CHEN RYAN

MEMORANDUM

TO: Ms. Rita Mahoney, Colrich

FROM: Jonathan Sanchez, TE; Chen Ryan Associates
Cristian Belmudez; Chen Ryan Associates

DATE: June 17, 2021

RE: Otay Mesa Lumina III – Traffic Analysis Memorandum PTS#651806

The purpose of this Traffic Analysis Memorandum is to identify and document potential significant transportation impacts associated with the development of the proposed Otay Mesa Lumina III project (the "Project"), as well as to recommend mitigation measures for any identified significant traffic impact on study area intersections or roadways. This project intends to tier off the Otay Mesa Community Plan Final Environmental Impact Report (OMCPU FEIR) as discussed later in this report.

Project Description

The 3.5-acre project site is located just west of Cactus Road, south of Airway Road within the City of San Diego Otay Mesa Community Planning Area (CPA). This project is part of the approved Otay Mesa Central Village Specific Plan. The project proposes to develop 25 multi-family units at a density of less than 20 du/acre. Project access is proposed via Central Main Street (now Secano Street), located off of Cactus Road. The project opening year is anticipated to take place in 2027.

The following facilities are assumed to be constructed by the project as part of project frontage and shall be completed and operational prior to first occupancy:

Roadway Segment

- Cactus Road, between Secano Street and southern property boundary – This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median). This roadway is classified as a 4-Lane Major Arterial in the currently adopted Otay Mesa Community Plan, which is consistent with the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).
- Secano Street, between Village Way and Cactus Road – This segment serves as the project frontage and will be constructed full width as a 2-Lane Collector with a two-way left-turn lane . This roadway is designated as a 2-Lane with TWLTL Green Street in the Central Village Specific Plan.

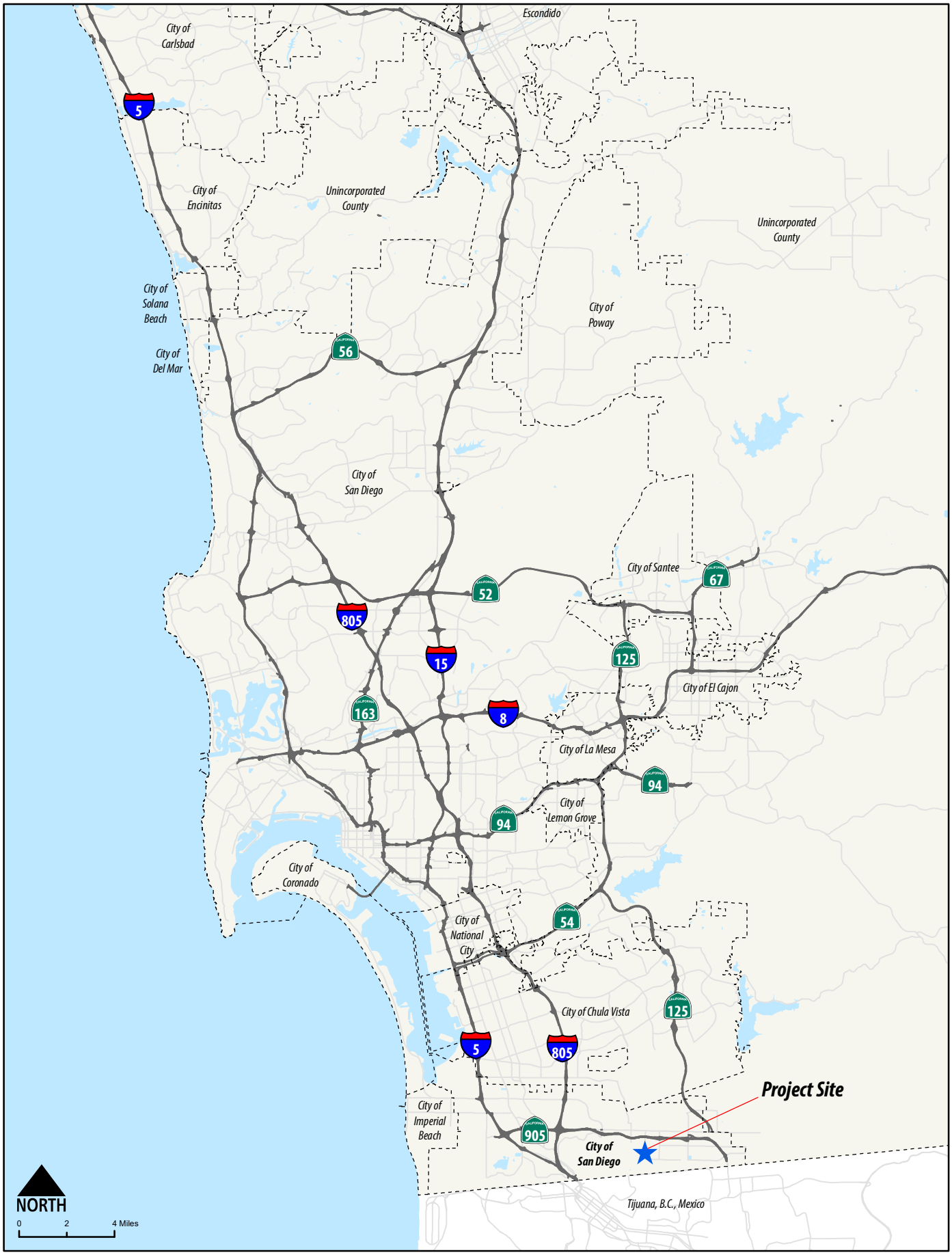
Intersection

- Cactus Road / Secano Street – Construction of an all-way stop controlled (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross-section mentioned above. However, the Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation will be taken into consideration when constructing this intersection. Full buildout of the Central Village Specific Plan will trigger the need for signalization of this intersection and the applicant shall contribute 25% towards the future signalization of this intersection because the project fronts one of four corners at this intersection. Per mitigation measure TRF-1 in the Central Village Specific Plan FEIR, March 17, 2017 (SCH. No. 2004651076).

It is important to note that the Lumina III project site is a remainder parcel to the Lumina development (PTS #555609) approved in 2019. Future development of the Lumina III site would be integrated into the overall Lumina development. Access to the Lumina III site would be provided by an off-site driveway west of the site within the Lumina project boundary. The current Lumina III Project only proposes a Tentative Map for grading and public improvements. A subsequent Neighborhood Development Permit (NDP) would be required to authorize development of structures on-site.

The entire Lumina III Project site and a portion of the Lumina site would be combined to create "Neighborhood H". A subsequent NDP that identifies building configuration and driveway location would be submitted for "Neighborhood H". Construction of the driveway access for "Neighborhood H" would be a condition of approval for the subsequent NDP.

Figure 1 displays the Project location while **Figure 2** displays the proposed site plan, respectively.



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Traffic Analysis Memorandum

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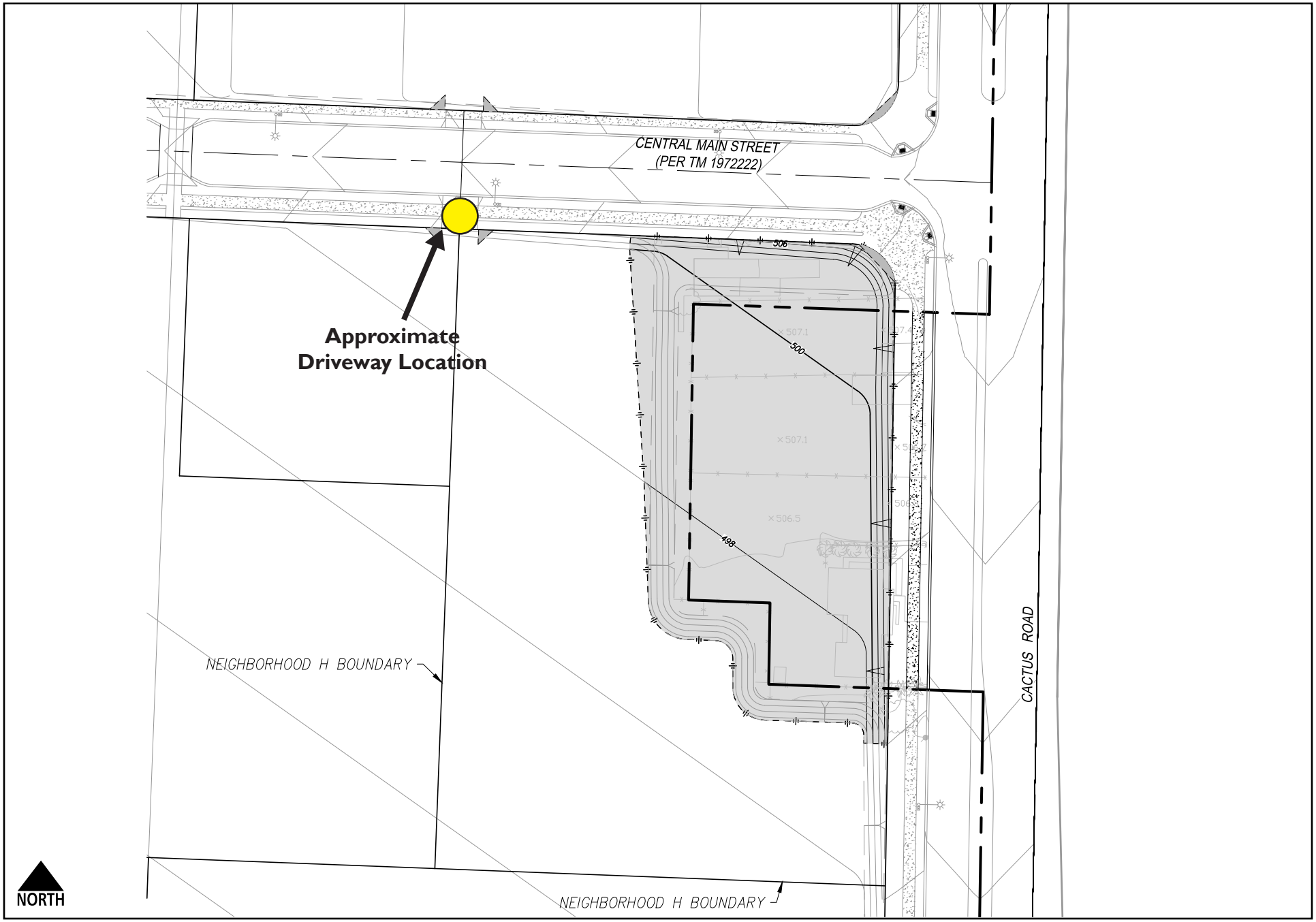
Figure 1
Project Location



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Traffic Analysis Memorandum
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Figure 2
Project Site Plan

Project Trip Generation

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

Table 1 Otay Mesa Lumina III – Trip Generation

		Trip		AM Peak Hour					PM Peak Hour				
Land Use	Units	Rate	ADT	%	Trips	Split	In	Out	%	Trips	Split	In	Out
Multi-Family	25	8 / DU	200	8%	16	2:8	3	13	10%	20	7:3	14	6

Source: City of San Diego Land Development Code – Trip Generation Manual, May 2003.

As shown in Table 1, the proposed project would generate a total of 200 daily trips, including 16 (3-in / 13-out) AM peak hour trips and 20 (14-in / 6-out) PM peak hour trips.

Project Distribution

Since the project is anticipated to be open in year 2027, the same project trip distribution (Year 2027) utilized in the Otay Mesa Lumina Transportation Impact Study (February 2019), was employed for the analysis of Otay Mesa Lumina III. **Figure 3** displays the project trip distribution patterns associated with the proposed project.

Project Assignment

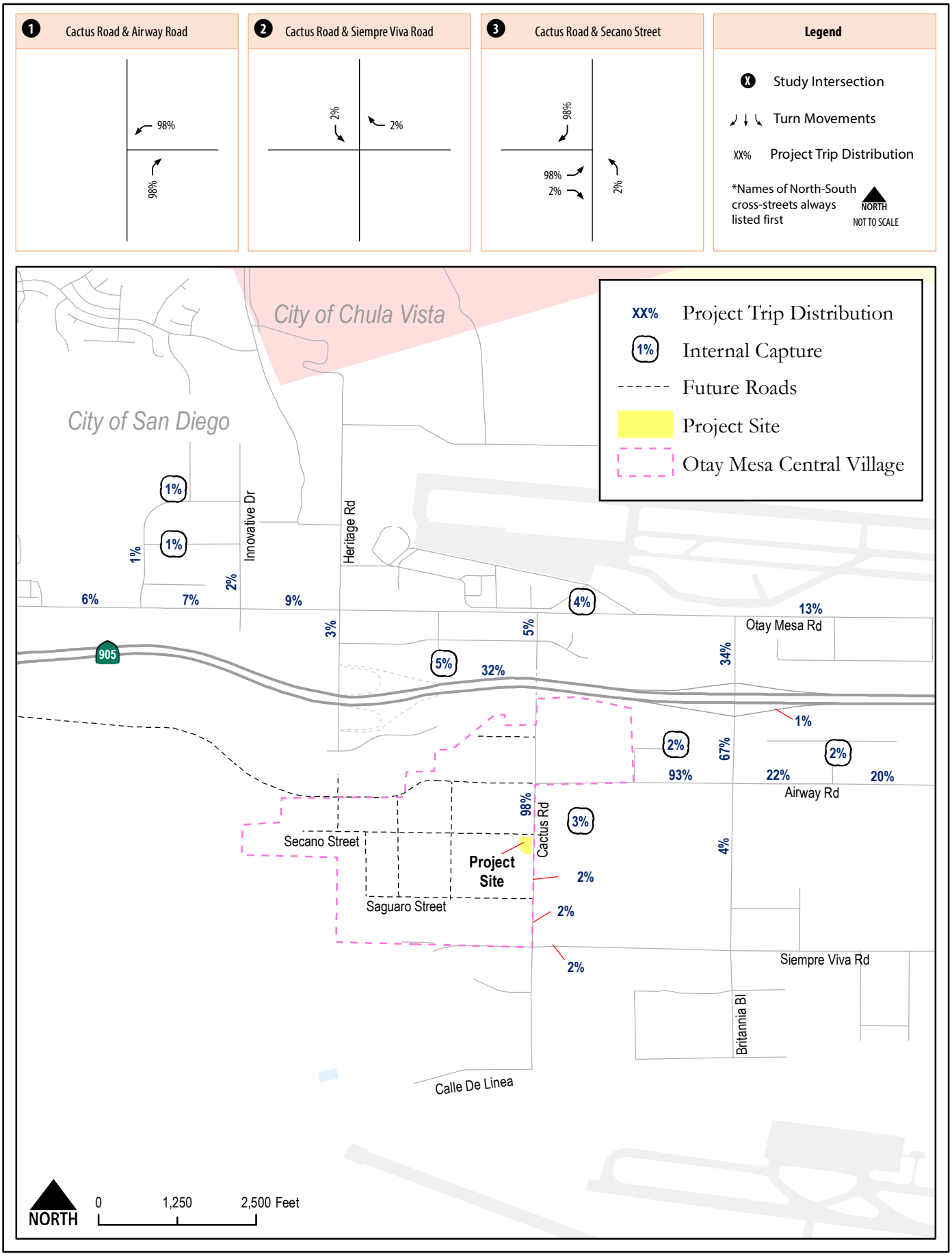
Based upon the project trip distribution patterns, the daily and AM/PM peak hour project trips were assigned to the study area roadway network. **Figure 4** displays the assignment of project trips to the roadway network and intersection.

Project Study Area

This section documents the project study area roadway and intersection configurations, traffic volumes and traffic operations.

Roadway Segments

- Cactus Road, between Airway Road and Siempre Viva Road
- Secano Street, between Cactus Road and Village Way



Otay Mesa Lumina III
Traffic Analysis Memorandum

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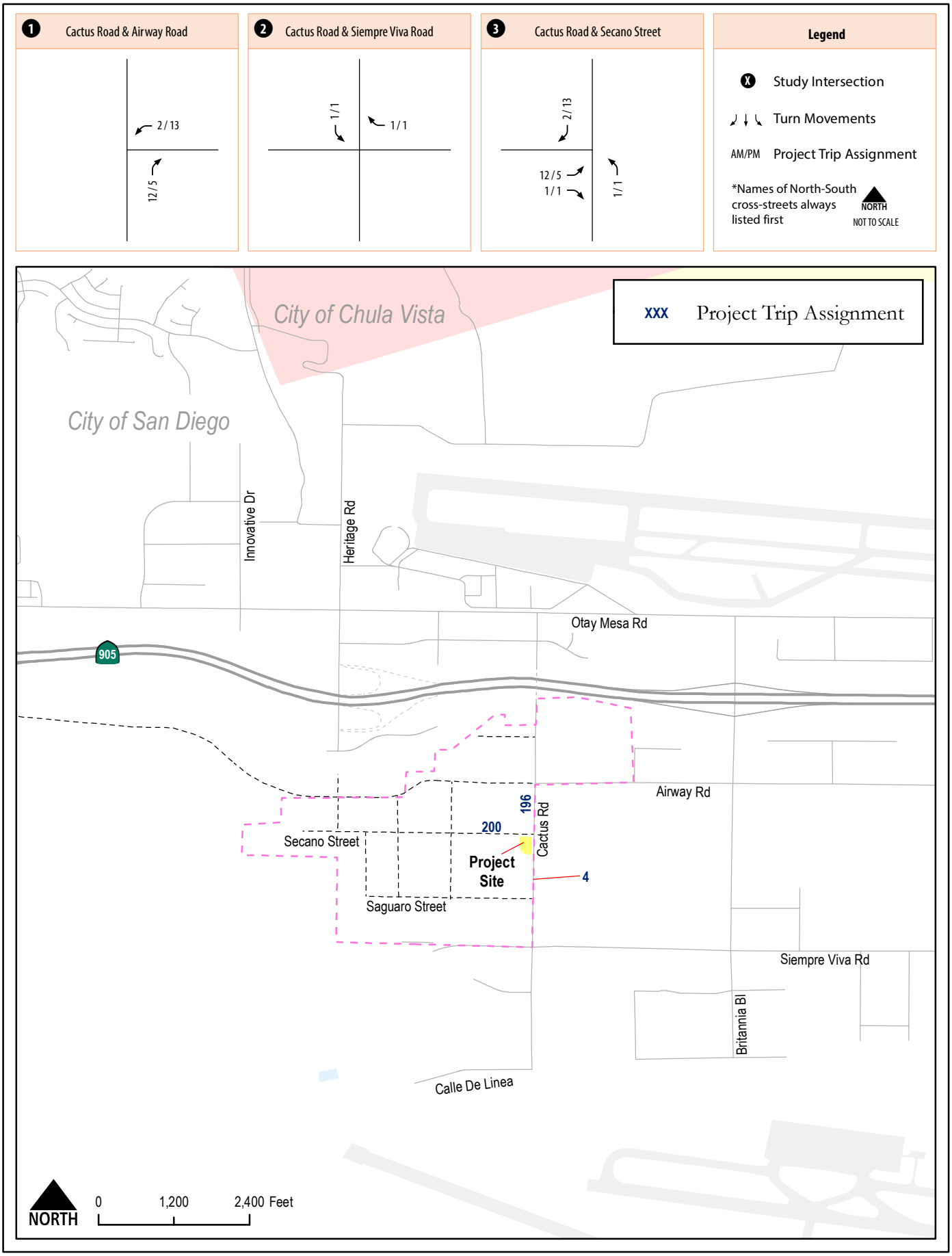
Figure 3
Project Trip Distribution



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Traffic Analysis Memorandum
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Figure 4
Project Trip Assignment

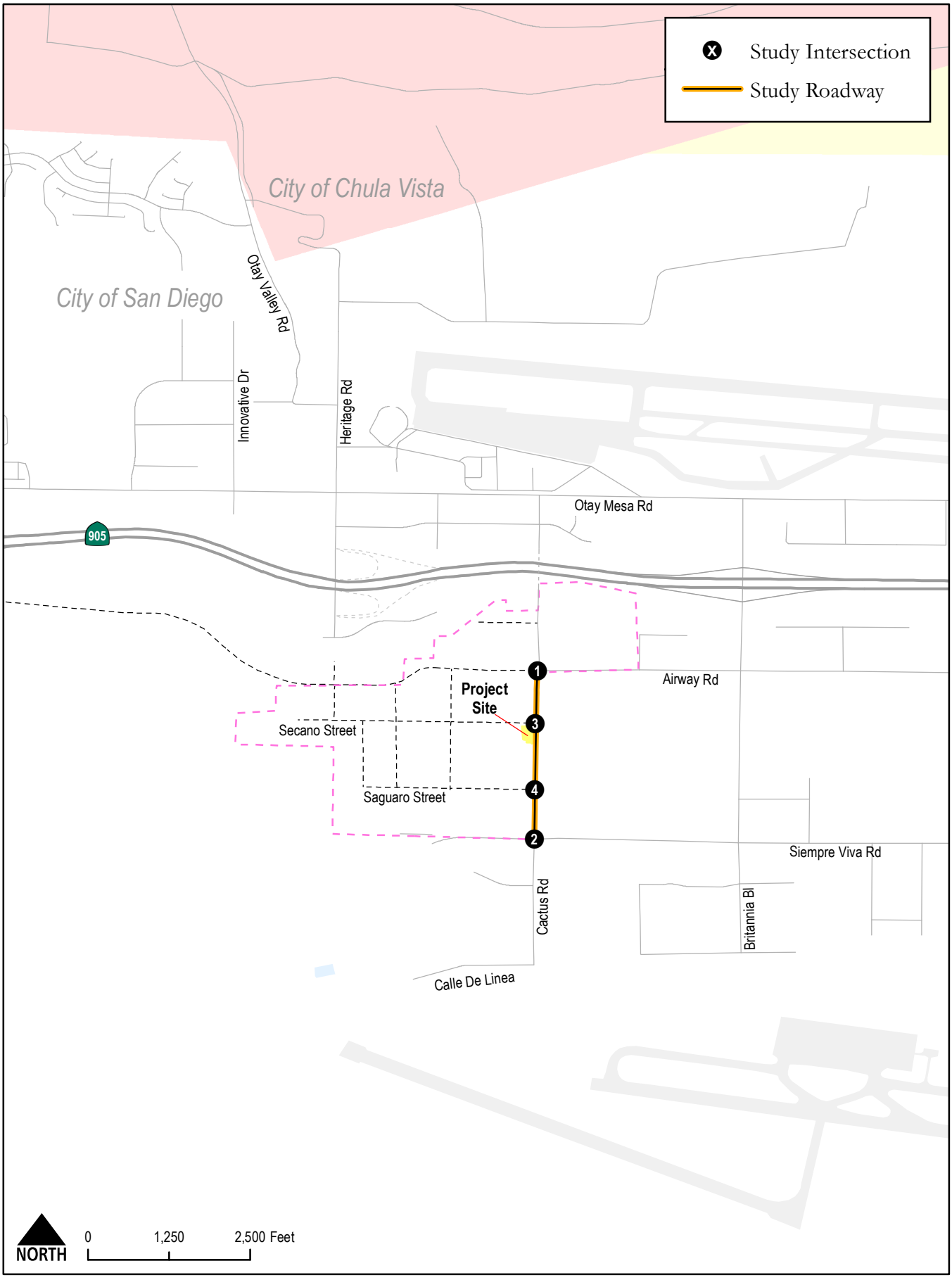
However, under Near-Term Year (Opening Day) 2027 conditions, due to other developments within the Central Village such as Lumina and Lumina II, the roadway segment of Cactus Road between Airway Road and Siempre Viva Road will be divided into four (4) study segments as follows:

- Cactus Road, between Airway Road and Secano Street;
- Cactus Road, between Secano Street and southern property boundary;
- Cactus Road, between southern property boundary and Street "C" (now Saguaro Street); and
- Cactus Road, between Saguaro Street and Siempre Viva Road

Intersections

1. Cactus Road / Airway Road
2. Cactus Road / Siempre Viva Road
3. Cactus Road / Secano Street
4. Cactus Road / Saguaro Street

Freeway mainline segments were not analyzed since the Project is not anticipated to add more than 50 peak hour trips, in either direction, to a freeway mainline segment. **Figure 5** displays the project study area.



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Traffic Analysis Memorandum
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Figure 5
Project Study Area

Existing Conditions

This section describes the study area, traffic volume information and LOS analysis results under existing conditions.

Roadway Network

Cactus Road, between Airway Road and Siempre Viva Road is currently a 2-lane undivided roadway with a posted speed limit of 35 MPH. Sidewalks are present only on the east side of the roadway for approximately 1,200 feet along ADESA Auto Auction frontage. Bike lanes are not present on either side of the roadway. On-street parallel parking is generally allowed. Cactus Road is classified as a 4-lane Major Arterial between Airway Road and Siempre Viva Road in the Otay Mesa Community Plan.

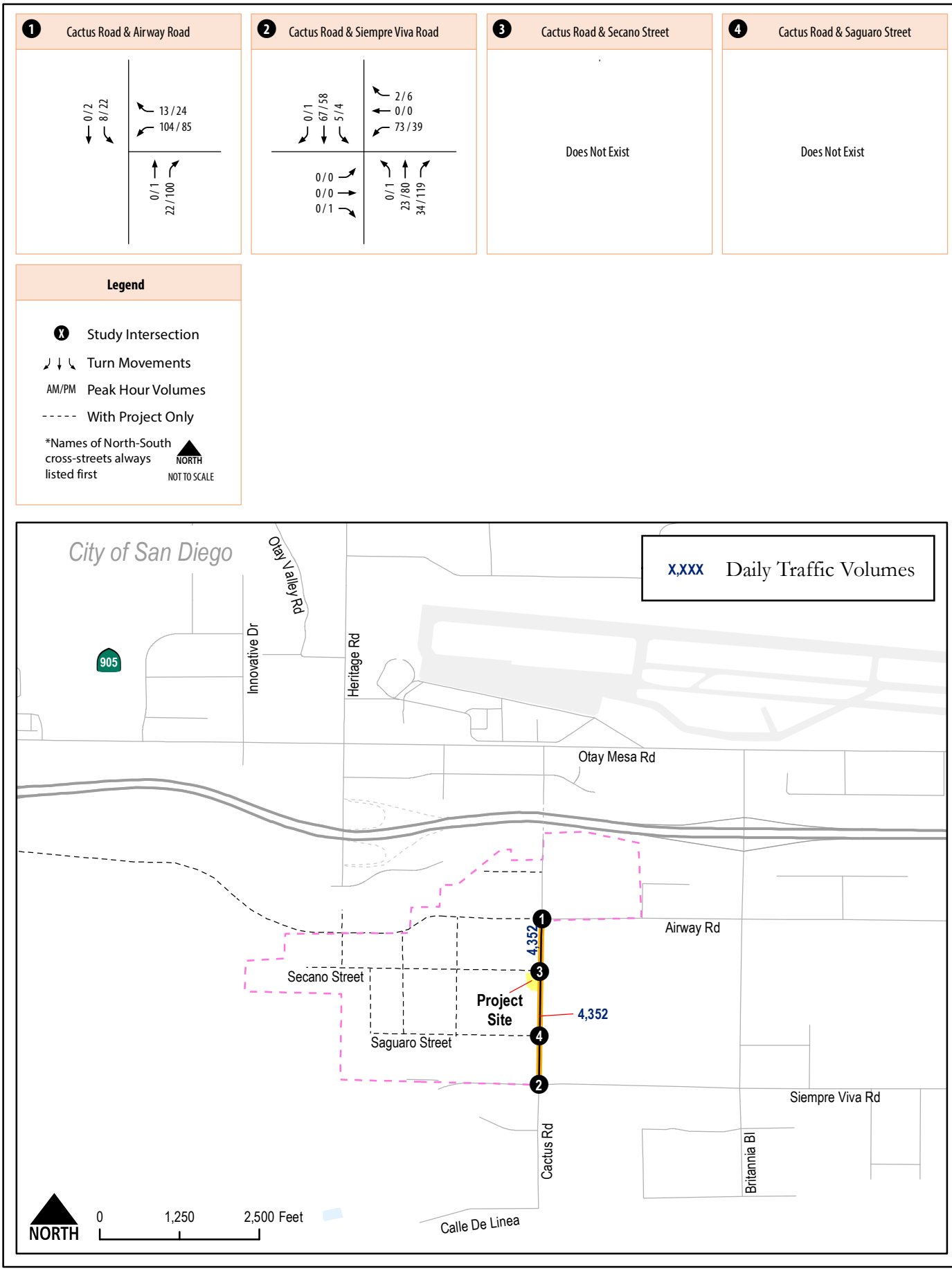
Existing Roadway and Intersection Volumes

Traffic Volumes

Due to construction on the roadway segment of Airway Road, between Cactus Road and Britannia Boulevard, traffic counts were not collected on the roadway segment of Cactus Road between Airway Road and Siempre Viva because traffic volumes and patterns are greatly affected by the construction. Therefore, historic counts from the years 2015 and 2019 for the near-by segment of Cactus Road north of Airway Road were utilized to develop a growth factor. As a result, an approximate growth of 100% (from 228 ADT to 478 ADT) was calculated in the area. This growth factor was applied to the 2015 historic counts on the roadway segment of Cactus Road between Airway Road and Siempre Viva Road in order to derive 2019-2020 daily traffic volumes of 4,352 ADT.

Traffic volumes at the intersection of Cactus Road and Siempre Viva Road were also estimated by applying the same approach/methodology described above. Historic counts from the years 2015 and 2019 for the near-by intersection of Cactus Road and Airway Road were utilized to develop a growth factor for both AM and PM peak hours. As a result, an approximate growth of 1% (from 202 total intersection peak hour volumes to 204 total intersection peak hour volumes) was calculated at the intersection during the AM peak hour and an approximate 6% growth (from 292 total intersection peak hour volumes to 310 total intersection peak hour volumes) was calculated at the intersection during the PM peak hour. These growth factors were applied to the 2015 historic counts at the intersection of Cactus Road and Siempre Viva Road in order to derive 2019-2020 volumes.

Figure 6 displays estimated existing daily traffic volumes within the study area roadway segment. See **Attachment 1** for traffic count calculations.



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Traffic Analysis Memorandum
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Figure 6
Traffic Volumes
Existing Conditions

Traffic Operations Under Existing Conditions

This section documents the traffic operations under Existing conditions within the study area. Roadway segment and intersection operations are discussed separately below. The roadway and intersection analyses were performed in accordance with the requirements of the City of San Diego Traffic Impact Study Manual, July 1998, the City of San Diego Significance Determination Thresholds, January 2016, and the enhanced California Environmental Quality Act (CEQA) project review process. Detailed information on roadway segment and intersection analysis methodologies, standards, and thresholds are found in **Attachment 2**.

Roadway Segment

Table 2 displays the daily roadway level of service for Cactus Road, along the project frontage under Existing conditions.

Table 2 Roadway Segment Level of Service Results – Existing Conditions

Roadway	Segment	Functional Classification	LOS Threshold (LOS E)	ADT	V/C	LOS
Cactus Road	Between Airway Road and Siempre Viva Road	2-Lane Collector w/ Commercial Fronting	8,000	4,352*	0.544	C

Source: Chen Ryan Associates, June 2021

Notes:
V/C = Volume to Capacity Ratio.
*Estimated ADT.

As shown in Table 2, Cactus Road operates at LOS C within the study area.

Intersection

Table 3 displays the intersection level of service for the project study area intersections under Existing Conditions. LOS calculation worksheets for Existing Conditions are provided in **Attachment 3**.

Table 3 Intersection Level of Service Results – Existing Conditions

			AM Peak Hour		PM Peak Hour	
#	Intersection	Control Type	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS
1	Cactus Road / Airway Road	SSSC	9.4	A	10.3	B
2	Cactus Road / Siempre Viva Road	AWSC	7.9	A	8.4	A
3	Cactus Road / Secano Street			DNE		
4	Cactus Road / Saguaro Street			DNE		

Source: Chen Ryan Associates, June 2021

Notes:
SSSC = Side-Street Stop Control. For SSSC, the delay shown is the worst delay experienced by any of the movements.
AWSC = All-Way Stop Control. For AWSC, the delay shown is the average delay experienced by all of the approaches.
DNE = Does Not Exist.

As shown in Table 3, both intersections operate at LOS B or better during both the AM and PM peak hour under Existing Conditions.

Existing With Project Conditions

This section describes the study area, traffic volume information and LOS analysis results under existing with project conditions.

Roadway Network

The following facilities are assumed to be constructed by the Project as part of project frontage:

Roadway Segment

- Cactus Road, between Secano Street and southern property boundary – This segment serves as the project frontage and will be improved to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median). This roadway is classified as a 4-Lane Major Arterial in the currently adopted Otay Mesa Community Plan, which is consistent with the project description in the Otay Mesa Public Facilities Financing Plan (PFFP).

- Secano Street, between Village Way and Cactus Road – This segment serves as the project frontage and will be constructed full width as a 2-Lane Collector with a two-way left-turn lane. This roadway is designated as a 2-Lane with TWLT Green Street in the Central Village Specific Plan.

Intersection

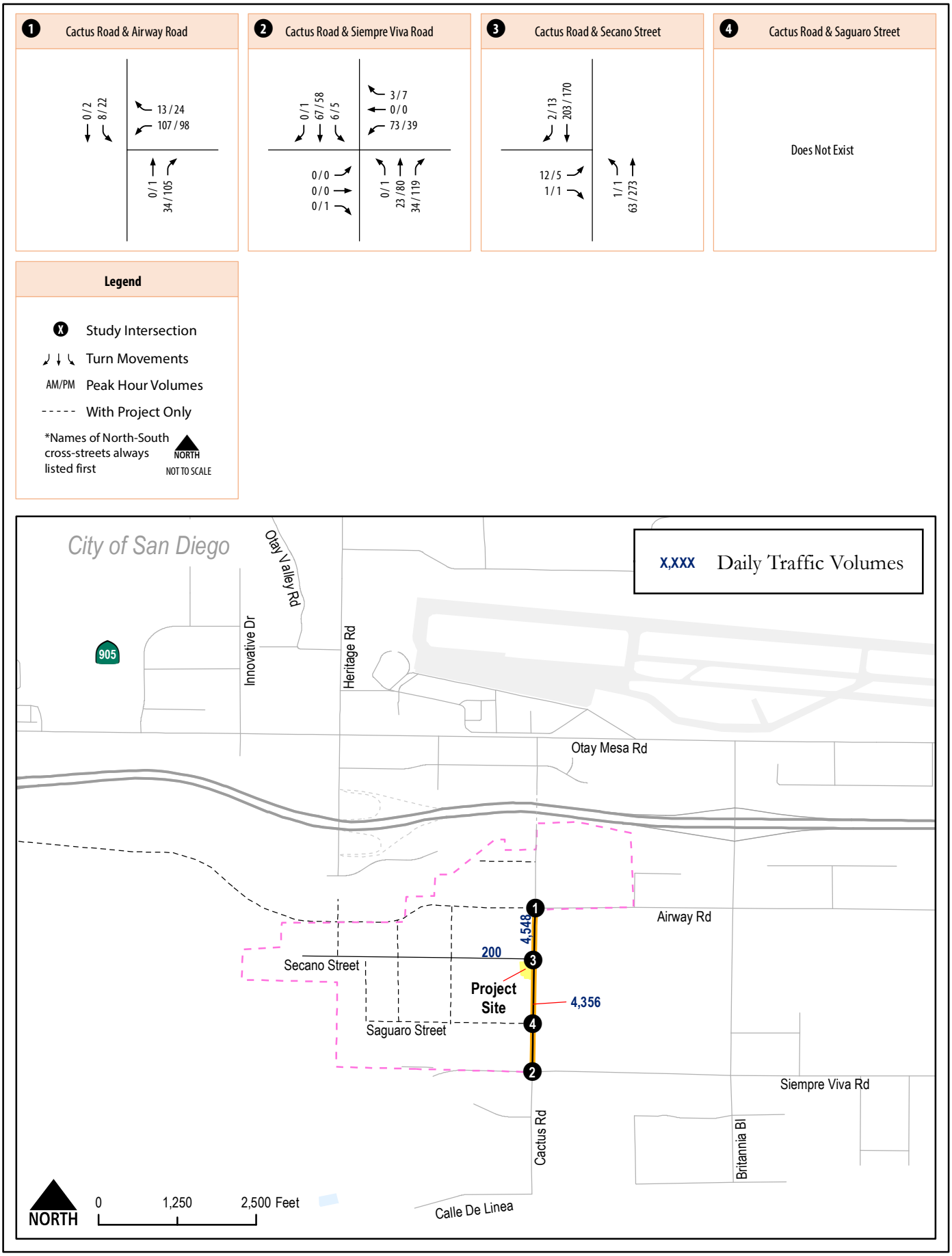
- Cactus Road / Secano Street – Construction of an all-way stop controlled (AWSC) T-intersection with an additional southbound through lane at the project frontage to match the roadway cross-section mentioned above. However, the Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) identifies this intersection as signalized. Therefore, appropriate design measures, such as the layout of the traffic signal foundation will be taken into consideration when constructing this intersection. Full buildout of the Central Village Specific Plan will trigger the need for signalization of this intersection and the applicant shall contribute 25% towards the future signalization of this intersection because the project fronts one of four corners at this intersection. Per mitigation measure TRF-1 in the Central Village Specific Plan FEIR, March 17, 2017 (SCH No. 2004651076).

Traffic Volumes

Existing With Project traffic volumes were derived by combining the existing traffic volumes (Figure 5) and the project trip assignment volumes displayed in (Figure 4). Existing With Project daily roadway and intersection volumes are displayed in **Figure 7**.

Traffic Operations Under Existing With Project Conditions

This section documents the traffic operations under Existing With Project conditions within the study area. Roadway segment and intersection operations are discussed separately below.



Otay Mesa Lumina III
Traffic Analysis Memorandum
CHEN RYAN

Figure 7
Traffic Volumes
Existing with Project Conditions

Roadway Segment

Table 4 displays the daily roadway level of service for Cactus Road and Secano Street under Existing With Project conditions.

Table 4 Roadway Segment Level of Service Results – Existing With Project Conditions

Roadway	Segment	Functional Classification	LOS Threshold (LOS E)	ADT	V/C	LOS	ADT w/o Project	V/C w/o Project	LOS w/o Project	ΔV/C	SI?
Cactus Road	Between Airway Road and Secano Street	2-Lane Collector w/ Commercial Fronting	8,000	4,548	0.569	C	4,352	0.544	C	0.025	N
Cactus Road	Between Secano Street and southern property boundary	3-Ln w / RM (1NB, 2 SB)	30,000[1]	4,356	0.145	A	4,352	0.544	B	-0.399	N
Cactus Road	Between southern property boundary and Siempre Viva Road	2-Lane Collector w/ Commercial Fronting	8,000	4,356	0.545	C	4,352	0.544	C	0.001	N
Secano Street	Between Village Way and Cactus Road	2-Lane Collector w/ Two-Way Left-Turn Lane	15,000	200	0.013	A	N/A	N/A	N/A	N/A	N

Source: Chen Ryan Associates, June 2021

Notes:
V/C = Volume to Capacity Ratio.
SI? = Significant Impact?
[1] Based on the capacity of a 4-Lane Major Arterial, reduced to exclude a lane. (3/4*40,000 = 30,000).
N/A = Not Available.

As shown in Table 4, all of the roadway segments operate at LOS C or better within the study area, with the implementation of the proposed project.

Based upon the significance impact criteria outlined in the City of San Diego Traffic Impact Study Manual, July 1998, the analyzed roadway segments **would not** be significantly impacted under Existing With Project conditions and mitigation measures **would not** be required.

Intersection

Table 5 displays the intersection level of service for the intersection of Cactus Road and Secano Street under Existing With Project conditions. LOS calculation worksheets for Existing With Project conditions are provided in **Attachment 4**.

Table 5 Intersection Level of Service Results – Existing With Project Conditions

#	Intersection	Control Type	AM Peak Hour Avg. Delay (sec)	AM Peak Hour LOS	PM Peak Hour Avg. Delay (sec)	PM Peak Hour LOS	Delay w/o Project (sec) AM/PM	LOS w/o Project AM/PM	Change in Delay (sec) AM/PM	SI?
1	Cactus Road / Airway Road	SSSC	9.5	A	10.4	B	9.4 / 10.3	A / B	0.1 / 0.1	N
2	Cactus Road / Siempre Viva Road	AWSC	7.9	A	8.4	A	7.9 / 8.4	A / A	0.0 / 0.0	N
3	Cactus Road / Secano Street	AWSC	8.3	A	9.8	A	N/A	N/A	N/A	N
4	Cactus Road / Saguaro Street			DNE			N/A	N/A	N/A	N/A

Source: Chen Ryan Associates, June2021

Notes:
SSSC = Side-Street Stop Control. For SSSC, the delay shown is the worst delay experienced by any of the movements.
AWSC = All-Way Stop Control. For AWSC, the delay shown is the average delay experienced by all of the approaches.
DNE = Does Not Exist.
SI? = Significant Impact?
N/A = Not Available.

As shown in Table 5, the study area intersections are projected to operate at LOS B or better during both the AM and PM peak hour, with the implementation of the proposed project.

Based upon the significance impact criteria outlined in the City of San Diego Traffic Impact Study Manual, July 1998, the analyzed intersection **would not** be significantly impacted under Existing With Project conditions and mitigation measures **would not** be required.

Near-Term Year (Opening Day) 2027 Conditions

This section describes the study area, traffic volume information and LOS analysis results under Near-Term Year (Opening Day) 2027 Conditions.

Description of Cumulative Projects

The same cumulative projects (Year 2027) utilized in the Otay Mesa Lumina Transportation Impact Study, February 2019, were included for the analysis of Otay Mesa Lumina III, with the addition of the following six (6) projects:

15. Otay Mesa Lumina – This project proposes to develop 1,655 medium high-density multi-family units, 213 low density multi-family units, 62, 500 square feet of commercial uses, 6.3 acres of school uses, and 6.6 acres of parks by the year 2027 (Full Development). This project is anticipated to generate a total of 15,581 daily trips, including 1,214 peak hour trips (390-in / 824-out) during the AM and 1,532 peak hour trips (944-in / 588-out) during the PM.

16. Otay Mesa Lumina II – This project proposes to develop 132 multi-family residential dwelling units. This project is anticipated to generate 792 daily trips, 64 peak hour trips (13-in / 51-out) during the AM and 72 peak hour trips (50-in / 22-out) during the PM.

17. Otay Mesa Floreo – This project proposes to develop 900 multi-family residential dwelling units, 10,000 square feet of community commercial uses, and 3.5 acres of park by year 2023. This project is anticipated to generate 6,275 daily trips, including 460 peak hour trips (103-in / 357-out) during the AM and 570 peak hour trips (382-in / 188-out) during the PM.

18. Southwest Village Specific Plan - This project proposes to develop 5,130 attached and detached residences, 175,000 square feet of community commercial and retail uses, 20 acres of parks, and a 7.5-acre school site. This project is anticipated to generate 45,050 daily trips, including 3,188 peak hour trips (904-in / 2,284-out) during the AM and 4,270 peak hour trips (2,631-in / 1,639-out) during the PM.

19. Plaza La Media South – This project proposes to develop 437,220 square feet of warehouse. This project is anticipated to generate 2,186 daily trips, including 328 peak hour trips (230-in / 98-out) during the AM and 350 peak hour trips (139-in / 211-out) during the PM.

20. Warehouse and Distribution Center – This project proposed to develop 235,480 square feet of warehouse and 12,000 square feet of office. This project is anticipated to generate 1,297 daily trips, including 195 peak hour trips (140-in / 55-out) during the AM and 206 peak hour trips (77-in / 129-out) during the PM.

Table 6 displays trip generation for the cumulative projects described above. Trip distribution and trip assignment for the cumulative projects was obtained from the Otay Mesa Lumina Transportation Impact Study, February 2019. Project information for the additional six projects listed above is included in **Attachment 5**.

Table 6 Cumulative Projects Trip Generation

Cumulative Project	Land Use	Daily Trips	AM Peak Hour (In / Out)	PM Peak Hour (In / Out)
1. 7-Eleven – Otay Mesa Road / Ocean View Hills Parkway (PTS#540084)	Convenience Store	1,800	144 (72-in / 72-out)	144 (72-in / 72-out)
2. Azul Playa Del Sol/Luna (California Terraces PA 6)	Residential	4,440	356 (71-in / 285-out)	400 (280-in / 120-out)
3. Candlelight (PTS#40329)	Residential	2,850	228 (46-in / 182-out)	257 (180-in / 77-out)
4. Southview (PTS#370044)	Residential	1,662	133 (27-in / 106-out)	299 (105-in / 194-out)
5. Southview East (PTS#371807)	Residential	816	65 (13-in / 52-out)	220 (51-in / 169-out)
6. Southwind (PTS#412529)	Residential	800	64 (13-in / 51-out)	80 (56-in / 24-out)
7. Handler Site (PTS#659064)[1]	Motel	1,701	136 (54-in / 82-out)	153 (61-in / 92-out)
	Restaurant (sit down high turnover)	3,120	250 (125-in / 125-out)	250 (150-in / 100-out)
	Fast food (with drive-through)	4,200	168 (101-in / 67-out)	336 (168-in / 168-out)
8. Arco #5770	Gas Station	60	4 (2-in / 2-out)	4 (2-in / 2-out)
9. Marijuana Production Facility (PTS#585510)	Marijuana Facility	346	69 (62-in / 7-out)	69 (14-in / 55-out)
10. California Terraces PA 61 (PTS#605191)	Mixed-use Residential/Commercial	4,716	252 (101-in / 151-out)	486 (271-in / 215-out)
11. Cross Border Facility (Full Buildout) (PTS#473500)	Cross Border Facility	46,700	2,313 (1,505-in / 808-out)	2,547 (1,115-in / 1,431-out)
12. Metro Airpark Site (PTS#559378)[2]	Airport / Retail	24,760	2,695 (2,116-in / 579-out)	2,780 (710-in / 2,070-out)
13. Plaza La Media (Full Buildout) (PTS#334235)	Commercial/Retail	8,660	310 (183-in / 127-out)	812 (407-in / 405-out)
14. Sunroad Otay Mesa (Phase 1 and Phase 2) (PTS#538140)	Warehouse	4,225	633 (444-in / 189-out)	676 (270-in / 406-out)
15. Otay Mesa Lumina[3] (PTS#555609)	Mixed-Use Residential/Commercial	15,581	1,214 (390-in / 824-out)	1,532 (944-in / 588-out)
16. Otay Mesa Lumina II[4] (PTS#625830)	Residential	792	64 (13-in / 51-out)	72 (50-in / 22-out)
17. Otay Mesa Floreo[5] (PTS#620164)	Mixed-Use Residential/Commercial	6,275	460 (103-in / 357-out)	570 (382-in / 188-out)
18. Southwest Village[6] (PTS#614791)	Mixed-Use Residential/Commercial	45,050	3,188 (904-in / 2,284-out)	4,270 (2,631-in / 1,639-out)
19. Plaza La Media South[7] (PTS#632813)	Warehouse	2,186	328 (230-in / 98-out)	350 (139-in / 211-out)

Table 6 Cumulative Projects Trip Generation

Cumulative Project	Land Use	Daily Trips	AM Peak Hour (In / Out)	PM Peak Hour (In / Out)
20. Warehouse Distribution Center[8] (PTS#665589)	Warehouse / Office	1,297	195 (140-in / 55-out)	206 (77-in / 129-out)
	Cumulative Total	**182,037**	**13,269 (6,715-in / 6,554-out)**	**16,513 (8,135-in / 8,377-out)**

Source: Chen Ryan Associates, January 2021

Notes:
[1] Handler Site is currently under review for CPA/RZ to 560 DU plus 7,500 sq. ft. of commercial under PTS #673818.
[2] Metro Airpark Site is currently under review for different SCR under PTS #664354.
[3] Trip Generation obtained from Otay Mesa Lumina TIS prepared by Chen Ryan Associates, Inc. February 20, 2019.
[4] Trip Generation obtained from Otay Mesa Lumina II TIS prepared by Chen Ryan Associates, Inc. January 14, 2021.
[5] Trip Generation obtained from the Draft Otay Mesa Floreo TIS prepared by Chen Ryan Associates, Inc. June 6, 2019. (under review).
[6] Trip Generation obtained from City of San Diego Land Development Code – Trip Generation Manual, May 2003.
[7] Trip Generation obtained from Plaza La Media South Traffic Sensitivity Analysis (TSA) prepared by Kimley-Horn Associates, Inc. February 2020. (under review)
[8] Trip Generation obtained from City of San Diego DSD staff.

Near-Term Year (Opening Day) 2027 Roadway and Intersection Volumes

Roadway Network

The roadway network was assumed to be identical to the Existing conditions network as shown in Figure 5.

Traffic Volumes

Figure 8 displays cumulative projects location and trip assignment. Near-Term Year (Opening Day) 2027 traffic volumes were derived by combining the existing traffic volumes (displayed in Figure 6), cumulative project trip assignment displayed in **Figure 9**, and the proposed project trip assignment volumes (displayed in Figure 4). **Figure 10** displays Near-Term Year (Opening Day) 2027 traffic volumes.

Traffic Operations Under Near-Term Year 2027 Conditions

This section documents the traffic operations under Near-Term Year (Opening Day) 2027 conditions within the study area. Roadway segment and intersection operations are discussed separately below.

Roadway Segment

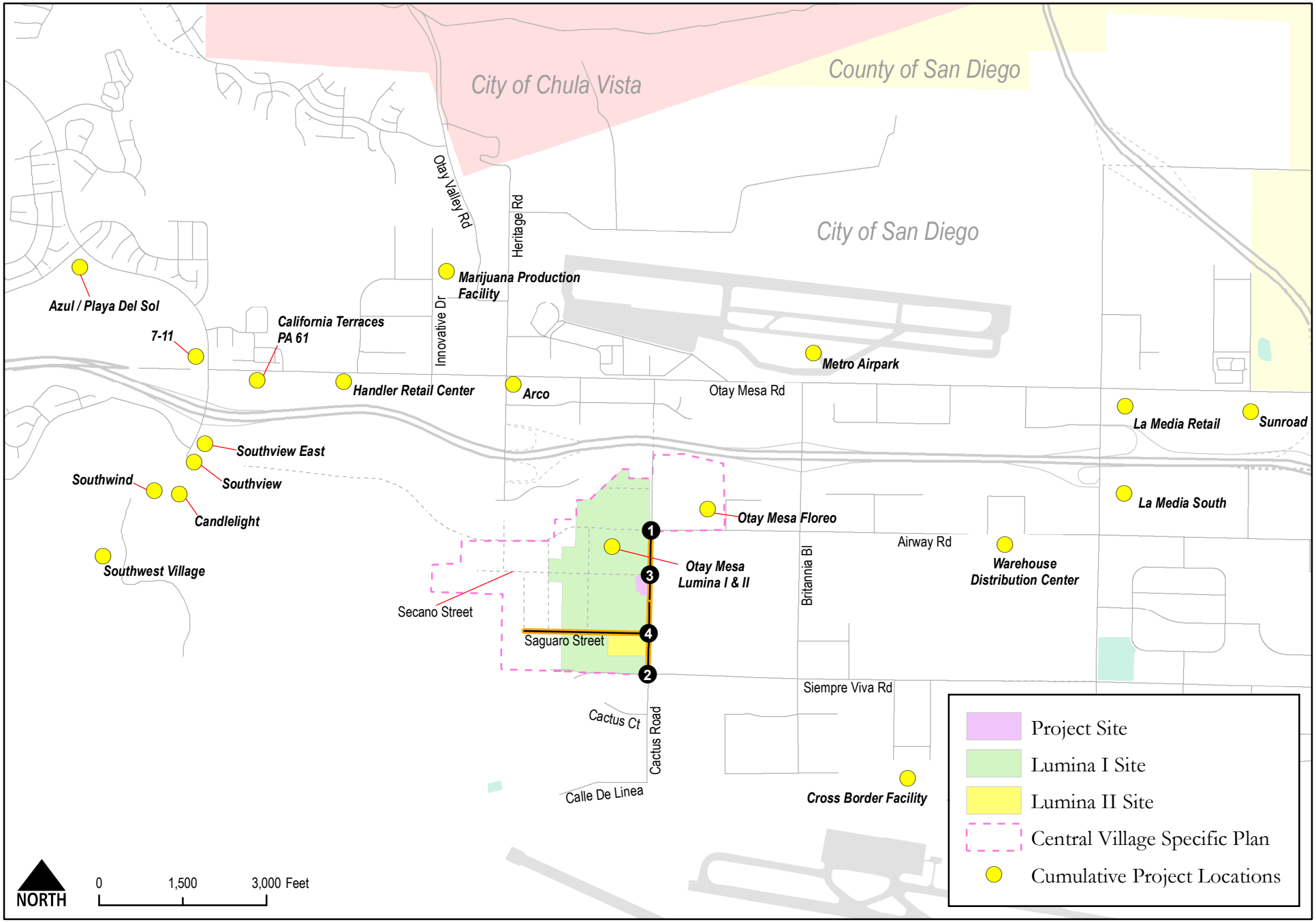
Table 7 displays the daily roadway level of service for Cactus Road and Secano Street under Near-Term Year (Opening Day) 2027 conditions.

Table 7 Roadway Segment Level of Service Results – Near-Term Year (Opening Day) 2027 Conditions

Roadway	Segment	Functional Classification	LOS Threshold (LOS E)	ADT	V/C	LOS
Cactus Road	Between Airway and Secano Street	2-Lane Collector w/ Commercial Fronting	8,000	11,487	1.436	**F**
Cactus Road	Between Secano Street and southern property boundary	2-Lane Collector w/ Commercial Fronting	8,000	8,371	1.046	**F**
Cactus Road	Between southern property boundary and Saguaro Street	2-Lane Collector w/ Commercial Fronting	8,000	8,371	1.046	**F**
Cactus Road	Between Saguaro Street and Siempre Viva Road	2-Lane Collector w/ Commercial Fronting	8,000	4,806	0.600	C
Secano Street	Between Village Way and Cactus Road	2-Lane Collector w/ Two-Way Left-Turn Lane	15,000	3,100	0.206	A

Source: Chen Ryan Associates, June 2021

Notes:
Bold letter indicates substandard LOS E or F.
V/C = Volume to Capacity Ratio.



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Traffic Analysis Memorandum
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Figure 8
Cumulative Project Locations

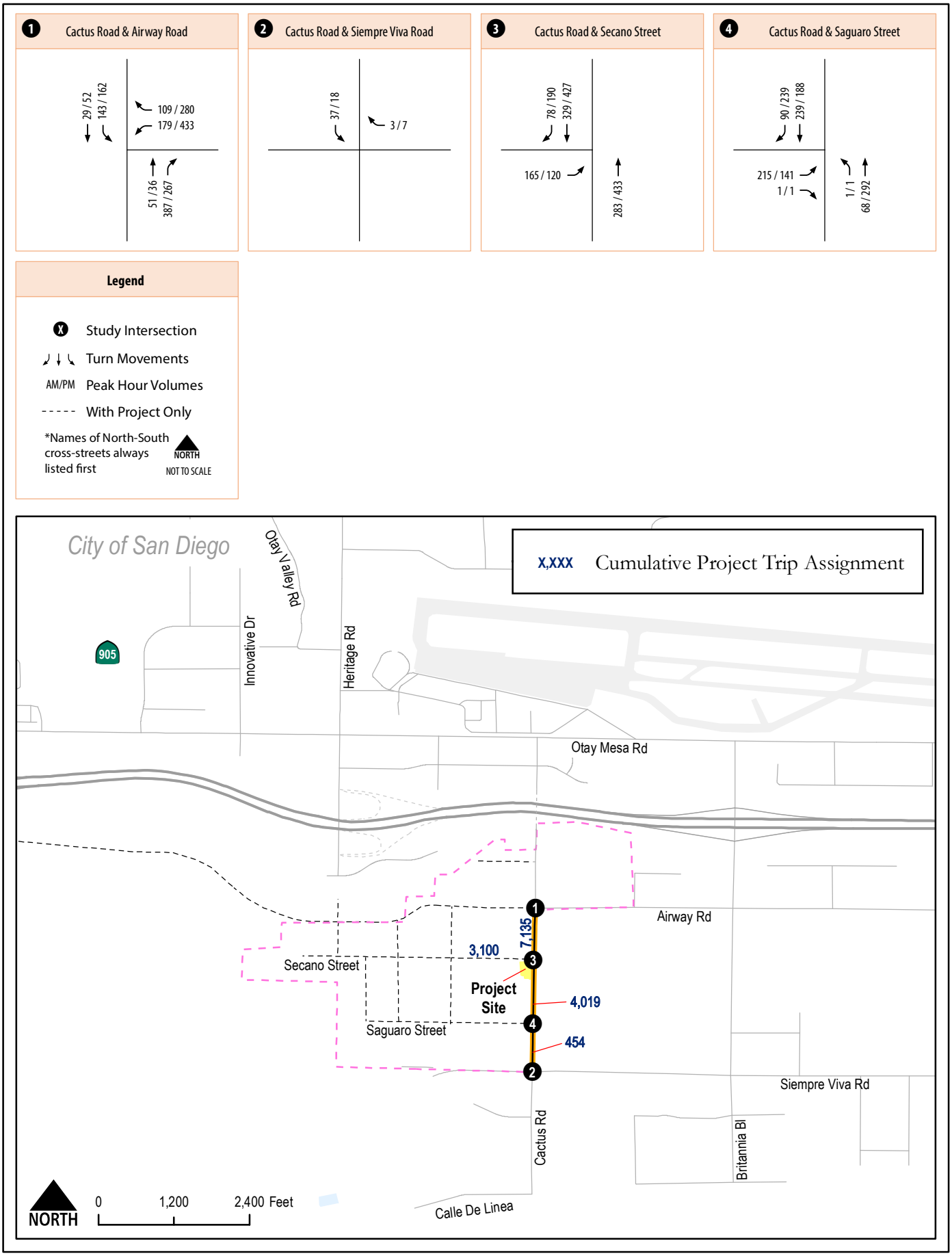

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Figure 9
Cumulative Project Trip Assignment

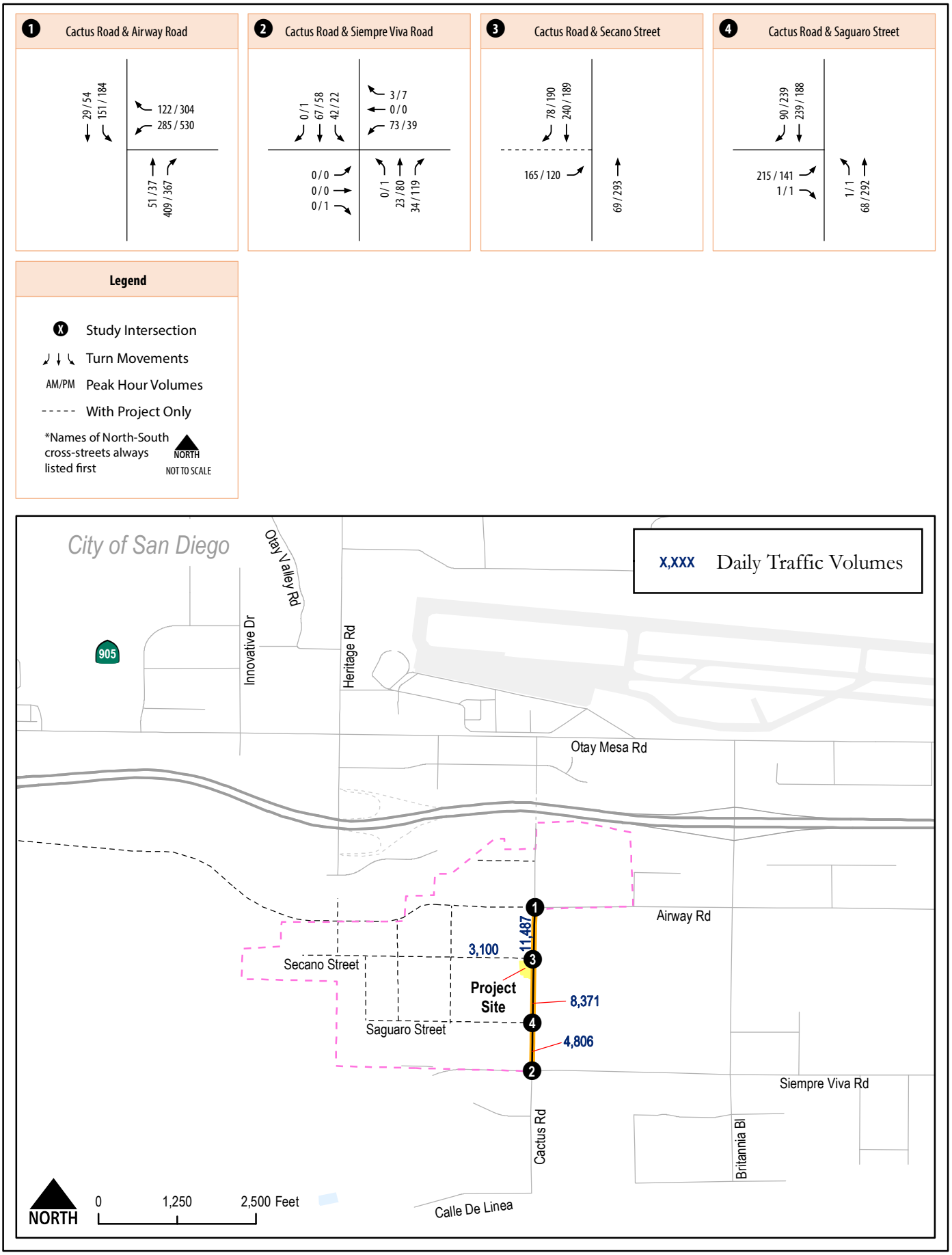

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Figure 10
Traffic Volumes
Near-Term Year 2027 Conditions

As shown in Table 7, three of five of the project study area roadway segments are projected to operate at LOS F, as follows:

- Cactus Road, between Airway Road and Secano Street – LOS F; and
- Cactus Road, between Secano Street and southern property boundary – LOS F; and
- Cactus Road, between southern property boundary and Saguaro Street – LOS F.

Intersection

Table 8 displays the intersection level of service for the project study area intersections under Near-Term Year (Opening Day) 2027 Conditions. LOS calculation worksheets for Near-Term Year (Opening Day) 2027 conditions are provided in **Attachment 6**.

Table 8 Intersection Level of Service Results – Near-Term Year (Opening Day) 2027 Conditions

			AM Peak Hour		PM Peak Hour	
#	Intersection	Control Type	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS
1	Cactus Road / Airway Road	SSSC	376.6	**F**	N/A[1]	**F**
2	Cactus Road / Siempre Viva Road	AWSC	8.1	A	8.4	A
3	Cactus Road / Secano Street	AWSC	11.7	B	16.9	C
4	Cactus Road / Saguaro Street	AWSC	9.9	A	11.5	B

Source: Chen Ryan Associates, June 2021

Notes:
Bold letter indicates substandard LOS E or F.
SSSC = Side-Street Stop Control. For SSSC, the delay shown is the worst delay experienced by any of the movements.
AWSC = All-Way Stop Control. For AWSC, the delay shown is the average delay experienced by all of the approaches.
[1] Exceeds maximum reasonable calculable delay of 600 seconds per Synchro 10.0 traffic analysis software.

As shown in Table 8, all study area intersections are projected to operate at LOS C or better during both the AM and PM peak hour, except for the following:

1. Cactus Road / Airway Road – LOS F during both the AM and PM peak hours.

Near-Term Year (Opening Day) 2027 with Project Conditions

This section describes the study area, traffic volume information and LOS analysis results under Near-Term Year (Opening Day) 2027 With Project conditions.

Roadway Network

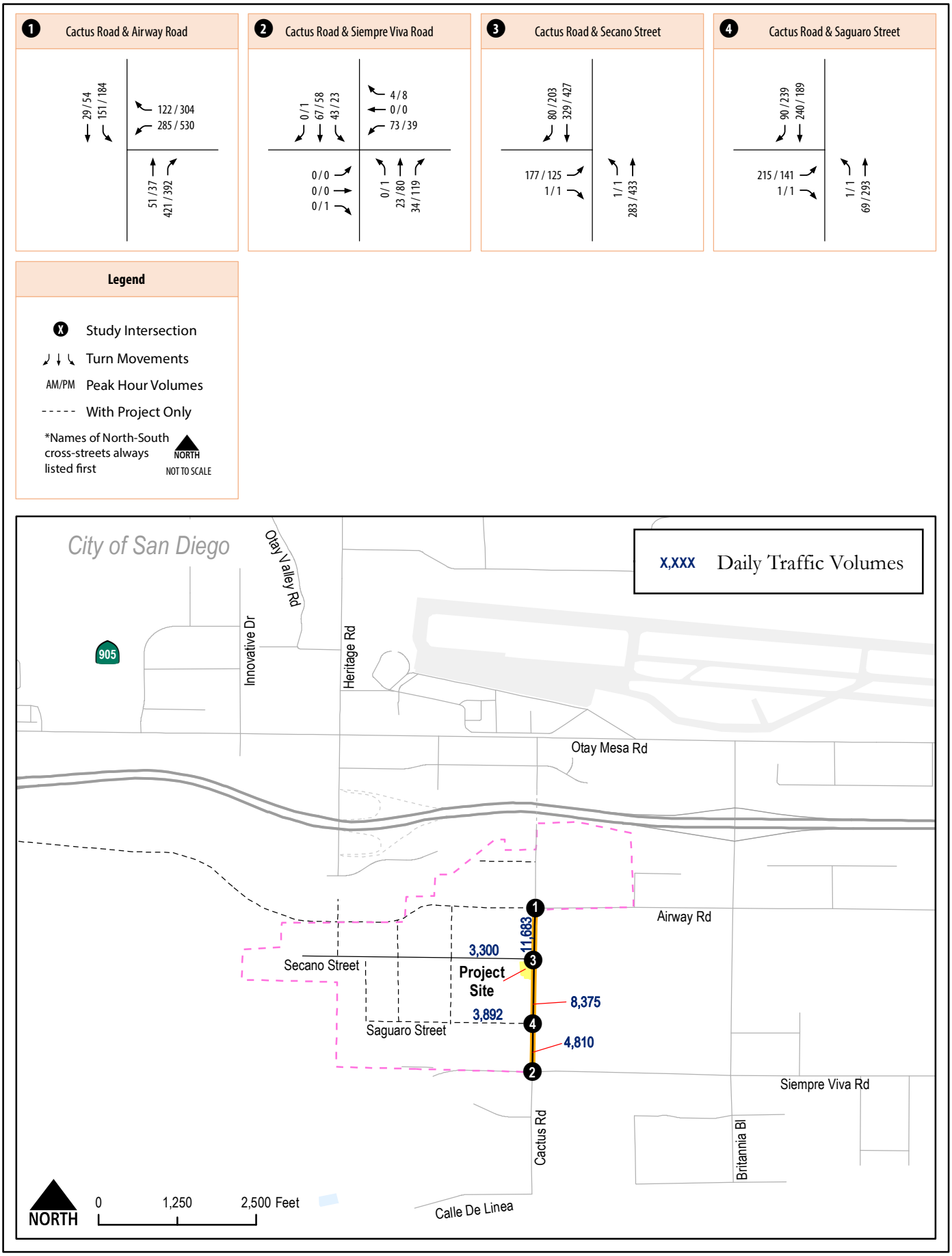
The roadway network was assumed to be identical to Existing conditions.

Traffic Volumes

Near-Term Year (Opening Day) 2027 With Project traffic volumes were derived by combining the Near-Term Year (Opening Day) 2027 traffic volumes (Figure 10) and the project trip assignment volumes displayed in (Figure 4). Near-Term Year (Opening Day) 2027 with Project daily roadway and intersection volumes are displayed in **Figure 11**.

Traffic Operations Under Near-Term Year (Opening Day) 2027 With Project Conditions

This section documents the traffic operations under Near-Term Year (Opening Day) 2027 With Project conditions within the study area. Roadway segment and intersection operations are discussed separately below.



Otay Mesa Lumina III
Traffic Analysis Memorandum
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Figure 11
Traffic Volumes
Near-Term Year 2027 with Project Conditions

Roadway Segment

Table 9 displays the daily roadway level of service for Cactus Road and Secano Street, along the project frontage under Near-Term Year (Opening Day) 2027 With Project conditions.

Table 9 Roadway Segment Level of Service Results – Near-Term Year (Opening Day) 2027 With Project Conditions

Roadway	Segment	Functional Classification	LOS Threshold (LOS E)	ADT	V/C	LOS	V/C w/o Project	LOS w/o Project	ΔV/C	SI?
Cactus Road	Between Airway Road and Secano Street	2-Lane Collector w/ Commercial Fronting	8,000	11,683	1.460	**F**	1.436	**F**	0.024	**Y**
Cactus Road	Between Secano Street and southern property boundary	3-Ln w / RM (1NB, 2 SB)	30,000[1]	8,375	0.279	C	1.046	**F**	-0.767	N
Cactus Road	Between southern property boundary and Saguaro Street	2-Lane Collector w/ Commercial Fronting	8,000	8,375	1.047	**F**	1.046	**F**	0.001	N
Cactus Road	Between Saguaro Street and Siempre Viva Road	2-Lane Collector w/ Commercial Fronting	8,000	4,810	0.601	C	0.600	C	0.001	N
Secano Street	Between Village Way and Cactus Road	2-Lane Collector w/ Two-Way Left-Turn Lane	15,000	3,300	0.220	A	0.206	A	0.014	N

Source: Chen Ryan Associates, June 2021

Notes:
Bold letter indicates substandard LOS E or F.
V/C = Volume to Capacity Ratio.
SI? = Significant Impact?
[1] Based on the capacity of a 4-Lane Major Arterial, reduced to exclude a lane. (3/4*40,000 = 30,000).

As shown in Table 9, all of the project study area roadway segments are projected to operate at LOS C or better with the exception of the following:

- Cactus Road, between Airway Road and Secano Street – LOS F; and
- Cactus Road, between southern property boundary and Saguaro Street – LOS F.

Based upon the significance impact criteria outlined in the City of San Diego Traffic Impact Study Manual, July 1998, only the following roadway segment **would** be significantly impacted under Near-Term Year (Opening Day) 2027 With Project conditions and mitigation measures **would** be required:

- Cactus Road, between Airway Road and Secano Street.

Intersection

Table 10 displays the intersection level of service for study intersections under Near-Term Year (Opening Day) 2027 With Project conditions. LOS calculation worksheets for Near-Term Year (Opening Day) 2027 With Project conditions are provided in **Attachment 7**.

Table 10 Intersection Level of Service Results – Near-Term Year (Opening Day) 2027 with Project Conditions

#	Intersection	Control Type	AM Peak Hour Avg. Delay (sec)	AM Peak Hour LOS	PM Peak Hour Avg. Delay (sec)	PM Peak Hour LOS	Delay w/o Project (sec) AM/PM	LOS w/o Project AM/PM	Change in Delay (sec) AM/PM	SI?
1	Cactus Road / Airway Road	SSSC	394.4	**F**	N/A[1]	**F**	376.6 / N/A[1]	F / F	17.8 / N/A	**Y**
2	Cactus Road / Siempre Viva Road	AWSC	8.1	A	8.4	A	8.1 / 8.4	A / A	0.0 / 0.0	N
3	Cactus Road / Secano Street	AWSC	11.9	B	17.3	C	11.7 / 16.9	B / C	0.2 / 0.4	N
4	Cactus Road / Saguaro Street	AWSC	9.9	A	11.5	B	9.9 / 11.5	A / B	0.0 / 0.0	N

Source: Chen Ryan Associates, June 2021

Notes:
Bold letter indicates substandard LOS E or F.
SSSC = Side-Street Stop Control. For SSSC, the delay shown is the worst delay experienced by any of the movements.
AWSC = All-Way Stop Control. For AWSC, the delay shown is the average delay experienced by all of the approaches.
SI? = Significant Impact?
[1] Exceeds maximum reasonable calculable delay of 600 seconds per Synchro 10.0 traffic analysis software.

As shown in Table 10, the study area intersections are projected to operate at LOS C or better during both the AM and PM peak hour, with the implementation of the proposed project, except for the following intersection:

1. Cactus Road / Airway Road – LOS F during both the AM and PM peak hours.

Based upon the significance impact criteria outlined in the City of San Diego Traffic Impact Study Manual, July 1998, the intersection above **would** be significantly impacted under Near-Term Year (Opening Day) 2027 With Project conditions and mitigation measures **would** be required.

Buildout of Community Plan Conditions

This section describes the study area, traffic volume information and LOS analysis results under Buildout of Community Plan Conditions.

Roadway Network

The same roadway network assumptions utilized in the Otay Mesa Lumina Transportation Impact Study, February 2019, were employed for the analysis of Otay Mesa Lumina III.

Buildout of Community Plan Conditions Roadway and Intersection Volumes

Traffic Volumes

Trips associated with the Proposed Project were subtracted from the roadway and intersection volumes utilized in the Otay Mesa Lumina Transportation Impact Study, February 2019. Then, these volumes were employed for the analysis of Otay Mesa Lumina III.

Traffic Operations Under Buildout of Community Plan Conditions

This section documents the traffic operations under Buildout of Community Plan Conditions within the study area. Roadway segment and intersection operations are discussed separately below.

Roadway Segment

Table 11 displays the daily roadway level of service for Cactus Road and Secano Street under Buildout of Community Plan Conditions.

Table 11 Roadway Segment Level of Service Results – Buildout of Community Plan Conditions

Roadway	Segment	Functional Classification	LOS Threshold (LOS E)	ADT	V/C	LOS
Cactus Road	Between Airway Road and Secano Street	4-Lane Major Arterial	40,000	38,791	0.970	**E**
Cactus Road	Between Secano Street and southern property boundary	4-Lane Major Arterial	40,000	38,929	0.973	**E**
Cactus Road	Between southern property boundary and Saguaro Street	4-Lane Major Arterial	40,000	38,929	0.973	**E**
Cactus Road	Between Saguaro Street and Siempre Viva Road	4-Lane Major Arterial	40,000	38,929	0.973	**E**
Secano Street	Between Village Way and Cactus Road	2-Lane Collector w/ Two-Way Left-Turn Lane	15,000	7,300	0.487	C

Source: Chen Ryan Associates, June 2021

Notes:
Bold letter indicates substandard LOS E or F.
V/C = Volume to Capacity Ratio.

As shown in Table 11, except for Secano Street, all of the project study area roadway segments are projected to operate at LOS E:

- Cactus Road, between Airway Road and Secano Street – LOS E;
- Cactus Road, between Secano Street and southern property boundary – LOS E;
- Cactus Road, between southern property boundary and Saguaro Street– LOS E; and
- Cactus Road, between Saguaro Street and Siempre Viva Road – LOS E.

Intersection

Table 12 displays the intersection level of service for the project study area intersections under Buildout of Community Plan Conditions. LOS calculation worksheets for Buildout of Community Plan Conditions are provided in **Attachment 8.**

Table 12 Intersection Level of Service Results – Buildout of Community Plan Conditions

			AM Peak Hour		PM Peak Hour	
#	Intersection	Control Type	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS
1	Cactus Road / Airway Road	Signal	358.1	**F**	400.7	**F**
2	Cactus Road / Siempre Viva Road	Signal	424.0	**F**	510.9	**F**
3	Cactus Road / Secano Street	AWSC	N/A[1]	**F**	N/A[1]	**F**
4	Cactus Road / Saguaro Street	AWSC	N/A[1]	**F**	N/A[1]	**F**

Source: Chen Ryan Associates, March 2021

Notes:
Bold letter indicates substandard LOS E or F.
AWSC = All-Way Stop Control. For AWSC, the delay shown is the average delay experienced by all of the approaches.
[1] Exceeds maximum reasonable calculable delay of 600 seconds per Synchro 10.0 traffic analysis software.

As shown in Table 12, all of the study area intersections are projected to operate at LOS F during both the AM and PM peak hour.

Buildout of Community Plan With Project Conditions

This section describes the study area, traffic volume information and LOS analysis results under Buildout of Community Plan With Project conditions.

Roadway Network

The roadway network was assumed to be identical to Buildout of Community Plan Conditions.

Traffic Volumes

The same roadway and intersection volumes utilized in the Otay Mesa Lumina Transportation Impact Study, February 2019, were employed for the analysis of Otay Mesa Lumina III.

Trip Distribution

The same project trip distribution (Buildout of Community Plan) utilized in the Otay Mesa Lumina Transportation Impact Study, February 2019, was employed for the analysis of Otay Mesa Lumina III.

Traffic Operations Under Buildout of Community Plan With Project Conditions

This section documents the traffic operations under Buildout of Community Plan With Project Conditions within the study area. Roadway segment and intersection operations are discussed separately below.

Roadway Segments

Table 13 displays the daily roadway level of service for Cactus Road and Secano Street, along the project frontage under Buildout of Community Plan With Project conditions.

Table 13 Roadway Segment Level of Service Results – Buildout of Community Plan With Project Conditions

Roadway	Segment	Functional Classification	LOS Threshold (LOS E)	ADT	V/C	LOS	V/C w/o Project	LOS w/o Project	ΔV/C	SI?
Cactus Road	Between Airway Road and Secano Street	4-Lane Major Arterial	40,000	38,960	0.974	**E**	0.970	**E**	0.004	N
Cactus Road	Between Secano Street and southern property boundary	4-Lane Major Arterial	40,000	38,960	0.974	**E**	0.973	**E**	0.001	N
Cactus Road	Between southern property boundary and Saguaro Street	4-Lane Major Arterial	40,000	38,960	0.974	**E**	0.973	**E**	0.001	N
Cactus Road	Between Saguaro Street and Siempre Viva Road	4-Lane Major Arterial	40,000	38,960	0.974	**E**	0.973	**E**	0.001	N
Secano Street	Between Village Way and Cactus Road	2-Lane Collector w/ Two-Way Left-Turn Lane	15,000	7,500	0.500	C	0.487	C	0.003	N

Source: Chen Ryan Associates, March 2021

Notes:
Bold letter indicates substandard LOS E or F.
V/C = Volume to Capacity Ratio.
SI? = Significant Impact?

As shown in Table 13, all of the project study area roadway segments are projected to operate at LOS E except for the following:

- Secano Street, between Village Way and Cactus Road – LOS C.

Based upon the significance impact criteria outlined in the City of San Diego Traffic Impact Study Manual, July 1998, these roadway segments **would not** be significantly impacted under Buildout of Community Plan With Project conditions and mitigation measures **would not** be required.

Intersections

Table 14 displays the intersection level of service for study intersections under Buildout of Community Plan With Project Conditions. LOS calculation worksheets for Buildout of Community Plan With Project conditions are provided in **Attachment 9**.

Table 14 Intersection Level of Service Results – Buildout of Community Plan With Project Conditions

#	Intersection	Control Type	AM Peak Hour Avg. Delay (sec)	AM Peak Hour LOS	PM Peak Hour Avg. Delay (sec)	PM Peak Hour LOS	Delay w/o Project (sec) AM/PM	LOS w/o Project AM/PM	Change in Delay (sec) AM/PM	SI?
1	Cactus Road / Airway Road	Signal	358.3	**F**	402.4	**F**	358.1 / 400.7	**F / F**	0.2 / 1.7	**Y**
2	Cactus Road / Siempre Viva Road	Signal	424.5	**F**	511.3	**F**	424.0 / 510.9	**F / F**	0.5 / 0.4	N
3	Cactus Road / Secano Street	AWSC	N/A[1]	**F**	N/A[1]	**F**	N/A[1] / N/A[1]	**F / F**	7.4 / 1.9	**Y**
4	Cactus Road / Saguaro Street	AWSC	N/A[1]	**F**	N/A[1]	**F**	N/A[1] / N/A[1]	**F / F**	0.6 / 0.6	N

Source: Chen Ryan Associates, March 2021

Notes:
Bold letter indicates substandard LOS E or F.
AWSC = All-Way Stop Control. For AWSC, the delay shown is the average delay experienced by all of the approaches.
SI? = Significant Impact?
[1] Exceeds maximum reasonable calculable delay of 600 seconds per Synchro 10.0 traffic analysis software.

As shown in Table 14, all of the study area intersections are projected to operate at LOS F during both the AM and PM peak hour, with the implementation of the proposed project.

Based upon the significance impact criteria outlined in the City of San Diego Traffic Impact Study Manual, July 1998, only the following analyzed intersections **would** be significantly impacted under Buildout of Community Plan With Project conditions and mitigation measures **would** be required:

1. Cactus Road / Airway Road
3. Cactus Road / Secano Street

Recommended Mitigation Measures

This section identifies required mitigation measures for roadway and intersection facilities that are associated with the Lumina III Project.

Near-Term Year (Opening Day) 2027

As discussed earlier in this memorandum, direct impacts were identified under Near-Term Year (Opening Day) 2027 with Project conditions. **Table 15** displays level of service analysis results both before and after implementation of the recommended mitigation measures at the impacted roadway segment under Near-Term Year (Opening Day) 2027 with Project conditions.

Roadway Segments

- Cactus Road, between Airway Road and Secano Street – The Project shall widen this roadway segment from a 2-Lane Collector to a 3-Lane Major Arterial (1 northbound lane and 2 southbound lanes with a raised median). This roadway is classified as a 4-Lane Major Arterial in the currently adopted Otay Mesa Community Plan, which is consistent with the project description in the Otay Mesa Public Facilities Financing Plan (PFFP). As shown in Table 15, this segment would operate at LOS B with the recommended mitigation measure under Near-Term Year (Opening Day) 2027 with Project conditions.

Table 15 Roadway Segment Level of Service Results – Near-Term Year (Opening Day) 2027 With Project Conditions - Mitigation Measures

		Before Mitigation Measures			After Mitigation Measures		
Roadway	Segment	ADT	Cross-Section	LOS	ADT	Cross-Section	LOS
Cactus Road	Airway Road to Secano Street	11,683	2-Ln	**F**	11,683	3-Ln w/RM[1]	B

Source: Chen Ryan Associates, March 2021

Notes:
Bold letter indicates substandard LOS E or F.
[1] 2 lanes SB and 1 lane NB with LOS E capacity assumed of 30,000 ADT

As shown in Table 15, the impacted roadway segment would operate at an acceptable LOS B with the implementation of the recommended mitigation measure.

Intersections

Table 16 displays level of service analysis results both before and after the implementation of the recommended mitigation measures at the impacted intersection under Near-Term Year (Opening Day) 2027 with Project conditions.

1. Cactus Road / Airway Road – The Project shall signalize this intersection. This recommended mitigation measure is consistent with the OMCPU EIR analysis of traffic at OMCPU buildout. As shown in Table 16, this intersection would operate at LOS B during the AM peak hour and LOS D during the PM peak hour with the recommended mitigation measure under Near-Term Year (Opening Day) 2027 with Project conditions. LOS calculation worksheets for Near-Term Year (Opening Day) 2027 With Project conditions – Mitigation Measures are provided in **Attachment 10**.

Table 16 Intersection Level of Service Results – Near-Term Year (Opening Day) 2027 With Project Conditions – Mitigation Measures

		Before Mitigation Measures				After Mitigation Measures			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
#	Intersection	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS
1	Cactus Road / Airway Road	394.4	**F**	N/A[1]	**F**	11.4	B	43.0	D

Source: Chen Ryan Associates, March 2021

Notes:
Bold letter indicates substandard LOS E or F.
[1] Exceeds maximum reasonable calculable delay of 600 seconds per Synchro 10.0 traffic analysis software.

As shown in Table 16, the impacted intersection would operate at an acceptable LOS B during the AM peak hour and LOS D during the PM peak hour with the recommended mitigation measure.

Buildout of Community Plan

As discussed earlier in this memorandum, significant project impacts were identified under Buildout of Community Plan Conditions.

Roadway Segments

No significant impacts.

Intersections

Table 17 displays level of service analysis results both before and after the implementation of the recommended mitigation measures at the impacted intersections under Buildout of Community Plan Conditions.

1. Cactus Road / Airway Road – In addition to signalizing the intersection at project's Opening Day in 2027, the project shall pay a 0.18% fair share contribution towards the widening of the eastbound approach (Airway Road) to accommodate dual left-turn lanes, three through lanes with a shared right-turn lane, and an exclusive right-turn lane, widen the southbound approach (Cactus Road) to accommodate dual left-turn lanes, two through lanes with a shared right-turn lane and an exclusive right-turn lane, widen the westbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout. LOS calculation worksheets for Buildout of Community Plan Conditions – Mitigation Measures as well as fair share calculations are provided in **Attachment 11.**

3. Cactus Road / Secano Street – Because the project fronts one of four corners of the intersection, the applicant shall contribute 25% towards the future signalization of this intersection (Per mitigation measure TRF-1 in the Central Village Specific Plan FEIR, March 17, 2017). LOS calculation worksheets for Buildout of Community Plan Conditions – Mitigation Measures are provided in Attachment 11.

Table 17 Intersection Level of Service Results – Buildout of Community Plan Conditions – Mitigation Measures

		Before Mitigation Measures				After Mitigation Measures			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
#	Intersection	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS
1	Cactus Road / Airway Road	358.3	**F**	402.4	**F**	175.0	**F**	250.8	**F**
3	Cactus Road / Secano Street	N/A[1]	**F**	N/A[1]	**F**	37.7	D	17.8	B

Source: Chen Ryan Associates, March 2021

Notes:
Bold letter indicates substandard LOS E or F.
[1] Exceeds maximum reasonable calculable delay of 600 seconds per Synchro 10.0 traffic analysis software.

As shown in Table 17, the impacted intersections would operate at better than pre-project conditions. The significant impacts at the following intersection is considered to be fully mitigated by improvements constructed by developers of the Central Village Specific Plan by buildout of the Specific Plan:

- Cactus Road / Secano Street

The OMCPU FEIR identified the intersection of Cactus Road/Airway Road as having a significant and unavoidable impact after implementation of mitigation measures. No new significant impacts in addition to what were already disclosed in the OMCPU FEIR are identified in the analysis of this project.

Conclusion

The proposed Otay Mesa Lumina III project is anticipated to cause direct and cumulative significant impacts at the following roadway segments and intersections under two different scenarios:

Near-Term Year (Opening Day) 2027 with Project

Roadway Segments

- Prior to issuance of the first building permit, Owner/Permittee shall assure by permit and bond the construction of Cactus Road between Airway Road and Secano Street as a 3-lane major (2 lanes southbound, 1 lane northbound with raised median), satisfactory to the City Engineer. Improvements shall be completed and operational prior to first occupancy.

Intersections

1. Prior to issuance of the first building permit, Owner/Permittee shall assure by permit and bond the signalization of the intersection of Cactus Road and Airway Road, satisfactory to the City Engineer. Improvements shall be completed and operational prior to first occupancy.

With the implementation of the recommended mitigation measures the significant direct impacts are considered fully mitigated.

Buildout of Community Plan with Project

Roadway Segments

No significant impacts.

Intersections

1. Prior to issuance of the first building permit, Owner/Permittee shall make a 0.18% fair-share contribution to the City of San Diego, towards the following improvements at the intersection of Cactus Road and Airway Road, satisfactory to the City Engineer: Widening of the eastbound approach (Airway Road) to accommodate dual left-turn lanes, three through lanes with a shared right-turn lane, and an exclusive right-turn lane, widen the southbound approach (Cactus Road) to accommodate dual left-turn lanes, two through lanes with a shared right-turn lane and an exclusive right-turn lane, widen the westbound approach to accommodate dual left-turn lanes, three through lanes and dual right-turn lanes, and widen the northbound approach to accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane. These recommended mitigation measures are consistent with the ultimate intersection geometrics assumption of the OMCPU EIR's analysis of traffic at OMCPU buildout.

3. Prior to issuance of the first building permit, Owner/Permittee shall make a 25% fair-share contribution to the City of San Diego, towards the following improvements at the intersection of Cactus Road and Secano Street, satisfactory to the City Engineer: Traffic signal infrastructure installation. (Per TRF. 1 in the Central Village Specific Plan FEIR, March 17, 2017).

Significant impact at the following intersection is considered to be fully mitigated by improvements constructed by developers of the Central Village Specific Plan by buildout of the Specific Plan:

- Cactus Road / Secano Street

The OMCPU FEIR identified the intersection of Cactus Road and Airway Road as having significant and unavoidable impacts after implementation of mitigation measures. No new significant impacts in addition to those that were already disclosed in the OMCPU FEIR are identified in the analysis of this project.

Please feel free to contact me at (619) 468-2739 with any questions and/or comments.

Sincerely,

Jonathan Sanchez, TE
Lic. No. 2957

CHEN RYAN

Attachment 1 – Traffic Counts & Calculations

CHEN RYAN

24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 33. Cactus Road Between Otay Mesa Road and Airway Road

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

Weather: *Sunny*

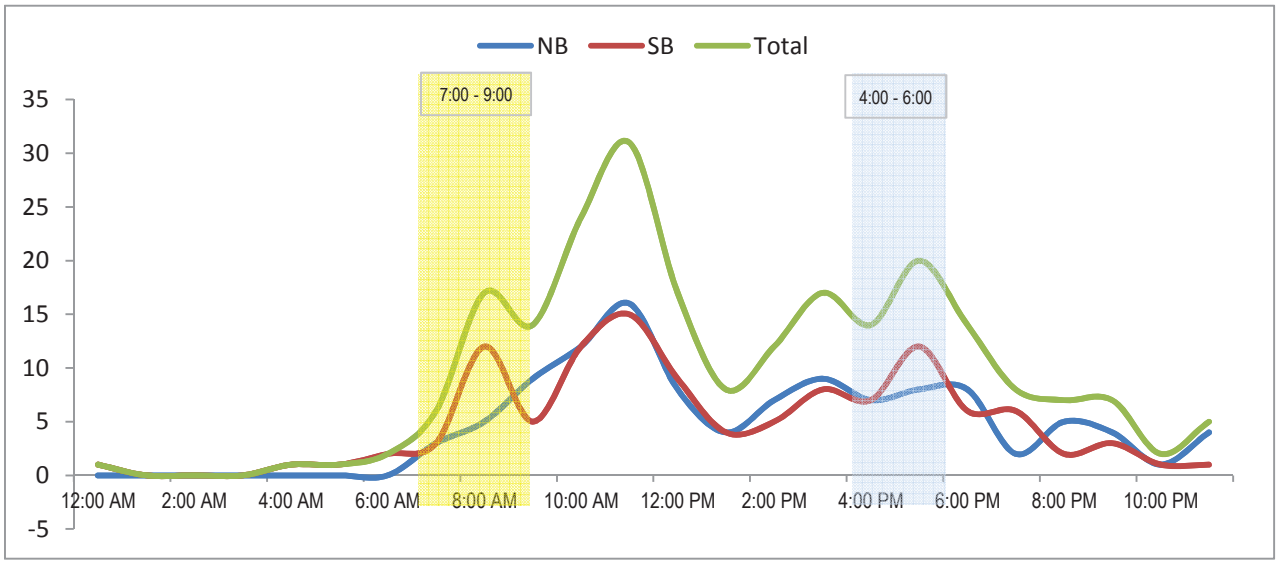
AVC Proj. No: *15-0415*

24 Hour Segment Volume			228

Time	Hourly Volume		
	NB	SB	Total
12:00 AM - 1:00 AM	0	1	1
1:00 AM - 2:00 AM	0	0	0
2:00 AM - 3:00 AM	0	0	0
3:00 AM - 4:00 AM	0	0	0
4:00 AM - 5:00 AM	0	1	1
5:00 AM - 6:00 AM	0	1	1
6:00 AM - 7:00 AM	0	2	2
7:00 AM - 8:00 AM	3	3	6
8:00 AM - 9:00 AM	5	12	17
9:00 AM - 10:00 AM	9	5	14
10:00 AM - 11:00 AM	12	12	24
11:00 AM - 12:00 PM	16	15	31
Total	**45**	**52**	**97**

Time	Hourly Volume		
	NB	SB	Total
12:00 PM - 1:00 PM	8	9	17
1:00 PM - 2:00 PM	4	4	8
2:00 PM - 3:00 PM	7	5	12
3:00 PM - 4:00 PM	9	8	17
4:00 PM - 5:00 PM	7	7	14
5:00 PM - 6:00 PM	8	12	20
6:00 PM - 7:00 PM	8	6	14
7:00 PM - 8:00 PM	2	6	8
8:00 PM - 9:00 PM	5	2	7
9:00 PM - 10:00 PM	4	3	7
10:00 PM - 11:00 PM	1	1	2
11:00 PM - 12:00 AM	4	1	5
Total	**67**	**64**	**131**

24-Hour NB Volume	112	24-Hour SB Volume	116



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24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 34. Cactus Road Between Airway Road and Siempre Viva Road

Orientation: *North-South*

Date of Count: *Thursday, October 01, 2015*

Analysts: *DASH*

Weather: *Sunny*

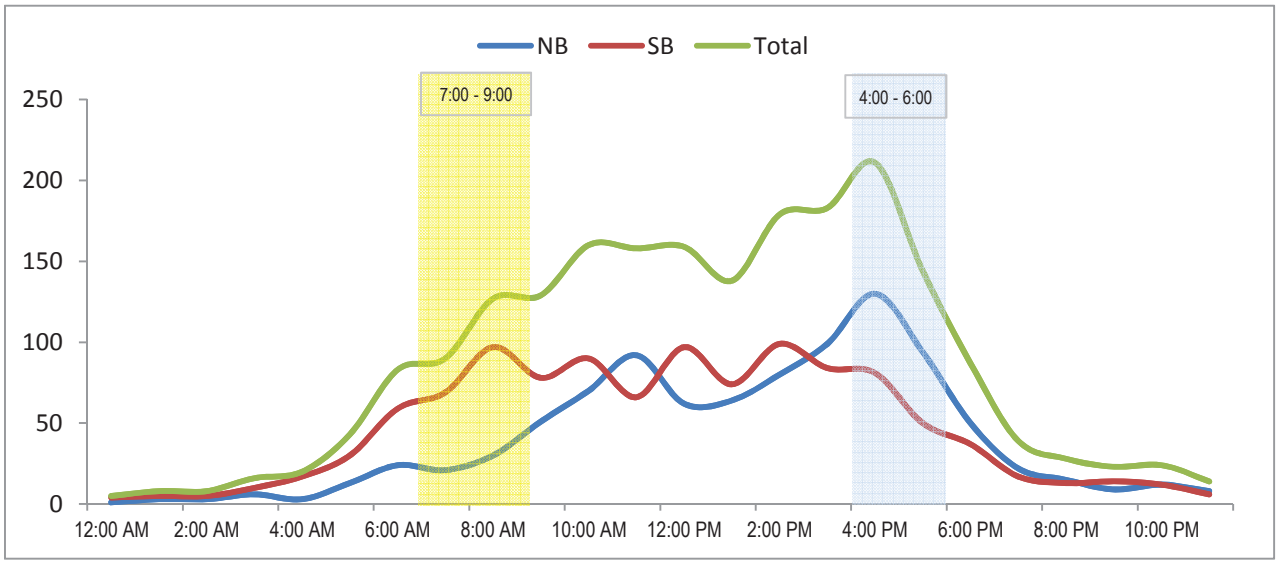
AVC Proj. No: *15-0415*

24 Hour Segment Volume 2,076

Time	Hourly Volume		
	NB	SB	Total
12:00 AM - 1:00 AM	1	4	5
1:00 AM - 2:00 AM	3	5	8
2:00 AM - 3:00 AM	3	5	8
3:00 AM - 4:00 AM	6	10	16
4:00 AM - 5:00 AM	3	17	20
5:00 AM - 6:00 AM	13	30	43
6:00 AM - 7:00 AM	24	59	83
7:00 AM - 8:00 AM	21	69	90
8:00 AM - 9:00 AM	30	97	127
9:00 AM - 10:00 AM	51	78	129
10:00 AM - 11:00 AM	70	90	160
11:00 AM - 12:00 PM	92	66	158
Total	**317**	**530**	**847**

Time	Hourly Volume		
	NB	SB	Total
12:00 PM - 1:00 PM	62	97	159
1:00 PM - 2:00 PM	64	74	138
2:00 PM - 3:00 PM	80	99	179
3:00 PM - 4:00 PM	99	84	183
4:00 PM - 5:00 PM	130	81	211
5:00 PM - 6:00 PM	94	50	144
6:00 PM - 7:00 PM	50	37	87
7:00 PM - 8:00 PM	22	17	39
8:00 PM - 9:00 PM	15	13	28
9:00 PM - 10:00 PM	9	14	23
10:00 PM - 11:00 PM	12	12	24
11:00 PM - 12:00 AM	8	6	14
Total	**645**	**584**	**1,229**

24-Hour NB Volume 962 **24-Hour SB Volume 1,114**



WEDNESDAY - APRIL 17, 2019 CITY: OTAY PROJECT: PTD19-0419-01

CACTUS - N/O AIRWAY

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	1		1					12:00	3		11				
00:15	1		0					12:15	7		3				
00:30	1		1					12:30	1		3				
00:45	0	3	1	3			6	12:45	5	16	6	23			39
01:00	1		0					13:00	3		3				
01:15	0		0					13:15	6		4				
01:30	1		0					13:30	2		3				
01:45	1	3	1	1			4	13:45	4	15	4	14			29
02:00	0		0					14:00	7		5				
02:15	0		0					14:15	6		4				
02:30	0		0					14:30	6		5				
02:45	1	1	1	1			2	14:45	5	24	9	23			47
03:00	0		0					15:00	14		6				
03:15	0		0					15:15	2		6				
03:30	0		0					15:30	1		2				
03:45	0	0	0	0				15:45	4	21	4	18			39
04:00	0		0					16:00	10		3				
04:15	0		0					16:15	11		10				
04:30	0		1					16:30	2		7				
04:45	0	0	0	1			1	16:45	6	29	3	23			52
05:00	0		0					17:00	1		4				
05:15	1		0					17:15	6		6				
05:30	0		1					17:30	8		5				
05:45	1	2	0	1			3	17:45	5	20	4	19			39
06:00	1		2					18:00	6		3				
06:15	0		1					18:15	4		6				
06:30	1		1					18:30	1		2				
06:45	1	3	0	4			7	18:45	1	12	6	17			29
07:00	3		3					19:00	4		3				
07:15	0		2					19:15	1		4				
07:30	1		3					19:30	0		3				
07:45	0	4	3	11			15	19:45	2	7	5	15			22
08:00	2		0					20:00	2		2				
08:15	1		3					20:15	1		1				
08:30	5		1					20:30	2		1				
08:45	4	12	3	7			19	20:45	2	7	6	10			17
09:00	6		7					21:00	1		0				
09:15	3		3					21:15	1		1				
09:30	3		6					21:30	1		0				
09:45	2	14	3	19			33	21:45	1	4	0	1			5
10:00	3		1					22:00	1		0				
10:15	7		6					22:15	0		0				
10:30	6		4					22:30	0		1				
10:45	2	18	3	14			32	22:45	1	2	0	1			3
11:00	1		4					23:00	2		0				
11:15	2		6					23:15	4		0				
11:30	3		2					23:30	0		1				
11:45	8	14	1	13			27	23:45	0	6	1	2			8
Total Vol.		74		75			**149**			163		166			**329**

Daily Totals

NB	SB	EB	WB	**Combined**
237	241			**478**

	AM			**PM**		
Split %	49.7%	50.3%	**31.2%**	49.5%	50.5%	**68.8%**
Peak Hour	11:30	11:15	**11:30**	14:15	14:30	**14:15**
Volume	21	20	**38**	31	26	**55**
P.H.F.	0.66	0.45	**0.68**	0.92	0.72	**0.69**

Roadway	Segment	ADT 2015	ADT 2019	Change	Estimated ADT
Cactus Road	North of Airway	228	478	210%	
	South of Airway	2076	N/A	210%	**4352**

Estimated Volumes

Time		NB	SB	
	12	1	4	5
	1	3	5	8
	2	3	5	8
	3	6	10	16
	4	3	17	20
	5	13	30	43
	6	24	59	83
	7	21	69	90
	8	30	97	127
	9	51	78	129
	10	70	90	160
	11	92	66	158
	12	62	97	159
	13	64	74	138
	14	80	99	179
	15	99	84	183
	16	130	81	211
	17	94	50	144
	18	50	37	87
	19	22	17	39
	20	15	13	28
	21	9	14	23
	22	12	12	24
	23	8	6	14
Total		962	1114	2076

Time		NB	SB	
	12	0.00	0.00	5
	1	0.00	0.00	8
	2	0.00	0.00	8
	3	0.00	0.00	16
	4	0.00	0.01	20
	5	0.01	0.01	43
	6	0.01	0.03	83
	7	0.01	0.03	90
	8	0.01	0.05	127
	9	0.02	0.04	129
	10	0.03	0.04	160
	11	0.04	0.03	158
	12	0.03	0.05	159
	13	0.03	0.04	138
	14	0.04	0.05	179
	15	0.05	0.04	183
	16	0.06	0.04	211
	17	0.05	0.02	144
	18	0.02	0.02	87
	19	0.01	0.01	39
	20	0.01	0.01	28
	21	0.00	0.01	23
	22	0.01	0.01	24
	23	0.00	0.00	14
Total		962	1114	2076

Time		NB	SB		
	12	2	8	10	
	1	6	10	17	
	2	6	10	17	
	3	13	21	34	
	4	6	36	42	
	5	27	63	90	
	6	50	124	174	
	7	44	145	189	
	8	63	203	266	<-- Peak Hour
	9	107	164	270	
	10	147	189	335	
	11	193	138	331	
	12	130	203	333	
	13	134	155	289	
	14	168	208	375	
	15	208	176	384	
	16	273	170	442	<-- Peak Hour
	17	197	105	302	
	18	105	78	182	
	19	46	36	82	
	20	31	27	59	
	21	19	29	48	
	22	25	25	50	
	23	17	13	29	
Total		2,017	2,335	4352	4352

CHEN RYAN

Attachment 2 – Analysis Methodology

2.0 Analysis Methodology

This TIS was performed in accordance with the requirements of the *City of San Diego Traffic Impact Study Manual, July 1998*, the *City of San Diego Significance Determination Thresholds, January 2011*, and the enhanced California Environmental Quality Act (CEQA) project review process. Detailed information on roadway segment and intersection analysis methodologies, standards, and thresholds are discussed in the following sections.

2.1 Level of Service Definition

Level of Service (LOS) is a quantitative measure describing operational conditions within a traffic stream, and the motorist's and/or passengers' perception of operations. A LOS definition generally describes these conditions in terms of such factors as delay, speed, travel time, freedom to maneuver, interruptions in traffic flow, queuing, comfort, and convenience. **Table 2.1** describes generalized definitions of the various LOS categories (A through F) as applied to roadway operations.

TABLE 2.1
LEVEL OF SERVICE DEFINITIONS

LOS Category	Definition of Operation
A	This LOS represents a completely free-flow condition, where the operation of vehicles is virtually unaffected by the presence of other vehicles and only constrained by the geometric features of the highway and by driver preferences.
B	This LOS represents a relatively free-flow condition, although the presence of other vehicles becomes noticeable. Average travel speeds are the same as in LOS A, but drivers have slightly less freedom to maneuver.
C	At this LOS the influence of traffic density on operations becomes marked. The ability to maneuver within the traffic stream is clearly affected by other vehicles.
D	At this LOS, the ability to maneuver is notably restricted due to traffic congestion, and only minor disruptions can be absorbed without extensive queues forming and the service deteriorating.
E	This LOS represents operations at or near capacity. LOS E is an unstable level, with vehicles operating with minimum spacing for maintaining uniform flow. At LOS E, disruptions cannot be dissipated readily thus causing deterioration down to LOS F.
F	At this LOS, forced or breakdown of traffic flow occurs, although operations appear to be at capacity, queues form behind these breakdowns. Operations within queues are highly unstable, with vehicles experiencing brief periods of movement followed by stoppages.

Source: Highway Capacity Manual 2000

2.2 Roadway Segment Level of Service Standards and Thresholds

Roadway segment LOS standards and thresholds provide the basis for analysis of arterial roadway segment performance. The analysis of roadway segment LOS is based on the functional classification of the roadway, the maximum capacity, roadway geometrics, and existing or forecast Average Daily Traffic (ADT) volumes. **Table 2.2** and **Table 2.3** present the roadway segment capacity and LOS standards for the City of San Diego and the City of Chula Vista, respectively. These standards were utilized to analyze roadways evaluated in this report.

TABLE 2.2
CITY OF SAN DIEGO
ROADWAY CLASSIFICATIONS AND LOS STANDARDS

Roadway Classification	LOS A	LOS B	LOS C	LOS D	LOS E
Expressway (6-lane)	< 30,000	< 42,000	< 60,000	< 70,000	< 80,000
Prime Arterial (6-lane)	< 25,000	< 35,000	< 50,000	< 55,000	< 60,000
Prime Arterial (5-lane)	< 20,000	< 28,000	< 40,000	< 45,000	<50,000
Prime Arterial (4-lane)	< 17,500	< 24,500	< 35,000	< 40,000	< 45,000
Major Arterial (6-lane, divided)	< 20,000	< 28,000	< 40,000	< 45,000	< 50,000
Major Arterial (4-lane, divided)	< 15,000	< 21,000	< 30,000	< 35,000	< 40,000
Major Arterial (3-lane, divided)	< 11,250	< 15,750	< 22,500	< 26,250	< 30,000
Collector (4-lane w/ center lane)	< 10,000	< 14,000	< 20,000	< 25,000	< 30,000
Collector (4-lane w/o center lane)	< 5,000	< 7,000	< 10,000	< 13,000	< 15,000
Collector (2-lane w/continuous left-turn lane)	< 5,000	< 7,000	< 10,000	< 13,000	< 15,000
Collector (2-lane no fronting property)	< 4,000	< 5,500	< 7,500	< 9,000	< 10,000
Collector (2-lane w/commercial fronting)	< 2,500	< 3,500	< 5,000	< 6,500	< 8,000
Collector (2-lane multi-family)	< 2,500	< 3,500	< 5,000	< 6,500	< 8,000
Sub-Collector (2-lane single-family)	-	-	< 2,200	-	-

Source: City of San Diego Traffic Impact Study Manual (1998)

These standards are generally used as long-range planning guidelines to determine the functional classification of roadways. The actual capacity of a roadway facility varies according to its physical attributes. Typically, the performance and LOS of a roadway segment is heavily influenced by the ability of its intersections to accommodate peak hour traffic volumes. For the purposes of this traffic analysis, LOS D is considered acceptable for circulation element roadway segments within the City of San Diego.

TABLE 2.3
CITY OF CHULA VISTA
ROADWAY CLASSIFICATION AND LOS STANDARDS

Roadway Classification	LOS A	LOS B	LOS C	LOS D	LOS E
Expressway (7 or 8-lane)	52,500	61,300	70,000	78,800	87,500
Gateway Street (6-lane)	40,800	47,600	54,400	**61,200**	68,000
Prime Arterial (6-lane)	37,500	43,800	50,000	56,300	62,500
Major Street (6-lane)	30,000	35,000	40,000	45,000	50,000
Major Street (4-lane)	22,500	26,300	30,000	33,800	37,500
Town Center Arterial (6-lane)	37,500	43,800	50,000	56,300	62,500
Town Center Arterial (4-lane)	22,500	26,300	30,000	33,800	37,500
Class I Collector (4-lane)	16,500	19,300	22,000	24,800	27,500
Class II Collector (3-lane)	9,000	10,500	12,000	13,500	15,000
Class III Collector (2-lane)	5,600	6,600	7,500	8,400	9,400

Source: City of Chula Vista

Note:
Bold numbers indicate the ADT thresholds for acceptable LOS.

LOS C is considered acceptable for Circulation Element roadway segments within the City of Chula Vista. Per the Otay SRP (Page 104), LOS D is permitted within the Otay Ranch Villages. Heritage Road, between Main Street and Avenida De Las Vistas was analyzed using City of Chula Vista standards.

2.3 Peak Hour Intersection Level of Service Standards and Thresholds

This section presents the methodologies used to perform peak hour intersection capacity analysis, including both signalized and unsignalized intersections. The following assumptions were utilized in conducting all intersection level of service analyses:

- *Heavy Vehicle Factor:* Based on heavy vehicle count data collected April 16-17, 2019.
- *Signal Timing:* Based on existing signal timing plans (as of May 2019), provided in **Appendix A.**
- *Peak Hour Factor*: Based on existing peak hour count data for existing conditions, 0.92 for near-term year 2023, and 0.95 for Buildout of Community Plan scenarios. All PHF utilized in the analysis is per approach.

Signalized Intersection Analysis

The proposed Otay Mesa Lumina III project is part of the Otay Mesa Central Village Specific Plan EIR (SCH No. 2004651076). Therefore, the same analysis methodology was employed in this report to be consistent with the Otay Mesa Central Village Transportation Facilities Trigger Analysis. This method defines LOS in terms of delay, or more specifically, average stopped delay per vehicle. Delay is a measure of driver and/or passenger discomfort, frustration, fuel consumption and lost travel time. This technique uses 1,900 vehicles per hour per lane (VPHPL) as the maximum saturation volume of an intersection. This saturation volume is adjusted to account for lane width, onstreet parking, pedestrians, traffic composition (i.e., percentage trucks) and shared lane movements (i.e. through and right-turn movements originating from the same lane). The LOS criteria used for this technique are described in **Table 2.4**. The computerized analysis of intersection operations was performed utilizing the *SYNCHRO 10.0* traffic analysis software.

TABLE 2.4
SIGNALIZED INTERSECTION LEVEL OF SERVICE CRITERIA

Average Stopped Delay Per Vehicle (seconds)	Level of Service (LOS) Characteristics
<10.0	*LOS A* describes operations with very low delay. This occurs when progression is extremely favorable, and most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
10.1 – 20.0	*LOS B* describes operations with generally good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
20.1 – 35.0	*LOS C* describes operations with higher delays, which may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
35.1 – 55.0	*LOS D* describes operations with high delay, resulting from some combination of unfavorable progression, long cycle lengths, or high volumes. The influence of congestion becomes more noticeable, and individual cycle failures are noticeable.
55.1 – 80.0	*LOS E* is considered the limit of acceptable delay. Individual cycle failures are frequent occurrences.
>80.0	*LOS F* describes a condition of excessively high delay, considered unacceptable to most drivers. This condition often occurs when arrival flow rates exceed the LOS D capacity of the intersection. Poor progression and long cycle lengths may also be major contributing causes to such delay.

Source: Highway Capacity Manual 2000, TRB Special Report 209

Unsignalized Intersection Analysis

Unsignalized intersections, including side-street and all-way stop controlled intersections, were analyzed using the unsignalized intersection analysis methodology employed in the Otay Mesa Central Village Transportation Facilities Trigger Analysis. The SYNCHRO 10.0 Traffic Analysis software supports this methodology and was utilized to produce LOS results. The LOS for a side-street stop controlled (SSSC) intersection is determined by the computed control delay and is defined for each minor movement and the worst-case minor movement is reported. The LOS for an all-way stop controlled (AWSC) intersection is determined by the computed control delay or measured average control delay of all movements. **Table 2.5** summarizes the LOS criteria for unsignalized intersections. The City of San Diego considers LOS D or better during the AM and PM peak hours to be acceptable for intersection LOS.

TABLE 2.5
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE CRITERIA

Average Control Delay (sec/veh)	Level of Service (LOS)
≤10	A
>10 and ≤15	B
>15 and ≤25	C
>25 and ≤35	D
>35 and ≤50	E
>50	F

Source: Highway Capacity Manual 2000, TRB Special Report 209

2.4 Ramp Metering Analysis

Ramp metering is a means of controlling the volume of traffic entering the freeway with the goal of improving the traffic operations and flow on the freeway main lanes. Freeway ramp meter analysis estimates the peak hour queues and delays at freeway ramps by comparing existing volumes to the meter rate at the given location. However, ramp meters are currently installed but not in operation within the project study area. Therefore, ramp metering analysis is only included in the Buildout of Community Plan Scenario.

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

2.5 Freeway Level of Service Standards and Thresholds

Freeway level of service analysis is based upon procedures developed by Caltrans District 11. The procedure for calculating freeway level of service involves estimating a peak hour volume to capacity (V/C) ratio. Peak hour volumes are estimated from the application of design hour ("K"), directional ("D") and truck ("T") factors to Average Daily Traffic (ADT) volumes. The base capacities were assumed to be 2,350 passenger-car per hour per main lane (pc/h/ln) and 1,410 pc/h/ln for auxiliary lane, respectively. A 0.95 peak-hour factor (PHF) is utilized for this analysis.

The resulting V/C ratio is then compared to acceptable ranges of V/C values corresponding to the various levels of service for each facility classification, as shown in **Table 2.6**. The corresponding level of service represents an approximation of existing or anticipated future freeway operating conditions in the peak direction of travel during the peak hour.

LOS D or better is used in this study as the threshold for acceptable freeway operations based upon Caltrans and the SANDAG Regional Growth Management Strategy (RGMS) requirements.

TABLE 2.6
CALTRANS DISTRICT 11
FREEWAY SEGMENT LEVEL OF SERVICE DEFINITIONS

LOS	V/C	Congestion/Delay	Traffic Description
Used for freeways, expressways and conventional highways			
"A"	<0.41	None	Free flow.
"B"	0.42-0.62	None	Free to stable flow, light to moderate volumes.
"C"	0.63-0.79	None to minimal	Stable flow, moderate volumes, freedom to maneuver noticeably restricted.
"D"	0.80-0.92	Minimal to substantial	Approaches unstable flow, heavy volumes, very limited freedom to maneuver.
"E"	0.93-1.00	Significant	Extremely unstable flow, maneuverability and psychological comfort extremely poor.
Used for conventional highways			
"F"	>1.00	Considerable	Forced or breakdown flow. Delay measured in average travel speed (MPH). Signalized segments experience delays >60.0 seconds/vehicle.
Used for freeways and expressways			
"F0"	1.01–1.25	Considerable (0-1 hour delay)	Forced flow, heavy congestion, long queues form behind breakdown points, stop and go.
"F1"	1.26-1.35	Severe (1-2 hour delay)	Very heavy congestion, very long queues.
"F2"	1.36-1.45	Very severe (2-3 hour delay)	Extremely heavy congestion, longer queues, more numerous breakdown points, longer stop periods.
"F3"	>1.46	Extremely severe (3+ hours of delay)	Gridlock.

Source: SANTEC/ITE Guidelines for TIS in the San Diego Region

2.6 Determination of Significant Impacts

City of San Diego

The *City of San Diego Significance Determination Thresholds* defines project impact thresholds by facility type. These thresholds are generally based upon an acceptable increase in the Volume / Capacity (V/C) ratio for roadway and freeway segments, and upon increases in vehicle delays for intersections and ramps.

In the City of San Diego, LOS D is considered acceptable for roadway and intersection operations. A project is considered to have a significant impact if it degrades the operations of a roadway or intersection from an acceptable LOS (D or better) to an unacceptable LOS (E or F), or if it adds additional delay to a facility already operating an unacceptable level. **Table 2.7** summarizes the impact significant thresholds as identified by the City of San Diego beyond which mitigation measures are required.

TABLE 2.7
MEASURE OF SIGNIFICANT PROJECT TRAFFIC IMPACTS

Level of Service (LOS) with Project*	Allowable Change Due to Impact**					
	Freeways		Roadway Segments		Intersections	Ramp Metering
	V/C	Speed (mph)	V/C	Speed (mph)	Delay (sec)	Delay (min.)
LOS E (or ramp meter delays > 15 min.)	0.010	1.0	0.02	1.0	2.0	2.0
LOS F (or ramp meter delays > 15 min.)	0.005	0.5	0.01	0.5	1.0	1.0

Source: City of San Diego, Significance Determination Thresholds (January 2011)

* All level of service (LOS) measurements are based upon HCM procedures for peak-hour conditions. However, vehicle to capacity (V/C) ratios for roadway segments may be estimated on an ADT/24-hour traffic volume basis (using Table 2.1 or a similar LOS chart for each jurisdiction). The acceptable LOS for freeways, roadways, and intersections is generally "D" ("C" for undeveloped or not densely developed locations per jurisdiction definitions). For metered freeway ramps, LOS does not apply. However, ramp meter delays above 15 minutes are considered excessive.

** If a proposed project's traffic causes the values shown in the table to be exceeded, the impacts are determined to be significant. These impact changes may be measured from appropriate computer programs or expanded manual spreadsheets. The project applicant shall then identify feasible mitigation (within the Traffic Impact Study report) that will maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see above * note), or if the project adds a significant amount of peak-hour trips to cause any traffic queues to exceed on- or off-ramp storage capacities, the project applicant shall be responsible for mitigating significant impact changes.

City of Chula Vista

Within the City of Chula Vista, traffic impacts are defined as either *project-specific impacts* or *cumulative impacts. Project-specific impacts* are those impacts for which the addition of project trips results in an identifiable degradation in Level of Service on freeway segments, roadway segments, or at intersections, triggering the need for specific project-related improvement strategies. *Cumulative impacts* are those in which the project trips incrementally contribute to a poor Level of Service in conjunction with other projects and existing traffic.

The following discussion outlines City of Chula Vista criteria for determining whether a project results in either project-specific or cumulative impacts on roadway segments. The City of Chula Vista maintains different significance standards for short-term and long-term conditions.

Short-Term (Study Horizon Year 0 To 4)

Roadway Segments

If the roadway segment volume to capacity (v/c) ratio indicates LOS C or better, there would be no project-specific or cumulative impact in the short-term. If the roadway segment volume to capacity ratio indicates LOS D, E or F, and the Growth Management Oversight Commission method is utilized, the following significance criteria apply:

- Direct Project specific impacts would occur to roadway segments under short-term conditions in the City of Chula Vista if all of the following conditions were found:
  - The roadway segment is projected to operate at LOS D for more than 2 hours or LOS E/F for 1 hour;
  - The project trips comprise 5% or more of the roadway segment volume; and
  - The project adds more than 800 ADT to the roadway segment.

Cumulative impacts would occur to a roadway segment under short-term conditions only if the roadway segment is projected to operate at LOS D for more than 2 hours or LOS E/F for 1 hour.

Long-Term (Study Horizon Year 5 and Later)

Roadway Segments

Direct Project-specific impacts would occur to roadway segments under long-term conditions in the City of Chula Vista if all of the following conditions are found:

- The roadway is projected to operate at LOS D, LOS E, or LOS F;
- The project trips comprise 5% or more of total segment volume; and
- The project adds more than 800 ADT to the roadway segment.

Cumulative impacts would occur to a roadway segment under long-term conditions if they are projected to operate at LOS D, E or F. However, in cases where roadway segments are projected to operate at LOS D or E under long-term conditions and all intersections along this segment are projected to operate at LOS D or better, the roadway segment impact (project-specific or cumulative) would *not* be significant since intersection analysis is more indicative of actual roadway system operations. However, if a roadway segment is projected to operate at LOS F under long-term conditions, the impact (direct project-specific or cumulative) would be significant regardless of intersection LOS.

Attachment 3 – Peak Hour Intersection Calculation Worksheets – Existing Conditions

Intersection	
Int Delay, s/veh	7.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	104	13	0	22	8	0
Future Vol, veh/h	104	13	0	22	8	0
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	89	89	79	79	50	50
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	117	15	0	28	16	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	46	14	0	0	28	0
Stage 1	14	-	-	-	-	-
Stage 2	32	-	-	-	-	-
Critical Hdwy	6.5	6.3	-	-	4.2	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	-	-	2.29	-
Pot Cap-1 Maneuver	944	1043	-	-	1535	-
Stage 1	988	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	935	1043	-	-	1535	-
Mov Cap-2 Maneuver	935	-	-	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	960	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	7.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	935	1043	1535	-
HCM Lane V/C Ratio	-	-	0.125	0.014	0.01	-
HCM Control Delay (s)	-	-	9.4	8.5	7.4	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0	0	-

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	73	0	2	0	23	34	5	67	0
Future Vol, veh/h	0	0	0	73	0	2	0	23	34	5	67	0
Peak Hour Factor	0.92	0.92	0.92	0.84	0.84	0.84	0.75	0.75	0.75	0.81	0.81	0.81
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	0	0	0	87	0	2	0	31	45	6	83	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	0	8.2	7.4	7.9
HCM LOS	-	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	97%	7%
Vol Thru, %	40%	100%	0%	93%
Vol Right, %	60%	0%	3%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	57	0	75	72
LT Vol	0	0	73	5
Through Vol	23	0	0	67
RT Vol	34	0	2	0
Lane Flow Rate	76	0	89	89
Geometry Grp	1	1	1	1
Degree of Util (X)	0.083	0	0.112	0.106
Departure Headway (Hd)	3.936	4.539	4.533	4.299
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	895	0	782	824
Service Time	2.026	2.539	2.613	2.378
HCM Lane V/C Ratio	0.085	0	0.114	0.108
HCM Control Delay	7.4	7.5	8.2	7.9
HCM Lane LOS	A	N	A	A
HCM 95th-tile Q	0.3	0	0.4	0.4

Intersection	
Int Delay, s/veh	4.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	85	24	1	100	22	2
Future Vol, veh/h	85	24	1	100	22	2
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	85	85	57	57	60	60
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	100	28	2	175	37	3

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	167	90	0	0	177	0
Stage 1	90	-	-	-	-	-
Stage 2	77	-	-	-	-	-
Critical Hdwy	6.5	6.3	-	-	4.2	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	-	-	2.29	-
Pot Cap-1 Maneuver	805	946	-	-	1352	-
Stage 1	914	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	783	946	-	-	1352	-
Mov Cap-2 Maneuver	783	-	-	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	901	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	7.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	783	946	1352	-
HCM Lane V/C Ratio	-	-	0.128	0.03	0.027	-
HCM Control Delay (s)	-	-	10.3	8.9	7.7	0
HCM Lane LOS	-	-	B	A	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	0.1	-

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	39	0	6	1	80	119	4	58	1
Future Vol, veh/h	0	0	1	39	0	6	1	80	119	4	58	1
Peak Hour Factor	0.25	0.25	0.25	0.60	0.60	0.60	0.85	0.85	0.85	0.68	0.68	0.68
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	0	0	4	65	0	10	1	94	140	6	85	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	8.4	8.5	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	0%	87%	6%
Vol Thru, %	40%	0%	0%	92%
Vol Right, %	59%	100%	13%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	200	1	45	63
LT Vol	1	0	39	4
Through Vol	80	0	0	58
RT Vol	119	1	6	1
Lane Flow Rate	235	4	75	93
Geometry Grp	1	1	1	1
Degree of Util (X)	0.263	0.005	0.102	0.116
Departure Headway (Hd)	4.025	4.27	4.873	4.5
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	899	839	737	799
Service Time	2.025	2.293	2.892	2.515
HCM Lane V/C Ratio	0.261	0.005	0.102	0.116
HCM Control Delay	8.5	7.3	8.4	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.1	0	0.3	0.4

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Attachment 4 – Peak Hour Intersection Calculation Worksheets – Existing With Project Conditions

Intersection	
Int Delay, s/veh	7.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	107	13	0	34	8	0
Future Vol, veh/h	107	13	0	34	8	0
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	89	89	79	79	50	50
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	120	15	0	43	16	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	54	22	0	0	43	0
Stage 1	22	-	-	-	-	-
Stage 2	32	-	-	-	-	-
Critical Hdwy	6.5	6.3	-	-	4.2	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	-	-	2.29	-
Pot Cap-1 Maneuver	934	1032	-	-	1516	-
Stage 1	980	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	924	1032	-	-	1516	-
Mov Cap-2 Maneuver	924	-	-	-	-	-
Stage 1	980	-	-	-	-	-
Stage 2	959	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	7.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	924	1032	1516	-
HCM Lane V/C Ratio	-	-	0.13	0.014	0.011	-
HCM Control Delay (s)	-	-	9.5	8.5	7.4	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0	0	-

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	73	0	3	0	23	34	6	67	0
Future Vol, veh/h	0	0	0	73	0	3	0	23	34	6	67	0
Peak Hour Factor	0.92	0.92	0.92	0.84	0.84	0.84	0.75	0.75	0.75	0.81	0.81	0.81
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	0	0	0	87	0	4	0	31	45	7	83	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	0	8.2	7.4	7.9
HCM LOS	-	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	96%	8%
Vol Thru, %	40%	100%	0%	92%
Vol Right, %	60%	0%	4%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	57	0	76	73
LT Vol	0	0	73	6
Through Vol	23	0	0	67
RT Vol	34	0	3	0
Lane Flow Rate	76	0	90	90
Geometry Grp	1	1	1	1
Degree of Util (X)	0.083	0	0.114	0.108
Departure Headway (Hd)	3.939	4.544	4.525	4.304
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	895	0	783	822
Service Time	2.031	2.544	2.606	2.385
HCM Lane V/C Ratio	0.085	0	0.115	0.109
HCM Control Delay	7.4	7.5	8.2	7.9
HCM Lane LOS	A	N	A	A
HCM 95th-tile Q	0.3	0	0.4	0.4

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	1	1	63	203	2
Future Vol, veh/h	12	1	1	63	203	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	13	1	1	68	221	2
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	8	8.1	8.4
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	92%	0%	0%
Vol Thru, %	0%	100%	0%	100%	97%
Vol Right, %	0%	0%	8%	0%	3%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	63	13	135	70
LT Vol	1	0	12	0	0
Through Vol	0	63	0	135	68
RT Vol	0	0	1	0	2
Lane Flow Rate	1	68	14	147	76
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.002	0.091	0.019	0.193	0.099
Departure Headway (Hd)	5.308	4.807	4.891	4.729	4.709
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	669	739	736	759	761
Service Time	3.078	2.577	2.891	2.458	2.438
HCM Lane V/C Ratio	0.001	0.092	0.019	0.194	0.1
HCM Control Delay	8.1	8.1	8	8.6	8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0	0.3	0.1	0.7	0.3

Intersection	
Int Delay, s/veh	4.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	98	24	1	105	22	2
Future Vol, veh/h	98	24	1	105	22	2
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	85	85	57	57	60	60
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	115	28	2	184	37	3

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	171	94	0	0	186	0
Stage 1	94	-	-	-	-	-
Stage 2	77	-	-	-	-	-
Critical Hdwy	6.5	6.3	-	-	4.2	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	-	-	2.29	-
Pot Cap-1 Maneuver	801	941	-	-	1342	-
Stage 1	910	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	779	941	-	-	1342	-
Mov Cap-2 Maneuver	779	-	-	-	-	-
Stage 1	910	-	-	-	-	-
Stage 2	900	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	7.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	779	941	1342	-
HCM Lane V/C Ratio	-	-	0.148	0.03	0.027	-
HCM Control Delay (s)	-	-	10.4	8.9	7.8	0
HCM Lane LOS	-	-	B	A	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	0.1	-

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	39	0	7	1	80	119	5	58	1
Future Vol, veh/h	0	0	1	39	0	7	1	80	119	5	58	1
Peak Hour Factor	0.25	0.25	0.25	0.60	0.60	0.60	0.85	0.85	0.85	0.68	0.68	0.68
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	0	0	4	65	0	12	1	94	140	7	85	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	8.4	8.5	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	0%	85%	8%
Vol Thru, %	40%	0%	0%	91%
Vol Right, %	59%	100%	15%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	200	1	46	64
LT Vol	1	0	39	5
Through Vol	80	0	0	58
RT Vol	119	1	7	1
Lane Flow Rate	235	4	77	94
Geometry Grp	1	1	1	1
Degree of Util (X)	0.263	0.005	0.104	0.118
Departure Headway (Hd)	4.031	4.278	4.864	4.508
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	896	837	739	797
Service Time	2.031	2.299	2.88	2.522
HCM Lane V/C Ratio	0.262	0.005	0.104	0.118
HCM Control Delay	8.5	7.3	8.4	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.1	0	0.3	0.4

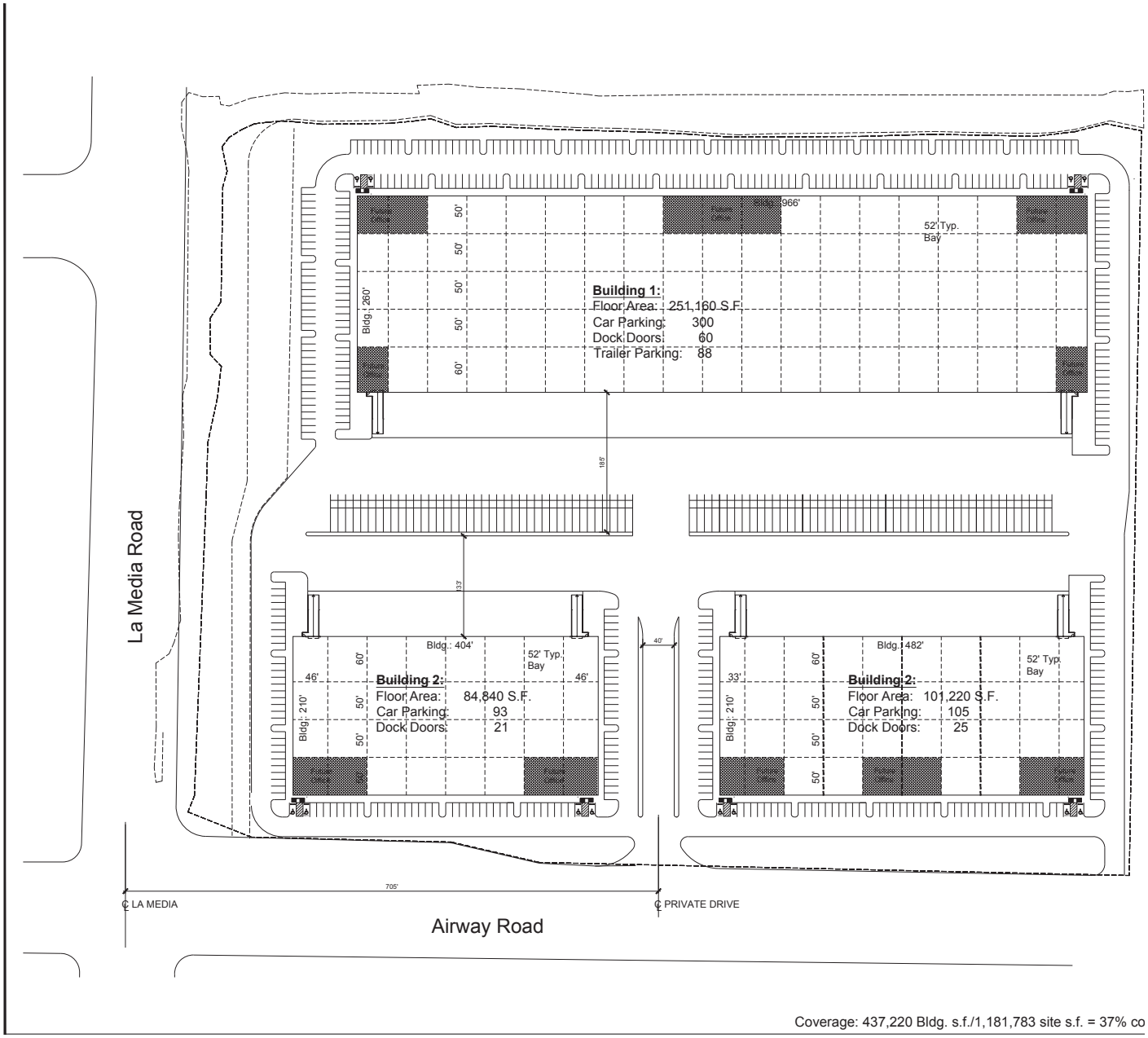
Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	1	1	273	170	13
Future Vol, veh/h	5	1	1	273	170	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	5	1	1	297	185	14
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	8.4	10.7	8.4
HCM LOS	A	B	A

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	83%	0%	0%
Vol Thru, %	0%	100%	0%	100%	81%
Vol Right, %	0%	0%	17%	0%	19%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	273	6	113	70
LT Vol	1	0	5	0	0
Through Vol	0	273	0	113	57
RT Vol	0	0	1	0	13
Lane Flow Rate	1	297	7	123	76
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.002	0.394	0.01	0.165	0.099
Departure Headway (Hd)	5.281	4.78	5.304	4.822	4.691
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	674	748	679	737	756
Service Time	3.042	2.541	3.304	2.601	2.47
HCM Lane V/C Ratio	0.001	0.397	0.01	0.167	0.101
HCM Control Delay	8.1	10.7	8.4	8.6	8
HCM Lane LOS	A	B	A	A	A
HCM 95th-tile Q	0	1.9	0	0.6	0.3

Attachment 5 – Cumulative Projects Information



Coverage: 437,220 Bldg. s.f./1,181,783 site s.f. = 37% co

Table 3 Trip Generation Summary

Description	Land Use	Units[1]	Trip Rate[2]	Daily Trips	AM Peak-Hour					PM Peak-Hour				
					% of ADT[2]	In:Out Ratio[2]	In	Out	Total	% of ADT[2]	In:Out Ratio[2]	In	Out	Total
Driveway Trips[3]														
Proposed														
Building 1	Warehousing	251.16 ksf	5 / ksf	1,256	15%	7.00 : 3.00	132	56	188	16%	4.00 : 6.00	80	121	201
Building 2	Warehousing	84.84 ksf	5 / ksf	424	15%	7.00 : 3.00	45	19	64	16%	4.00 : 6.00	27	41	68
Building 3	Warehousing	101.22 ksf	5 / ksf	506	15%	7.00 : 3.00	53	23	76	16%	4.00 : 6.00	32	49	81
Proposed Total				**2,186**			**230**	**98**	**328**			**139**	**211**	**350**

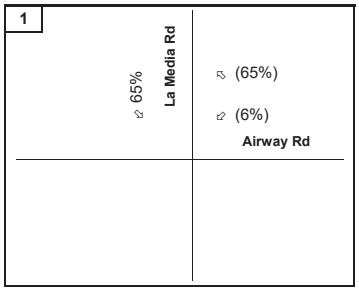
Note:

1. ksf = Thousand Square Feet
2. Daily and peak-hour trip generation rates referenced from the City of San Diego Land Development Code - Trip Generation Manual, May 2003.
3. Driveway trips are the total number of trips generated by a site.

K:\SND_LDEV\195208002 - Majestic Airway\Traffic\Sensitivity Analysis\ANALYSIS\EXCEL\[095208002_TG01.xlsm]Summary

Figure 4 — Project Traffic Distribution

Plaza La Media South | Traffic Sensitivity Analysis | February 2020



Jonathan Sanchez

From: Justin Rasas <justin@losengineering.com>
Sent: Monday, April 06, 2020 3:28 PM
To: Jonathan Sanchez
Cc: Monique Chen; Brooke Peterson
Subject: Re: Southwest Village Project Information

Hi Johnathan,

Thanks for asking – my family and I are doing well, staying home, and hopefully staying safe. I hope you and yours are safe as well.

The Southwest Village traffic analysis is still in flux. Sorry I don't have any project volumes to share. I also don't have a timeline of when the project will settle down. I can share the project description that was recently published (2/26/20) as part of the NOP.

The Southwest Village Specific Plan (Specific Plan) provides a comprehensive policy framework intended to guide future development in Southwest Village, consistent with the Otay Mesa Community Plan (OMCP) and City of Villages Strategy. The Specific Plan encompasses approximately 490 acres, will allow up to 5,130 attached and detached residences, and will facilitate creation of a new village anchored by up to 175,000 square feet of commercial and retail uses in a mixed-use Village Core. The Specific Plan would include dedication a new elementary school site, developed parks, trails, natural open space, and habitat conservation. Access to the Specific Plan area will be from Caliente Avenue to the north and from an extension of Beyer Boulevard, connecting the Specific Plan area to San Ysidro. Additionally, a Vesting Tentative Map (VTM), Site Development Permit, and Multi- Habitat Planning Area (MHPA) Boundary Line Adjustment is requested in order to develop approximately 74 acres within Planning Areas 8 through 14 to implement approximately 830 residential units within the Specific Plan. Concurrent with implementation of the VTM, Beyer Boulevard will be graded to its full width and improved as a two-lane road with bicycle facilities. The site is not included on any Government Code listing of hazardous waste sites.

Thanks,
Justin Rasas, P.E. (RCE 60690), PTOE
Principal

LOS Engineering, Inc.
11622 El Camino Real, Suite 100
San Diego, CA 92130
619.890.1253 Phone
Justin@LOSengineering.com
www.LOSengineering.com

From: Jonathan Sanchez <jsanchez@chenryanmobility.com>
Sent: Monday, April 6, 2020 1:10 PM
To: Justin Rasas <justin@losengineering.com>

Cc: Monique Chen <mchen@chenryanmobility.com>
Subject: Southwest Village Project Information

Hi Justin,

First and foremost, I hope you and your family are doing great and staying healthy 😊 ⚫these crazy times we are living.

I wanted to reach out to see if you could help me out with some information regarding a project you are working on – **Southwest Village** in Otay Mesa. This project was identified as a cumulative project for a TIS I am currently preparing (Lumina II) and wanted to check in with you regarding the following information:

- Project Description
- Trip Generation
- Trip Distribution
- Trip Assignment

Do you think you could provide us with that information? Let me know if you have any questions.

Thanks!!

Jonathan Sanchez
Chen Ryan Associates
3900 Fifth Avenue, Suite 310 | San Diego, CA 92103
(619) 468-2739
www.ChenRyanMobility.com

3.2 Project Trip Generation, Distribution, and Assignment

Project Trip Generation

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

TABLE 3.1
OTAY MESA FLORIO
PROPOSED PROJECT TRIP GENERATION

Land Use	Units	Trip Rate	ADT	AM Peak Hour					PM Peak Hour				
				%	Trips	Split	In	Out	%	Trips	Split	In	Out
Multi-Family (Over 20 DU/acre)	900 DU	6	5,400	8%	432	2:8	86	346	9%	486	7:3	340	146
Park (Developed)	3.5 Acres	50	175	4%	7	5:5	4	3	8%	14	5:5	7	7
Community Commercial[a]	10 KSF	70[a]	700	3%	21	6:4	13	8	10%	70	5:5	35	35
		Total	**6,275**	**-**	**460**	**-**	**103**	**357**	**-**	**570**	**-**	**382**	**188**

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

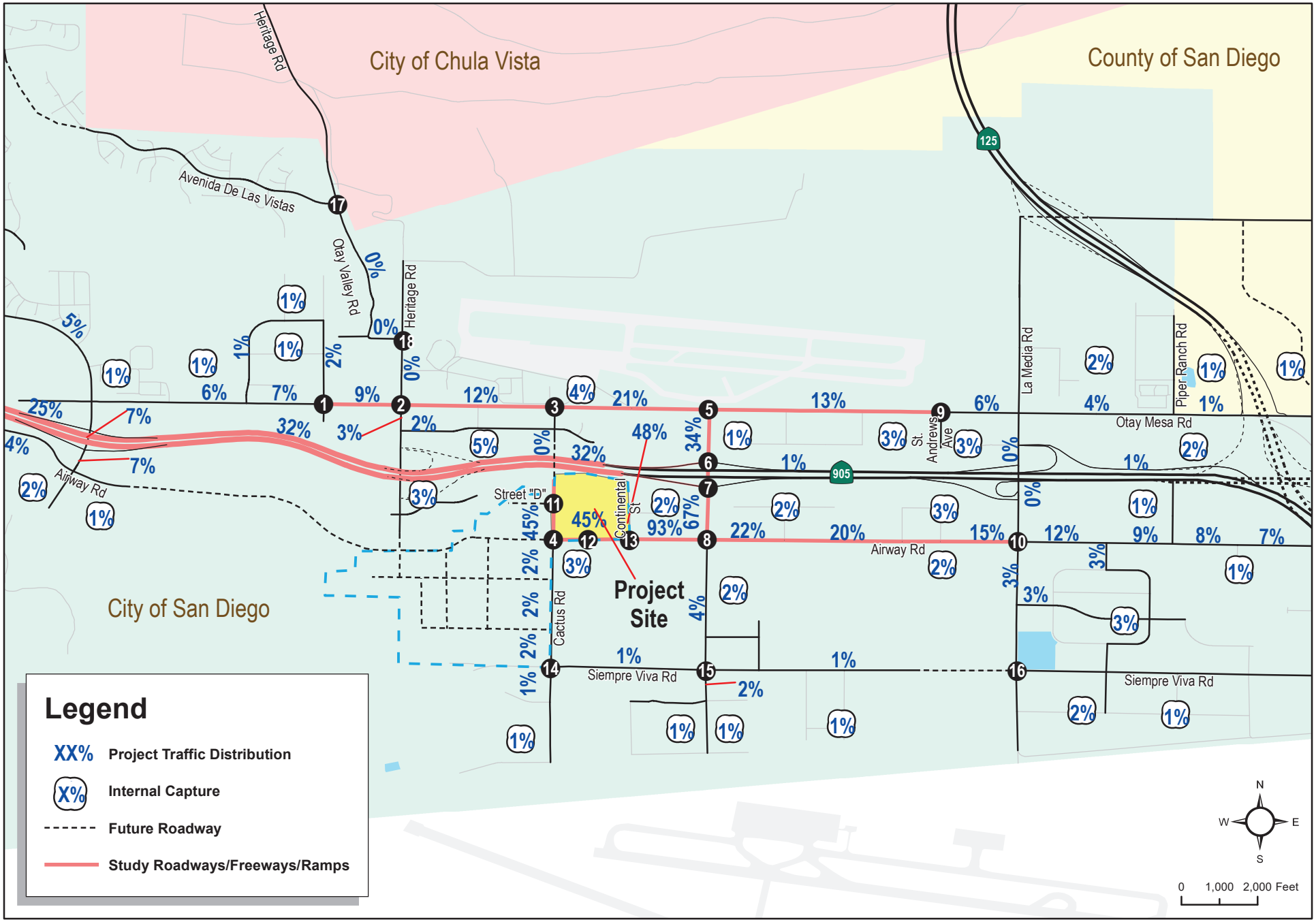
Notes:
[a] Trip generation rate used is consistent with the Otay Mesa CPU & OMCVSP. Community Commercial land use is defined in the Otay Mesa Community Plan FEIR as "provides for shopping areas with retail, service, civic, and office uses for the community at large within three to six miles" and density range of CC-2-3 with 0.3 FAR.

As shown in Table 3.1, the Proposed Project is anticipated to generate a total of 6,275 daily trips, including 460 (103-in / 357-out) AM peak hour trips and 570 (382-in / 188-out) PM peak hour trips.

Project Trip Distribution

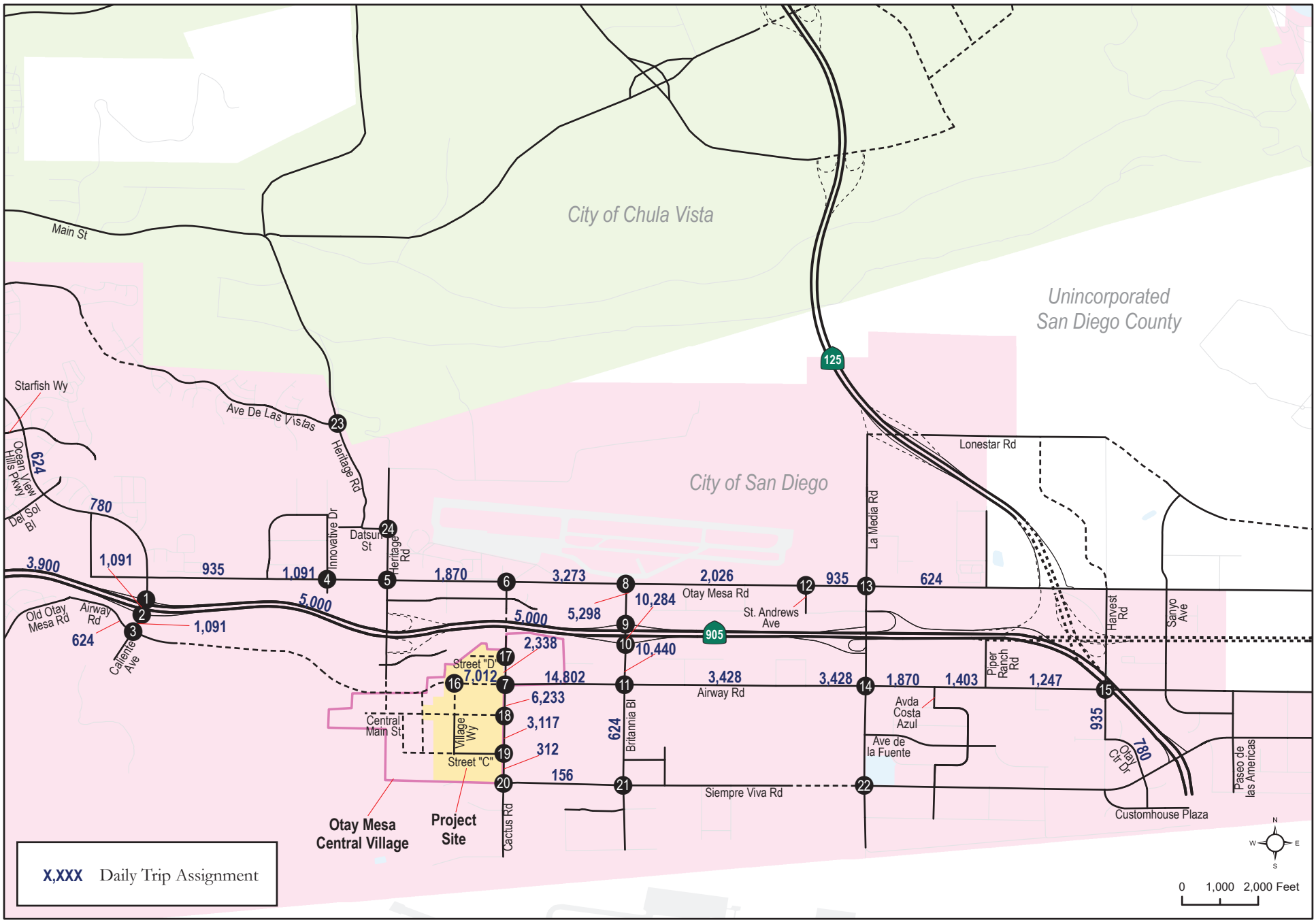
Project trip distribution patterns were derived from the same SANDAG Select Zone Assignment that was conducted for the approved Otay Mesa Central Village Specific Plan Transportation Facilities Trigger Analysis (TFTA) and utilized for the Otay Mesa Lumina TIS, February 20, 2019. Due to the similar nature of the land uses in both the Lumina Project and this Florio Project, project trip distribution patterns were assumed to be consistent with the Otay Mesa Lumina TIS.

Trip distribution is identical under the Existing plus Project and the Near-Term Year 2023 plus Project (Opening Day) scenarios. The difference in trip distribution between Existing plus Project, Near-Term Year 2023 plus Project (Opening Day), and Buildout of Community Plan Conditions lies in trips not being assigned on Heritage Road, as the land uses in Chula Vista are not fully developed, and a higher percentage of trips using SR-905 heading west under Existing and Near-Term scenarios. Under Buildout of Community Plan Conditions, the same project trip distribution utilized for the Otay Mesa Central Village Specific Plan TFTA was employed as the model assumed buildout of the community.



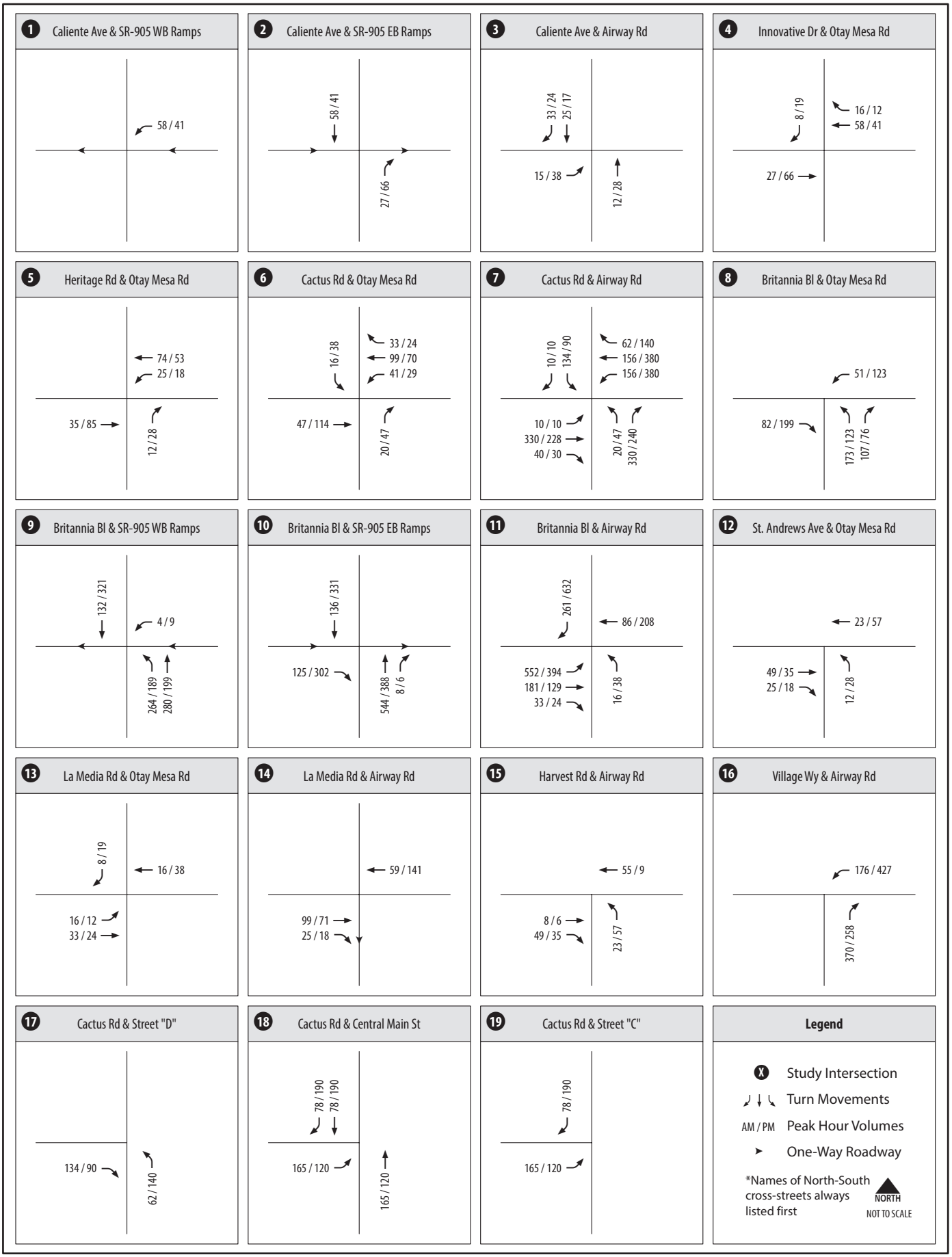
Otay Mesa Florio
Memorandum of Approach
CHEN RYAN

Figure 3-2
Project Trip Distribution



Otay Mesa Lumina
Transportation Impact Study
CHEN RYAN

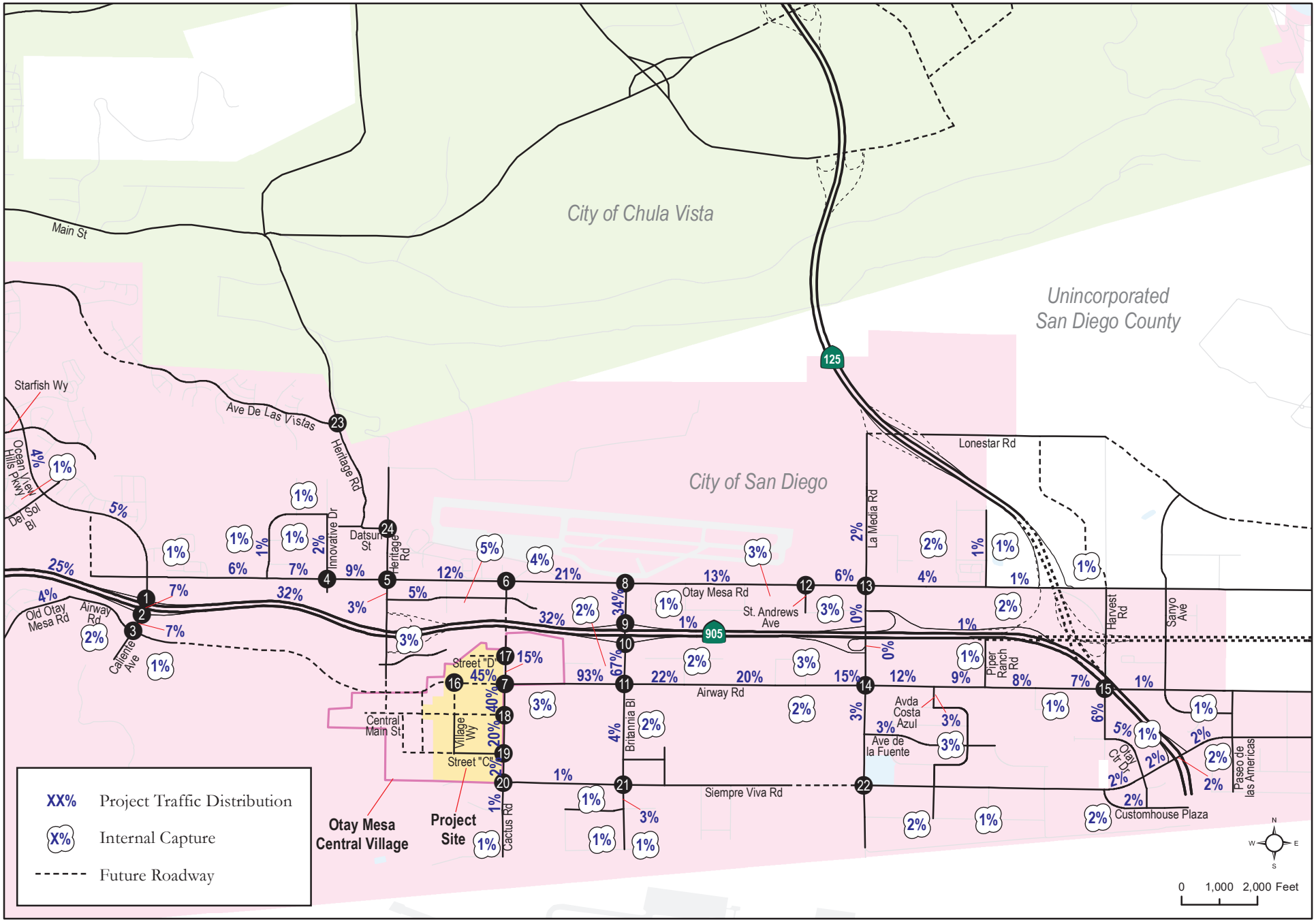
Figure 3-8
Project Trip Assignment (Full Development) - Existing and Near-Term 2027 Roadway Network



Otay Mesa Lumina
Transportation Impact Study

CHEN RYAN

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



Otay Mesa Lumina
Transportation Impact Study
CHEN RYAN

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

Project Trip Generation

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

Table 1 Otay Mesa Lumina II – Trip Generation

		Trip		AM Peak Hour					PM Peak Hour				
Land Use	Units	Rate	ADT	%	Trips	Split	In	Out	%	Trips	Split	In	Out
Multi-Family	132	6 / DU	792	8%	64	2:8	13	51	9%	72	7:3	50	22

Source: City of San Diego Land Development Code – Trip Generation Manual, May 2003.

As shown in Table 1, the proposed project would generate a total of 792 daily trips, including 64 (13-in / 51-out) AM peak hour trips and 72 (50-in / 22-out) PM peak hour trips.

Project Distribution

Since the project is anticipated to have an opening year by 2027, the same project trip distribution (Year 2027) utilized in the *Otay Mesa Lumina Transportation Impact Study*, February 2019, was employed for the analysis of Otay Mesa Lumina II. **Figure 3** displays the project trip distribution patterns associated with the proposed project.

Project Assignment

Based upon the project trip distribution patterns, the daily and AM/PM peak hour project trips were assigned to the study area roadway network. **Figure 4** displays the assignment of project trips to the roadway network and intersections.

Project Study Area

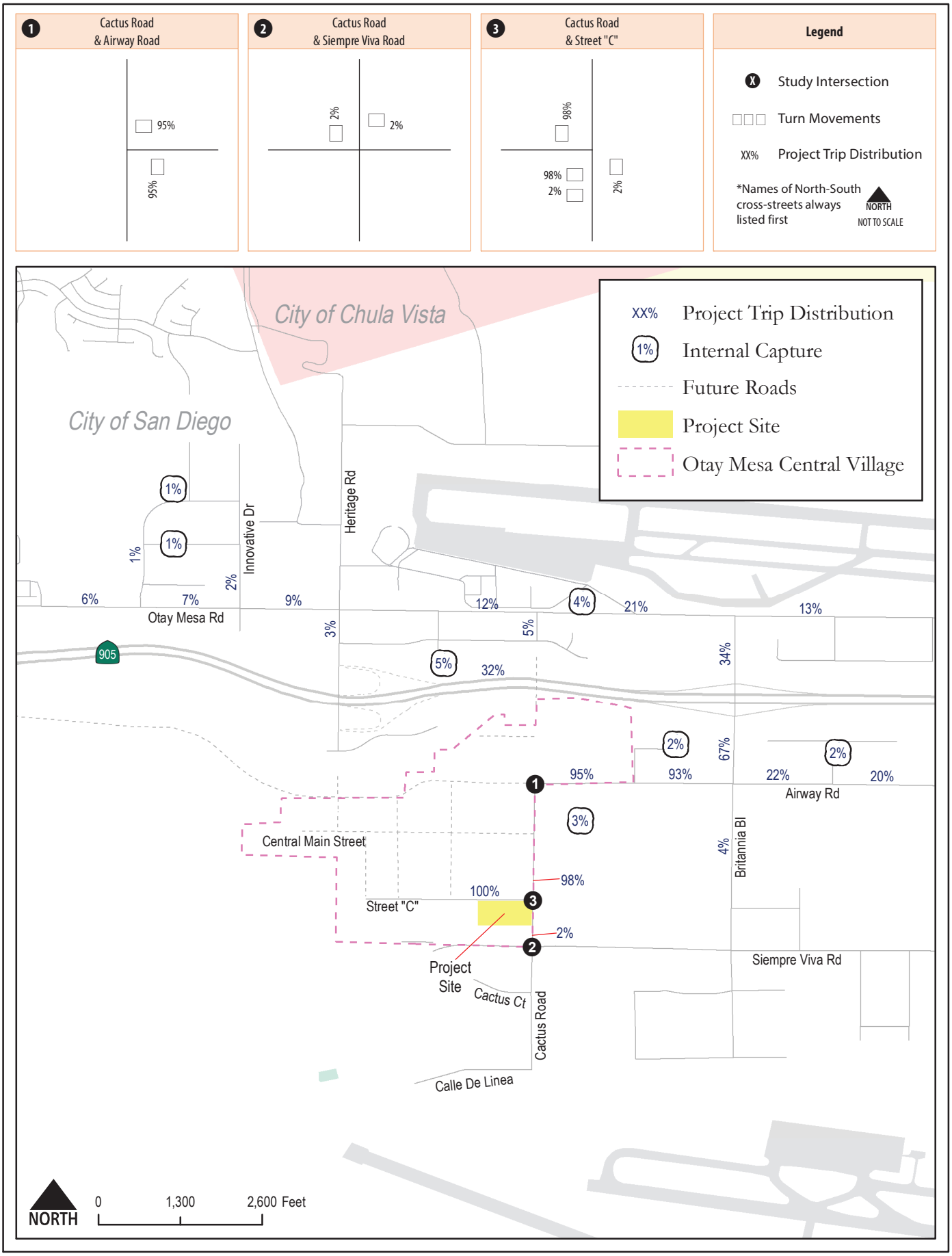
This section documents the project study area roadway and intersection configurations, traffic volumes and traffic operations.

Roadway Segments

- Cactus Road, between Airway Road and Siempre Viva Road
- Street C, between Cactus Road and Village Way

After implementation of the proposed project, the roadway segment of Cactus Road, between Airway Road and Siempre Viva Road will be divided into three (3) study segments as follows:

- Cactus Road, between Airway Road and Street "C";
- Cactus Road, between Street "C" and southern property boundary; and
- Cactus Road, between southern property boundary and Siempre Viva Road.



Otay Mesa Lumina II
Traffic Analysis Memorandum
CHEN RYAN

Figure 3
Project Trip Distribution

CHEN RYAN

Attachment 6 – Peak Hour Intersection Calculation Worksheets – Near-Term Year 2027 Conditions

Intersection	
Int Delay, s/veh	89

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	283	122	51	409	151	29
Future Vol, veh/h	283	122	51	409	151	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	79	79	50	50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	318	137	65	518	302	58

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	986	324	0	0	583	0
Stage 1	324	-	-	-	-	-
Stage 2	662	-	-	-	-	-
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	~ 275	717	-	-	991	-
Stage 1	733	-	-	-	-	-
Stage 2	513	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 188	717	-	-	991	-
Mov Cap-2 Maneuver	~ 188	-	-	-	-	-
Stage 1	733	-	-	-	-	-
Stage 2	351	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	266.5	0	8.6
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	188	717	991	-
HCM Lane V/C Ratio	-	-	1.691	0.191	0.305	-
HCM Control Delay (s)	-	-	$ 376.6	11.2	10.2	0
HCM Lane LOS	-	-	F	B	B	A
HCM 95th %tile Q(veh)	-	-	21.7	0.7	1.3	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	73	0	5	0	23	34	42	67	0
Future Vol, veh/h	0	0	0	73	0	3	0	23	34	42	67	0
Peak Hour Factor	0.92	0.92	0.92	0.84	0.84	0.84	0.75	0.75	0.75	0.81	0.81	0.81
Heavy Vehicles, %	5	5	5	10	5	10	5	10	10	10	10	5
Mvmt Flow	0	0	0	87	0	4	0	31	45	52	83	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	0	8.3	7.5	8.3
HCM LOS	-	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	96%	39%
Vol Thru, %	40%	100%	0%	61%
Vol Right, %	60%	0%	4%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	57	0	76	109
LT Vol	0	0	73	42
Through Vol	23	0	0	67
RT Vol	34	0	3	0
Lane Flow Rate	76	0	90	135
Geometry Grp	1	1	1	1
Degree of Util (X)	0.086	0	0.118	0.163
Departure Headway (Hd)	4.084	4.571	4.713	4.364
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	882	0	765	810
Service Time	2.088	2.576	2.716	2.456
HCM Lane V/C Ratio	0.086	0	0.118	0.167
HCM Control Delay	7.5	7.6	8.3	8.3
HCM Lane LOS	A	N	A	A
HCM 95th-tile Q	0.3	0	0.4	0.6

Intersection	
Intersection Delay, s/veh	11.7
Intersection LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	165	0	0	283	329	78
Future Vol, veh/h	165	0	0	283	329	78
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	179	0	0	308	358	85
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	11.4	13.4	10.6
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	0%
Vol Thru, %	100%	100%	0%	100%	58%
Vol Right, %	0%	0%	0%	0%	42%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	283	165	219	188
LT Vol	0	0	165	0	0
Through Vol	0	283	0	219	110
RT Vol	0	0	0	0	78
Lane Flow Rate	0	308	179	238	204
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0	0.48	0.295	0.356	0.288
Departure Headway (Hd)	5.62	5.62	5.928	5.481	5.187
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	0	646	608	660	698
Service Time	3.32	3.32	3.943	3.181	2.887
HCM Lane V/C Ratio	0	0.477	0.294	0.361	0.292
HCM Control Delay	8.3	13.4	11.4	11.2	10
HCM Lane LOS	N	B	B	B	A
HCM 95th-tile Q	0	2.6	1.2	1.6	1.2

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	215	1	1	68	239	90
Future Vol, veh/h	215	1	1	68	239	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	234	1	1	74	260	98
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	10.7	9	9.5
HCM LOS	B	A	A

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	100%	47%
Vol Right, %	0%	0%	0%	0%	53%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	68	216	159	170
LT Vol	1	0	215	0	0
Through Vol	0	68	0	159	80
RT Vol	0	0	1	0	90
Lane Flow Rate	1	74	235	173	184
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.002	0.114	0.333	0.252	0.249
Departure Headway (Hd)	6.035	5.529	5.109	5.242	4.868
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	590	645	702	682	736
Service Time	3.799	3.294	3.156	2.99	2.615
HCM Lane V/C Ratio	0.002	0.115	0.335	0.254	0.25
HCM Control Delay	8.8	9	10.7	9.8	9.2
HCM Lane LOS	A	A	B	A	A
HCM 95th-tile Q	0	0.4	1.5	1	1

Intersection	
Int Delay, s/veh	458.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	518	304	37	367	184	54
Future Vol, veh/h	518	304	37	367	184	54
Conflicting Peds, #/hr	1	0	0	0	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	57	57	60	60
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	609	358	65	644	307	90

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1093	388	0	0	710	0
Stage 1	388	-	-	-	-	-
Stage 2	705	-	-	-	-	-
Critical Hdwy	6.5	6.3	-	-	4.2	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	-	-	2.29	-
Pot Cap-1 Maneuver	~ 229	643	-	-	853	-
Stage 1	668	-	-	-	-	-
Stage 2	~ 476	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 142	642	-	-	852	-
Mov Cap-2 Maneuver	~ 142	-	-	-	-	-
Stage 1	667	-	-	-	-	-
Stage 2	~ 295	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 979.4	0	9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	142	642	852	-
HCM Lane V/C Ratio	-	-	4.292	0.557	0.36	-
HCM Control Delay (s)	-	-	$ 1543.9	17.4	11.6	0
HCM Lane LOS	-	-	F	C	B	A
HCM 95th %tile Q(veh)	-	-	62.1	3.4	1.6	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	39	0	13	1	80	119	22	58	1
Future Vol, veh/h	0	0	1	39	0	7	1	80	119	22	58	1
Peak Hour Factor	0.25	0.25	0.25	0.60	0.60	0.60	0.85	0.85	0.85	0.68	0.68	0.68
Heavy Vehicles, %	5	5	5	10	5	10	5	10	10	10	10	5
Mvmt Flow	0	0	4	65	0	12	1	94	140	32	85	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	8.5	8.4	8.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	0%	85%	27%
Vol Thru, %	40%	0%	0%	72%
Vol Right, %	59%	100%	15%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	200	1	46	81
LT Vol	1	0	39	22
Through Vol	80	0	0	58
RT Vol	119	1	7	1
Lane Flow Rate	235	4	77	119
Geometry Grp	1	1	1	1
Degree of Util (X)	0.259	0.005	0.105	0.15
Departure Headway (Hd)	3.965	4.243	4.912	4.547
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	908	844	731	791
Service Time	1.975	2.266	2.93	2.561
HCM Lane V/C Ratio	0.259	0.005	0.105	0.15
HCM Control Delay	8.4	7.3	8.5	8.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0	0.4	0.5

Intersection	
Intersection Delay, s/veh	16.9
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	120	0	0	433	427	190
Future Vol, veh/h	120	0	0	433	427	190
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	130	0	0	471	464	207
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	11.8	23.8	13.1
HCM LOS	B	C	B

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	0%
Vol Thru, %	100%	100%	0%	100%	43%
Vol Right, %	0%	0%	0%	0%	57%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	433	120	285	332
LT Vol	0	0	120	0	0
Through Vol	0	433	0	285	142
RT Vol	0	0	0	0	190
Lane Flow Rate	0	471	130	309	361
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0	0.751	0.24	0.475	0.514
Departure Headway (Hd)	5.744	5.744	6.633	5.523	5.118
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	0	631	541	653	704
Service Time	3.472	3.472	4.67	3.246	2.841
HCM Lane V/C Ratio	0	0.746	0.24	0.473	0.513
HCM Control Delay	8.5	23.8	11.8	13.2	13.1
HCM Lane LOS	N	C	B	B	B
HCM 95th-tile Q	0	6.7	0.9	2.6	3

Intersection	
Intersection Delay, s/veh	11.5
Intersection LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	141	1	1	292	188	239
Future Vol, veh/h	141	1	1	292	188	239
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	153	1	1	317	204	260
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	10.9	13.1	10.6
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	99%	0%	0%
Vol Thru, %	0%	100%	0%	100%	21%
Vol Right, %	0%	0%	1%	0%	79%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	292	142	125	302
LT Vol	1	0	141	0	0
Through Vol	0	292	0	125	63
RT Vol	0	0	1	0	239
Lane Flow Rate	1	317	154	136	328
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.002	0.478	0.25	0.201	0.432
Departure Headway (Hd)	5.927	5.422	5.831	5.303	4.743
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	599	660	610	672	751
Service Time	3.71	3.205	3.928	3.076	2.516
HCM Lane V/C Ratio	0.002	0.48	0.252	0.202	0.437
HCM Control Delay	8.7	13.1	10.9	9.4	11.1
HCM Lane LOS	A	B	B	A	B
HCM 95th-tile Q	0	2.6	1	0.7	2.2

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Attachment 7 – Peak Hour Intersection Calculation Worksheets – Near-Term Year 2027 With Project Conditions

Intersection	
Int Delay, s/veh	92.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	285	122	51	421	151	29
Future Vol, veh/h	285	122	51	421	151	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	79	79	50	50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	320	137	65	533	302	58

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	994	332	0	0	598	0
Stage 1	332	-	-	-	-	-
Stage 2	662	-	-	-	-	-
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	~ 272	710	-	-	979	-
Stage 1	727	-	-	-	-	-
Stage 2	513	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 185	710	-	-	979	-
Mov Cap-2 Maneuver	~ 185	-	-	-	-	-
Stage 1	727	-	-	-	-	-
Stage 2	349	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	279.6	0	8.6
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	185	710	979	-
HCM Lane V/C Ratio	-	-	1.731	0.193	0.308	-
HCM Control Delay (s)	-	-	$ 394.4	11.3	10.3	0
HCM Lane LOS	-	-	F	B	B	A
HCM 95th %tile Q(veh)	-	-	22.3	0.7	1.3	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	73	0	6	0	23	34	43	67	0
Future Vol, veh/h	0	0	0	73	0	4	0	23	34	43	67	0
Peak Hour Factor	0.92	0.92	0.92	0.84	0.84	0.84	0.75	0.75	0.75	0.81	0.81	0.81
Heavy Vehicles, %	5	5	5	10	5	10	5	10	10	10	10	5
Mvmt Flow	0	0	0	87	0	5	0	31	45	53	83	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	0	8.4	7.5	8.3
HCM LOS	-	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	95%	39%
Vol Thru, %	40%	100%	0%	61%
Vol Right, %	60%	0%	5%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	57	0	77	110
LT Vol	0	0	73	43
Through Vol	23	0	0	67
RT Vol	34	0	4	0
Lane Flow Rate	76	0	92	136
Geometry Grp	1	1	1	1
Degree of Util (X)	0.086	0	0.12	0.165
Departure Headway (Hd)	4.088	4.576	4.707	4.367
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	881	0	765	809
Service Time	2.094	2.582	2.71	2.462
HCM Lane V/C Ratio	0.086	0	0.12	0.168
HCM Control Delay	7.5	7.6	8.4	8.3
HCM Lane LOS	A	N	A	A
HCM 95th-tile Q	0.3	0	0.4	0.6

Intersection	
Intersection Delay, s/veh	11.9
Intersection LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	177	1	1	283	329	80
Future Vol, veh/h	177	1	1	283	329	80
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	192	1	1	308	358	87
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	11.7	13.6	10.8
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	99%	0%	0%
Vol Thru, %	0%	100%	0%	100%	58%
Vol Right, %	0%	0%	1%	0%	42%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	283	178	219	190
LT Vol	1	0	177	0	0
Through Vol	0	283	0	219	110
RT Vol	0	0	1	0	80
Lane Flow Rate	1	308	193	238	206
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.002	0.484	0.318	0.367	0.3
Departure Headway (Hd)	6.175	5.669	5.926	5.541	5.242
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	581	637	608	653	691
Service Time	3.898	3.392	3.956	3.241	2.942
HCM Lane V/C Ratio	0.002	0.484	0.317	0.364	0.298
HCM Control Delay	8.9	13.6	11.7	11.4	10.2
HCM Lane LOS	A	B	B	B	B
HCM 95th-tile Q	0	2.6	1.4	1.7	1.3

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	215	1	1	69	240	90
Future Vol, veh/h	215	1	1	69	240	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	234	1	1	75	261	98
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	10.7	9	9.5
HCM LOS	B	A	A

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	100%	47%
Vol Right, %	0%	0%	0%	0%	53%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	69	216	160	170
LT Vol	1	0	215	0	0
Through Vol	0	69	0	160	80
RT Vol	0	0	1	0	90
Lane Flow Rate	1	75	235	174	185
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.002	0.115	0.334	0.253	0.25
Departure Headway (Hd)	6.038	5.532	5.114	5.246	4.872
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	590	644	702	683	735
Service Time	3.803	3.297	3.16	2.993	2.619
HCM Lane V/C Ratio	0.002	0.116	0.335	0.255	0.252
HCM Control Delay	8.8	9	10.7	9.8	9.3
HCM Lane LOS	A	A	B	A	A
HCM 95th-tile Q	0	0.4	1.5	1	1

Intersection	
Int Delay, s/veh	505.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	530	304	37	392	184	54
Future Vol, veh/h	530	304	37	392	184	54
Conflicting Peds, #/hr	1	0	0	0	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	57	57	60	60
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	624	358	65	688	307	90

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1115	410	0	0	754	0
Stage 1	410	-	-	-	-	-
Stage 2	705	-	-	-	-	-
Critical Hdwy	6.5	6.3	-	-	4.2	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	-	-	2.29	-
Pot Cap-1 Maneuver	~ 222	625	-	-	821	-
Stage 1	653	-	-	-	-	-
Stage 2	~ 476	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 134	624	-	-	820	-
Mov Cap-2 Maneuver	~ 134	-	-	-	-	-
Stage 1	652	-	-	-	-	-
Stage 2	~ 288	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, $	1092.9	0	9.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	134	624	820	-
HCM Lane V/C Ratio	-	-	4.653	0.573	0.374	-
HCM Control Delay (s)	-	-	$ 1709.3	18.2	12	0
HCM Lane LOS	-	-	F	C	B	A
HCM 95th %tile Q(veh)	-	-	64.8	3.6	1.7	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	39	0	14	1	80	119	23	58	1
Future Vol, veh/h	0	0	1	39	0	8	1	80	119	23	58	1
Peak Hour Factor	0.25	0.25	0.25	0.60	0.60	0.60	0.85	0.85	0.85	0.68	0.68	0.68
Heavy Vehicles, %	5	5	5	10	5	10	5	10	10	10	10	5
Mvmt Flow	0	0	4	65	0	13	1	94	140	34	85	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	8.5	8.4	8.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	0%	83%	28%
Vol Thru, %	40%	0%	0%	71%
Vol Right, %	59%	100%	17%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	200	1	47	82
LT Vol	1	0	39	23
Through Vol	80	0	0	58
RT Vol	119	1	8	1
Lane Flow Rate	235	4	78	121
Geometry Grp	1	1	1	1
Degree of Util (X)	0.26	0.005	0.107	0.153
Departure Headway (Hd)	3.971	4.25	4.903	4.554
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	908	842	732	790
Service Time	1.982	2.275	2.923	2.568
HCM Lane V/C Ratio	0.259	0.005	0.107	0.153
HCM Control Delay	8.4	7.3	8.5	8.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0	0.4	0.5

Intersection	
Intersection Delay, s/veh	17.3
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	125	1	1	433	427	203
Future Vol, veh/h	125	1	1	433	427	203
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	136	1	1	471	464	221
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	11.9	24.4	13.5
HCM LOS	B	C	B

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	99%	0%	0%
Vol Thru, %	0%	100%	0%	100%	41%
Vol Right, %	0%	0%	1%	0%	59%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	433	126	285	345
LT Vol	1	0	125	0	0
Through Vol	0	433	0	285	142
RT Vol	0	0	1	0	203
Lane Flow Rate	1	471	137	309	375
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.002	0.757	0.253	0.477	0.536
Departure Headway (Hd)	6.297	5.791	6.638	5.555	5.139
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	569	626	541	650	702
Service Time	4.028	3.522	4.677	3.282	2.865
HCM Lane V/C Ratio	0.002	0.752	0.253	0.475	0.534
HCM Control Delay	9	24.4	11.9	13.3	13.7
HCM Lane LOS	A	C	B	B	B
HCM 95th-tile Q	0	6.8	1	2.6	3.2

Intersection	
Intersection Delay, s/veh	11.5
Intersection LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	141	1	1	293	189	239
Future Vol, veh/h	141	1	1	293	189	239
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	153	1	1	318	205	260
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	10.9	13.2	10.6
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	99%	0%	0%
Vol Thru, %	0%	100%	0%	100%	21%
Vol Right, %	0%	0%	1%	0%	79%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	293	142	126	302
LT Vol	1	0	141	0	0
Through Vol	0	293	0	126	63
RT Vol	0	0	1	0	239
Lane Flow Rate	1	318	154	137	328
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.002	0.48	0.25	0.202	0.433
Departure Headway (Hd)	5.928	5.424	5.836	5.304	4.745
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	599	659	610	671	752
Service Time	3.711	3.206	3.933	3.077	2.518
HCM Lane V/C Ratio	0.002	0.483	0.252	0.204	0.436
HCM Control Delay	8.7	13.2	10.9	9.4	11.1
HCM Lane LOS	A	B	B	A	B
HCM 95th-tile Q	0	2.6	1	0.8	2.2

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Attachment 8 – Peak Hour Intersection Calculation Worksheets – Buildout of Community Plan Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	770	1235	1640	273	1085	1095	785	375	413	800	345	510
Future Volume (veh/h)	770	1235	1640	273	1085	1095	785	375	413	800	345	510
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	811	1300	1726	287	1142	1153	826	395	435	842	363	537
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	426	1452	676	173	1203	560	426	486	433	449	498	444
Arrive On Green	0.12	0.43	0.43	0.05	0.35	0.35	0.12	0.27	0.27	0.13	0.28	0.28
Sat Flow, veh/h	3456	3404	1585	3456	3404	1585	3456	1777	1585	3456	1777	1585
Grp Volume(v), veh/h	811	1300	1726	287	1142	1153	826	395	435	842	363	537
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1702	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	18.5	53.1	64.0	7.5	49.0	53.0	18.5	31.2	41.0	19.5	27.7	42.0
Cycle Q Clear(g_c), s	18.5	53.1	64.0	7.5	49.0	53.0	18.5	31.2	41.0	19.5	27.7	42.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	426	1452	676	173	1203	560	426	486	433	449	498	444
V/C Ratio(X)	1.90	0.90	2.55	1.66	0.95	2.06	1.94	0.81	1.00	1.87	0.73	1.21
Avail Cap(c_a), veh/h	426	1452	676	173	1203	560	426	486	433	449	498	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.8	39.9	43.0	71.3	47.2	48.5	65.8	50.9	54.5	65.2	48.9	54.0
Incr Delay (d2), s/veh	415.0	7.6	702.8	321.7	15.4	482.6	430.7	10.2	44.2	401.8	5.4	113.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	32.7	23.6	156.8	11.1	23.2	95.9	33.7	15.3	21.6	33.7	13.1	30.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	480.7	47.5	745.8	392.9	62.6	531.1	496.4	61.1	98.7	467.1	54.2	167.9
LnGrp LOS	F	D	F	F	E	F	F	E	F	F	D	F
Approach Vol, veh/h		3837			2582			1656			1742	
Approach Delay, s/veh		453.2			308.5			288.1			288.8	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	68.5	24.0	45.5	23.0	57.5	23.0	46.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	64.0	19.5	41.0	18.5	53.0	18.5	42.0
Max Q Clear Time (g_c+I1), s	9.5	66.0	21.5	43.0	20.5	55.0	20.5	44.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	358.1
HCM 6th LOS	F

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	310	1454	85	80	2094	340
Future Volume (veh/h)	310	1454	85	80	2094	340
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	326	1531	89	84	2204	358
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	10	10	10	10	10	10
Cap, veh/h	547	441	127	108	2143	2557
Arrive On Green	0.17	0.17	0.07	0.07	0.66	0.77
Sat Flow, veh/h	3237	2613	1792	1450	3237	3416
Grp Volume(v), veh/h	326	1531	87	86	2204	358
Grp Sat Flow(s),veh/h/ln	1618	1306	1664	1491	1618	1664
Q Serve(g_s), s	13.3	24.1	7.3	8.1	94.5	4.0
Cycle Q Clear(g_c), s	13.3	24.1	7.3	8.1	94.5	4.0
Prop In Lane	1.00	1.00		0.97	1.00	
Lane Grp Cap(c), veh/h	547	441	124	111	2143	2557
V/C Ratio(X)	0.60	3.47	0.70	0.78	1.03	0.14
Avail Cap(c_a), veh/h	547	441	209	187	2143	2726
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.8	59.3	64.5	64.9	24.1	4.3
Incr Delay (d2), s/veh	1.8	1117.3	6.9	11.0	27.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	76.4	3.3	3.4	41.4	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	56.6	1176.6	71.4	75.9	51.3	4.3
LnGrp LOS	E	F	E	E	F	A
Approach Vol, veh/h	1857		173			2562
Approach Delay, s/veh	980.0		73.7			44.7
Approach LOS	F		E			D

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	99.0	15.1			114.1	28.6
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	94.5	17.9			116.9	24.1
Max Q Clear Time (g_c+I1), s	96.5	10.1			6.0	26.1
Green Ext Time (p_c), s	0.0	0.5			2.7	0.0

Intersection Summary		
HCM 6th Ctrl Delay		424.0
HCM 6th LOS		F

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	691.5
Intersection LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	153	154	64	1420	2185	76
Future Vol, veh/h	153	154	64	1420	2185	76
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	161	162	67	1495	2300	80
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	24.9	882.8	656.4
HCM LOS	C	F	F

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	50%	0%	0%
Vol Thru, %	0%	100%	0%	100%	91%
Vol Right, %	0%	0%	50%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	64	1420	307	1457	804
LT Vol	64	0	153	0	0
Through Vol	0	1420	0	1457	728
RT Vol	0	0	154	0	76
Lane Flow Rate	67	1495	323	1533	847
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.144	2.997	0.612	2.858	1.563
Departure Headway (Hd)	8.846	8.339	8.873	8.679	8.61
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	408	448	410	445	432
Service Time	6.546	6.039	6.873	6.379	6.31
HCM Lane V/C Ratio	0.164	3.337	0.788	3.445	1.961
HCM Control Delay	13	922	24.9	860.6	286.7
HCM Lane LOS	B	F	C	F	F
HCM 95th-tile Q	0.5	112.1	3.9	100.7	36.2

Intersection	
Intersection Delay, s/veh	610
Intersection LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	165	10	10	1319	2259	78
Future Vol, veh/h	165	10	10	1319	2259	78
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	174	11	11	1388	2378	82
Number of Lanes	1	0	1	1	2	0

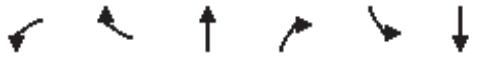
Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	17.3	753.4	572.9
HCM LOS	C	F	F

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	94%	0%	0%
Vol Thru, %	0%	100%	0%	100%	91%
Vol Right, %	0%	0%	6%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	1319	175	1506	831
LT Vol	10	0	165	0	0
Through Vol	0	1319	0	1506	753
RT Vol	0	0	10	0	78
Lane Flow Rate	11	1388	184	1585	875
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.021	2.631	0.367	2.644	1.443
Departure Headway (Hd)	9.169	8.663	9.137	7.39	7.322
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	393	430	396	507	507
Service Time	6.869	6.363	7.137	5.09	5.022
HCM Lane V/C Ratio	0.028	3.228	0.465	3.126	1.726
HCM Control Delay	12.1	759	17.3	761.6	230.9
HCM Lane LOS	B	F	C	F	F
HCM 95th-tile Q	0.1	89.3	1.7	104.7	34.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	510	1125	475	488	1835	550	1560	350	745	690	765	750
Future Volume (veh/h)	510	1125	475	488	1835	550	1560	350	745	690	765	750
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	537	1184	500	514	1932	579	1642	368	784	726	805	789
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	219	1139	480	219	1276	364	611	729	650	288	563	502
Arrive On Green	0.06	0.32	0.32	0.06	0.32	0.32	0.18	0.41	0.41	0.08	0.32	0.32
Sat Flow, veh/h	3456	3524	1483	3456	3946	1125	3456	1777	1585	3456	1777	1585
Grp Volume(v), veh/h	537	1144	540	514	1653	858	1642	368	784	726	805	789
Grp Sat Flow(s),veh/h/ln	1728	1702	1603	1728	1702	1668	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	9.5	48.5	48.5	9.5	48.5	48.5	26.5	23.1	61.5	12.5	47.5	47.5
Cycle Q Clear(g_c), s	9.5	48.5	48.5	9.5	48.5	48.5	26.5	23.1	61.5	12.5	47.5	47.5
Prop In Lane	1.00		0.93	1.00		0.67	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	219	1101	518	219	1101	539	611	729	650	288	563	502
V/C Ratio(X)	2.45	1.04	1.04	2.35	1.50	1.59	2.69	0.51	1.21	2.52	1.43	1.57
Avail Cap(c_a), veh/h	219	1101	518	219	1101	539	611	729	650	288	563	502
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.3	50.8	50.8	70.3	50.8	50.8	61.8	32.9	44.3	68.8	51.2	51.3
Incr Delay (d2), s/veh	667.7	37.8	51.0	620.8	230.6	274.8	765.0	0.6	106.9	694.7	203.9	266.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.5	26.4	26.7	23.1	55.8	61.3	76.5	10.2	43.2	33.3	52.9	56.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	738.0	88.5	101.8	691.1	281.3	325.5	826.7	33.5	151.2	763.4	255.2	318.1
LnGrp LOS	F	F	F	F	F	F	F	C	F	F	F	F
Approach Vol, veh/h		2221			3025			2794			2320	
Approach Delay, s/veh		248.8			363.5			532.7			435.6	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	53.0	17.0	66.0	14.0	53.0	31.0	52.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	48.5	12.5	61.5	9.5	48.5	26.5	47.5
Max Q Clear Time (g_c+I1), s	11.5	50.5	14.5	63.5	11.5	50.5	28.5	49.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	400.7
HCM 6th LOS	F



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	80	2219	345	310	1829	85
Future Volume (veh/h)	80	2219	345	310	1829	85
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	84	2336	363	326	1925	89
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	10	10	10	10	10	10
Cap, veh/h	1021	824	270	239	1394	2074
Arrive On Green	0.32	0.32	0.16	0.16	0.43	0.62
Sat Flow, veh/h	3237	2613	1757	1480	3237	3416
Grp Volume(v), veh/h	84	2336	362	327	1925	89
Grp Sat Flow(s),veh/h/ln	1618	1306	1664	1485	1618	1664
Q Serve(g_s), s	2.4	41.0	21.0	21.0	56.0	1.3
Cycle Q Clear(g_c), s	2.4	41.0	21.0	21.0	56.0	1.3
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	1021	824	269	240	1394	2074
V/C Ratio(X)	0.08	2.83	1.35	1.36	1.38	0.04
Avail Cap(c_a), veh/h	1021	824	269	240	1394	2074
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	44.5	54.5	54.5	37.0	9.5
Incr Delay (d2), s/veh	0.0	829.0	178.4	188.1	175.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	108.0	22.1	20.4	55.7	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.3	873.5	232.9	242.6	212.9	9.5
LnGrp LOS	C	F	F	F	F	A
Approach Vol, veh/h	2420		689			2014
Approach Delay, s/veh	844.3		237.5			203.9
Approach LOS	F		F			F

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	60.0	25.0			85.0	45.0
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0
Max Green Setting (Gmax), s	56.0	21.0			81.0	41.0
Max Q Clear Time (g_c+I1), s	58.0	23.0			3.3	43.0
Green Ext Time (p_c), s	0.0	0.0			0.6	0.0

Intersection Summary			
HCM 6th Ctrl Delay		510.9	
HCM 6th LOS		F	

Intersection	
Intersection Delay, s/veh	1154.4
Intersection LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	115	59	59	2540	1550	178
Future Vol, veh/h	115	59	59	2540	1550	178
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	121	62	62	2674	1632	187
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	21.2	1800.6	296.7
HCM LOS	C	F	F

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	66%	0%	0%
Vol Thru, %	0%	100%	0%	100%	74%
Vol Right, %	0%	0%	34%	0%	26%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	59	2540	174	1033	695
LT Vol	59	0	115	0	0
Through Vol	0	2540	0	1033	517
RT Vol	0	0	59	0	178
Lane Flow Rate	62	2674	183	1088	731
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.126	5.049	0.353	1.827	1.192
Departure Headway (Hd)	8.256	7.748	11.844	9.359	9.171
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	437	508	306	402	402
Service Time	5.956	5.448	9.844	7.059	6.871
HCM Lane V/C Ratio	0.142	5.264	0.598	2.706	1.818
HCM Control Delay	12.1	1842.1	21.2	403.8	137.4
HCM Lane LOS	B	F	C	F	F
HCM 95th-tile Q	0.4	238.8	1.5	45.5	18.8

Intersection	
Intersection Delay, s/veh	1119.9
Intersection LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	120	60	60	2479	1419	190
Future Vol, veh/h	120	60	60	2479	1419	190
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	126	63	63	2609	1494	200
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	21.2	1750.2	248.3
HCM LOS	C	F	F

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	67%	0%	0%
Vol Thru, %	0%	100%	0%	100%	71%
Vol Right, %	0%	0%	33%	0%	29%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	60	2479	180	946	663
LT Vol	60	0	120	0	0
Through Vol	0	2479	0	946	473
RT Vol	0	0	60	0	190
Lane Flow Rate	63	2609	189	996	698
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.128	4.939	0.363	1.68	1.139
Departure Headway (Hd)	8.091	7.583	11.657	9.321	9.11
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	446	522	311	398	405
Service Time	5.791	5.283	9.657	7.021	6.81
HCM Lane V/C Ratio	0.141	4.998	0.608	2.503	1.723
HCM Control Delay	12	1792.3	21.2	339.5	118.2
HCM Lane LOS	B	F	C	F	F
HCM 95th-tile Q	0.4	237.5	1.6	39.1	16.9

Attachment 9 – Peak Hour Intersection Calculation Worksheets – Buildout of Community With Project Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	770	1235	1640	275	1085	1095	785	375	425	800	345	510
Future Volume (veh/h)	770	1235	1640	275	1085	1095	785	375	425	800	345	510
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	811	1300	1726	289	1142	1153	826	395	447	842	363	537
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	426	1452	676	173	1203	560	426	486	433	449	498	444
Arrive On Green	0.12	0.43	0.43	0.05	0.35	0.35	0.12	0.27	0.27	0.13	0.28	0.28
Sat Flow, veh/h	3456	3404	1585	3456	3404	1585	3456	1777	1585	3456	1777	1585
Grp Volume(v), veh/h	811	1300	1726	289	1142	1153	826	395	447	842	363	537
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1702	1585	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	18.5	53.1	64.0	7.5	49.0	53.0	18.5	31.2	41.0	19.5	27.7	42.0
Cycle Q Clear(g_c), s	18.5	53.1	64.0	7.5	49.0	53.0	18.5	31.2	41.0	19.5	27.7	42.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	426	1452	676	173	1203	560	426	486	433	449	498	444
V/C Ratio(X)	1.90	0.90	2.55	1.67	0.95	2.06	1.94	0.81	1.03	1.87	0.73	1.21
Avail Cap(c_a), veh/h	426	1452	676	173	1203	560	426	486	433	449	498	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.8	39.9	43.0	71.3	47.2	48.5	65.8	50.9	54.5	65.2	48.9	54.0
Incr Delay (d2), s/veh	415.0	7.6	702.8	326.7	15.4	482.6	430.7	10.2	51.6	401.8	5.4	113.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	32.7	23.6	156.8	11.2	23.2	95.9	33.7	15.3	22.5	33.7	13.1	30.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	480.7	47.5	745.8	397.9	62.6	531.1	496.4	61.1	106.1	467.1	54.2	167.9
LnGrp LOS	F	D	F	F	E	F	F	E	F	F	D	F
Approach Vol, veh/h		3837			2584			1668			1742	
Approach Delay, s/veh		453.2			309.2			288.7			288.8	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	68.5	24.0	45.5	23.0	57.5	23.0	46.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	64.0	19.5	41.0	18.5	53.0	18.5	42.0
Max Q Clear Time (g_c+I1), s	9.5	66.0	21.5	43.0	20.5	55.0	20.5	44.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	358.3
HCM 6th LOS	F

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	310	1455	85	80	2095	340
Future Volume (veh/h)	310	1455	85	80	2095	340
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	326	1532	89	84	2205	358
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	10	10	10	10	10	10
Cap, veh/h	547	441	127	108	2143	2557
Arrive On Green	0.17	0.17	0.07	0.07	0.66	0.77
Sat Flow, veh/h	3237	2613	1792	1450	3237	3416
Grp Volume(v), veh/h	326	1532	87	86	2205	358
Grp Sat Flow(s),veh/h/ln	1618	1306	1664	1491	1618	1664
Q Serve(g_s), s	13.3	24.1	7.3	8.1	94.5	4.0
Cycle Q Clear(g_c), s	13.3	24.1	7.3	8.1	94.5	4.0
Prop In Lane	1.00	1.00		0.97	1.00	
Lane Grp Cap(c), veh/h	547	441	124	111	2143	2557
V/C Ratio(X)	0.60	3.47	0.70	0.78	1.03	0.14
Avail Cap(c_a), veh/h	547	441	209	187	2143	2726
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.8	59.3	64.5	64.9	24.1	4.3
Incr Delay (d2), s/veh	1.8	1118.4	6.9	11.0	27.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	76.5	3.3	3.4	41.5	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	56.6	1177.7	71.4	75.9	51.4	4.3
LnGrp LOS	E	F	E	E	F	A
Approach Vol, veh/h	1858		173			2563
Approach Delay, s/veh	981.0		73.7			44.8
Approach LOS	F		E			D

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	99.0	15.1			114.1	28.6
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	94.5	17.9			116.9	24.1
Max Q Clear Time (g_c+I1), s	96.5	10.1			6.0	26.1
Green Ext Time (p_c), s	0.0	0.5			2.7	0.0

Intersection Summary		
HCM 6th Ctrl Delay		424.5
HCM 6th LOS		F

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	698.9
Intersection LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	165	155	65	1420	2185	78
Future Vol, veh/h	165	155	65	1420	2185	78
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	174	163	68	1495	2300	82
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	26.4	890.2	668.4
HCM LOS	D	F	F

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	52%	0%	0%
Vol Thru, %	0%	100%	0%	100%	90%
Vol Right, %	0%	0%	48%	0%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	65	1420	320	1457	806
LT Vol	65	0	165	0	0
Through Vol	0	1420	0	1457	728
RT Vol	0	0	155	0	78
Lane Flow Rate	68	1495	337	1533	849
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.148	3.016	0.64	2.889	1.583
Departure Headway (Hd)	8.78	8.273	8.887	8.797	8.726
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	411	463	411	429	424
Service Time	6.48	5.973	6.887	6.497	6.426
HCM Lane V/C Ratio	0.165	3.229	0.82	3.573	2.002
HCM Control Delay	13	930.4	26.4	874.8	295.6
HCM Lane LOS	B	F	D	F	F
HCM 95th-tile Q	0.5	114	4.3	101	36.7

Intersection	
Intersection Delay, s/veh	610.6
Intersection LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	165	10	10	1320	2260	78
Future Vol, veh/h	165	10	10	1320	2260	78
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	174	11	11	1389	2379	82
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	17.3	754.3	573.2
HCM LOS	C	F	F

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	94%	0%	0%
Vol Thru, %	0%	100%	0%	100%	91%
Vol Right, %	0%	0%	6%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	1320	175	1507	831
LT Vol	10	0	165	0	0
Through Vol	0	1320	0	1507	753
RT Vol	0	0	10	0	78
Lane Flow Rate	11	1389	184	1586	875
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.021	2.633	0.367	2.645	1.443
Departure Headway (Hd)	9.17	8.664	9.141	7.391	7.324
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	393	431	396	508	508
Service Time	6.87	6.364	7.141	5.091	5.024
HCM Lane V/C Ratio	0.028	3.223	0.465	3.122	1.722
HCM Control Delay	12.1	759.9	17.3	762	230.9
HCM Lane LOS	B	F	C	F	F
HCM 95th-tile Q	0.1	89.4	1.7	104.8	34.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	510	1125	475	500	1835	550	1560	350	750	690	765	750
Future Volume (veh/h)	510	1125	475	500	1835	550	1560	350	750	690	765	750
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	537	1184	500	526	1932	579	1642	368	789	726	805	789
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	219	1139	480	219	1276	364	611	729	650	288	563	502
Arrive On Green	0.06	0.32	0.32	0.06	0.32	0.32	0.18	0.41	0.41	0.08	0.32	0.32
Sat Flow, veh/h	3456	3524	1483	3456	3946	1125	3456	1777	1585	3456	1777	1585
Grp Volume(v), veh/h	537	1144	540	526	1653	858	1642	368	789	726	805	789
Grp Sat Flow(s),veh/h/ln	1728	1702	1603	1728	1702	1668	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	9.5	48.5	48.5	9.5	48.5	48.5	26.5	23.1	61.5	12.5	47.5	47.5
Cycle Q Clear(g_c), s	9.5	48.5	48.5	9.5	48.5	48.5	26.5	23.1	61.5	12.5	47.5	47.5
Prop In Lane	1.00		0.93	1.00		0.67	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	219	1101	518	219	1101	539	611	729	650	288	563	502
V/C Ratio(X)	2.45	1.04	1.04	2.40	1.50	1.59	2.69	0.51	1.21	2.52	1.43	1.57
Avail Cap(c_a), veh/h	219	1101	518	219	1101	539	611	729	650	288	563	502
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.3	50.8	50.8	70.3	50.8	50.8	61.8	32.9	44.3	68.8	51.2	51.3
Incr Delay (d2), s/veh	667.7	37.8	51.0	645.3	230.6	274.8	765.0	0.6	110.1	694.7	203.9	266.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.5	26.4	26.7	23.8	55.8	61.3	76.5	10.2	43.8	33.3	52.9	56.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	738.0	88.5	101.8	715.5	281.3	325.5	826.7	33.5	154.3	763.4	255.2	318.1
LnGrp LOS	F	F	F	F	F	F	F	C	F	F	F	F
Approach Vol, veh/h		2221			3037			2799			2320	
Approach Delay, s/veh		248.8			369.0			532.9			435.6	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	53.0	17.0	66.0	14.0	53.0	31.0	52.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	48.5	12.5	61.5	9.5	48.5	26.5	47.5
Max Q Clear Time (g_c+I1), s	11.5	50.5	14.5	63.5	11.5	50.5	28.5	49.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	402.4
HCM 6th LOS	F

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	80	2220	345	310	1830	85
Future Volume (veh/h)	80	2220	345	310	1830	85
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	84	2337	363	326	1926	89
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	10	10	10	10	10	10
Cap, veh/h	1021	824	270	239	1394	2074
Arrive On Green	0.32	0.32	0.16	0.16	0.43	0.62
Sat Flow, veh/h	3237	2613	1757	1480	3237	3416
Grp Volume(v), veh/h	84	2337	362	327	1926	89
Grp Sat Flow(s),veh/h/ln	1618	1306	1664	1485	1618	1664
Q Serve(g_s), s	2.4	41.0	21.0	21.0	56.0	1.3
Cycle Q Clear(g_c), s	2.4	41.0	21.0	21.0	56.0	1.3
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	1021	824	269	240	1394	2074
V/C Ratio(X)	0.08	2.84	1.35	1.36	1.38	0.04
Avail Cap(c_a), veh/h	1021	824	269	240	1394	2074
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	44.5	54.5	54.5	37.0	9.5
Incr Delay (d2), s/veh	0.0	829.6	178.4	188.1	176.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	108.1	22.1	20.4	55.7	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.3	874.1	232.9	242.6	213.2	9.5
LnGrp LOS	C	F	F	F	F	A
Approach Vol, veh/h	2421		689			2015
Approach Delay, s/veh	844.8		237.5			204.2
Approach LOS	F		F			F

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	60.0	25.0			85.0	45.0
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0
Max Green Setting (Gmax), s	56.0	21.0			81.0	41.0
Max Q Clear Time (g_c+I1), s	58.0	23.0			3.3	43.0
Green Ext Time (p_c), s	0.0	0.0			0.6	0.0

Intersection Summary			
HCM 6th Ctrl Delay		511.3	
HCM 6th LOS		F	

Intersection	
Intersection Delay, s/veh	1156.5
Intersection LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	120	60	60	2540	1550	190
Future Vol, veh/h	120	60	60	2540	1550	190
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	126	63	63	2674	1632	200
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	21.6	1806.5	302.7
HCM LOS	C	F	F

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	67%	0%	0%
Vol Thru, %	0%	100%	0%	100%	73%
Vol Right, %	0%	0%	33%	0%	27%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	60	2540	180	1033	707
LT Vol	60	0	120	0	0
Through Vol	0	2540	0	1033	517
RT Vol	0	0	60	0	190
Lane Flow Rate	63	2674	189	1088	744
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.128	5.064	0.366	1.838	1.218
Departure Headway (Hd)	8.294	7.786	11.875	9.435	9.237
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	435	508	307	402	402
Service Time	5.994	5.486	9.875	7.135	6.937
HCM Lane V/C Ratio	0.145	5.264	0.616	2.706	1.851
HCM Control Delay	12.2	1848.9	21.6	408.9	147.4
HCM Lane LOS	B	F	C	F	F
HCM 95th-tile Q	0.4	238.6	1.6	45.7	19.7

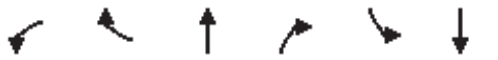
Intersection	
Intersection Delay, s/veh	1120.5
Intersection LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	120	60	60	2480	1420	190
Future Vol, veh/h	120	60	60	2480	1420	190
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	126	63	63	2611	1495	200
Number of Lanes	1	0	1	1	2	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	21.2	1751.1	248.6
HCM LOS	C	F	F

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	67%	0%	0%
Vol Thru, %	0%	100%	0%	100%	71%
Vol Right, %	0%	0%	33%	0%	29%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	60	2480	180	947	663
LT Vol	60	0	120	0	0
Through Vol	0	2480	0	947	473
RT Vol	0	0	60	0	190
Lane Flow Rate	63	2611	189	996	698
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.128	4.941	0.363	1.681	1.139
Departure Headway (Hd)	8.092	7.584	11.659	9.322	9.112
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	446	522	311	399	405
Service Time	5.792	5.284	9.659	7.022	6.812
HCM Lane V/C Ratio	0.141	5.002	0.608	2.496	1.723
HCM Control Delay	12	1793.2	21.2	340	118.2
HCM Lane LOS	B	F	C	F	F
HCM 95th-tile Q	0.4	237.5	1.6	39.1	16.9

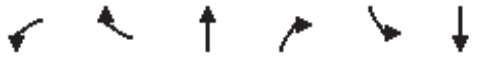
Attachment 10 – Peak Hour Intersection Calculation Worksheets – Near-Term Year 2027 Conditions With Project Conditions – Mitigation Measures



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	285	122	51	421	151	29
Future Volume (veh/h)	285	122	51	421	151	29
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	320	137	65	533	302	58
Peak Hour Factor	0.89	0.89	0.79	0.79	0.50	0.50
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	429	382	81	663	0	863
Arrive On Green	0.24	0.24	0.46	0.46	0.00	0.46
Sat Flow, veh/h	1781	1585	175	1437	0	1870
Grp Volume(v), veh/h	320	137	0	598	0	58
Grp Sat Flow(s),veh/h/ln	1781	1585	0	1612	0	1870
Q Serve(g_s), s	5.0	2.2	0.0	9.6	0.0	0.5
Cycle Q Clear(g_c), s	5.0	2.2	0.0	9.6	0.0	0.5
Prop In Lane	1.00	1.00		0.89	0.00	
Lane Grp Cap(c), veh/h	429	382	0	744	0	863
V/C Ratio(X)	0.75	0.36	0.00	0.80	0.00	0.07
Avail Cap(c_a), veh/h	559	498	0	986	0	1669
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.6	9.5	0.0	7.0	0.0	4.5
Incr Delay (d2), s/veh	3.9	0.6	0.0	3.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.6	0.0	2.3	0.0	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.5	10.1	0.0	10.6	0.0	4.6
LnGrp LOS	B	B	A	B	A	A
Approach Vol, veh/h	457		598			58
Approach Delay, s/veh	13.2		10.6			4.6
Approach LOS	B		B			A

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	0.0	18.5			18.5	11.8
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	4.0	18.5			27.0	9.5
Max Q Clear Time (g_c+I1), s	0.0	11.6			2.5	7.0
Green Ext Time (p_c), s	0.0	2.4			0.2	0.4

Intersection Summary	
HCM 6th Ctrl Delay	11.4
HCM 6th LOS	B



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	530	304	37	392	184	54
Future Volume (veh/h)	530	304	37	392	184	54
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	624	358	65	688	307	90
Peak Hour Factor	0.85	0.85	0.57	0.57	0.60	0.60
Percent Heavy Veh, %	10	10	10	10	10	10
Cap, veh/h	668	594	67	707	0	901
Arrive On Green	0.40	0.40	0.51	0.51	0.00	0.51
Sat Flow, veh/h	1668	1485	130	1375	0	1752
Grp Volume(v), veh/h	624	358	0	753	0	90
Grp Sat Flow(s),veh/h/ln	1668	1485	0	1504	0	1752
Q Serve(g_s), s	37.8	20.1	0.0	51.3	0.0	2.8
Cycle Q Clear(g_c), s	37.8	20.1	0.0	51.3	0.0	2.8
Prop In Lane	1.00	1.00		0.91	0.00	
Lane Grp Cap(c), veh/h	668	594	0	774	0	901
V/C Ratio(X)	0.93	0.60	0.00	0.97	0.00	0.10
Avail Cap(c_a), veh/h	751	669	0	784	0	1055
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.3	25.0	0.0	24.9	0.0	13.1
Incr Delay (d2), s/veh	17.6	1.2	0.0	25.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.9	7.1	0.0	22.6	0.0	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	47.9	26.2	0.0	50.3	0.0	13.2
LnGrp LOS	D	C	A	D	A	B
Approach Vol, veh/h	982		753			90
Approach Delay, s/veh	40.0		50.3			13.2
Approach LOS	D		D			B

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	0.0	58.8			58.8	46.7
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	4.0	55.0			63.5	47.5
Max Q Clear Time (g_c+I1), s	0.0	53.3			4.8	39.8
Green Ext Time (p_c), s	0.0	0.9			0.5	2.4

Intersection Summary	
HCM 6th Ctrl Delay	43.0
HCM 6th LOS	D

Attachment 11 – Peak Hour Intersection Calculation Worksheets – Buildout of Community Conditions – Mitigation Measures & Fair Share Calculations

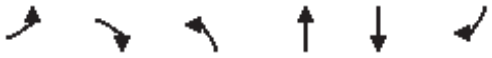
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	770	1235	1640	275	1085	1095	785	375	425	800	345	510
Future Volume (veh/h)	770	1235	1640	275	1085	1095	785	375	425	800	345	510
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	811	1300	1726	289	1142	1153	826	395	447	842	363	537
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	558	1421	1205	219	1464	800	564	971	433	582	511	866
Arrive On Green	0.16	0.38	0.38	0.06	0.29	0.29	0.16	0.27	0.27	0.16	0.27	0.27
Sat Flow, veh/h	3563	3741	3170	3456	5106	2790	3456	3554	1585	3563	1870	3170
Grp Volume(v), veh/h	811	1300	1726	289	1142	1153	826	395	447	842	363	537
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	1702	1395	1728	1777	1585	1781	1870	1585
Q Serve(g_s), s	23.5	49.5	57.0	9.5	30.8	43.0	24.5	13.6	41.0	24.5	26.2	22.2
Cycle Q Clear(g_c), s	23.5	49.5	57.0	9.5	30.8	43.0	24.5	13.6	41.0	24.5	26.2	22.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	558	1421	1205	219	1464	800	564	971	433	582	511	866
V/C Ratio(X)	1.45	0.91	1.43	1.32	0.78	1.44	1.46	0.41	1.03	1.45	0.71	0.62
Avail Cap(c_a), veh/h	558	1421	1205	219	1464	800	564	971	433	582	511	866
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.3	44.2	46.5	70.3	49.2	53.5	62.8	44.6	54.5	62.8	49.1	47.7
Incr Delay (d2), s/veh	213.7	9.4	199.6	172.5	2.8	205.9	218.2	0.3	51.6	210.7	4.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.2	24.7	55.7	9.5	13.5	37.9	27.9	6.1	22.5	28.1	13.0	9.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	277.0	53.6	246.1	242.8	51.9	259.4	280.9	44.8	106.1	273.5	53.7	49.0
LnGrp LOS	F	D	F	F	D	F	F	D	F	F	D	D
Approach Vol, veh/h		3837			2584			1668			1742	
Approach Delay, s/veh		187.4			165.9			178.2			158.5	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	61.5	29.0	45.5	28.0	47.5	29.0	45.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	57.0	24.5	41.0	23.5	43.0	24.5	41.0
Max Q Clear Time (g_c+I1), s	11.5	59.0	26.5	43.0	25.5	45.0	26.5	28.2
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8

Intersection Summary	
HCM 6th Ctrl Delay	175.0
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	165	155	65	1420	2185	78
Future Volume (veh/h)	165	155	65	1420	2185	78
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	174	163	68	1495	2300	82
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	140	132	87	2749	2425	86
Arrive On Green	0.16	0.16	0.05	0.77	0.69	0.69
Sat Flow, veh/h	865	811	1781	3647	3594	124
Grp Volume(v), veh/h	338	0	68	1495	1160	1222
Grp Sat Flow(s),veh/h/ln	1681	0	1781	1777	1777	1848
Q Serve(g_s), s	22.8	0.0	5.3	23.1	81.2	84.1
Cycle Q Clear(g_c), s	22.8	0.0	5.3	23.1	81.2	84.1
Prop In Lane	0.51	0.48	1.00			0.07
Lane Grp Cap(c), veh/h	273	0	87	2749	1231	1280
V/C Ratio(X)	1.24	0.00	0.78	0.54	0.94	0.95
Avail Cap(c_a), veh/h	273	0	197	2991	1242	1292
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.8	0.0	66.1	6.2	19.1	19.6
Incr Delay (d2), s/veh	134.6	0.0	14.1	0.2	14.0	15.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.9	0.0	2.8	7.8	35.2	38.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	193.5	0.0	80.1	6.4	33.1	34.9
LnGrp LOS	F	A	F	A	C	C
Approach Vol, veh/h	338			1563	2382	
Approach Delay, s/veh	193.5			9.6	34.0	
Approach LOS	F			A	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		113.2		27.3	11.4	101.8
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		118.2		22.8	15.5	98.2
Max Q Clear Time (g_c+I1), s		25.1		24.8	7.3	86.1
Green Ext Time (p_c), s		20.1		0.0	0.1	11.2

Intersection Summary	
HCM 6th Ctrl Delay	37.7
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

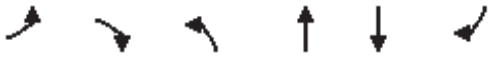
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	510	1126	476	500	1837	550	1558	350	750	690	765	750
Future Volume (veh/h)	510	1126	476	500	1837	550	1558	350	750	690	765	750
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	537	1304	422	526	1934	579	1640	368	789	726	660	886
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	297	1590	449	288	1447	790	795	1457	650	368	530	898
Arrive On Green	0.08	0.28	0.28	0.08	0.28	0.28	0.23	0.41	0.41	0.10	0.28	0.28
Sat Flow, veh/h	3563	5611	1585	3456	5106	2790	3456	3554	1585	3563	1870	3170
Grp Volume(v), veh/h	537	1304	422	526	1934	579	1640	368	789	726	660	886
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	1702	1395	1728	1777	1585	1781	1870	1585
Q Serve(g_s), s	12.5	32.5	39.0	12.5	42.5	28.2	34.5	10.2	61.5	15.5	42.5	41.7
Cycle Q Clear(g_c), s	12.5	32.5	39.0	12.5	42.5	28.2	34.5	10.2	61.5	15.5	42.5	41.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	297	1590	449	288	1447	790	795	1457	650	368	530	898
V/C Ratio(X)	1.81	0.82	0.94	1.83	1.34	0.73	2.06	0.25	1.21	1.97	1.25	0.99
Avail Cap(c_a), veh/h	297	1590	449	288	1447	790	795	1457	650	368	530	898
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.8	50.2	52.5	68.8	53.8	48.6	57.7	29.1	44.2	67.3	53.8	53.5
Incr Delay (d2), s/veh	377.0	3.6	27.9	385.3	156.4	3.5	482.9	0.1	110.1	447.2	125.6	26.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.3	15.8	19.0	21.0	39.1	10.2	68.4	4.5	43.8	29.9	38.4	19.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	445.8	53.7	80.4	454.0	210.1	52.1	540.6	29.2	154.3	514.4	179.4	80.1
LnGrp LOS	F	D	F	F	F	D	F	C	F	F	F	F
Approach Vol, veh/h		2263			3039			2797			2272	
Approach Delay, s/veh		151.7			222.2			364.4			247.7	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	47.0	20.0	66.0	17.0	47.0	39.0	47.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	42.5	15.5	61.5	12.5	42.5	34.5	42.5
Max Q Clear Time (g_c+I1), s	14.5	41.0	17.5	63.5	14.5	44.5	36.5	44.5
Green Ext Time (p_c), s	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary		
HCM 6th Ctrl Delay		250.8
HCM 6th LOS		F

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	120	60	60	2538	1551	190
Future Volume (veh/h)	120	60	60	2538	1551	190
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	126	63	63	2672	1633	200
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	144	72	80	2869	2328	281
Arrive On Green	0.13	0.13	0.05	0.81	0.73	0.73
Sat Flow, veh/h	1135	567	1781	3647	3287	385
Grp Volume(v), veh/h	190	0	63	2672	897	936
Grp Sat Flow(s),veh/h/ln	1711	0	1781	1777	1777	1801
Q Serve(g_s), s	14.9	0.0	4.8	79.5	37.6	39.9
Cycle Q Clear(g_c), s	14.9	0.0	4.8	79.5	37.6	39.9
Prop In Lane	0.66	0.33	1.00			0.21
Lane Grp Cap(c), veh/h	217	0	80	2869	1296	1313
V/C Ratio(X)	0.88	0.00	0.78	0.93	0.69	0.71
Avail Cap(c_a), veh/h	351	0	94	2951	1323	1341
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	0.0	64.4	10.2	10.1	10.4
Incr Delay (d2), s/veh	13.5	0.0	29.8	6.1	1.5	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	0.0	2.8	26.2	13.9	15.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	71.9	0.0	94.2	16.2	11.6	12.2
LnGrp LOS	E	A	F	B	B	B
Approach Vol, veh/h	190			2735	1833	
Approach Delay, s/veh	71.9			18.0	11.9	
Approach LOS	E			B	B	

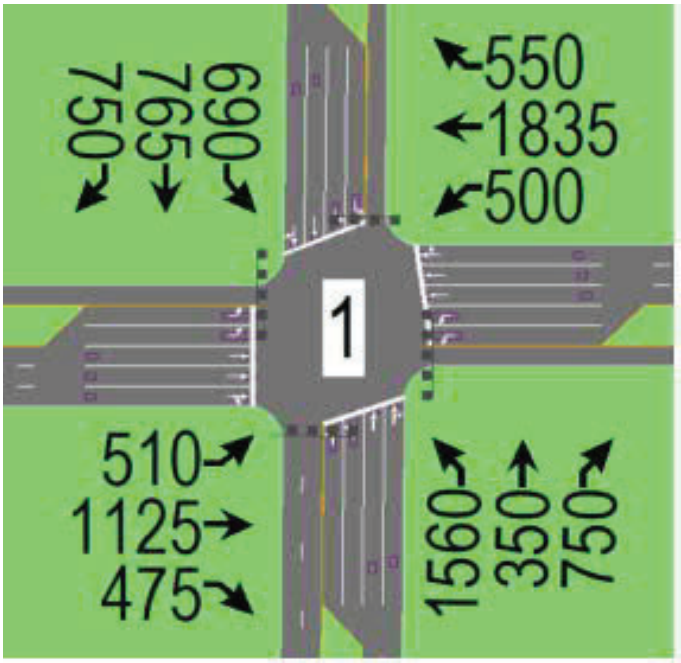
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		114.5		21.7	10.6	103.8
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		113.1		27.9	7.2	101.4
Max Q Clear Time (g_c+I1), s		81.5		16.9	6.8	41.9
Green Ext Time (p_c), s		28.5		0.4	0.0	26.8

Intersection Summary	
HCM 6th Ctrl Delay	17.8
HCM 6th LOS	B

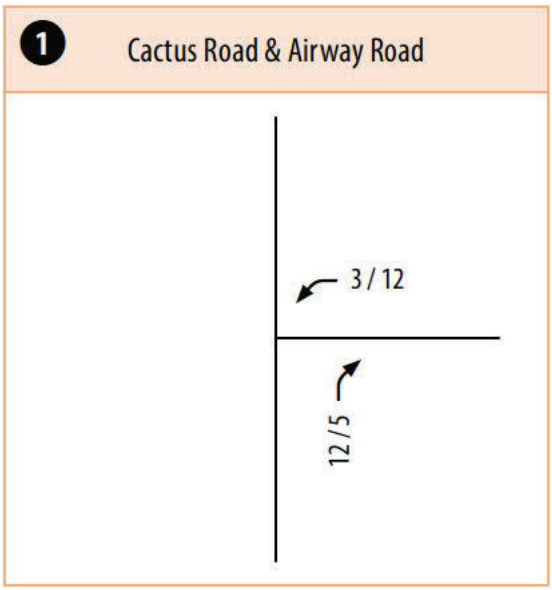
Notes

User approved volume balancing among the lanes for turning movement.

Cactus Road / Airway Road – Buildout of Community PM



Lumina III – Trip Assignment



FAIR SHARE CALCULATION

The volume shown below is the sum of all movements

Intersection No.	Existing AM	Existing PM	Cumulative Projects AM Trips	Cumulative Projects PM Trips	Project Assignment AM	Project Assignment PM	Buildout + Project AM	Buildout + Project PM	AM Fair Share	PM Fair Share
1	-	234	-	9843	-	17	-	9860	-	0.18%

Fair Share = Proposed Project Trips / (Cumulative Projects Trips + Proposed Project Trips)