2		

		South Driveway				*Faraday Avenue*				
		Eastbound			Westbound	Northbound		Southbound		
		LT	TH	RT	LT-RT	LT	TH-RT	LT	TH	RT
AM	LOS				B		A	A	A	
	Delay				10.4			7.6		
PM	LOS				B		A	A	A	
	Delay				11.4			8.1		

Table 5. 95th Percentile Queues

Intersection	Movement	Peak Hour	Volume	Queue Length (ft)
North Driveway/ Faraday Ave	SBL	AM	33	3
		PM	20	3
	WBL*	AM	40	5
		PM	24	3
South Driveway/ Faraday Ave	SBL	AM	20	0
		PM	12	0
	WBL*	AM	27	3
		PM	16	3

*Includes WBR volume, and queue includes all movements

4.4. MULTI-MODAL ACCESS

As previously discussed, the park project itself will include multiple internal facilities for pedestrians and cyclists, including a system of ADA-compliant access paths which will connect the various areas of the park. Faraday Avenue also includes sidewalks and bike lanes, which will remain in place with the project and will continue to provide pedestrian and bicycle access to the site. Figure 12 shows the City trail system per the *Trails Master Plan*[11] in the project area, including direct multi-use trail connections to the park. The figure also illustrates the non-vehicular (i.e. pedestrian and bicycle) access points to the park. Note that although Whitman Way is not included in the plan, there are sidewalks along both sides of the roadway in the project area.

Transportation Impact Study Veterans Memorial Park	*Figure 12.* *Multimodal Facilities and Park Access*	PSOMAS September 2021

A multi-use trail will be constructed along the perimeter of the park as part of the project, forming a loop around the park itself and providing connectivity to existing off-site trails adjacent to the park. The perimeter multi-use trail also provides multiple access points to the internal pathways. In the northern portion of the park, access to the perimeter multi-use trail will be provided from both Faraday Avenue and Whitman Way. The Whitman Way access will allow cyclists southbound on Faraday Avenue to turn left onto Whitman Way, accessing the park without having to cross Faraday Avenue at a mid-block location. The perimeter trail will then allow cyclists to reach various areas of the park, including the bike park area at the south end of the project. It is assumed that pedestrians from the north would cross Faraday Avenue at the Cannon Road signal, then will travel south along the east side of Faraday Avenue to access the park.

In the southern portion of the park, there will be additional access points to the perimeter multi-use trail from Faraday Avenue. The project will also include a trail connection to the multi-use trail within the existing underpass beneath Faraday Avenue that connects to The Crossings Golf Course multi-use trail. Bicycle parking will be provided throughout the site.

Lastly, although the park as designed will provide access for pedestrians and cyclists from all directions, additional improvements may be included with the CIP for the Faraday Avenue Improvement project. The improvements may include traffic calming features to slow traffic on Faraday Avenue which would be one way to improve safety for pedestrians and/or cyclists who may wish to cross the roadway.

The existing North County Transit District (NCTD) Route 444 along Faraday Avenue will not be affected by the project. The existing bus stop on the east side of Faraday Avenue, immediately adjacent to the project site, will be improved with the project, including construction of a 5-foot wide level concrete pad for passenger boarding and alighting.

4.5. PARKING

Two separate parking areas will be provided within the park. At the northern park access, the parking lot will consist of 68 total parking spaces, including 12 ADA spaces, 8 EV charging stations, and a drop-off area. At the southern park access, the parking lot will consist of 37 total parking spaces, including 2 ADA spaces, 4 EV charging stations, and a drop-off area. On-street parking will remain on Faraday Avenue along the project frontage. Per the *Veterans Memorial Park Parking Assessment*, the 105 onsite parking spaces and approximately 100 street parking spaces are expected to be sufficient to serve the needs of the park (approximately 66 peak hour vehicles).

On weekends or during special events, it is possible that both parking areas will be full, and visitors will have to park in the existing on-street parking areas. However, both parking lots will include drop-off areas, which may also reduce overall parking needs.

Lastly, based on Carlsbad Municipal Code Section 18.21.150 California Green Building Standards Code Chapter 5, six of the EV charging stations will need to be installed with the project and six additional spaces need to be EV-ready.

5. STUDY AREA OPERATIONAL ANALYSIS

5.1. VEHICLE OPERATIONS

5.1.1. Intersection Operations

The existing signalized intersection of Cannon Road and Faraday Avenue was evaluated based on the City guidelines. The intersection currently includes left turn lanes in both directions on Cannon Road. In addition, northbound traffic on Faraday Avenue is served by a single left turn lane and a shared left turn-through-right turn lane. Table 6 shows the turning volumes at the intersection, the City thresholds, and the 95th percentile queues.

Table 6. Turn Lane Evaluation – Cannon Road/Faraday Avenue

Movement	Volume (veh per hr)*	Threshold (veh per hr)	95th %ile Queue (ft)**	Existing Storage (ft)
EBL (Cannon Rd)	15	250 (dual LT lanes)	23	175
EBR (Cannon Rd)	358	150	N/A	N/A
WBL (Cannon Rd)	51	250 (dual LT lanes)	54	240
WBR (Cannon Rd)	6	150	N/A	N/A
NBL (Faraday Ave)	352	250 (dual LT lanes)	162	120***
NBR (Faraday Ave)	40	150	N/A	N/A
SBL (Faraday Ave)	4	250 (dual LT lanes)	N/A	N/A
SBR (Faraday Ave)	8	150	N/A	N/A

*Largest peak hour volume shown for 2024 + Project conditions
**From Synchro, left turn movements only
***Existing single exclusive lane and shared lane

As shown in the table, dual northbound left turn lanes should be provided on Faraday Avenue. Both northbound lanes allow left turn movements and the northbound through and right turn movements are minimal, so the existing geometry is considered to be acceptable. The left turn lane storage is limited by the existing southbound left turn lane at Whitman Way.

The northbound buffered bike lane striping changes to a dashed stripe approximately 100 feet west of the intersection, allowing right turn vehicles to move out of the through lane before turning onto Faraday Avenue, which is an acceptable condition.

In addition, an eastbound right turn lane should be provided based on the City threshold. However, as with the bike lane on Faraday Avenue, the eastbound buffered bike lane striping changes to a dashed stripe approximately 100 feet before the intersection, proving a de-factor right turn lane. This is considered to be an acceptable condition.

Conditions in 2024 with and without the Project are expected to be similar to existing conditions; no additional turn lanes are expected to be warranted.

5.1.2. Roadway Operations

Recall that the evaluation of operations on Cannon Road between Faraday Avenue and El Camino Real is based on the LOS thresholds established by the City in terms of vehicles per hour in the peak direction. Table 7 shows the existing, 2024 without project, and 2024 with project volumes on the study segment of Cannon Road for the AM and PM peak hours. The City LOS thresholds are also included for reference.

Table 7. Cannon Road Peak Hour Volumes

Cannon Rd, Faraday Ave to El Camino Real	Direction of Travel	2021 Est.	2024	Project	2024 + Project	LOS C Threshold	LOS D Threshold	LOS
AM Peak Hour (veh)	WB	1,112	1,129	23	1,152	1,280	1,620	C
PM Peak Hour (veh)	EB	1,160	1,177	16	1,193	1,280	1,620	C

The volumes shown in the table indicate that the roadway is operating at LOS C in all scenarios. Therefore, the roadway is considered to be operating acceptably and no improvements are required with the project.

5.2. BICYCLE OPERATIONS

Per City guidelines, the bicycle level of service was calculated for both sides of Faraday Avenue in the project area for each of the following scenarios:

- Existing Conditions
- Existing + Project Conditions
- Cumulative Conditions (2024)
- Cumulative + Project Conditions (2024)

The multimodal LOS (MMLOS) was calculated using the spreadsheets provided by the City, which are included in Appendix F. Table 8 shows the results; as seen in the table, the bicycle LOS is B in the northbound direction and A in the southbound direction for all scenarios. Therefore, no improvements are required.

Table 8. Bicycle Level of Service – Faraday Ave, Cannon Rd to Camino Hills Dr

Scenario	NB		SB	
	Score	LOS	Score	LOS
Existing	80	B	90	A
Existing + Project	80	B	90	A
Cumulative Conditions	80	B	90	A
Cumulative + Project	80	B	90	A

5.3. PEDESTRIAN OPERATIONS

As for bicycle operations, the pedestrian LOS was evaluated using the City MMLOS methodology. Per the guidelines, the pedestrian LOS was only evaluated for the east side of Faraday Avenue in the project area. Table 9 shows the results, and the MMLOS calculations are included in Appendix F.

Table 9. Pedestrian Level of Service – Faraday Ave, Cannon Rd to Camino Hills Dr

Scenario	East Side	
	Score	LOS
Existing	85	B
Existing + Project	85	B
Cumulative Conditions	85	B
Cumulative + Project	85	B

As seen in the table, the pedestrian LOS on the east side of Faraday Avenue will be B under all four scenarios. Therefore, no improvements are required.

5.4. TRANSIT OPERATIONS

Per the scoping agreement, transit operations were to be evaluated for Cannon Road between Faraday Avenue and El Camino Real and for Faraday Avenue from the South Driveway of the Project to the nearest bus stops to the south/east. However, there are no existing bus routes along Cannon Road between Faraday Avenue and El Camino Real, so that segment could not be evaluated.

The study segment of Faraday Avenue was evaluated using the MMLOS spreadsheets, which are included in Appendix F. Because the transit stops both north and south of the Project only include lighting and none of the other listed amenities, the transit in both directions is automatically assumed to be operating at LOS F, as shown in Table 10.

The Project will include the addition of a concrete pad and a bench at the bus stop north of the site on the east side of the roadway. The addition of the bench will improve the transit operations to LOS A for that stop.

The LOS would remain unchanged with the Project at all the other three bus stops. Because the transit facilities are currently operating at LOS F, there is assumed to be a significant impact on the transit system. Therefore, to mitigate the impact, benches should be added at each of the other three bus stops. With the addition of the benches, the transit LOS will improve to A for all stops in the Project area, also shown in Table 10.

Table 10. Transit Level of Service – Faraday Ave, Cannon Rd to Camino Hills Dr

Scenario	Transit Stop	Existing Stop Conditions		Improved Stop Conditions*	
		Score	LOS	Score	LOS
Existing	Faraday/Whitman (NB)	0	F	100	A
	Faraday/Cannon (SB)	0	F	100	A
	Faraday/1530 (NB)	0	F	100	A
	Faraday/1525 (SB)	0	F	100	A
Existing + Project	Faraday/Whitman (NB)	0	F	100	A
	Faraday/Cannon (SB)	0	F	100	A
	Faraday/1530 (NB)	0	F	100	A
	Faraday/1525 (SB)	0	F	100	A
Cumulative Conditions	Faraday/Whitman (NB)	0	F	100	A
	Faraday/Cannon (SB)	0	F	100	A
	Faraday/1530 (NB)	0	F	100	A
	Faraday/1525 (SB)	0	F	100	A
Cumulative + Project	Faraday/Whitman (NB)	0	F	100	A
	Faraday/Cannon (SB)	0	F	100	A
	Faraday/1530 (NB)	0	F	100	A
	Faraday/1525 (SB)	0	F	100	A

*This includes the addition of a bench with the Project at the Faraday/Whitman (NB) stop and addition of benches at the other three stops as a mitigation measure.

6. SUMMARY

This traffic study provided an evaluation of the proposed Veterans Memorial Park, which will include development of 48 acres of a 91.5-acre site; the remaining 43.5 acres are located within a habitat preserve area. The project is expected to include a bike park, playground areas, formal picnic areas, outdoor recreation areas, organized outdoor education, two buildings with storage and restroom facilities, a veteran's memorial plaza, and various trails and open areas. The project is expected to generate 893 weekday daily trips, including 132 peak hour trips.

6.1. LEVEL OF SERVICE FINDINGS

The Level of Service for vehicle, pedestrian, bicycle, and transit facilities was evaluated in the study area consistent with City guidelines. The analyses show that vehicle, pedestrian, and bicycle facilities currently operate at an acceptable LOS and will continue to do so in the future with or without the project. Access for pedestrians and cyclists will be provided throughout the park from Faraday Avenue, Whitman Way, and existing recreational trails, including access to The Crossings Golf Course via the existing tunnel crossing. It is expected that pedestrians traveling to/from the north will cross to the east side of Faraday Avenue at the Cannon Road signal. Cyclists will be able to turn onto Whitman Way to access the park perimeter loop, and additional crossings of Faraday Avenue may be included with the City CIP improvements.

Transit on Faraday Avenue is currently operating at LOS F because of the limited amenities at the existing bus stops. The Project will include addition of a concrete pad and a bench at the bus stop just north of the Project near Whitman Way. To mitigate the impacts on the transit network, benches should be added at each of the other tree bus stops in the area as well. The LOS will be acceptable with the addition of the benches.

In addition to the study area, anticipated operations at the Project driveways were evaluated. Both proposed driveways are expected to operate with acceptable delays and minimal queues in both peak hours. Some on-street parking will need to be prohibited to provide sufficient sight distance, but in doing so, left turn movements will be allowed both into and out of the Project at both driveways.

6.2. MOBILITY ELEMENT POLICY 3-P.11

The project will generate fewer than the City threshold of 110 daily employee trips[12] for requiring a Transportation Demand Management Plan. However, additional guidance in Mobility Element Policy 3.P-11 indicates that a TDM plan shall be developed for the Project.

Per Mobility Element Policy 3.P-11, Cannon Road between Avenida Encinas and Paseo del Norte has been identified through City CMP monitoring as failing to meet LOS standards for vehicles. This roadway segment was exempted from vehicular level of service standards by City Council on January 12, 2021. Based on the City requirements, if the project adds 110 daily trips or 11 peak hour trips to the segment, the project is subject to implementing TSM and TDM strategies per Mobility Element Policy 3-P.11.

Although the segment of Cannon Road in question is not included in the LOS analysis, the trip distribution in the scoping agreement indicates that the Project will add more than 110 daily trips and more than 11 trips in the peak hour. Therefore, the Project will implement TSM and TDM strategies as required by the Mobility Element Policy 3-P.11.

The Project will implement TSM measures to the satisfaction of the City Traffic Engineer. In order to meet the requirements of the Mobility Element policy, the Project will fund the installation of one traffic signal controller.

To meet TDM requirements associated with Mobility Element Policy 3-P.11, the Project will prepare the equivalent of a Tier 1 TDM Plan to the satisfaction of the City Engineer.

7. REFERENCES

[1] *City of Carlsbad Transportation Impact Analysis Guidelines.* City of Carlsbad, April 2018.

[2] *City of Carlsbad Roadway Capacity Tables Report.* City of Carlsbad, February 2019.

[3] *Citywide Facilities and Improvements Plan.* City of Carlsbad, August 22, 2017.

[4] *Highway Capacity Manual, 6th Edition*. Transportation Research Board, October 2016.

[5] *Carlsbad General Plan, Mobility Element.* City of Carlsbad, September 2015.

[6] *Trip Generation, 10th Edition*. Institute of Transportation Engineers (ITE). Washington, D.C., 2017.

[7] *Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region.* San Diego Association of Governments (SANDAG), April 2002.

[8] *Veterans Memorial Park Parking Assessment.* Fehr & Peers, June 23, 2021.

[9] *Highway Design Manual.* California Department of Transportation, 2020.

[10] *Highway Capacity Manual, 6th Edition*. Transportation Research Board, October 2016.

[11] *Trails Master Plan.* City of Carlsbad, August 27, 2019.

[12] *City of Carlsbad Transportation Demand Management. https://www.carlsbadca.gov/departments/environmental-management/transportation-demand-management, accessed July 2021.*

Appendix A – Scoping Agreement

ATTACHMENT A

SCOPING AGREEMENT FOR TRANSPORTATION IMPACT STUDY

This letter acknowledges the City of Carlsbad Traffic Engineering Division requirements for the transportation impact analysis of the following project. The analysis must follow the latest City of Carlsbad Transportaion Impact Study Guidelines dated September 2017.

Case No. _____

Project Name: Carlsbad Veterans Memorial Park

Project Location: Faraday Avenue

Project Description: Traffic Impact Analysis - Level V

Related Cases -

SP No. _____

EIR No. _____

GPA No. _____

CZ No. _____

	Consultant	Developer
Name:	Darlene Yellowhair, Psomas	Eric Chastain, RJM Design Group
Address:	333 E. Wetmore Road, Ste. 450	31591 Camino Capistrano
	Tucson, AZ 85705	San Juan Capistrano, CA 92675
Telephone:	520-690-7878	949-493-2600

A. Trip Generation Source: SANDAG (support is provided in the form of estimated trips based on assumed park usage, also included as an attachment)

Extended Land Use: Open Space/Trails — Proposed Land Use: Park

Extended Zoning: Open Space — Proposed Zoning: Open Space

Total Daily Trips: N/A (minimal) — Forcast Daily Trips: 893 weekday, 1,099 weekend

(Attach a trip generation table. Describe Trip Reduction Factors proposed and included in the trip generation table.) Trip generation table is attached

B. Trip Distribution: ☐ Select Zone (Model Series ____)
(Provide exhibit for detailed trip distribution and assignment.)

The attached trip distribution figure shows original estimates and updated recommendations based on the SANDAG model results.

C. Background Traffic

Phased Project ☒ No ☐ Yes Phases: _____

Please contact the Engineering Devision or use the most recently provided data

Model/Forcast Methodology: Cumulative conditions analysis will be completed based on other approved and reasonably foreseeable pending projects identified by the City - see attached list. The City will provide copies of the TIAs for the "other" projects if available. If no data is available, an ambient growth factor of 0.5% per year (based on SANDAG projections) will be used. LOS analysis year will be 2024.

The City will provide available traffic data for existing conditions analysis. Other necessary unavailable data will be collected; adjustments may be required due to Covid-19 conditions.

D. Study Intersections: (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments)

1. Cannon Rd/Faraday Ave
2. North Project Driveway/Faraday Ave
3. South Project Driveway/Faraday Ave
4.
5.
6.
7.
8.

E. Study Roadway Segments: (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments)

1. Cannon Rd, Faraday Ave to El Camino Real
2.
3.
4.
5. Faraday Ave, Cannon Road to Camino Hills Drive (pedestrian and bicycle only - transit to be evaluated approximately 0.5 miles from the project access south/east to nearest bus stops)
6.
7.
8.

Segment 1 includes vehicles and transit only. Pedestrian facilities to be evaluated for east side of Faraday Avenue. Bicycle and transit facilities will be evaluated for both sides of the roadways as applicable per the City TIA guidelines.

F. Other Jurisdictional Impacts

Is this project within any other Agency's Sphere of Influence or one-mile radius of boundaries? ☐ Yes ☒ No

If so, name of Jurisdiction:

The project will be required to comply with Mobility Element Policy 3-P.11, which will apply to Cannon Road (El Camino Road to College Boulevard) and El Camino Real (Cannon Road to College Boulevard).

G. Site Plan (Attach a legible 11'X17' copy) Attached

H. Specific issues to be adressed in the Study (in addition to the standard analysis described in the Guidelines) (To be filled out by Engineering Devision)

Operational analysis (including queuing) at the two project driveways and identification of potential sight distance issues.

No Caltrans facilities meet the City requirements for review; therefore, no coordination with Caltrans will be required.

Recommended by:

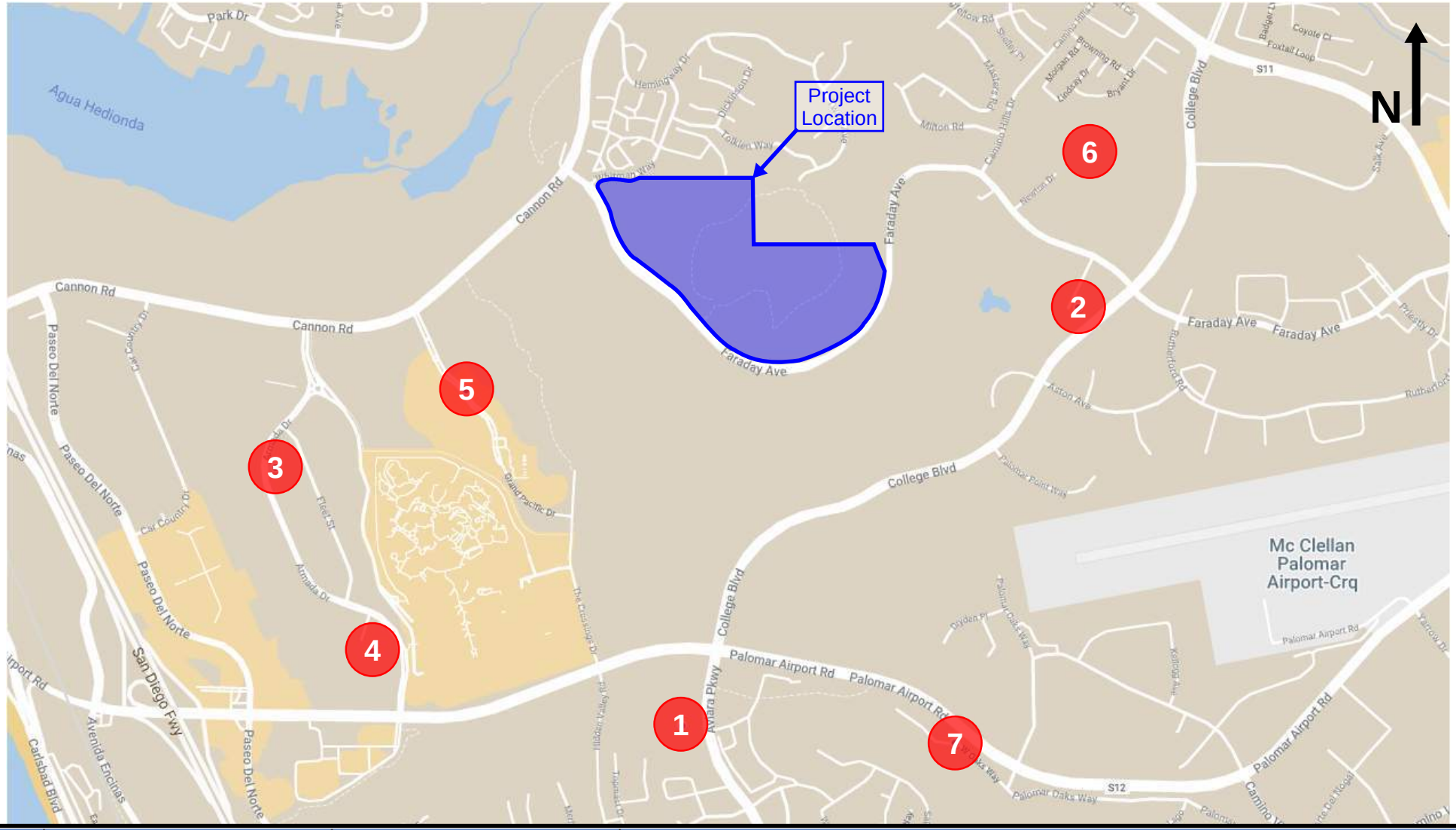
Consultant's Representative — Date: 6-7-2021

Scoping Agreement Submitted on — Date:

Scoping Agreement Resubmitted on — Date:

Approved Scoping Agreement:

City of Carlsbad
Traffic Engineering Division — Date: 6.8.21



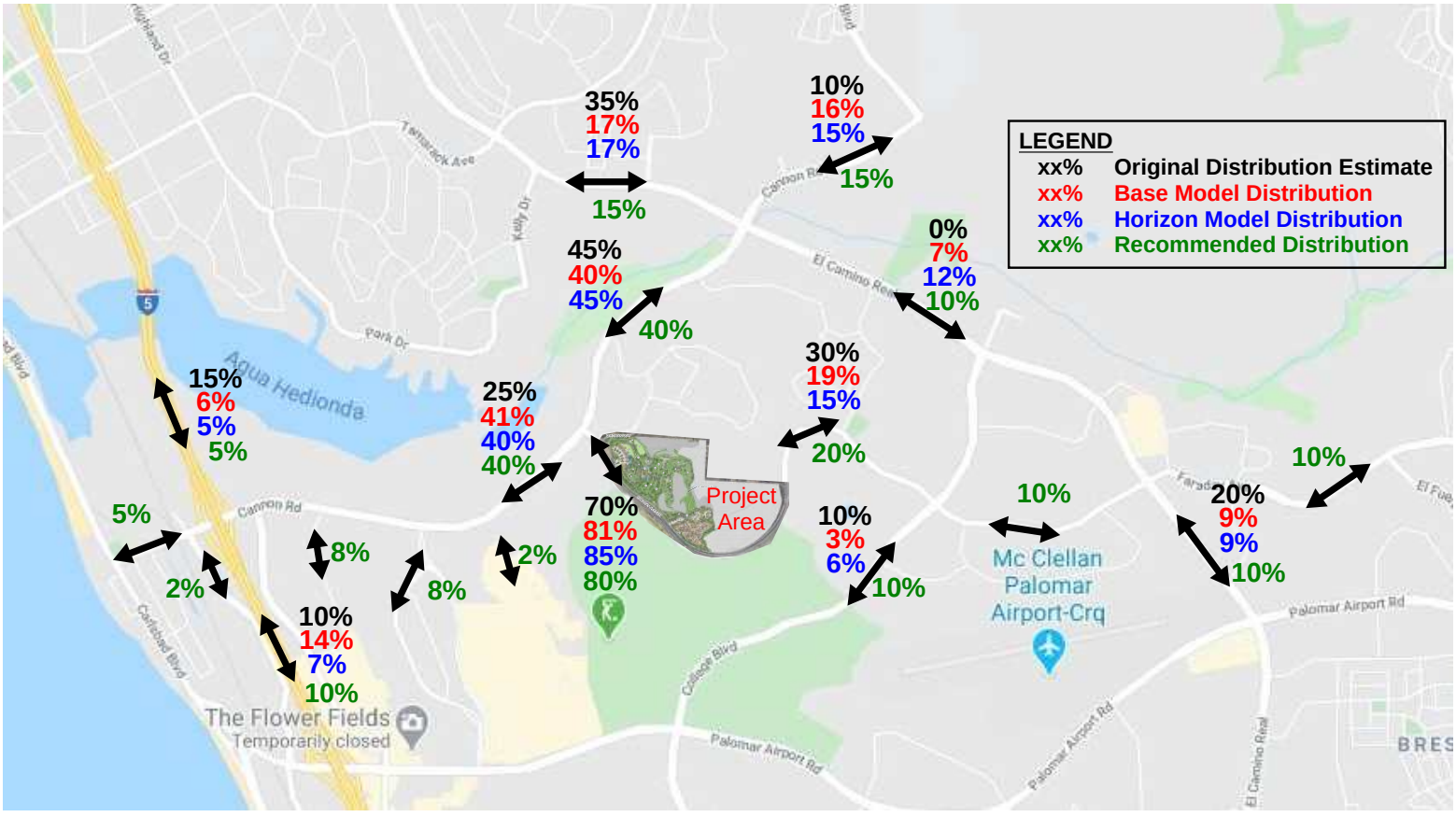
ID #	Project Name	Address	Description
1	Aviara Apartments	1205 Aviara Parkway	247 market rate units and 82 affordable units
2	Dr. Winkler	5814 Van Allen Way, # 225	2,538 SF office becoming medical office
3	Drawbridge Realty	5759 Fleet Street, # 100	10,000 SF office becoming fitness center
4	Grand Pacific Palisades Resort	5803 Armada Drive	Hotel - 29 rooms
5	Sheraton Hotel	5410 Grand Pacific Drive	Hotel - 33 rooms
6	Thermo-Newton	5823 Newton Drive	Existing 175,872 sf warehouse - 54,645 sf converted to office, 8,787 sf converted to lecture hall
7	West Oaks	1600-1899 West Oaks Way	150 market rate apartments and 42 affordable units

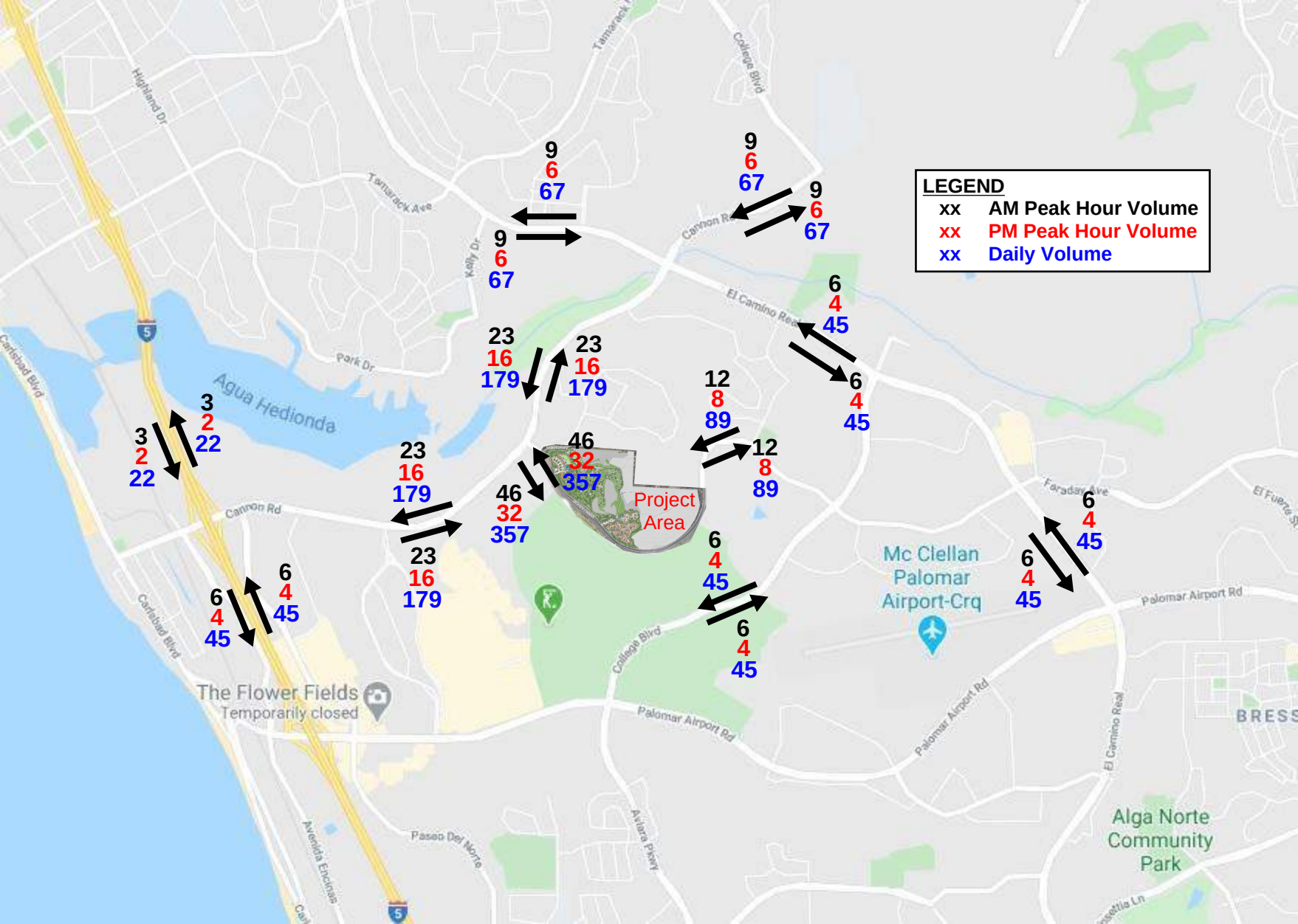
Trip Generation - SANDAG rates will be used for the study

SANDAG Land Use	Trip Rate	Acres	Daily Trips	AM Peak			PM Peak		
				Total	In	Out	Total	In	Out
City Park	50 trips/acre	14.5	725	94	47	47	65	33	33
County Park	5 trips/acre	33.5	168	22	11	11	15	8	8
TOTAL (Weekday)			**893**	**116**	**58**	**58**	**80**	**40**	**40**

For reference only	Weekday	Saturday	Notes
Peak Usage (people)	305	800	Provided/approved by City based on park uses
Average vehicle occupancy	2.1	2.8	Weekday capacity taken from National Household Travel Survey; weekend assumed to be 33% higher
Parked vehicles in peak	145	286	
% inbound during peak hour	50%	50%	From SANDAG
% outbound during peak hour	50%	50%	
% arrive/leave during peak	75%	50%	
Veh arrive in peak	54	71	
Veh leave in peak	54	71	
Peak Hour Volume (vehicles)	**109**	**143**	
Daily Volume (vehicles)	**838**	**1,099**	Assuming 13% of daily is in peak hour (SANDAG)

Trip Distribution




LEGEND
xx AM Peak Hour Volume
xx PM Peak Hour Volume
xx Daily Volume
Project Area
Agua Hedionda
Cannon Rd
Park Dr
Tamarack Ave
Kelly Dr
College Blvd
El Camino Real
Carlsbad Blvd
Palomar Airport Rd
Faraday Ave
Mc Clellan Palomar Airport-Crq
The Flower Fields
Temporarily closed
Paseo Del Norte
Aviara Pkwy
Avenida Encinas
Alga Norte Community Park
9 6 67
23 16 179
12 8 89
46 32 357
6 4 45
3 2 22

ATTACHMENT E

PARK AREAS LEGEND

- A. VETERANS MEMORIAL PLAZA
- B. COMMUNITY GATHERING AREA
- C. BUILDING (2,000sf) with PAVILION, RESTROOM, & CATERING SUPPORT ROOM
- D. PLAY AREAS
  - D1. INCLUSIVE PLAYGROUND
  - D2. RUSTIC, NATURE-INSPIRED PLAYGROUND
  - D3. YOUNG KIDS PLAYGROUND
- E. VISTA TERRACES
  - E1. SENSORY GARDENS
  - E2. YOGA & PASSIVE RELAXATION AREAS
  - E3. MEDITATION & REFLECTIVE AREAS
- F. NATIVE GARDENS
- G. OPEN LAWN
- H. PICNIC AREAS
- I. ACTIVITY WALK / TRAIL
- J. NORTH PARKING AREA (64 [12 ADA] STALLS)
- K. WATER QUALITY TREATMENT AREAS
- L. REFLECTIVE VETERANS MEMORIAL
- M. INTERPRETIVE GARDEN
- N. RESTROOM (1,200sf)
- O. FAMILY-ORIENTED BIKE PARK
- P. MULTI-GENERATIONAL OUTDOOR FITNESS AREA
- Q. OUTDOOR EDUCATION AREA
- R. SOUTH PARKING AREA (39 [2 ADA] STALLS)
- S. ROCKY STAIR CLIMB
- T. BOCCE BALL
- U. MEADOWS
- V. OVERLOOK

RJM DESIGN GROUP

06/30/2020

0 50' 100' 200'

SITE PLAN

VETERANS MEMORIAL PARK

CITY OF CARLSBAD, CALIFORNIA

SANDAG
Series 13 2014
Revenue Constrained
Version 13.4

City of Carlsbad
Veteran Memorial Park

Base Year 2014
plus Veteran Memorial Park
Scenario ID 1280

Average Daily Traffic

Functional Classifications:

- Freeway
- Prime
- Major
- Collector
- Local Collector
- Rural Collector
- Local Road
- Freeway Ramp
- Local Ramp
- Zone Connectors

Average Daily Traffic

\# 24-Hour Total Flow (ADT)

\# Select Zone Volume

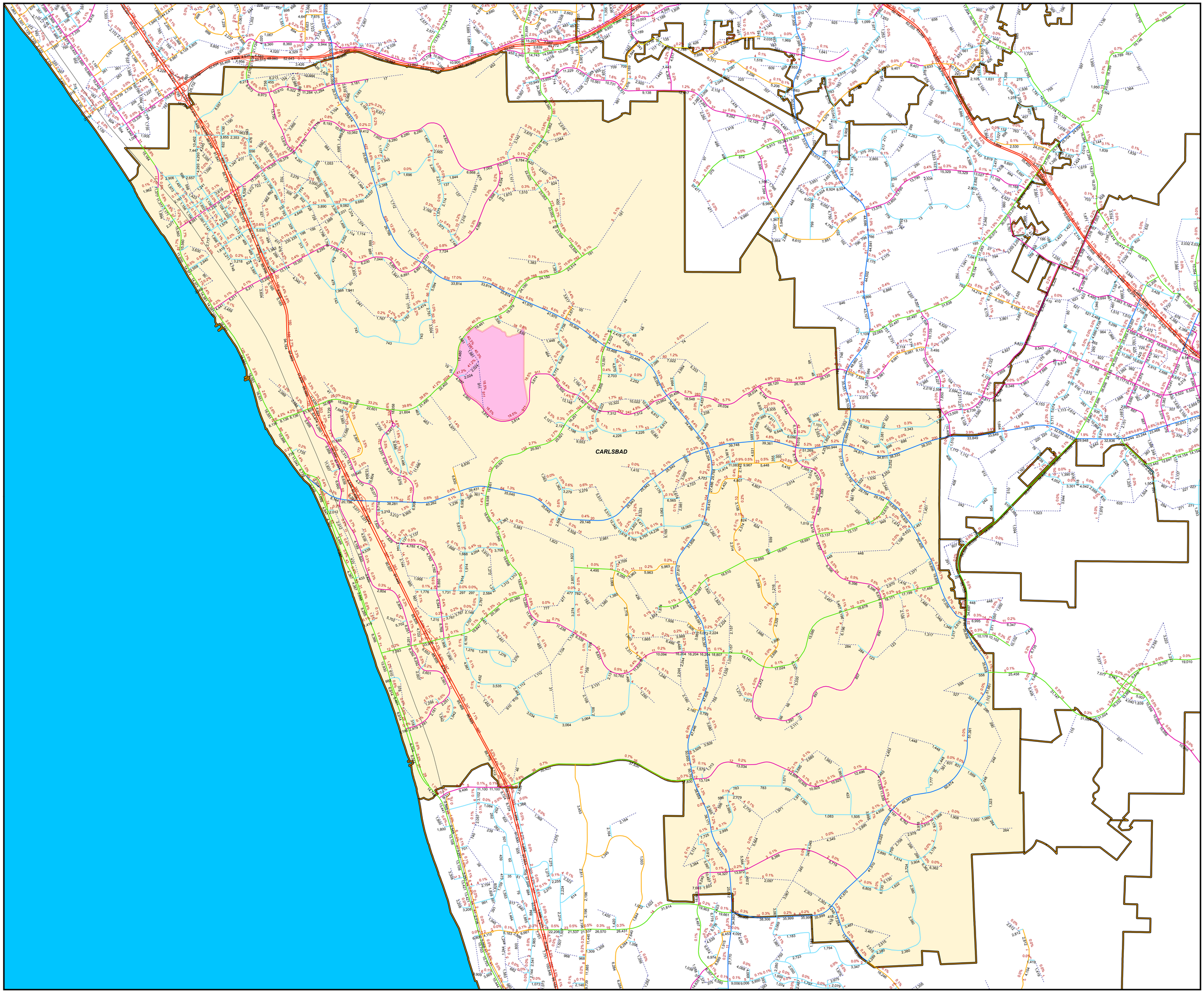
% Select Zone Percentage

SAN DIEGO ASSOCIATION OF GOVERNMENTS
401 B STREET, SUITE 800
SAN DIEGO, CALIFORNIA 92101 USA
(619) 699-1900
E-mail: sandag@sandag.org
Web site: www.sandag.org

0 0.25 0.5 0.75
Miles

servicebureau
SANDAG

2/9/2021



SANDAG
Series 13 2035
Revenue Constrained
Version 13.4

City of Carlsbad
Veteran Memorial Park

CB General Plan Update plus Veteran Memorial Park Scenario ID 1272

Average Daily Traffic

Functional Classifications:

- Freeway
- Prime
- Major
- Collector
- Local Collector
- Rural Collector
- Local Road
- Freeway Ramp
- Local Ramp
- Zone Connectors
- Commuter Rail

Average Daily Traffic

\# 24-Hour Total Flow (ADT)

\# Select Zone Volume

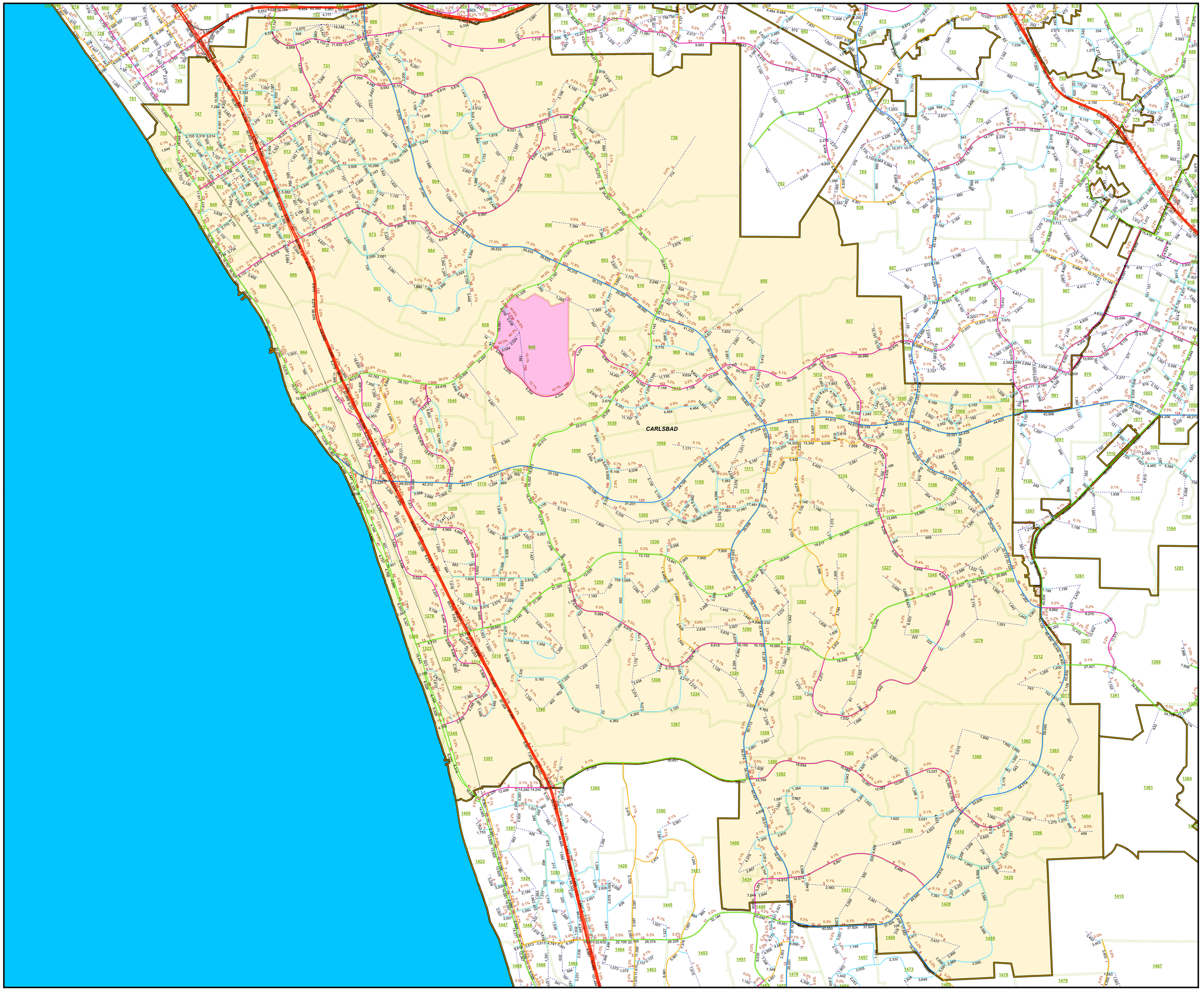
% Select Zone Percentage

SAN DIEGO ASSOCIATION OF GOVERNMENTS
401 B STREET, SUITE 800
SAN DIEGO, CALIFORNIA 92101 USA
(619) 699-1900
E-mail: sandag@sandag.org
Web site: www.sandag.org

0 0.2 0.4 0.6
Miles

servicebureau
SANDAG

1/26/2021



Appendix B – Traffic Volume Data

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	Faraday Ave.	DATE:	07/23/2015	LOCATION:	Carlsbad
E-W STREET:	Cannon Rd.	DAY:	THURSDAY	PROJECT#	15-1194-039
CONTROL:	Signal				

AM	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1.33	0.33	0.33	0	1	0	1	2	1	1	2	0	
6:30 AM	19	2	1	0	0	1	0	28	58	2	125	1	237
6:45 AM	20	0	2	0	0	0	1	24	65	5	155	0	272
7:00 AM	24	0	3	1	0	0	0	26	60	5	214	1	334
7:15 AM	41	0	3	0	0	2	1	33	76	8	166	2	332
7:30 AM	42	1	2	0	0	0	0	30	85	11	163	1	335
7:45 AM	29	0	1	0	0	1	1	35	101	10	208	3	389
8:00 AM	33	0	3	0	0	1	2	54	86	15	222	2	418
8:15 AM	30	0	2	0	0	0	4	41	85	6	125	5	298
8:30 AM	32	0	1	0	0	1	4	56	87	13	133	2	329
8:45 AM	28	0	4	0	0	1	8	66	108	7	106	1	329
9:00 AM	24	0	2	0	1	0	2	58	101	7	87	4	286
9:15 AM	21	0	5	0	1	0	5	54	89	3	111	2	291
Volumes	343	3	29	1	2	7	28	505	1001	92	1815	24	3850
Approach %	91.47	0.80	7.73	10.00	20.00	70.00	1.83	32.92	65.25	4.76	93.99	1.24	
App/Depart	375	/	55	10	/	1095	1534	/	535	1931	/	2165	
Peak Volumes	145	1	9	0	0	4	4	152	348	44	759	8	1474
Approach %	93.55	0.65	5.81	0.00	0.00	100.00	0.79	30.16	69.05	5.43	93.59	0.99	
Pk Hr FACTOR:	0.86			0.50			0.89			0.85			0.8816
AM Pk Hr at:	715												

PM	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
3:30 PM	73	0	3	4	0	3	1	177	31	3	88	1	384
3:45 PM	64	1	3	1	2	1	1	155	34	3	92	0	357
4:00 PM	79	0	8	1	1	3	2	180	30	4	76	1	385
4:15 PM	83	0	7	1	0	0	1	147	43	3	86	0	371
4:30 PM	95	1	6	1	0	0	0	176	41	0	78	0	398
4:45 PM	96	0	12	0	0	0	3	185	34	0	115	0	445
5:00 PM	137	1	23	0	0	0	2	206	38	0	82	0	489
5:15 PM	152	0	18	0	0	0	1	217	28	1	106	0	523
5:30 PM	104	0	9	0	0	2	2	186	40	1	93	0	437
5:45 PM	90	0	8	0	0	0	0	200	31	1	73	0	403
6:00 PM	70	0	2	2	0	2	0	176	45	3	76	0	376
6:15 PM	62	1	3	0	0	0	1	153	27	0	71	0	318
Volumes	1105	4	102	10	3	11	14	2158	422	19	1036	2	4886
Approach %	91.25	0.33	8.42	41.67	12.50	45.83	0.54	83.19	16.27	1.80	98.01	0.19	
App/Depart	1211	/	20	24	/	444	2594	/	2270	1057	/	2152	
Peak Volumes	489	1	62	0	0	2	8	794	140	2	396	0	1894
Approach %	88.59	0.18	11.23	0.00	0.00	100.00	0.85	84.29	14.86	0.50	99.50	0.00	
Pk Hr FACTOR:	0.81			0.25			0.96			0.87			0.9054
PM Pk Hr at:	445												

Prepared by NDS/ATD

VOLUME

Cannon Rd Bet. Faraday Ave & El Camino Real

Day: Wednesday
Date: 5/8/2019

City: Carlsbad
Project #: CA19_4201_022

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,652	8,353	16,005

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			14		4		18		12:00			97		105		202	
00:15			12		4		16		12:15			96		121		217	
00:30			8		4		12		12:30			102		104		206	
00:45			8	42	6	18	14	60	12:45			77	372	120	450	197	822
01:00			6		1		7		13:00			112		98		210	
01:15			2		3		5		13:15			97		121		218	
01:30			4		0		4		13:30			88		166		254	
01:45			3	15	1	5	4	20	13:45			104	401	113	498	217	899
02:00			4		0		4		14:00			128		92		220	
02:15			4		2		6		14:15			100		115		215	
02:30			1		2		3		14:30			136		126		262	
02:45			2	11	4	8	6	19	14:45			135	499	177	510	312	1009
03:00			2		3		5		15:00			211		113		324	
03:15			2		3		5		15:15			152		125		277	
03:30			2		3		5		15:30			222		88		310	
03:45			4	10	13	22	17	32	15:45			189	774	113	439	302	1213
04:00			0		10		10		16:00			216		108		324	
04:15			2		7		9		16:15			211		107		318	
04:30			3		27		30		16:30			254		114		368	
04:45			8	13	27	71	35	84	16:45			235	916	121	450	356	1366
05:00			6		35		41		17:00			321		130		451	
05:15			6		37		43		17:15			266		101		367	
05:30			7		56		63		17:30			323		95		418	
05:45			15	34	84	212	99	246	17:45			238	1148	91	417	329	1565
06:00			14		106		120		18:00			231		100		331	
06:15			22		198		220		18:15			184		92		276	
06:30			39		273		312		18:30			141		71		212	
06:45			38	113	329	906	367	1019	18:45			96	652	48	311	144	963
07:00			57		248		305		19:00			124		48		172	
07:15			51		237		288		19:15			89		54		143	
07:30			73		262		335		19:30			98		54		152	
07:45			116	297	308	1055	424	1352	19:45			85	396	37	193	122	589
08:00			129		267		396		20:00			88		41		129	
08:15			77		275		352		20:15			76		41		117	
08:30			71		199		270		20:30			75		36		111	
08:45			64	341	189	930	253	1271	20:45			69	308	47	165	116	473
09:00			80		158		238		21:00			61		74		135	
09:15			57		144		201		21:15			67		49		116	
09:30			71		119		190		21:30			41		32		73	
09:45			68	276	135	556	203	832	21:45			61	230	17	172	78	402
10:00			68		133		201		22:00			38		16		54	
10:15			57		114		171		22:15			32		16		48	
10:30			63		100		163		22:30			31		9		40	
10:45			73	261	119	466	192	727	22:45			28	129	16	57	44	186
11:00			82		110		192		23:00			26		13		39	
11:15			63		109		172		23:15			19		7		26	
11:30			92		101		193		23:30			13		6		19	
11:45			107	344	91	411	198	755	23:45			12	70	5	31	17	101
TOTALS				1757		4660		6417	TOTALS				5895		3693		9588
SPLIT %				27.4%		72.6%		40.1%	SPLIT %				61.5%		38.5%		59.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,652	8,353	16,005

AM Peak Hour			11:45	07:30	07:30	PM Peak Hour	17:00	14:30	16:45
AM Pk Volume			402	1112	1507	PM Pk Volume	1148	541	1592
Pk Hr Factor			0.939	0.903	0.889	Pk Hr Factor	0.889	0.764	0.882
7 - 9 Volume	0	0	638	1985	2623	4 - 6 Volume	0 0 2064	867	2931
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour	17:00	16:15	16:45
7 - 9 Pk Volume	0	0	395	1112	1507	4 - 6 Pk Volume	0 0 1148	472	1592
Pk Hr Factor	0.000	0.000	0.766	0.903	0.889	Pk Hr Factor	0.000 0.000 0.889	0.908	0.882

National Data & Surveying Services

Intersection Turning Movement Count

Location: Cannon Rd & Faraday Ave/Discovery Center Dwy
City: Carlsbad
Control: Signalized

Project ID: 21-040003-001
Date: 1/21/2021

Total

NS/EW Streets:	Cannon Rd				Cannon Rd				Faraday Ave/Discovery Center Dwy				Faraday Ave/Discovery Center Dwy				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0	1	0	0	1.3	0.3	0.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	18	36	0	3	102	0	0	0	0	0	0	30	0	2	0	191
7:15 AM	0	26	37	1	3	117	1	0	0	0	0	0	22	0	1	0	208
7:30 AM	0	33	49	2	4	128	0	0	0	0	0	0	27	0	1	0	244
7:45 AM	0	57	75	2	4	146	1	0	1	0	0	0	28	0	1	0	315
8:00 AM	2	52	57	1	9	94	3	0	2	1	1	0	21	0	2	0	245
8:15 AM	2	58	62	3	5	137	1	0	0	0	1	0	36	1	4	0	310
8:30 AM	1	52	54	2	4	76	1	0	0	0	1	0	31	0	1	0	223
8:45 AM	1	44	67	1	5	97	3	0	1	1	0	0	30	2	1	0	253
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	6	340	437	12	37	897	10	0	4	2	3	0	225	3	13	0	1989
APPROACH %'s :	0.75%	42.77%	54.97%	1.51%	3.92%	95.02%	1.06%	0.00%	44.44%	22.22%	33.33%	0.00%	93.36%	1.24%	5.39%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	4	200	243	8	22	505	5	0	3	1	2	0	112	1	8	0	1114
PEAK HR FACTOR :	0.500	0.862	0.810	0.667	0.611	0.865	0.417	0.000	0.375	0.250	0.500	0.000	0.778	0.250	0.500	0.000	0.884
		0.849				0.881				0.375				0.738			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0	1	0	0	1.3	0.3	0.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	1	129	38	0	1	81	1	1	0	1	0	0	66	0	7	0	326
4:15 PM	0	123	29	4	1	73	0	0	0	0	0	0	64	0	5	0	299
4:30 PM	0	155	29	0	1	100	0	0	0	0	0	0	73	0	6	0	364
4:45 PM	0	144	29	1	5	77	0	2	0	0	1	0	65	0	2	0	326
5:00 PM	0	162	35	0	0	90	0	0	0	1	6	0	69	0	7	0	370
5:15 PM	2	164	59	0	2	84	3	0	0	0	0	0	72	0	7	0	393
5:30 PM	0	141	31	0	0	73	0	0	2	2	2	0	57	1	3	0	312
5:45 PM	0	129	38	0	2	52	0	0	0	1	1	0	34	0	2	0	259
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	1147	288	5	12	630	4	3	2	5	10	0	500	1	39	0	2649
APPROACH %'s :	0.21%	79.49%	19.96%	0.35%	1.85%	97.07%	0.62%	0.46%	11.76%	29.41%	58.82%	0.00%	92.59%	0.19%	7.22%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	2	625	152	1	8	351	3	2	0	1	7	0	279	0	22	0	1453
PEAK HR FACTOR :	0.250	0.953	0.644	0.250	0.400	0.878	0.250	0.250	0.000	0.250	0.292	0.000	0.955	0.000	0.786	0.000	0.924
		0.867				0.901				0.286				0.953			

Prepared by National Data & Surveying Services

VOLUME

Cannon Rd Bet. Faraday Ave & El Camino Real

Day: Thursday
Date: 1/21/2021

City: Carlsbad
Project #: CA21_040004_001

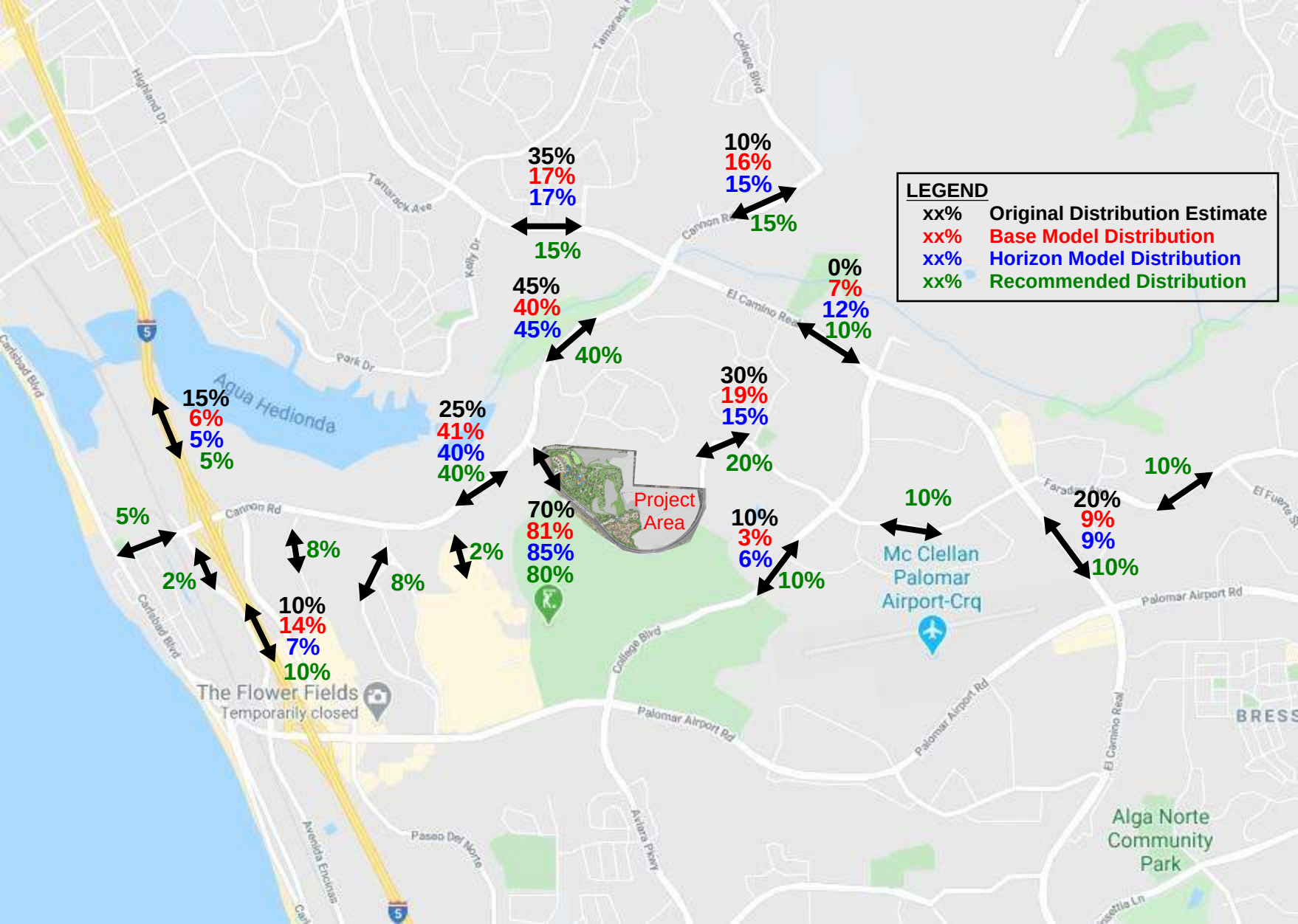
DAILY TOTALS	NB	SB	EB	WB	Total
	4,649	4,977	0	0	9,626

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	5		3				8		12:00	85		95				180	
00:15	2		2				4		12:15	88		75				163	
00:30	2		3				5		12:30	89		81				170	
00:45	2	11	2	10			4	21	12:45	80	342	98	349			178	691
01:00	1		1				2		13:00	90		87				177	
01:15	2		3				5		13:15	65		83				148	
01:30	3		1				4		13:30	85		84				169	
01:45	1	7	1	6			2	13	13:45	64	304	90	344			154	648
02:00	0		1				1		14:00	71		89				160	
02:15	2		0				2		14:15	104		108				212	
02:30	2		2				4		14:30	121		105				226	
02:45	3	7	2	5			5	12	14:45	107	403	99	401			206	804
03:00	1		2				3		15:00	146		99				245	
03:15	1		2				3		15:15	103		103				206	
03:30	3		3				6		15:30	124		99				223	
03:45	1	6	3	10			4	16	15:45	129	502	82	383			211	885
04:00	0		3				3		16:00	135		83				218	
04:15	1		7				8		16:15	128		79				207	
04:30	1		7				8		16:30	159		94				253	
04:45	3	5	12	29			15	34	16:45	148	570	83	339			231	909
05:00	0		18				18		17:00	163		88				251	
05:15	7		31				38		17:15	169		88				257	
05:30	5		45				50		17:30	153		71				224	
05:45	7	19	64	158			71	177	17:45	128	613	55	302			183	915
06:00	14		71				85		18:00	101		52				153	
06:15	10		78				88		18:15	84		40				124	
06:30	11		75				86		18:30	82		50				132	
06:45	28	63	82	306			110	369	18:45	65	332	27	169			92	501
07:00	22		104				126		19:00	61		35				96	
07:15	24		121				145		19:15	64		30				94	
07:30	38		131				169		19:30	51		21				72	
07:45	63	147	146	502			209	649	19:45	58	234	18	104			76	338
08:00	55		115				170		20:00	38		24				62	
08:15	57		135				192		20:15	39		11				50	
08:30	57		87				144		20:30	24		9				33	
08:45	46	215	104	441			150	656	20:45	28	129	12	56			40	185
09:00	43		86				129		21:00	27		11				38	
09:15	44		90				134		21:15	24		11				35	
09:30	34		84				118		21:30	16		13				29	
09:45	44	165	94	354			138	519	21:45	20	87	13	48			33	135
10:00	67		86				153		22:00	12		10				22	
10:15	49		83				132		22:15	6		3				9	
10:30	44		89				133		22:30	4		7				11	
10:45	52	212	77	335			129	547	22:45	2	24	3	23			5	47
11:00	43		53				96		23:00	1		2				3	
11:15	76		82				158		23:15	2		2				4	
11:30	61		80				141		23:30	3		1				4	
11:45	65	245	82	297			147	542	23:45	1	7	1	6			2	13
TOTALS		1102		2453				**3555**	**TOTALS**		3547		2524				**6071**
SPLIT %		31.0%		69.0%				**36.9%**	**SPLIT %**		58.4%		41.6%				**63.1%**

DAILY TOTALS	NB	SB	EB	WB	Total
	4,649	4,977	0	0	9,626

AM Peak Hour	11:45	07:30						**07:30**	**PM Peak Hour**	16:30	14:15							**16:30**
AM Pk Volume	327	527						**740**	**PM Pk Volume**	639	411							**992**
Pk Hr Factor	0.919	0.902						**0.885**	**Pk Hr Factor**	0.945	0.951							**0.965**
7 - 9 Volume	362	943	0	0				**1305**	**4 - 6 Volume**	1183	641	0	0					**1824**
7 - 9 Peak Hour	07:45	07:30						**07:30**	**4 - 6 Peak Hour**	16:30	16:30							**16:30**
7 - 9 Pk Volume	232	527	0	0				**740**	**4 - 6 Pk Volume**	639	353	0	0					**992**
Pk Hr Factor	0.921	0.902	0.000	0.000				**0.885**	**Pk Hr Factor**	0.945	0.939	0.000	0.000					**0.965**

Appendix C – Area Trip Distribution


LEGEND
xx% Original Distribution Estimate
xx% Base Model Distribution
xx% Horizon Model Distribution
xx% Recommended Distribution
35%
17%
17%
15%
10%
16%
15%
15%
0%
7%
12%
10%
45%
40%
45%
40%
30%
19%
15%
20%
15%
6%
5%
5%
25%
41%
40%
40%
5%
2%
8%
8%
2%
70%
81%
85%
80%
10%
3%
6%
10%
10%
20%
9%
9%
10%
10%
14%
7%
10%
Project Area
Aqua Hedionda
Cannon Rd
Carlsbad Blvd
Park Dr
Tamarack Ave
Kelly Dr
College Blvd
El Camino Real
Palomar Airport Rd
Paseo Del Norte
Aviara Pkwy
Avenida Encinas
Mc Clellan Palomar Airport-Crq
The Flower Fields
Temporarily closed
Alga Norte Community Park

Appendix D – Signal Warrant Worksheets

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 1 of 5)

DIST ____ CO ____ RTE ____ PM ____

COUNT DATE 1/21/2021
CALC ____ DATE ____
CHK ____ DATE ____

Major St: Faraday Avenue
Minor St: North Project DW

Critical Approach Speed 40 mph
Critical Approach Speed 25 mph

Speed limit or critical speed on major street traffic > 40 mph..... ☐
In built up area of isolated community of < 10,000 population..... ☐ } RURAL (R)
or
☒ URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume SATISFIED YES ☐ NO ☒
(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume 100% SATISFIED YES ☐ NO ☒
80% SATISFIED YES ☐ NO ☐

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				7-8 A	8-9 A	12-1 P	1-2 P	2-3 P	3-4 P	4-5 P	5-6 P
	U	R	U	R								Hour
APPROACH LANES	1		2 or More									
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	649	656	691	648	804	885	909	915
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	35	<35	<24	<24	<24	<24	24	<24

Condition B - Interruption of Continuous Traffic 100% SATISFIED YES ☐ NO ☒
80% SATISFIED YES ☐ NO ☐

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				7-8 A	8-9 A	12-1 P	1-2 P	2-3 P	3-4 P	4-5 P	5-6 P
	U	R	U	R								Hour
APPROACH LANES	1		2 or More									
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)	649	656	691	648	804	885	909	915
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	35	<35	<24	<24	<24	<24	24	<24

Combination of Conditions A & B SATISFIED YES ☐ NO ☒

REQUIREMENT	CONDITION	✓	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME		Yes ☐ No ☒
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC		
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Peak hour data is all that is available for the minor street - however, it is safe to assume that off-peak volumes will be lower and therefore will not meet the warrant.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

WARRANT 2 - Four Hour Vehicular Volume **SATISFIED* YES ☐ NO ☒**

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	2-3 P	3-4 P	4-5 P	5-6 P
Both Approaches - Major Street	X		804	885	909	915
Higher Approach - Minor Street	X		<24	<24	24	<24

Peak hour data is all that is available for the minor street - however, it is safe to assume that off-peak volumes will be lower and therefore will not meet the warrant.

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes ☐ No ☐
OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	Yes ☐ No ☐

WARRANT 3 - Peak Hour **SATISFIED YES ☐ NO ☒**
(Part A or Part B must be satisfied)

PART A **SATISFIED YES ☐ NO ☒**

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐ No ☐
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ☐ No ☒
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☐ No ☐

PART B **SATISFIED YES ☐ NO ☒**

APPROACH LANES	One	2 or More	7:30-8:30 A
Both Approaches - Major Street	X		588
Higher Approach - Minor Street	X		35

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	Yes ☐ No ☒
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

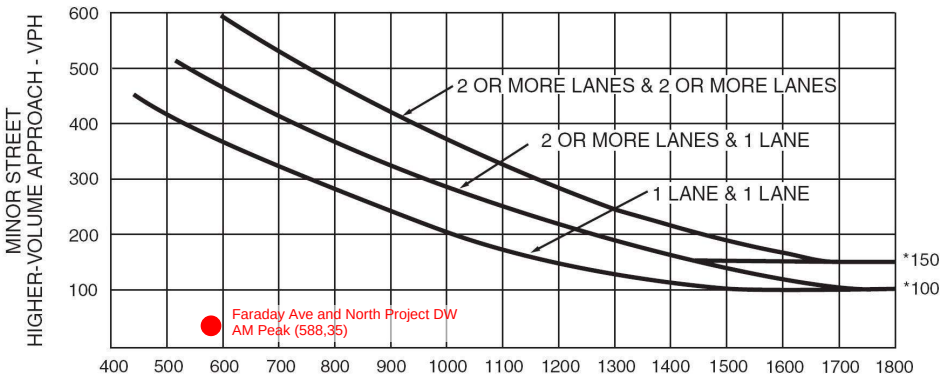


Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 3 of 5)

WARRANT 4 - Pedestrian Volume
(Parts 1 and 2 Must Be Satisfied)

SATISFIED YES ☐ NO ☒

No pedestrian data is available - warrant was not evaluated

Part 1 (Parts A or B must be satisfied)

	Hours - - ->				
A.	Vehicles per hour for any 4 hours				
	Pedestrians per hour for any 4 hours				

Figure 4C-5 or Figure 4C-6
SATISFIED YES ☐ NO ☐

	Hours - - ->				
B.	Vehicles per hour for any 1 hour				
	Pedestrians per hour for any 1 hour				

Figure 4C-7 or Figure 4C-8
SATISFIED YES ☐ NO ☐

Part 2 **SATISFIED YES ☐ NO ☐**

AND, The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes ☐ No ☐
OR, The proposed traffic signal will not restrict progressive traffic flow along the major street.	Yes ☐ No ☐

WARRANT 5 - School Crossing
(Parts A and B Must Be Satisfied)

SATISFIED YES ☐ NO ☒

There is no school crossing

Part A
Gap/Minutes and # of Children

SATISFIED YES ☐ NO ☐

		Hour
Gaps vs Minutes	Minutes Children Using Crossing	
	Number of Adequate Gaps	
School Age Pedestrians Crossing Street / hr		

Gaps < Minutes YES ☐ NO ☐
AND Children > 20/hr YES ☐ NO ☐

AND, Consideration has been given to less restrictive remedial measures.	Yes ☐ No ☐

Part B **SATISFIED YES ☐ NO ☐**

The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes ☐ No ☐
OR, The proposed signal will not restrict the progressive movement of traffic.	Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 4 of 5)

WARRANT 6 - Coordinated Signal System **SATISFIED YES ☐ NO ☒**
(All Parts Must Be Satisfied)

MINIMUM REQUIREMENTS	DISTANCE TO NEAREST SIGNAL	
≥ 1000 ft	N 800' ft, S 8450' ft, E N/A' ft, W N/A' ft	Yes ☐ No ☒
On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.		Yes ☐ No ☐
OR, On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.		

WARRANT 7 - Crash Experience Warrant **SATISFIED YES ☐ NO ☒**
(All Parts Must Be Satisfied)

Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency.			Yes ☐ No ☐
REQUIREMENTS	Number of crashes reported within a 12 month period susceptible to correction by a traffic signal, and involving injury or damage exceeding the requirements for a reportable crash.		Yes ☐ No ☒
5 OR MORE			
REQUIREMENTS	CONDITIONS	✓	
ONE CONDITION SATISFIED 80%	Warrant 1, Condition A - Minimum Vehicular Volume		Yes ☐ No ☐
	OR, Warrant 1, Condition B - Interruption of Continuous Traffic		
	OR, Warrant 4, Pedestrian Volume Condition Ped Vol ≥ 80% of Figure 4C-5 through Figure 4C-8		

Per the Transporattion Injury Mapping System (https://tims.berkeley.edu/tools/query/summary.php), there were no crashes from 2015-2019.

WARRANT 8 - Roadway Network **SATISFIED YES ☐ NO ☒**
(All Parts Must Be Satisfied)

MINIMUM VOLUME REQUIREMENTS	ENTERING VOLUMES - ALL APPROACHES	✓	FULFILLED
1000 Veh/Hr	During Typical Weekday Peak Hour 623 Veh/Hr and has 5-year projected traffic volumes that meet one or more of Warrants 1, 2, and 3 during an average weekday.		Yes ☐ No ☒
	OR During Each of Any 5 Hrs. of a Sat. or Sun _____ Veh/Hr		

CHARACTERISTICS OF MAJOR ROUTES	MAJOR ROUTE A	MAJOR ROUTE B	
Hwy. System Serving as Principal Network for Through Traffic			
Rural or Suburban Highway Outside Of, Entering, or Traversing a City			
Appears as Major Route on an Official Plan			
Any Major Route Characteristics Met, Both Streets			Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 5 of 5)

WARRANT 9 - Intersection Near a Grade Crossing **SATISFIED YES ☐ NO ☒**
(Both Parts A and B Must Be Satisfied)

PART A A grade crossing exists on an approach controlled by a STOP or YIELD sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line on the approach. Track Center Line to Limit Line _____ ft	Yes ☐ No ☒
PART B **There is one minor street approach lane at the track crossing -** During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-9. Major Street - Total of both approaches: _____ VPH Minor Street - Crosses the track (one direction only, approaching the intersection): _____ VPH X AF (Use Tables 4C-2, 3, & 4 below to calculate AF) = _____ VPH	Yes ☐ No ☐
OR, There are two or more minor street approach lanes at the track crossing - During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-10. Major Street - Total of both approaches : _____ VPH Minor Street - Crosses the track (one direction only, approaching the intersection): _____ VPH X AF (Use Tables 4C-2, 3, & 4 below to calcualte AF) = _____ VPH	

The minor street approach volume may be multiplied by up to three following adjustment factors (AF) as described in Section 4C.10.

1- Number of Rail Traffic per Day_____ Adjustment factor from table 4C-2____

2- Percentage of High-Occupancy Buses on Minor Street Approach_____ Adjustment factor from table 4C-3____

3- Percentage of Tractor-Trailer Trucks on Minor Street Approach_____ Adjustment factor from table 4C-4____

NOTE: If no data is availale or known, then use AF = 1 (no adjustment)

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 1 of 5)

COUNT DATE 1/21/2021

DIST ____ CO ____ RTE ____ PM ____

CALC ____ DATE ____

CHK ____ DATE ____

Major St: Faraday Avenue — Critical Approach Speed 40 mph

Minor St: South Project DW — Critical Approach Speed 25 mph

Speed limit or critical speed on major street traffic > 40 mph..... ☐
or
In built up area of isolated community of < 10,000 population..... ☐ } RURAL (R)

☒ URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume SATISFIED YES ☐ NO ☒
(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume 100% SATISFIED YES ☐ NO ☒
80% SATISFIED YES ☐ NO ☐

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				7-8 A	8-9 A	12-1 P	1-2 P	2-3 P	3-4 P	4-5 P	5-6 P
	U	R	U	R								
APPROACH LANES	1		2 or More									Hour
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	649	656	691	648	804	885	909	915
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	23	<23	<16	<16	<16	<16	16	<16

Condition B - Interruption of Continuous Traffic 100% SATISFIED YES ☐ NO ☒
80% SATISFIED YES ☐ NO ☐

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				7-8 A	8-9 A	12-1 P	1-2 P	2-3 P	3-4 P	4-5 P	5-6 P
	U	R	U	R								
APPROACH LANES	1		2 or More									Hour
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)	649	656	691	648	804	885	909	915
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	23	<23	<16	<16	<16	<16	16	<16

Combination of Conditions A & B SATISFIED YES ☐ NO ☒

REQUIREMENT	CONDITION	✓	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME		Yes ☐ No ☒
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC		
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Peak hour data is all that is available for the minor street - however, it is safe to assume that off-peak volumes will be lower and therefore will not meet the warrant.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

WARRANT 2 - Four Hour Vehicular Volume **SATISFIED* YES ☐ NO ☒**

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	2-3 P	3-4 P	4-5 P	5-6 P
Both Approaches - Major Street	X		804	885	909	915
Higher Approach - Minor Street	X		<16	<16	16	<16

Peak hour data is all that is available for the minor street - however, it is safe to assume that off-peak volumes will be lower and therefore will not meet the warrant.

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes ☐ No ☐
OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	Yes ☐ No ☐

WARRANT 3 - Peak Hour **SATISFIED YES ☐ NO ☒**
(Part A or Part B must be satisfied)

PART A **SATISFIED YES ☐ NO ☒**

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐ No ☐
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ☐ No ☒
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☐ No ☐

PART B **SATISFIED YES ☐ NO ☒**

APPROACH LANES	One	2 or More	7:30-8:30 A
Both Approaches - Major Street	X		554
Higher Approach - Minor Street	X		23

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	Yes ☐ No ☒
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

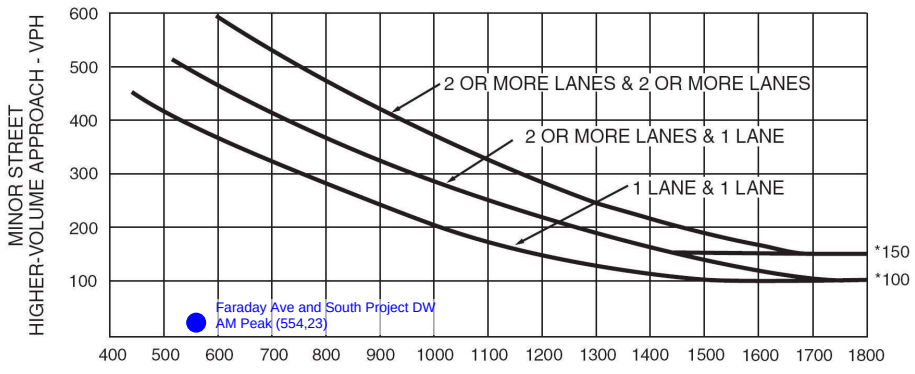


Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 3 of 5)

WARRANT 4 - Pedestrian Volume
(Parts 1 and 2 Must Be Satisfied)

SATISFIED YES ☐ NO ☒

No pedestrian data is available - warrant was not evaluated

Part 1 (Parts A or B must be satisfied)

	Hours - - ->				
A.	Vehicles per hour for any 4 hours				
	Pedestrians per hour for any 4 hours				

Figure 4C-5 or Figure 4C-6
SATISFIED YES ☐ NO ☐

	Hours - - ->				
B.	Vehicles per hour for any 1 hour				
	Pedestrians per hour for any 1 hour				

Figure 4C-7 or Figure 4C-8
SATISFIED YES ☐ NO ☐

Part 2 **SATISFIED YES ☐ NO ☐**

AND, The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes ☐ No ☐
OR, The proposed traffic signal will not restrict progressive traffic flow along the major street.	Yes ☐ No ☐

WARRANT 5 - School Crossing
(Parts A and B Must Be Satisfied)

SATISFIED YES ☐ NO ☒

There is no school crossing

Part A
Gap/Minutes and # of Children

SATISFIED YES ☐ NO ☐

		Hour
Gaps vs Minutes	Minutes Children Using Crossing	
	Number of Adequate Gaps	
School Age Pedestrians Crossing Street / hr		

Gaps < Minutes YES ☐ NO ☐
AND Children > 20/hr YES ☐ NO ☐

AND, Consideration has been given to less restrictive remedial measures.	Yes ☐ No ☐

Part B **SATISFIED YES ☐ NO ☐**

The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes ☐ No ☐
OR, The proposed signal will not restrict the progressive movement of traffic.	Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 4 of 5)

WARRANT 6 - Coordinated Signal System **SATISFIED YES ☐ NO ☒**
(All Parts Must Be Satisfied)

MINIMUM REQUIREMENTS	DISTANCE TO NEAREST SIGNAL	
≥ 1000 ft	N 2350' ft, S 6860' ft, E N/A' ft, W N/A' ft	Yes ☒ No ☐
On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.		Yes ☐ No ☒
OR, On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.		

WARRANT 7 - Crash Experience Warrant **SATISFIED YES ☐ NO ☒**
(All Parts Must Be Satisfied)

Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency.			Yes ☐ No ☐
REQUIREMENTS	Number of crashes reported within a 12 month period susceptible to correction by a traffic signal, and involving injury or damage exceeding the requirements for a reportable crash.		Yes ☐ No ☒
5 OR MORE			
REQUIREMENTS	CONDITIONS	✓	
ONE CONDITION SATISFIED 80%	Warrant 1, Condition A - Minimum Vehicular Volume		Yes ☐ No ☐
	OR, Warrant 1, Condition B - Interruption of Continuous Traffic		
	OR, Warrant 4, Pedestrian Volume Condition Ped Vol ≥ 80% of Figure 4C-5 through Figure 4C-8		

Per the Transporattion Injury Mapping System (https://tims.berkeley.edu/tools/query/summary.php), there were no crashes from 2015-2019.

WARRANT 8 - Roadway Network **SATISFIED YES ☐ NO ☒**
(All Parts Must Be Satisfied)

MINIMUM VOLUME REQUIREMENTS	ENTERING VOLUMES - ALL APPROACHES	✓	FULFILLED
1000 Veh/Hr	During Typical Weekday Peak Hour 586 Veh/Hr and has 5-year projected traffic volumes that meet one or more of Warrants 1, 2, and 3 during an average weekday.		Yes ☐ No ☒
	OR During Each of Any 5 Hrs. of a Sat. or Sun _____ Veh/Hr		

CHARACTERISTICS OF MAJOR ROUTES	MAJOR ROUTE A	MAJOR ROUTE B	
Hwy. System Serving as Principal Network for Through Traffic			
Rural or Suburban Highway Outside Of, Entering, or Traversing a City			
Appears as Major Route on an Official Plan			
Any Major Route Characteristics Met, Both Streets			Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 5 of 5)

WARRANT 9 - Intersection Near a Grade Crossing **SATISFIED YES ☐ NO ☒**
(Both Parts A and B Must Be Satisfied)

PART A A grade crossing exists on an approach controlled by a STOP or YIELD sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line on the approach. Track Center Line to Limit Line _____ ft	Yes ☐ No ☒
PART B **There is one minor street approach lane at the track crossing -** During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-9. Major Street - Total of both approaches: _____ VPH Minor Street - Crosses the track (one direction only, approaching the intersection): _____ VPH X AF (Use Tables 4C-2, 3, & 4 below to calculate AF) = _____ VPH	Yes ☐ No ☐
OR, There are two or more minor street approach lanes at the track crossing - During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-10. Major Street - Total of both approaches : _____ VPH Minor Street - Crosses the track (one direction only, approaching the intersection): _____ VPH X AF (Use Tables 4C-2, 3, & 4 below to calcualte AF) = _____ VPH	

The minor street approach volume may be multiplied by up to three following adjustment factors (AF) as described in Section 4C.10.

1- Number of Rail Traffic per Day_____ Adjustment factor from table 4C-2____

2- Percentage of High-Occupancy Buses on Minor Street Approach_____ Adjustment factor from table 4C-3____

3- Percentage of Tractor-Trailer Trucks on Minor Street Approach_____ Adjustment factor from table 4C-4____

NOTE: If no data is availale or known, then use AF = 1 (no adjustment)

Appendix E – Synchro Reports

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	33	175	7	33	384
Future Vol, veh/h	7	33	175	7	33	384
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	-	-	-	50	-
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	36	190	8	36	417

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	683	194	0	0	198	0
Stage 1	194	-	-	-	-	-
Stage 2	489	-	-	-	-	-
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	415	847	-	-	1375	-
Stage 1	839	-	-	-	-	-
Stage 2	616	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	404	847	-	-	1375	-
Mov Cap-2 Maneuver	404	-	-	-	-	-
Stage 1	817	-	-	-	-	-
Stage 2	616	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	711	1375	-
HCM Lane V/C Ratio	-	-	0.061	0.026	-
HCM Control Delay (s)	-	-	10.4	7.7	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Int Delay, s/veh	0.7

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	20	371	162	7	7	20
Future Vol, veh/h	20	371	162	7	7	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	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	22	403	176	8	8	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	184	0	-	0	627	180
Stage 1	-	-	-	-	180	-
Stage 2	-	-	-	-	447	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1391	-	-	-	447	863
Stage 1	-	-	-	-	851	-
Stage 2	-	-	-	-	644	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1391	-	-	-	440	863
Mov Cap-2 Maneuver	-	-	-	-	440	-
Stage 1	-	-	-	-	837	-
Stage 2	-	-	-	-	644	-

Approach	SE	NW	SW
HCM Control Delay, s	0.4	0	10.4
HCM LOS			B

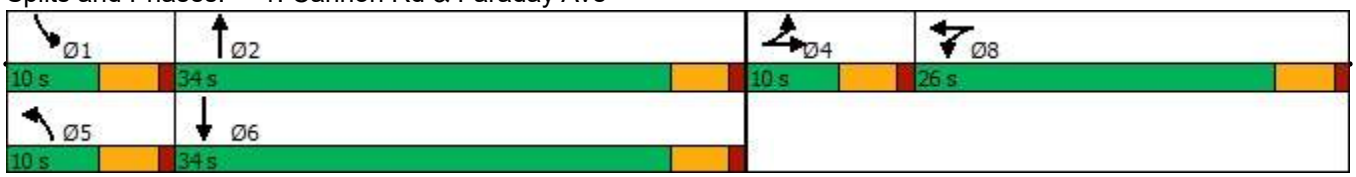
Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1391	-	691
HCM Lane V/C Ratio	-	-	0.016	-	0.042
HCM Control Delay (s)	-	-	7.6	-	10.4
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0	-	0.1

Lanes, Volumes, Timings
1: Cannon Rd & Faraday Ave 07/12/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1	3	170	1	36	15	269	361	54	650	6
Future Volume (vph)	4	1	3	170	1	36	15	269	361	54	650	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	120		0	175		0	240		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			45			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.949			0.947			0.914			0.999	
Flt Protected		0.976		0.950	0.969		0.950			0.950		
Satd. Flow (prot)	0	1725	0	1681	1624	0	1770	3235	0	1770	3536	0
Flt Permitted		0.976		0.950	0.969		0.950			0.950		
Satd. Flow (perm)	0	1725	0	1681	1624	0	1770	3235	0	1770	3536	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			34			392			1	
Link Speed (mph)		40			40			50			50	
Link Distance (ft)		115			323			767			676	
Travel Time (s)		2.0			5.5			10.5			9.2	
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
Adj. Flow (vph)	4	1	3	185	1	39	16	292	392	59	707	7
Shared Lane Traffic (%)				38%								
Lane Group Flow (vph)	0	8	0	115	110	0	16	684	0	59	714	0
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Total Split (s)	10.0	10.0		26.0	26.0		10.0	34.0		10.0	34.0	
Total Lost Time (s)		4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Act Effct Green (s)		6.1		8.9	8.9		6.1	19.9		6.1	21.8	
Actuated g/C Ratio		0.16		0.23	0.23		0.16	0.51		0.16	0.56	
v/c Ratio		0.03		0.30	0.28		0.06	0.37		0.21	0.36	
Control Delay		19.4		18.1	14.1		21.9	5.4		22.3	9.1	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		19.4		18.1	14.1		21.9	5.4		22.3	9.1	
LOS		B		B	B		C	A		C	A	
Approach Delay		19.4			16.1			5.8			10.1	
Approach LOS		B			B			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 38.9			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.37			
Intersection Signal Delay: 9.1		Intersection LOS: A	
Intersection Capacity Utilization 43.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Cannon Rd & Faraday Ave



Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	8	115	110	16	684	59	714
v/c Ratio	0.03	0.30	0.28	0.06	0.37	0.21	0.36
Control Delay	19.4	18.1	14.1	21.9	5.4	22.3	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	18.1	14.1	21.9	5.4	22.3	9.1
Queue Length 50th (ft)	1	13	8	2	12	7	35
Queue Length 95th (ft)	14	87	69	23	82	57	169
Internal Link Dist (ft)	35		243		687		596
Turn Bay Length (ft)		120		175		240	
Base Capacity (vph)	273	1032	1010	278	2740	278	2920
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.11	0.11	0.06	0.25	0.21	0.24

Intersection Summary

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	20	372	4	20	198
Future Vol, veh/h	4	20	372	4	20	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	-	-	-	50	-
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	4	22	404	4	22	215

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	665	406	0	0	408	0
Stage 1	406	-	-	-	-	-
Stage 2	259	-	-	-	-	-
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	425	645	-	-	1151	-
Stage 1	673	-	-	-	-	-
Stage 2	784	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	417	645	-	-	1151	-
Mov Cap-2 Maneuver	417	-	-	-	-	-
Stage 1	660	-	-	-	-	-
Stage 2	784	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	591	1151	-
HCM Lane V/C Ratio	-	-	0.044	0.019	-
HCM Control Delay (s)	-	-	11.4	8.2	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	0.5

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	12	190	364	4	4	12
Future Vol, veh/h	12	190	364	4	4	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	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	13	207	396	4	4	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	400	0	-	0	631	398
Stage 1	-	-	-	-	398	-
Stage 2	-	-	-	-	233	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1159	-	-	-	445	652
Stage 1	-	-	-	-	678	-
Stage 2	-	-	-	-	806	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1159	-	-	-	440	652
Mov Cap-2 Maneuver	-	-	-	-	440	-
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	806	-

Approach	SE	NW	SW
HCM Control Delay, s	0.5	0	11.4
HCM LOS			B

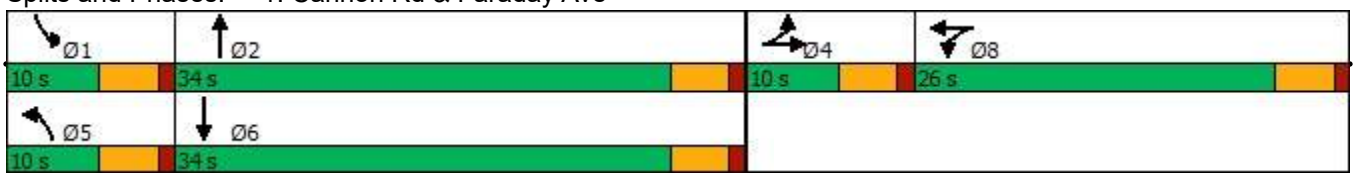
Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1159	-	582
HCM Lane V/C Ratio	-	-	0.011	-	0.03
HCM Control Delay (s)	-	-	8.1	-	11.4
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0	-	0.1

Lanes, Volumes, Timings
1: Cannon Rd & Faraday Ave 07/09/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	8	352	0	40	3	709	190	27	411	3
Future Volume (vph)	0	1	8	352	0	40	3	709	190	27	411	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	120		0	175		0	240		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			45			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.878			0.970			0.968			0.999	
Flt Protected				0.950	0.962		0.950			0.950		
Satd. Flow (prot)	0	1635	0	1681	1651	0	1770	3426	0	1770	3536	0
Flt Permitted				0.950	0.962		0.950			0.950		
Satd. Flow (perm)	0	1635	0	1681	1651	0	1770	3426	0	1770	3536	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			143			48			1	
Link Speed (mph)		40			40			50			50	
Link Distance (ft)		115			323			767			676	
Travel Time (s)		2.0			5.5			10.5			9.2	
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
Adj. Flow (vph)	0	1	9	383	0	43	3	771	207	29	447	3
Shared Lane Traffic (%)				44%								
Lane Group Flow (vph)	0	10	0	214	212	0	3	978	0	29	450	0
Turn Type		NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Total Split (s)	10.0	10.0		26.0	26.0		10.0	34.0		10.0	34.0	
Total Lost Time (s)		4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Act Effct Green (s)		6.3		13.1	13.1		6.3	21.5		6.3	23.1	
Actuated g/C Ratio		0.13		0.27	0.27		0.13	0.44		0.13	0.47	
v/c Ratio		0.05		0.48	0.39		0.01	0.64		0.13	0.27	
Control Delay		19.8		22.1	9.9		30.0	14.6		29.7	10.1	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		19.8		22.1	9.9		30.0	14.6		29.7	10.1	
LOS		B		C	A		C	B		C	B	
Approach Delay		19.8			16.0			14.7			11.3	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 48.9			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 14.1		Intersection LOS: B	
Intersection Capacity Utilization 50.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Cannon Rd & Faraday Ave



Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	10	214	212	3	978	29	450
v/c Ratio	0.05	0.48	0.39	0.01	0.64	0.13	0.27
Control Delay	19.8	22.1	9.9	30.0	14.6	29.7	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.8	22.1	9.9	30.0	14.6	29.7	10.1
Queue Length 50th (ft)	0	37	11	1	67	6	26
Queue Length 95th (ft)	16	162	85	10	283	39	121
Internal Link Dist (ft)	35		243		687		596
Turn Bay Length (ft)		120		175		240	
Base Capacity (vph)	217	843	899	227	2373	227	2509
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.25	0.24	0.01	0.41	0.13	0.18

Intersection Summary

Appendix F – MMLOS Worksheets

ROADWAY INFO

Roadway Name	Faraday Avenue
From	Cannon Road
To	Camino Hills Drive
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	7,700

BICYCLE

NB SCORE | LOS	SB SCORE | LOS
80 | B	90 | A

	Roadway Direction	
	NB	**SB**
* Do the roadway pavement conditions appear to be good (e.g., no pot holes)?	Yes	Yes
* Does bike facility on roadway appear to be free of obstructions (e.g., drainage grates)?	Yes	Yes
* Does the bicycle facility appear to meet MUTCD signing and striping design guidelines?	Yes	Yes
Is on-street parking provided?	Parallel parking with door-side buffered bike lane	No
Speed limit (miles per hour - mph):	higher than 35 mph	higher than 35 mph
Does the bikeway on the study segment and side streets meet and/or exceed the Bicycle Master Plan?	Both	Both
Is there enhanced bicycle detection or video detection provided at intersections?	No	No
Any bicycle racks are provided along segment?	No	No
Bicycle Facility Provided:	Bike Lane	Bike Lane
	Lane Width (ft)	Lane Width (ft)
	7	6
	Bicycle Buffer Width (ft)	Bicycle Buffer Width (ft)
	0	7
	Bike lanes are striped continuously through the study segment?	Bike lanes are striped continuously through the study segment?
	Yes	Yes

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Faraday Avenue
From	Cannon Road
To	Camino Hills Drive
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	7,700

PEDESTRIAN

NB SCORE | LOS	SB SCORE | LOS
85 | B	85 | B

	Roadway Direction	
	NB	SB
* Do pedestrian crossings appear consistent with the CA MUTCD?	Yes	Yes
* Minimum Sidewalk Unobstructed Width in Feet (Minimum ADA unobstructed width requirement is 4'):	5	5
* Do sidewalks appear to meet ADA requirements (e.g., cross-slope and trip hazards)?	Yes	Yes
* Do ramps and landings appear to meet ADA requirements?	Yes	Yes
* Do the street light locations appear adequate?	Yes	Yes
Speed limit (miles per hour - mph):	higher than 35 mph	higher than 35 mph
Number of Through Lanes:	1	1
Are there 3 lanes or less to be crossed without pedestrian refuge? (Include turn lanes in count)	Yes	Yes
Width (ft.) of landscaped buffer between pedestrian facility and vehicle travel way:	0' to 2'	0' to 2'
Does on-street parking or a bike lane provide 6' or more buffer between pedestrians and vehicle travel way?	Yes	Yes
Any apparent sight distance issues at intersections and pedestrian crossings?	No	No
Are there any permanent speed control devices installed?	No	No
Are there traffic calming measures that reduce crossing width (e.g., bulbouts, chokers, right-turn median island)?	No	No
Do crosswalks appear to be high visibility?	No	No
Are there intersection enhancements provided for pedestrians (e.g., pedestrian signal phasing, countdown heads)?	No	No
Are there Rectangular Rapid Flashing Beacons (RRFBs) at street crossings?	No	No
Is there pedestrian scale lighting?	No	No
Do active building frontages appear to be present on 80% of street curb line?	No	No
Does the street furniture appear to be oriented towards businesses or attractions?	No	No
Do the street trees appear to provide shade over more than 50% of the sidewalk length?	No	No

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Faraday Avenue
From	Cannon Road
To	North Project Access
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	7,700

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
0 | F	0 | F

	Roadway Direction	
	NB	**SB**
* **Transit stop amenities available:**	☐ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users	☐ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users
Do the sidewalks or path to the transit stop appear to be ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	Yes	Yes
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	Yes	Yes
* **Closest distance to existing transit stop:**	1/4 to 1/2 mile walk to bus/rail	1/4 to 1/2 mile walk to bus/rail
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
* **Is area governed by an adopted TDM ordinance that will promote ridesharing and/or the use of non-auto modes?**	No	No

*

*

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

X

Roadway Name	Cannon Road
From	South Project Access
To	0.5 miles south/east of South Project Access
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	7,700

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
0 | F	0 | F

	Roadway Direction	
	NB	**SB**
* **Transit stop amenities available:**	☐ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users	☐ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users
Do the sidewalks or path to the transit stop appear to be ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	Yes	Yes
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	Yes	Yes
* **Closest distance to existing transit stop:**	1/4 to 1/2 mile walk to bus/rail	1/4 to 1/2 mile walk to bus/rail
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
* **Is area governed by an adopted TDM ordinance that will promote ridesharing and/or the use of non-auto modes?**	No	No

*

*

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

Existing Transit
With Improvements

ROADWAY INFO

Roadway Name	Faraday Avenue
From	Cannon Road
To	North Project Access
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	7,700

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	NB	**SB**
* **Transit stop amenities available:**	☑ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users	☑ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users
Do the sidewalks or path to the transit stop appear to be ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	Yes	Yes
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	Yes	Yes
* **Closest distance to existing transit stop:**	1/4 to 1/2 mile walk to bus/rail	1/4 to 1/2 mile walk to bus/rail
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
* **Is area governed by an adopted TDM ordinance that will promote ridesharing and/or the use of non-auto modes?**	No	No

*

*

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

Existing Transit
With Improvements

ROADWAY INFO

Roadway Name	Cannon Road
From	South Project Access
To	0.5 miles south/east of South Project Access
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	7,700

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	NB	**SB**
* **Transit stop amenities available:**	☑ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users	☑ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users
Do the sidewalks or path to the transit stop appear to be ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	Yes	Yes
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	Yes	Yes
* **Closest distance to existing transit stop:**	1/4 to 1/2 mile walk to bus/rail	1/4 to 1/2 mile walk to bus/rail
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
* **Is area governed by an adopted TDM ordinance that will promote ridesharing and/or the use of non-auto modes?**	No	No

*

*

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Faraday Avenue
From	Cannon Road
To	Camino Hills Drive
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,400

BICYCLE

NB SCORE | LOS	SB SCORE | LOS
80 | B	90 | A

	Roadway Direction	
	NB	**SB**
* Do the roadway pavement conditions appear to be good (e.g., no pot holes)?	Yes	Yes
* Does bike facility on roadway appear to be free of obstructions (e.g., drainage grates)?	Yes	Yes
* Does the bicycle facility appear to meet MUTCD signing and striping design guidelines?	Yes	Yes
Is on-street parking provided?	Parallel parking with door-side buffered bike lane	No
Speed limit (miles per hour - mph):	higher than 35 mph	higher than 35 mph
Does the bikeway on the study segment and side streets meet and/or exceed the Bicycle Master Plan?	Both	Both
Is there enhanced bicycle detection or video detection provided at intersections?	No	No
Any bicycle racks are provided along segment?	No	No
Bicycle Facility Provided:	Bike Lane	Bike Lane
	Lane Width (ft)	Lane Width (ft)
	7	6
	Bicycle Buffer Width (ft)	Bicycle Buffer Width (ft)
	0	7
	Bike lanes are striped continuously through the study segment?	Bike lanes are striped continuously through the study segment?
	Yes	Yes

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

City of Carlsbad

ROADWAY INFO

X

Roadway Name	Faraday Avenue
From	Cannon Road
To	Camino Hills Drive
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,400

PEDESTRIAN

NB SCORE | LOS	SB SCORE | LOS
85 | B	85 | B

	Roadway Direction	
	NB	SB
* Do pedestrian crossings appear consistent with the CA MUTCD?	Yes	Yes
* Minimum Sidewalk Unobstructed Width in Feet (Minimum ADA unobstructed width requirement is 4'):	5	5
* Do sidewalks appear to meet ADA requirements (e.g., cross-slope and trip hazards)?	Yes	Yes
* Do ramps and landings appear to meet ADA requirements?	Yes	Yes
* Do the street light locations appear adequate?	Yes	Yes
Speed limit (miles per hour - mph):	higher than 35 mph	higher than 35 mph
Number of Through Lanes:	1	1
Are there 3 lanes or less to be crossed without pedestrian refuge? (Include turn lanes in count)	Yes	Yes
Width (ft.) of landscaped buffer between pedestrian facility and vehicle travel way:	0' to 2'	0' to 2'
Does on-street parking or a bike lane provide 6' or more buffer between pedestrians and vehicle travel way?	Yes	Yes
Any apparent sight distance issues at intersections and pedestrian crossings?	No	No
Are there any permanent speed control devices installed?	No	No
Are there traffic calming measures that reduce crossing width (e.g., bulbouts, chokers, right-turn median island)?	No	No
Do crosswalks appear to be high visibility?	No	No
Are there intersection enhancements provided for pedestrians (e.g., pedestrian signal phasing, countdown heads)?	No	No
Are there Rectangular Rapid Flashing Beacons (RRFBs) at street crossings?	No	No
Is there pedestrian scale lighting?	No	No
Do active building frontages appear to be present on 80% of street curb line?	No	No
Does the street furniture appear to be oriented towards businesses or attractions?	No	No
Do the street trees appear to provide shade over more than 50% of the sidewalk length?	No	No

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Faraday Avenue
From	Cannon Road
To	North Project Access
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,400

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
0 | F	0 | F

	Roadway Direction	
	NB	**SB**
* **Transit stop amenities available:**	☐ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users	☐ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users
Do the sidewalks or path to the transit stop appear to be ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	Yes	Yes
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	Yes	Yes
* **Closest distance to existing transit stop:**	1/4 to 1/2 mile walk to bus/rail	1/4 to 1/2 mile walk to bus/rail
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
* **Is area governed by an adopted TDM ordinance that will promote ridesharing and/or the use of non-auto modes?**	No	No

*

*

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Cannon Road
From	South Project Access
To	0.5 miles south/east of South Project Access
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,400

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
0 | F	0 | F

	Roadway Direction	
	NB	**SB**
* **Transit stop amenities available:**	☐ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users	☐ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users
Do the sidewalks or path to the transit stop appear to be ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	Yes	Yes
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	Yes	Yes
* **Closest distance to existing transit stop:**	1/4 to 1/2 mile walk to bus/rail	1/4 to 1/2 mile walk to bus/rail
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
* **Is area governed by an adopted TDM ordinance that will promote ridesharing and/or the use of non-auto modes?**	No	No

*

*

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Faraday Avenue
From	Cannon Road
To	North Project Access
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,400

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	NB	**SB**
* **Transit stop amenities available:**	☑ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users	☑ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users
Do the sidewalks or path to the transit stop appear to be ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	Yes	Yes
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	Yes	Yes
* **Closest distance to existing transit stop:**	1/4 to 1/2 mile walk to bus/rail	1/4 to 1/2 mile walk to bus/rail
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
* **Is area governed by an adopted TDM ordinance that will promote ridesharing and/or the use of non-auto modes?**	No	No

*

*

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Cannon Road
From	South Project Access
To	0.5 miles south/east of South Project Access
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,400

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	NB	**SB**
* **Transit stop amenities available:**	☑ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users	☑ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users
Do the sidewalks or path to the transit stop appear to be ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	Yes	Yes
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	Yes	Yes
* **Closest distance to existing transit stop:**	1/4 to 1/2 mile walk to bus/rail	1/4 to 1/2 mile walk to bus/rail
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
* **Is area governed by an adopted TDM ordinance that will promote ridesharing and/or the use of non-auto modes?**	No	No

*

*

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Faraday Avenue
From	Cannon Road
To	Camino Hills Drive
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,000

BICYCLE

NB SCORE | LOS	SB SCORE | LOS
80 | B	90 | A

	Roadway Direction	
	NB	**SB**
* Do the roadway pavement conditions appear to be good (e.g., no pot holes)?	Yes	Yes
* Does bike facility on roadway appear to be free of obstructions (e.g., drainage grates)?	Yes	Yes
* Does the bicycle facility appear to meet MUTCD signing and striping design guidelines?	Yes	Yes
Is on-street parking provided?	Parallel parking with door-side buffered bike lane	No
Speed limit (miles per hour - mph):	higher than 35 mph	higher than 35 mph
Does the bikeway on the study segment and side streets meet and/or exceed the Bicycle Master Plan?	Both	Both
Is there enhanced bicycle detection or video detection provided at intersections?	No	No
Any bicycle racks are provided along segment?	No	No
Bicycle Facility Provided:	Bike Lane	Bike Lane
	Lane Width (ft)	Lane Width (ft)
	7	6
	Bicycle Buffer Width (ft)	Bicycle Buffer Width (ft)
	0	7
	Bike lanes are striped continuously through the study segment?	Bike lanes are striped continuously through the study segment?
	Yes	Yes

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

City of Carlsbad

ROADWAY INFO

Roadway Name	Faraday Avenue
From	Cannon Road
To	Camino Hills Drive
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,000

PEDESTRIAN

NB SCORE | LOS	SB SCORE | LOS
85 | B	85 | B

	Roadway Direction	
	NB	**SB**
* Do pedestrian crossings appear consistent with the CA MUTCD?	Yes	Yes
* Minimum Sidewalk Unobstructed Width in Feet (Minimum ADA unobstructed width requirement is 4'):	5	5
* Do sidewalks appear to meet ADA requirements (e.g., cross-slope and trip hazards)?	Yes	Yes
* Do ramps and landings appear to meet ADA requirements?	Yes	Yes
* Do the street light locations appear adequate?	Yes	Yes
Speed limit (miles per hour - mph):	higher than 35 mph	higher than 35 mph
Number of Through Lanes:	1	1
Are there 3 lanes or less to be crossed without pedestrian refuge? (Include turn lanes in count)	Yes	Yes
Width (ft.) of landscaped buffer between pedestrian facility and vehicle travel way:	0' to 2'	0' to 2'
Does on-street parking or a bike lane provide 6' or more buffer between pedestrians and vehicle travel way?	Yes	Yes
Any apparent sight distance issues at intersections and pedestrian crossings?	No	No
Are there any permanent speed control devices installed?	No	No
Are there traffic calming measures that reduce crossing width (e.g., bulbouts, chokers, right-turn median island)?	No	No
Do crosswalks appear to be high visibility?	No	No
Are there intersection enhancements provided for pedestrians (e.g., pedestrian signal phasing, countdown heads)?	No	No
Are there Rectangular Rapid Flashing Beacons (RRFBs) at street crossings?	No	No
Is there pedestrian scale lighting?	No	No
Do active building frontages appear to be present on 80% of street curb line?	No	No
Does the street furniture appear to be oriented towards businesses or attractions?	No	No
Do the street trees appear to provide shade over more than 50% of the sidewalk length?	No	No

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Faraday Avenue
From	Cannon Road
To	North Project Access
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,000

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
0 | F	0 | F

	Roadway Direction	
	NB	**SB**
* **Transit stop amenities available:**	☐ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users	☐ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users
Do the sidewalks or path to the transit stop appear to be ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	Yes	Yes
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	Yes	Yes
* **Closest distance to existing transit stop:**	1/4 to 1/2 mile walk to bus/rail	1/4 to 1/2 mile walk to bus/rail
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
* **Is area governed by an adopted TDM ordinance that will promote ridesharing and/or the use of non-auto modes?**	No	No

*

*

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

X

Roadway Name	Cannon Road
From	South Project Access
To	0.5 miles south/east of South Project Access
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,000

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
0 | F	0 | F

	Roadway Direction	
	NB	**SB**
* **Transit stop amenities available:**	☐ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users	☐ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users
Do the sidewalks or path to the transit stop appear to be ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	Yes	Yes
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	Yes	Yes
* **Closest distance to existing transit stop:**	1/4 to 1/2 mile walk to bus/rail	1/4 to 1/2 mile walk to bus/rail
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
* **Is area governed by an adopted TDM ordinance that will promote ridesharing and/or the use of non-auto modes?**	No	No

*

*

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

Future Transit
With Improvements

ROADWAY INFO

Roadway Name	Faraday Avenue
From	Cannon Road
To	North Project Access
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,000

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	NB	**SB**
* **Transit stop amenities available:**	☑ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users	☑ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users
Do the sidewalks or path to the transit stop appear to be ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	Yes	Yes
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	Yes	Yes
* **Closest distance to existing transit stop:**	1/4 to 1/2 mile walk to bus/rail	1/4 to 1/2 mile walk to bus/rail
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
* **Is area governed by an adopted TDM ordinance that will promote ridesharing and/or the use of non-auto modes?**	No	No

*

*

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

Future Transit
With Improvements

ROADWAY INFO

Roadway Name	Cannon Road
From	South Project Access
To	0.5 miles south/east of South Project Access
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,000

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	NB	**SB**
* **Transit stop amenities available:**	☑ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users	☑ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users
Do the sidewalks or path to the transit stop appear to be ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	Yes	Yes
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	Yes	Yes
* **Closest distance to existing transit stop:**	1/4 to 1/2 mile walk to bus/rail	1/4 to 1/2 mile walk to bus/rail
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
* **Is area governed by an adopted TDM ordinance that will promote ridesharing and/or the use of non-auto modes?**	No	No

*

*

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Faraday Avenue
From	Cannon Road
To	Camino Hills Drive
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,700

BICYCLE

NB SCORE | LOS	SB SCORE | LOS
80 | B	90 | A

	Roadway Direction	
	NB	**SB**
* Do the roadway pavement conditions appear to be good (e.g., no pot holes)?	Yes	Yes
* Does bike facility on roadway appear to be free of obstructions (e.g., drainage grates)?	Yes	Yes
* Does the bicycle facility appear to meet MUTCD signing and striping design guidelines?	Yes	Yes
Is on-street parking provided?	Parallel parking with door-side buffered bike lane	No
Speed limit (miles per hour - mph):	higher than 35 mph	higher than 35 mph
Does the bikeway on the study segment and side streets meet and/or exceed the Bicycle Master Plan?	Both	Both
Is there enhanced bicycle detection or video detection provided at intersections?	No	No
Any bicycle racks are provided along segment?	No	No
Bicycle Facility Provided:	Bike Lane	Bike Lane
	Lane Width (ft)	Lane Width (ft)
	7	6
	Bicycle Buffer Width (ft)	Bicycle Buffer Width (ft)
	0	7
	Bike lanes are striped continuously through the study segment?	Bike lanes are striped continuously through the study segment?
	Yes	Yes

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

City of Carlsbad

ROADWAY INFO

X

Roadway Name	Faraday Avenue
From	Cannon Road
To	Camino Hills Drive
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,700

PEDESTRIAN

NB SCORE | LOS	SB SCORE | LOS
85 | B	85 | B

	Roadway Direction	
	NB	**SB**
* Do pedestrian crossings appear consistent with the CA MUTCD?	Yes	Yes
* Minimum Sidewalk Unobstructed Width in Feet (Minimum ADA unobstructed width requirement is 4'):	5	5
* Do sidewalks appear to meet ADA requirements (e.g., cross-slope and trip hazards)?	Yes	Yes
* Do ramps and landings appear to meet ADA requirements?	Yes	Yes
* Do the street light locations appear adequate?	Yes	Yes
Speed limit (miles per hour - mph):	higher than 35 mph	higher than 35 mph
Number of Through Lanes:	1	1
Are there 3 lanes or less to be crossed without pedestrian refuge? (Include turn lanes in count)	Yes	Yes
Width (ft.) of landscaped buffer between pedestrian facility and vehicle travel way:	0' to 2'	0' to 2'
Does on-street parking or a bike lane provide 6' or more buffer between pedestrians and vehicle travel way?	Yes	Yes
Any apparent sight distance issues at intersections and pedestrian crossings?	No	No
Are there any permanent speed control devices installed?	No	No
Are there traffic calming measures that reduce crossing width (e.g., bulbouts, chokers, right-turn median island)?	No	No
Do crosswalks appear to be high visibility?	No	No
Are there intersection enhancements provided for pedestrians (e.g., pedestrian signal phasing, countdown heads)?	No	No
Are there Rectangular Rapid Flashing Beacons (RRFBs) at street crossings?	No	No
Is there pedestrian scale lighting?	No	No
Do active building frontages appear to be present on 80% of street curb line?	No	No
Does the street furniture appear to be oriented towards businesses or attractions?	No	No
Do the street trees appear to provide shade over more than 50% of the sidewalk length?	No	No

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Faraday Avenue
From	Cannon Road
To	North Project Access
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,700

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
0 | F	0 | F

	Roadway Direction	
	NB	**SB**
* **Transit stop amenities available:**	☐ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users	☐ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users
Do the sidewalks or path to the transit stop appear to be ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	Yes	Yes
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	Yes	Yes
* **Closest distance to existing transit stop:**	1/4 to 1/2 mile walk to bus/rail	1/4 to 1/2 mile walk to bus/rail
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
* **Is area governed by an adopted TDM ordinance that will promote ridesharing and/or the use of non-auto modes?**	No	No

*

*

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Cannon Road
From	South Project Access
To	0.5 miles south/east of South Project Access
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,700

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
0 | F	0 | F

	Roadway Direction	
	NB	**SB**
* **Transit stop amenities available:**	☐ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users	☐ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users
Do the sidewalks or path to the transit stop appear to be ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	Yes	Yes
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	Yes	Yes
* **Closest distance to existing transit stop:**	1/4 to 1/2 mile walk to bus/rail	1/4 to 1/2 mile walk to bus/rail
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
* **Is area governed by an adopted TDM ordinance that will promote ridesharing and/or the use of non-auto modes?**	No	No

*

*

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Faraday Avenue
From	Cannon Road
To	North Project Access
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,700

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	NB	**SB**
* **Transit stop amenities available:**	☑ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users	☑ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users
Do the sidewalks or path to the transit stop appear to be ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	Yes	Yes
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	Yes	Yes
* **Closest distance to existing transit stop:**	1/4 to 1/2 mile walk to bus/rail	1/4 to 1/2 mile walk to bus/rail
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
* **Is area governed by an adopted TDM ordinance that will promote ridesharing and/or the use of non-auto modes?**	No	No

*

*

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*

ROADWAY INFO

Roadway Name	Cannon Road
From	South Project Access
To	0.5 miles south/east of South Project Access
Street Typology from Mobility Element	Employment/Transit Connectors
Average Daily Traffic (ADT) volume (2-way total)	8,700

TRANSIT

NB SCORE | LOS	SB SCORE | LOS
100 | A	100 | A

	Roadway Direction	
	NB	**SB**
* **Transit stop amenities available:**	☑ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users	☑ Bench ☐ Trash Cans ☐ Covered Bus Stop ☑ Well-lit Stops ☐ Stop located within a block of commercial users
Do the sidewalks or path to the transit stop appear to be ADA compliant?	Yes	Yes
Do multiple transit routes stop on the study segment?	Yes	Yes
Do any of the routes provide a direct link to a COASTER station or mobility hub?	Yes	Yes
Do any of the routes provide a single transfer to reach a COASTER station or mobility hub?	Yes	Yes
* **Closest distance to existing transit stop:**	1/4 to 1/2 mile walk to bus/rail	1/4 to 1/2 mile walk to bus/rail
What type of transit priority is present?	None present	None present
Headways between 6:30-8:30 am and 4-6 pm on weekdays:	30 minutes	30 minutes
Is there commute shuttle service provided during the morning and afternoon commute periods?	No	No
On weekends, are the headways no more than 1 hour headways between 9 am-5 pm?	Yes	Yes
Is there bike parking available at the bus stop?	No	No
Is the bus stop within 1/4 mile of a bike repair shop?	No	No
* **Is area governed by an adopted TDM ordinance that will promote ridesharing and/or the use of non-auto modes?**	No	No

*

*

* *Indicates an essential feature that strongly supports and promotes the goals identifed in the Climate Action Plan (CAP).*


PSOMAS