TRANSPORTATION IMPACT STUDY

CROSS BORDER FACILITY

STREET VACATIONS AND ONE-WAY CONFIGURATION

SAN DIEGO, CALIFORNIA

PDP NUMBER: 609801
SDP NUMBER: 896755
PTS NUMBER: 597523

This Transportation Impact Study has been prepared under the supervision of

Les Card, P.E. and T.E.

Signed: Les Card

LSA

August 2019

TRANSPORTATION IMPACT STUDY

CROSS BORDER FACILITY

STREET VACATIONS AND ONE-WAY CONFIGURATION

SAN DIEGO, CALIFORNIA

PDP NUMBER: 609801
SDP NUMBER: 896755
PTS NUMBER: 597523

Submitted to:

City of San Diego
Development Services Department
1222 First Avenue
San Diego, California 92101

Prepared by:

LSA
20 Executive Park, Suite 200
Irvine, California 92614
(949) 553-0666

Project No. TST1501

August 2019

EXECUTIVE SUMMARY

LSA has prepared this Transportation Impact Study to evaluate the potential impacts of the proposed Cross Border Facility (CBF) street vacations and conversion to one-way operation for the existing two-way public streets (i.e., Otay Pacific Drive, Otay Pacific Place, and Las Californias Drive).

The CBF is on a 63.8-acre site south of Siempre Viva Road, east of Britannia Boulevard, west of La Media Road, and north of the United States–Mexico border and Tijuana International Airport. The Cross Border Facility currently operates in a 45,000-square foot (sf) configuration, but the approved CBF project consists of a 95,000 sf cross border facility and is entitled for the following proposed uses: 402,000 sf of industrial use, 34,000 sf of specialty retail use, 340 hotel rooms, a 12-pump gas station with a convenience market and a car wash, and 6,000 sf of restaurant use (PDP No. 609801, SDP No. 896755, and PTS No. 169653). At build out, the CBF will serve 17,225 average daily airport passengers and is expected to generate 46,691 average daily trips.

LSA prepared the *San Diego-Tijuana Cross Border Facility Project Traffic Impact Study* (TIS) (2011) for the approved CBF and ancillary commercial/industrial uses. The approved TIS (Appendix J of the Final Environmental Impact Report for the Cross Border Facility that was certified in 2012) evaluated intersections and roadways in the project vicinity and identified circulation mitigations for both near-term and long-range conditions. The proposed project's land uses and intensity (i.e., square footage and anticipated passengers) would not change with the current circulation proposal. As such, the project impact analysis results and mitigations of the approved TIS and EIR would remain the same. The purpose of this TIS is to evaluate the impacts of the proposed street vacations and conversion to a one-way operation.

The approved 2011 TIS previously considered two-way public streets within the CBF site (i.e., Otay Pacific Drive, Otay Pacific Place, and Las Californias Drive). The project proposes to convert these streets to private one-way streets. As a result, all vehicles would enter the CBF site at Otay Pacific Drive/Siempre Viva Road and exit at Las Californias Drive/Siempre Viva Road (i.e., vehicles would travel southbound on Otay Pacific Drive, eastbound on Otay Pacific Place, and northbound on Las Californias Drive).

The 2011 TIS was prepared and approved using the land use and circulation assumptions of the Otay Mesa Community Plan adopted in 1981. The 1981 Otay Mesa Community Plan (which did not include the CBF) had a forecast average daily traffic (ADT) volume of 52,500 along Siempre Viva Road east of Britannia Boulevard under build-out conditions. The 2014 Otay Mesa Community Plan Update (which includes the CBF) shows a forecast ADT volume of 42,500 along Siempre Viva Road east of Britannia Boulevard under build-out conditions.

This Transportation Impact Study evaluates the changes of the project as they relate to the intersection traffic volumes and levels of service (LOS) presented in the 2011 TIS based on the 1981 Otay Mesa Community Plan. Because the forecast ADT volume in the 1981 Otay Mesa Community Plan was higher than the build-out ADT in the 2014 Otay Mesa Community Plan Update, the peak-hour intersection volumes developed from the 1981 Otay Mesa Community Plan were likely also

higher. As such, this Transportation Impact Study presents a conservative, worst-case intersection analysis.

In addition, this Transportation Impact Study also evaluates the roadway segment of Siempre Viva Road between Britannia Boulevard and La Media Road under the previously adopted Otay Mesa Community Plan build-out conditions (that did not include the CBF) and currently adopted Otay Mesa Community Plan build-out conditions (that includes the CBF).

Class II bicycle lanes exist on Siempre Viva Road. These facilities consist of 5–6 foot (ft) lanes that are striped between the curb and vehicular travel lanes and identified with signs and pavement markings. A dedicated 6 ft bicycle lane will be provided southbound along Otay Pacific Drive between Siempre Viva Road and Otay Pacific Place. A shared 14 ft vehicular travel lane and bicycle route will be provided northbound between Las Californias Drive and Siempre Viva Road. A shared 16 ft vehicular travel lane and bicycle route will be provided eastbound along Otay Pacific Place between Otay Pacific Drive and Las Californias Drive. Appropriate striping, signage, and pavement markings will be provided for these on-site bicycle facilities.

This Transportation Impact Study analyzes the forecasted operation of four intersections and one roadway segment that have been constructed as part of the CBF under the following scenarios:

- Phase 1 (Complete)
- Phase 2 (Currently under construction with an anticipated completion date of 2024)
- Phase 3 (Completion currently expected in 2035)

The following intersections were evaluated as part of this Transportation Impact Study:

1. Otay Pacific Drive/Siempre Viva Road
2. Las Californias Drive/Siempre Viva Road
3. Otay Pacific Drive/Otay Pacific Place
4. Las Californias Drive/Otay Pacific Place

Based on the results of this Transportation Impact Study, the proposed street vacations and conversion of the public two-way streets to private one-way streets would result in acceptable operations of the study area locations with the following intersection mitigations:

- **Las Californias Drive/Siempre Viva Road:** Installation of a traffic signal in Phase 2
- **Otay Pacific Drive/Siempre Viva Road:** Dual westbound left-turn lanes in Phase 3
- **Otay Pacific Drive/Otay Pacific Place:** Dual southbound left-turn lanes in Phase 3

In addition to levels of service, turn-pocket lengths were evaluated for the proposed reconfiguration of the four study intersections based on the Transportation Research Board *Highway Capacity Manual*'s (2000) 95th percentile queue criteria used in the approved TIS. Intersection queues were analyzed in the a.m., p.m., and midday peak hours to determine the most appropriate storage requirements throughout the day.

The following are recommendations for turn pocket lengths at the study intersections:

1. **Otay Pacific Drive/Siempre Viva Road**
   - Eastbound Right Lane 1: 300 ft
   - Eastbound Right Lane 2: 300 ft
   - Westbound Left Lane 1: 175 ft
   - Westbound Left Lane 2: 175 ft
2. **Las Californias Drive/Siempre Viva Road**
   - Northbound Left Lane: 350 ft
   - Northbound Right Lane: 175 ft
3. **Otay Pacific Drive/Otay Pacific Place**
   - Southbound Left Lane 1: 100 ft
   - Southbound Left Lane 2: 100 ft
4. **Las Californias Drive/Otay Pacific Place**
   - Eastbound Left Lane 1: 175 ft

TABLE OF CONTENTS

APPENDICES

FIGURES AND TABLES

FIGURES

TABLES

LIST OF ABBREVIATIONS AND ACRONYMS

ADT	average daily traffic/trips
approved TIS	*San Diego-Tijuana Cross Border Facility Project Traffic Impact Study, LSA, 2011* *Appendix J to FEIR for Cross Border Facility, HELIX Environmental Planning, Inc., 2012.*
CBF	Cross Border Facility
EIR	Environmental Impact Report
ft	foot, feet
HCM	*Highway Capacity Manual*
LOS	level of service
project	Cross Border Facility
sf	square feet
TIS	Transportation Impact Study

TRANSPORTATION IMPACT STUDY
CROSS BORDER FACILITY

INTRODUCTION

LSA has prepared this Transportation Impact Study (TIS) for the purpose of identifying potential traffic impacts associated with the proposed Cross Border Facility (CBF) circulation revisions. The impacts of the project were evaluated following the standards and methodologies set forth in the City of San Diego *Traffic Impact Study Manual* (1998) and consistent with the approved *San Diego-Tijuana Cross Border Facility Project Traffic Impact Study* (approved TIS) (LSA 2011), Appendix J to the Final Environmental Impact Report (EIR) certified in 2012.

LSA prepared the approved TIS that evaluated intersections and roadways in the project vicinity and identified circulation mitigations for both near-term and long-range conditions. The proposed project would not change the approved CBF and ancillary commercial/industrial uses or intensity (square footages and anticipated passengers). Therefore, the results and mitigation measures of the approved CBF TIS/EIR would remain the same.

The proposed project includes street vacations and conversion of the current two-way public streets within the CBF site (i.e., Otay Pacific Drive, Otay Pacific Place, and Las Californias Drive) to one-way private streets. As a result, all vehicles would enter the CBF site at Otay Pacific Drive/Siempre Viva Road and exit at Las Californias Drive/Siempre Viva Road (i.e., vehicles would travel southbound on Otay Pacific Drive, eastbound on Otay Pacific Place, and northbound on Las Californias Drive). The purpose of this focused TIS is to determine any potential impacts of the proposed circulation revisions.

EXISTING CONDITIONS

The CBF project is on a 63.8-acre site south of Siempre Viva Road, east of Britannia Boulevard, west of La Media Road, and north of the United States–Mexico border and Tijuana International Airport. Access to the site is via Siempre Viva Road, a designated as a primary arterial in the Otay Mesa Community Plan (City of San Diego 2014b). From Siempre Viva Road, three public roads extend through the site: Otay Pacific Drive, Las Californias Drive, and Otay Pacific Place. The current CBF operates in a 45,000-square-foot (sf) configuration, but is approved for a 95,000 sf building. Figure 1 illustrates the existing CBF site, circulation, and study area intersections. Figures 2 through 5 show the existing geometrics for the following four intersections providing access to and circulation within the CBF:

- Otay Pacific Drive/Siempre Viva Road
- Las Californias Drive/Siempre Viva Road
- Otay Pacific Drive/Otay Pacific Place
- Las Californias Drive/Otay Pacific Place

LSA

LEGEND

- Study Area Intersection

N

0 105 210
FEET

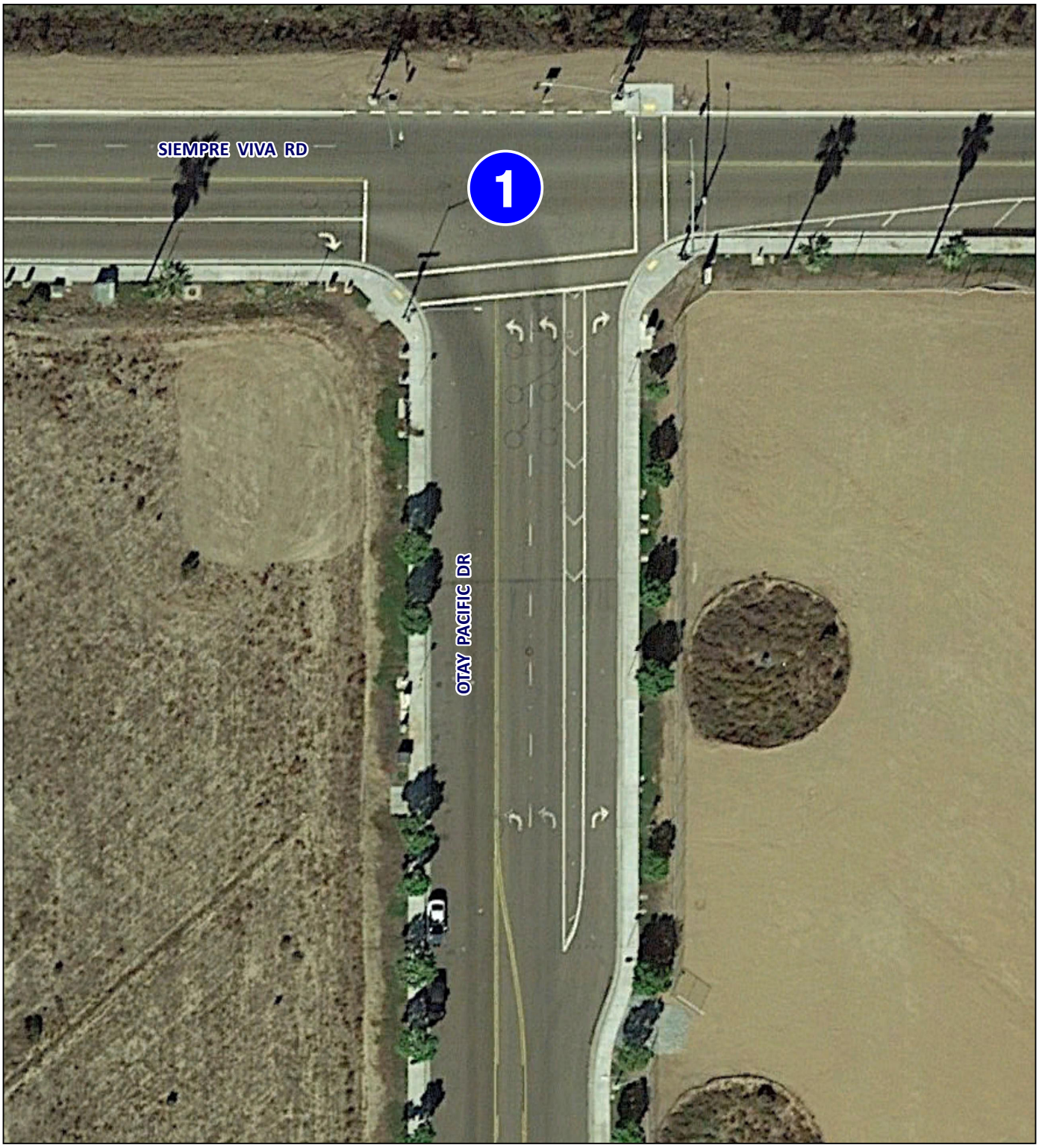
SOURCE: Google Earth

I:\TST1501\G\Site Plan&Ints.cdr (3/8/2019)

FIGURE 1

Cross Border Facility

Existing Site Plan and Study Area Intersections



LSA

FIGURE 2

LEGEND

- Study Area Intersection

N

0 25 50

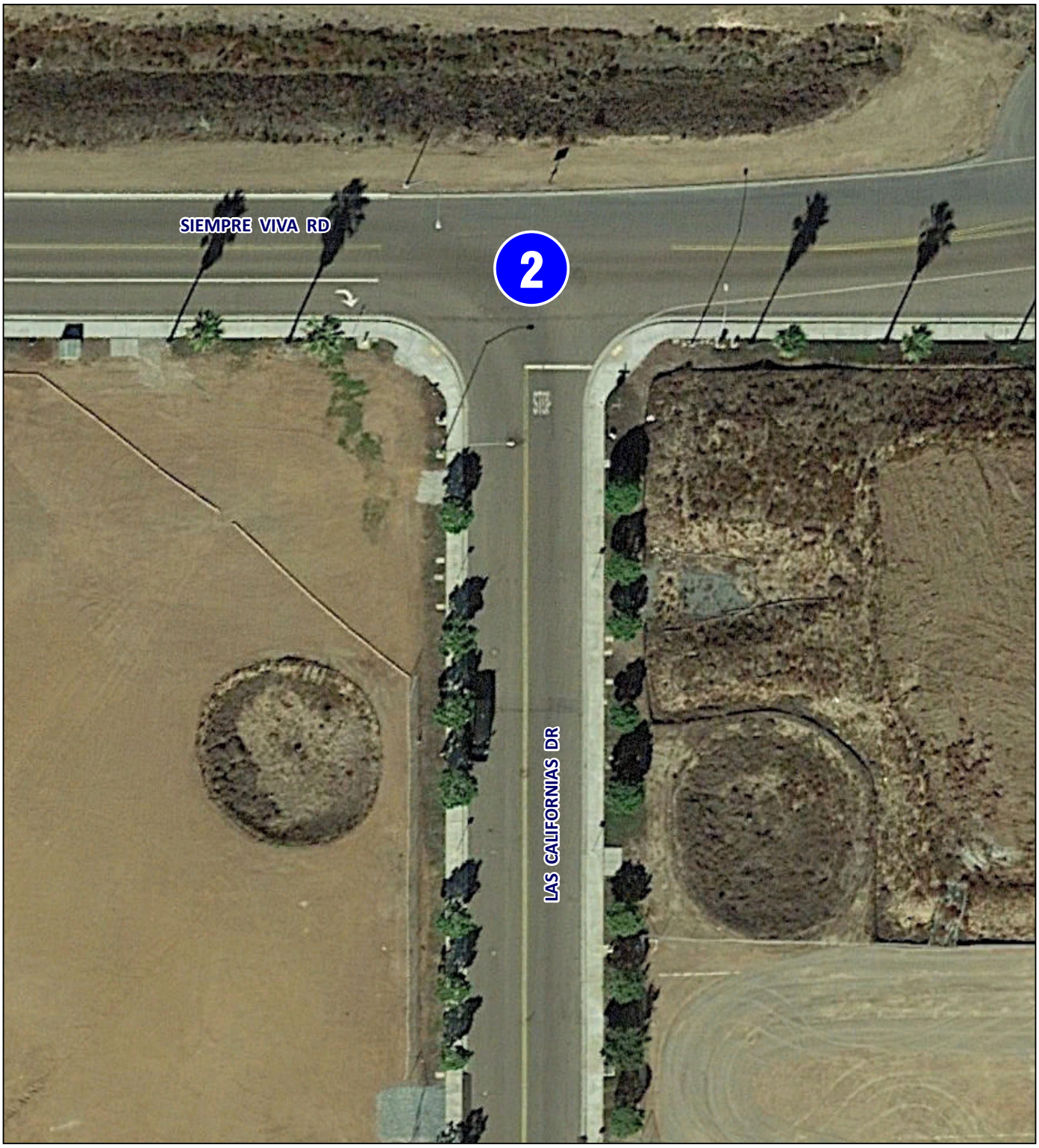
FEET

SOURCE: Google Earth

Cross Border Facility

Intersection #1
Existing Otay Pacific Drive/Siempre Viva Road
Intersection Geometrics

I:\TST1501\G\Intersection 1 Geometrics.cdr (2/14/2019)



LSA

LEGEND

- Study Area Intersection

FIGURE 3

N

0 25 50

FEET

SOURCE: Google Earth

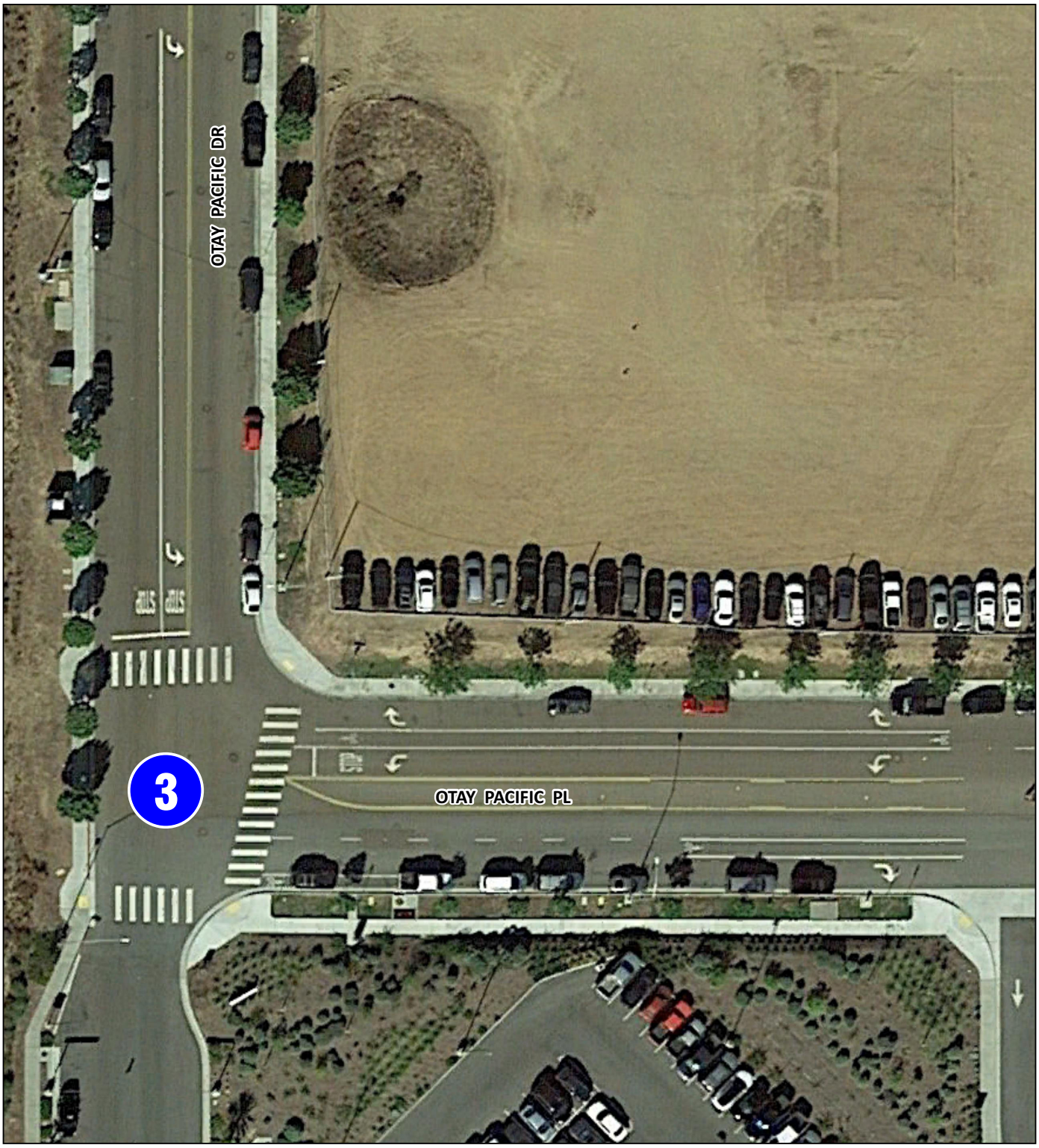
Cross Border Facility

Intersection #2

Existing Las Californias Drive/Siempre Viva Road

Intersection Geometrics

I:\TST1501\G\Intersection 2 Geometrics.cdr (2/14/2019)



LSA

LEGEND

- Study Area Intersection

FIGURE 4

N

0 25 50

FEET

SOURCE: Google Earth

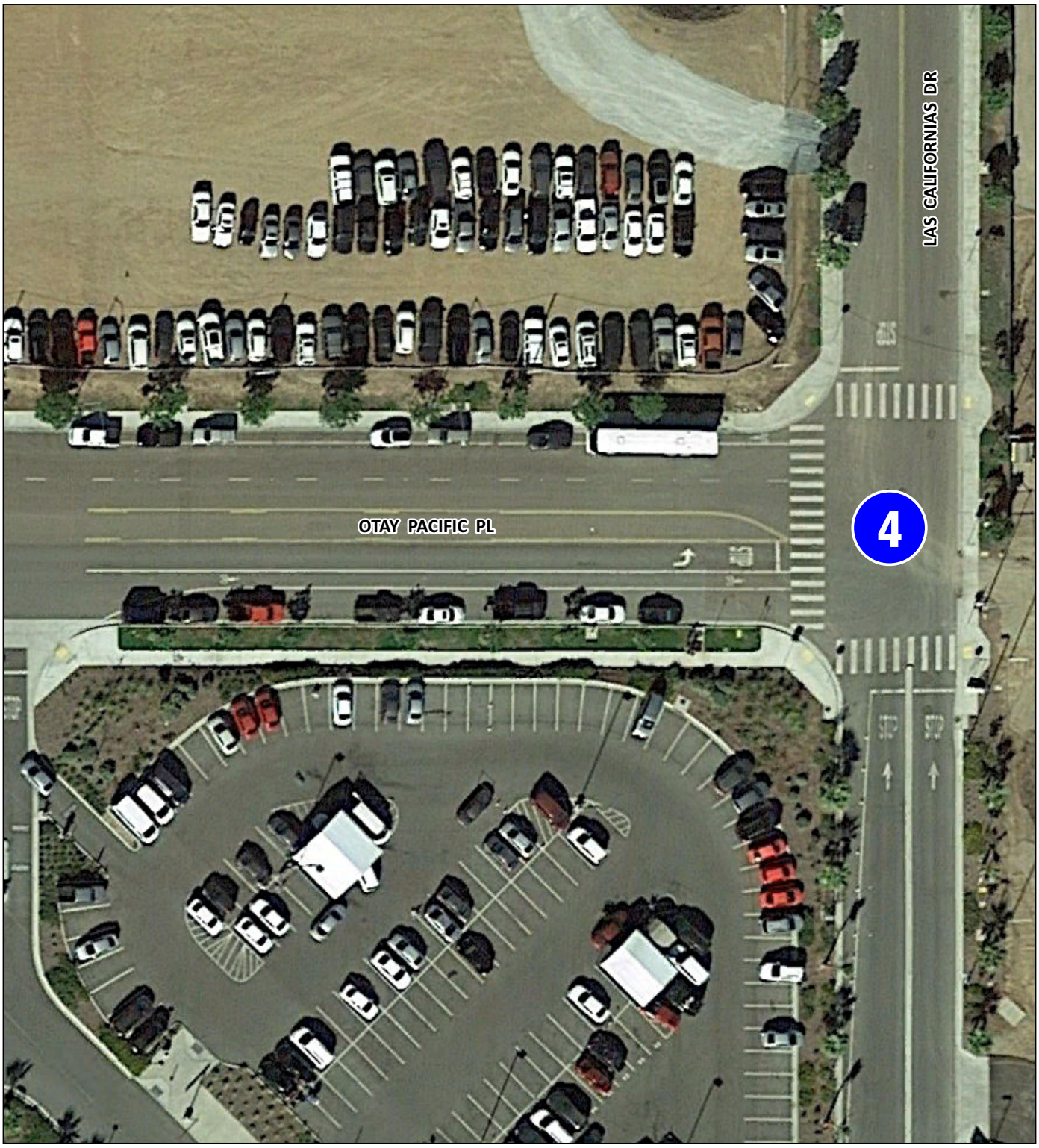
Cross Border Facility

Intersection #3

Existing Otay Pacific Drive/Otay Pacific Place

Intersection Geometrics

I:\TST1501\G\Intersection 3 Geometrics.cdr (2/14/2019)



LSA

FIGURE 5

LEGEND

- Study Area Intersection

N

0 25 50

FEET

SOURCE: Google Earth

Cross Border Facility
Intersection #4
Existing Las Californias Drive/Otay Pacific Place
Intersection Geometrics

I:\TST1501\G\Intersection 4 Geometrics.cdr (3/8/2019)

APPROVED SAN DIEGO-TIJUANA CROSS BORDER FACILITY TRAFFIC IMPACT STUDY

The CBF is entitled for development of a 95,000 sf cross border facility and 402,000 sf of industrial use, 34,000 sf of specialty retail use, 340 hotel rooms, a 12-pump gas station with a convenience market and a car wash, and 6,000 sf of restaurant use (PDP No. 609801, SDP No. 896755, and PTS No. 169653). The CBF will serve 17,225 average daily passengers at build out, and is expected to generate 46,691 average daily trips at project buildout (currently estimated for year 2030).

LSA prepared the approved TIS to identify the potential traffic and circulation impacts resulting from the planned development of the CBF and the ancillary commercial/uses. The approved TIS is Appendix J of the Final EIR for the CBF (certified on January 10, 2012).

Phasing

The approved TIS anticipated that build out of the CBF facility would occur in the following three phases:

- **Phase 1 (which is now complete):** The CBF building, a 45,000 sf, two-level facility designed to serve up to approximately 6,838 average daily passengers; currently serves 6,708 average daily passengers.
- **Phase 2 (the approved TIS anticipated completion in 2017, but is now estimated at 2024):** The CBF facility is planned to be expanded by approximately 10,000 sf to a 55,000 sf facility to serve up to 10,141 average daily passenger service. Phase 2 plans also include a total of 20,000 sf of specialty retail use, 170 hotel rooms, and a 12-pump gas station with a 1,200 sf convenience market and a car wash.
- **Phase 3 (the approved TIS anticipated completion in 2026, but is now estimated at 2030):** The CBF building would be expanded by approximately 50,000 sf for a total of 95,000 sf, designed to serve 17,225 average daily passengers. The remaining 402,000 sf of industrial use, 14,000 sf of specialty retail use, 170 hotel rooms, and 6,000 sf of restaurant use were also planned for Phase 3.

Trip Generation

The trip generation for each phase in the approved TIS is listed below. The trip generation tables from the approved TIS are provided shown in Tables A-1, A-2, and A-3.

- **Phase 1**: 527 a.m. peak-hour trips (308 in and 219 out), 534 p.m. peak-hour trips (260 in and 274 out), and 13,683 average daily traffic (ADT)
- **Phase 2**: 1,055 a.m. peak-hour trips (606 in and 449 out), 1,167 p.m. peak-hour trips (587 in and 580 out), and 24,652 ADT
- **Phase 3**: 2,313 a.m. peak-hour trips (1,505 in and 808 out), 2,547 p.m. peak-hour trips (1,116 in and 1,431 out), and 46,691 ADT

Table A-1: Phase 1 Project Trip Generation Summary

Land Use	Size	Units	ADT	A.M. Peak Hour			P.M. Peak Hour		
				In	Out	Total	In	Out	Total
Trip Rate									
Hotel (with convention facilities/restaurant)[1]		Rooms	10.00	0.36	0.24	0.60	0.48	0.32	0.80
Sit-Down Restaurant[2]		TSF	130.00	5.20	5.20	10.40	6.24	4.16	10.40
Gasoline Station with Food Mart and Car Wash[3]		VFS	155.00	6.20	6.20	12.40	6.98	6.98	13.95
Specialty Retail[1]		TSF	40.00	0.72	0.48	1.20	1.80	1.80	3.60
Industrial/Business Park (no commercial)[1]		TSF	12.00	1.19	0.13	1.32	0.29	1.15	1.44
Cross Border Facility[4]			2.00	0.05	0.03	0.08	0.04	0.04	0.08
Trip Generation									
Hotel	0	Rooms	0	0	0	0	0	0	0
Sit-Down Restaurant	0.000	TSF	0	0	0	0	0	0	0
Gasoline Station	0	VFS	0	0	0	0	0	0	0
Specialty Retail	0.000	TSF	0	0	0	0	0	0	0
Industrial/Business Park	0.000	TSF	0	0	0	0	0	0	0
Cross Border Facility (2012)	6,838	Passengers	13,683	308	219	527	260	274	533
Total Project Trip Generation (veh)			**13,683**	**308**	**219**	**527**	**260**	**274**	**533**

Source: San Diego—Tijuana Cross Border Facility Project Traffic Impact Study, Table AP (LSA, June 28,2011)
Trip rates referenced from the San Diego Municipal Code Land Development Code, "Trip Generation Manual," May 2003.
[1] Hotel (With Convention Facilities/Restaurant), Specialty Center/Strip Commercial, Industrial/Business Park (No Commercial)
[2] Driveway Vehicle trip rate based on High Turnover (Sit-Down) Restaurant.
[3] Driveway Vehicle trip rate based on Gasoline Station with Food Mart and Car Wash.
[4] Trip Rates based on San Diego International Airport Master Plan EIR, April 2008 (Proposed Airport Land Use Plan, Year 2030).
ADT = average daily trips
EIR = Environmental Impact Report
veh = vehicles
TSF = thousand square feet
VFS = vehicle fueling space

Table A-2: Phase 2 Project Trip Generation Summary

Land Use	Size	Units	ADT	A.M. Peak Hour			P.M. Peak Hour		
				In	Out	Total	In	Out	Total
Trip Rate									
Hotel (with convention facilities/restaurant)[1]		Rooms	10.00	0.36	0.24	0.60	0.48	0.32	0.80
Sit-Down Restaurant[2]		TSF	130.00	5.20	5.20	10.40	6.24	4.16	10.40
Gasoline Station with Food Mart and Car Wash[3]		VFS	155.00	6.20	6.20	12.40	6.98	6.98	13.95
Specialty Retail[1]		TSF	40.00	0.72	0.48	1.20	1.80	1.80	3.60
Industrial/Business Park (no commercial)[1]		TSF	12.00	1.19	0.13	1.32	0.29	1.15	1.44
Cross Border Facility[4]			2.00	0.05	0.03	0.08	0.04	0.04	0.08
Trip Generation									
Hotel	170	Rooms	1,700	61	41	102	82	54	136
Sit-Down Restaurant	0.000	TSF	0	0	0	0	0	0	0
Gasoline Station	12	VFS	1,860	74	74	149	84	84	167
Specialty Retail	20.000	TSF	800	14	10	24	36	36	72
Industrial/Business Park	0.000	TSF	0	0	0	0	0	0	0
Cross Border Facility (2017)	10,141	Passengers	20,292	456	325	781	385	406	791
Total Project Trip Generation (veh)			**24,652**	**606**	**449**	**1,056**	**587**	**580**	**1,166**

Source: San Diego—Tijuana Cross Border Facility Project Traffic Impact Study, Table AQ (LSA, June 28,2011)
Trip rates referenced from the San Diego Municipal Code Land Development Code, "Trip Generation Manual," May 2003.
[1] Hotel (With Convention Facilities/Restaurant), Specialty Center/Strip Commercial, Industrial/Business Park (No Commercial)
[2] Driveway Vehicle trip rate based on High Turnover (Sit-Down) Restaurant.
[3] Driveway Vehicle trip rate based on Gasoline Station with Food Mart and Car Wash.
[4] Trip Rates based on San Diego International Airport Master Plan EIR, April 2008 (Proposed Airport Land Use Plan, Year 2030).
ADT = average daily trips
EIR = Environmental Impact Report
veh = vehicles
TSF = thousand square feet
VFS = vehicle fueling space

Table A-3: Phase 3 Project Trip Generation Summary

Land Use	Size	Units	ADT	A.M. Peak Hour			P.M. Peak Hour		
				In	Out	Total	In	Out	Total
Trip Rate									
Hotel (with convention facilities/restaurant)[1]		Rooms	10.00	0.36	0.24	0.60	0.48	0.32	0.80
Sit-Down Restaurant[2]		TSF	130.00	5.20	5.20	10.40	6.24	4.16	10.40
Gasoline Station with Food Mart and Car Wash[3]		VFS	155.00	6.20	6.20	12.40	6.98	6.98	13.95
Specialty Retail[1]		TSF	40.00	0.72	0.48	1.20	1.80	1.80	3.60
Industrial/Business Park (no commercial) [1]		TSF	12.00	1.19	0.13	1.32	0.29	1.15	1.44
Cross Border Facility[4]			2.00	0.05	0.03	0.08	0.04	0.04	0.08
Trip Generation									
Hotel	340	Rooms	3,400	122	82	204	163	109	272
Sit-Down Restaurant	6.000	TSF	780	31	31	62	37	25	62
Gasoline Station	12	VFS	1,860	74	74	149	84	84	167
Specialty Retail	34.000	TSF	1,360	24	16	41	61	61	122
Industrial/Business Park	402.000	TSF	4,824	478	53	531	116	463	579
Cross Border Facility (2030)	17,225	Passengers	34,467	775	551	1,326	655	689	1,344
Total Project Trip Generation (veh)			**46,691**	**1,505**	**808**	**2,313**	**1,116**	**1,431**	**2,547**

Source: San Diego—Tijuana Cross Border Facility Project Traffic Impact Study, Table B (LSA, June 28,2011)
Trip rates referenced from the San Diego Municipal Code Land Development Code, "Trip Generation Manual," May 2003.

[1] Hotel (With Convention Facilities/Restaurant), Specialty Center/Strip Commercial, Industrial/Business Park (No Commercial)
[2] Driveway Vehicle trip rate based on High Turnover (Sit-Down) Restaurant.
[3] Driveway Vehicle trip rate based on Gasoline Station with Food Mart and Car Wash.
[4] Trip Rates based on San Diego International Airport Master Plan EIR, April 2008 (Proposed Airport Land Use Plan, Year 2030).

ADT = average daily trips
EIR = Environmental Impact Report
veh = vehicles
TSF = thousand square feet
VFS = vehicle fueling space

Intersection Geometrics

The following describes intersection geometrics assumed in the approved 2011 TIS for each of the study area intersections by phase. Any differences between the TIS assumptions and the existing intersection geometrics are detailed below in italics.

- **Intersection #1: Otay Pacific Drive/Siempre Viva Road**
  - **Phases 1 and 2:** 1 northbound left, 1 northbound right, 2 eastbound through, 1 eastbound right, 1 westbound left, and 1 westbound through
  - **Phase 3:** 2 northbound left, 1 northbound right, 3 eastbound through, 2 eastbound right, 1 westbound left, and 3 westbound through
  - **Existing (2019):** *2 northbound left, 1 eastbound through***,** 1 shared westbound left/through, 1 northbound right, and 1 eastbound right
- **Intersection #2: Las Californias Drive/Siempre Viva Road**
  - **Phases 1 and 2:** 1 shared northbound left/right, 1 shared eastbound through/right, and 1 shared westbound through/left
  - **Phase 3:** 1 northbound left, 1 northbound right, 3 eastbound through, 1 eastbound right, 1 westbound left, and 3 westbound through
  - **Existing (2019):** *1 eastbound left and 1 eastbound through***,** 1 shared northbound left/right, and 1 shared through/left
- **Intersection #3: Otay Pacific Drive/Otay Pacific Place**
  - **Phase 1:** 1 southbound left, 1 southbound through, 1 eastbound left, 1 westbound left, and 1 westbound right
  - **Phase 2:** 1 southbound left, 1 shared southbound through/right, 1 eastbound left, 1 westbound left, and 1 westbound right
  - **Phase 3 (Signal):** 1 southbound left, 1 southbound through, 1 shared southbound through/ right, 1 shared eastbound left/through, 1 westbound left, 1 shared westbound through/ right, and 1 westbound right
  - **Existing (2019):** *No eastbound movements***,** 1 southbound left, 1 southbound through, 1 westbound left, and 1 westbound right
- **Intersection #4: Las Californias Drive/Otay Pacific Place**
  - **Phases 1 and 2:** 1 northbound left, 1 northbound through, 1 southbound right, and 1 eastbound left
  - **Phase 3 (Signal):** 2 northbound left, 1 northbound through, 1 southbound left, 1 southbound right, 1 eastbound left, 1 eastbound through, 1 westbound through, and 1 westbound right
  - **Existing (2019):** *2 northbound through***,** 1 southbound right, and 1 eastbound left

Highway Capacity Manual Analysis

The internal circulation should be designed based on the peak hour of the project generator, which is the hour the CBF would generate the highest number of vehicle trips. Because the CBF peak hour may occur outside of the typical commute hours, the internal circulation should be designed to accommodate the expected highest hour of CBF traffic. The approved TIS assumed that the CBF would generate its highest levels of traffic during the midday peak hour (i.e., approximately 42 percent higher than the a.m. peak hour).

As such, the approved TIS provided a midday level of service (LOS) analysis for the four study area intersections using the *Highway Capacity Manual* (HCM) 2000 methodology (the latest version of the HCM methodology at that time). This analysis was conducted based on the anticipated intersection volumes and geometrics for all three CBF development phases. Based on the results of this analysis, each intersection would operate at satisfactory LOS D or better for all three phases.

PROPOSED PROJECT

The proposed project includes converting the current two-way public streets within the CBF site (i.e., Otay Pacific Drive, Otay Pacific Place, and Las Californias Drive) to one-way private streets. This would result in a counter-clockwise circulation pattern (i.e., vehicles would travel southbound on Otay Pacific Drive, eastbound on Otay Pacific Place, and northbound on Las Californias Drive). All CBF vehicles would enter at Otay Pacific Drive/Siempre Viva Road and exit at Las Californias Drive/Siempre Viva Road. The proposed street vacations and conversion to one-way streets would allow the CBF to better control traffic flow during peak periods, thereby reducing or avoiding passenger delays. One-way streets would also reduce potential conflicts in traffic movements.

Volume Adjustments

Based on the proposed reconfiguration of Otay Pacific Drive, Otay Pacific Place, and Las Californias Drive from two-way public streets to one-way private streets, the traffic volumes for the three CBF development phases at the four study area intersections have been reassigned. The regional trip distribution of the approved TIS, which is based on the select zone assignment traffic forecasts prepared using the Series 11 traffic model and the previously adopted Otay Mesa Community Plan, remains unchanged. In the approved 2011 TIS, Siempre Viva Road was a dirt road (closed) east of Las Californias Drive. As such, all project trips during the Existing with Cumulative Project (Phase 1) and Phase 2 conditions are diverted toward the west along Siempre Viva Road. The final trip distribution percentages for the CBF along Siempre Viva Road with buildout of the Otay Mesa Community Plan are approximately 75 percent toward the west and 25 percent toward the east.

All CBF inbound vehicles have been adjusted to make an eastbound right turn or westbound left turn from Siempre Viva Road onto Otay Pacific Drive while all CBF outbound vehicles have been adjusted to make a northbound left turn or right turn from Las Californias Drive onto Siempre Viva Road.

Similar volume adjustments have been made to inbound and outbound vehicles along Otay Pacific Place to and from Otay Pacific Drive and Las Californias Drive based on the circulation reconfiguration.

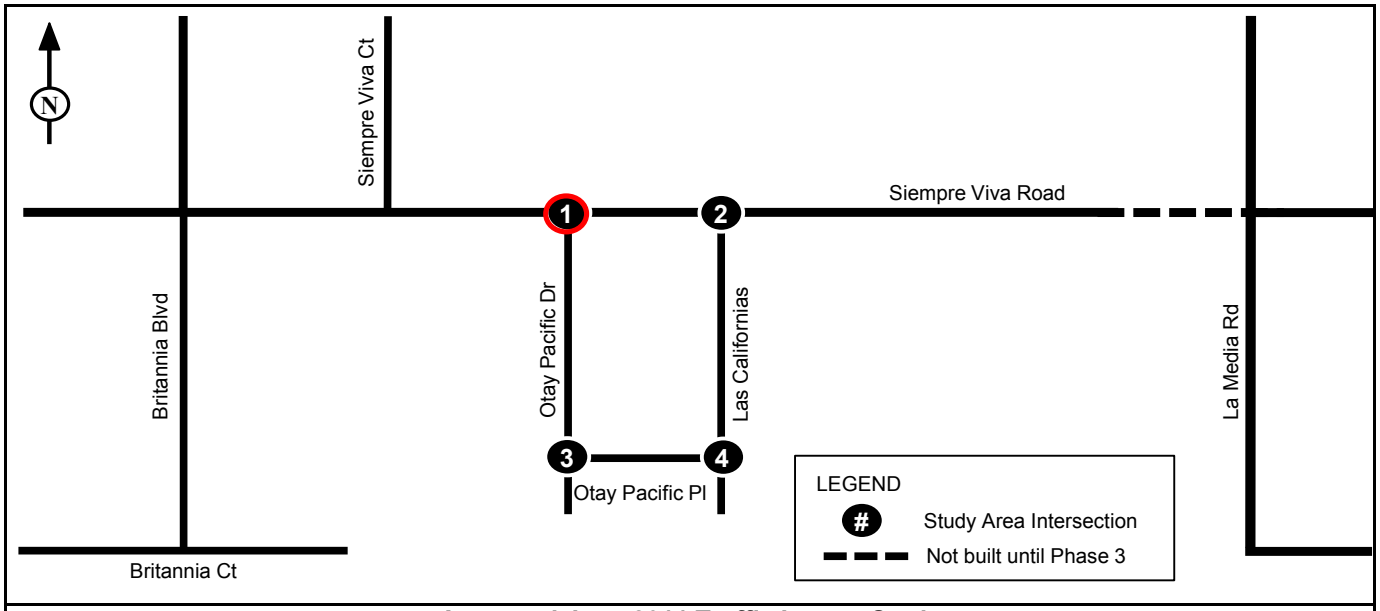
It should be noted that the approved TIS assumed that the Siempre Viva Road extension from east of the project site to La Media Road would occur during Phase 3. As such, no CBF vehicles have been assumed to make a westbound left turn from Siempre Viva Road onto Otay Pacific Drive or a northbound right turn from Las Californias Drive onto Siempre Viva Road under Phases 1 and 2.

Appendix A provides a detailed worksheet illustrating the intersection volumes from the approved TIS and the subsequent intersection volume adjustments for the proposed one-way, counter-clockwise circulation. Figures 6 through 9 illustrate the approved TIS volumes and the adjusted volumes for each intersection by phase.

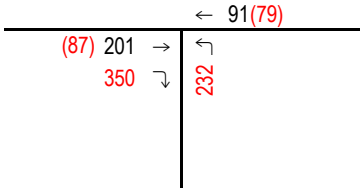
Geometric Improvements

The intersection geometrics at the four study area intersections have also been revised to reflect the proposed conversion of Otay Pacific Drive, Otay Pacific Place, and Las Californias Drive from two-way public streets to one-way private streets. The reconfigured geometrics at these intersections for the three phases of the CBF development are summarized below. Figures 10 through 13 illustrate the approved TIS (LSA 2011) phased geometrics and the proposed geometrics for the proposed one-way circulation for each intersection by phase.

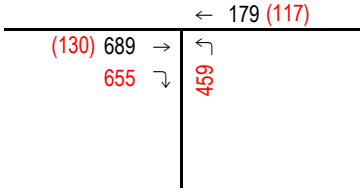
- **Intersection #1: Otay Pacific Drive/Siempre Viva Road**
  - **Phases 1 and 2:** 1 eastbound through, 1 eastbound right, 1 westbound left, and 1 westbound through
  - **Phase 3**: 3 eastbound through, 2 eastbound right, 2 westbound left, and 3 westbound through
- **Intersection #2: Las Californias Drive/Siempre Viva Road**
  - **Phase 1 and Phase 2 (Signal):** 1 shared northbound left/right, 1 eastbound through, and 1 westbound through
  - **Phase 3 (Signal):** 1 northbound left, 1 northbound right, 3 eastbound through, and 3 westbound through
- **Intersection #3: Otay Pacific Drive/Otay Pacific Place**
  - **Phases 1 and 2:** 1 southbound left, 1 shared southbound through/right, and 1 eastbound right
  - **Phase 3 (Signal):** 2 southbound left, 1 southbound through, 1 shared southbound through/right, 1 shared eastbound through/right
- **Intersection #4: Las Californias Drive/Otay Pacific Place**
  - **Phases 1 and 2:** 1 northbound through and 1 eastbound left
  - **Phase 3 (Signal):** 1 northbound through, 1 shared northbound through/right, 1 eastbound left, 1 eastbound through/right, and 1 westbound right



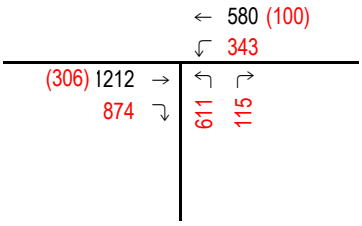
Approved June 2011 Traffic Impact Study



Phase 1 Volumes

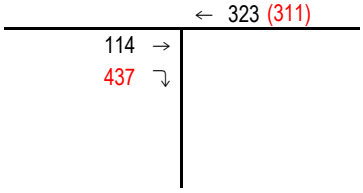


Phase 2 Volumes

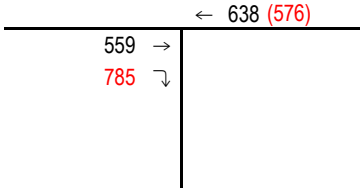


Phase 3 Volumes

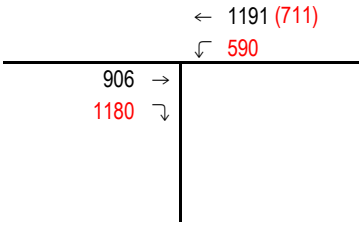
Adjusted for One-Way Circulation



Phase 1 Volumes



Phase 2 Volumes



Phase 3 Volumes

FIGURE 6

LSA

LEGEND

XXXX Midday Volume

Cross Border Facility

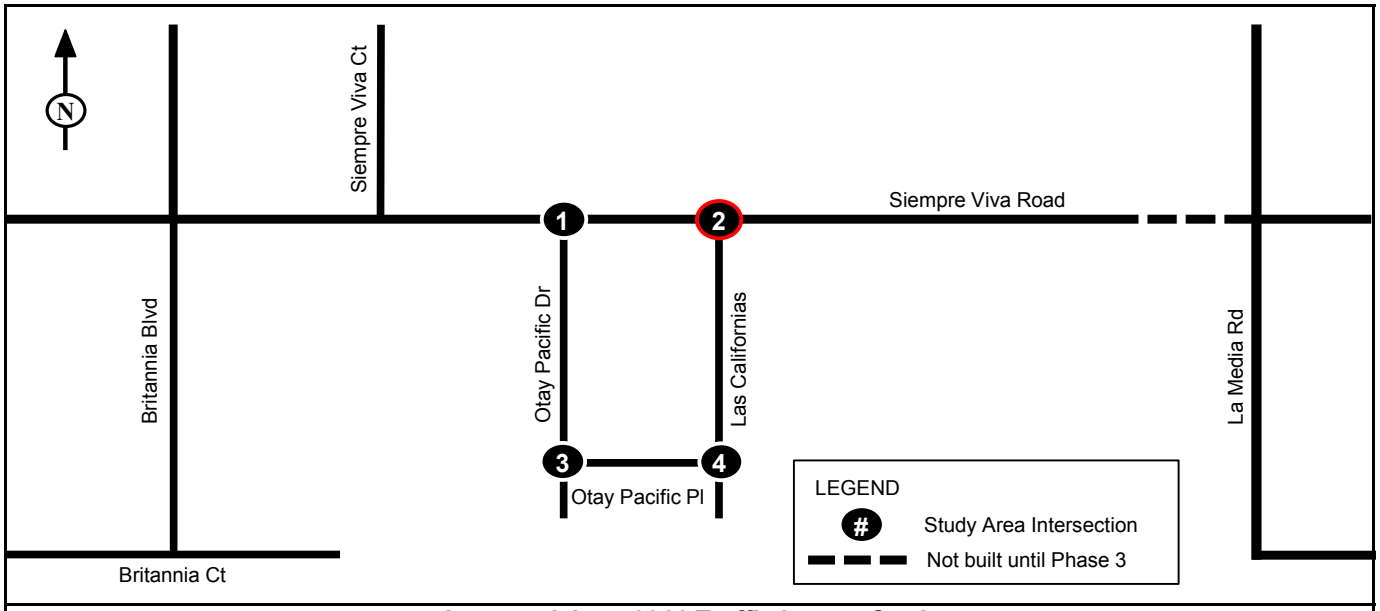
Intersection #1

Approved and Adjusted Otay Pacific Drive/Siempre Viva Road

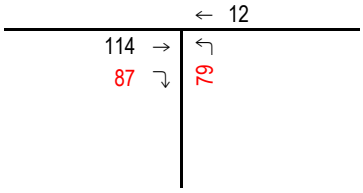
Total Intersection Volumes

Note: Project trips are shown in RED.

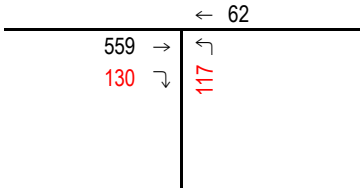
P:\TST1501\Figures\1. March 2019\Figure 6 intersection volumes.xlsx (4/1/2019)



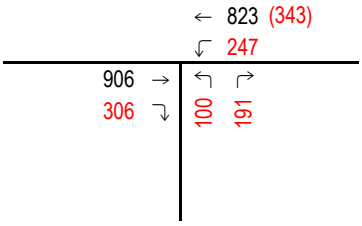
Approved June 2011 Traffic Impact Study



Phase 1 Volumes

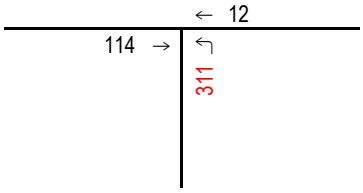


Phase 2 Volumes

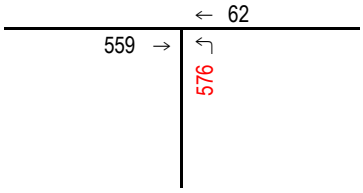


Phase 3 Volumes

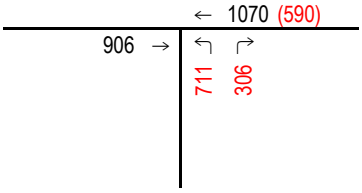
Adjusted for One-Way Circulation



Phase 1 Volumes



Phase 2 Volumes



Phase 3 Volumes

LSA

FIGURE 7

LEGEND

XXX Midday Volume

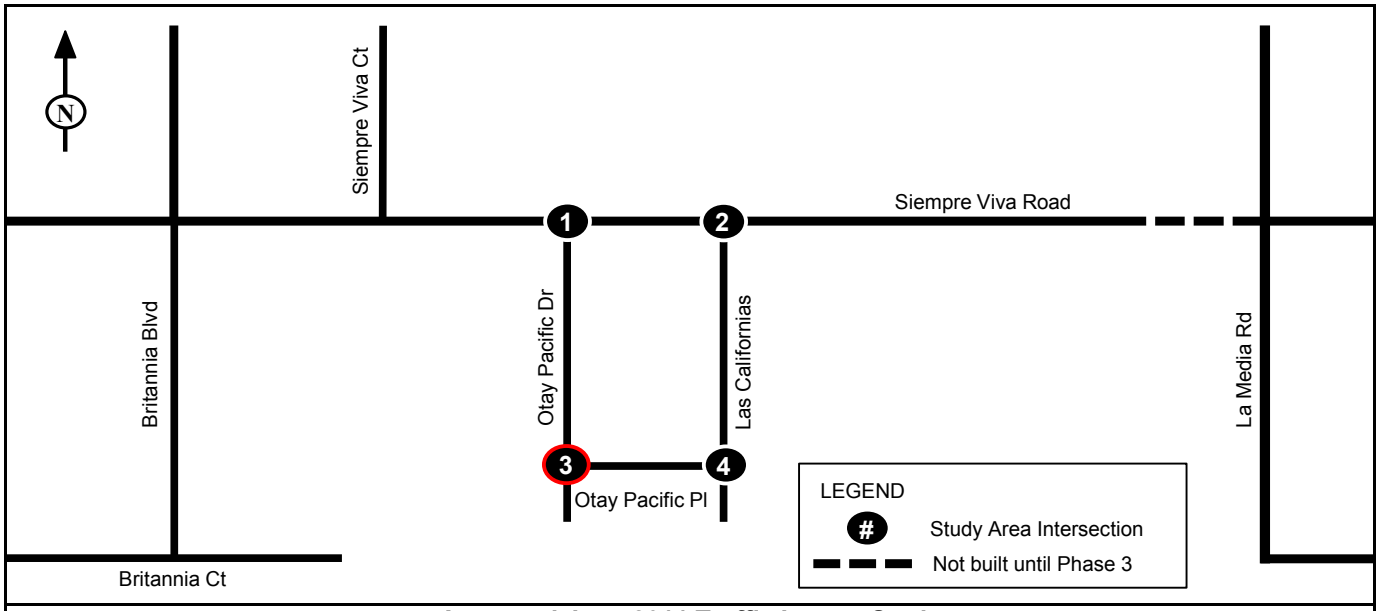
Cross Border Facility

Intersection #2

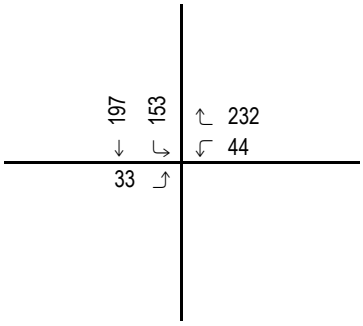
Approved and Adjusted Las Californias Drive/Siempre Viva Road

Total Intersection Volumes

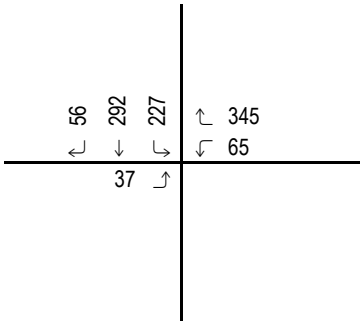
Note: Project trips are shown in RED.



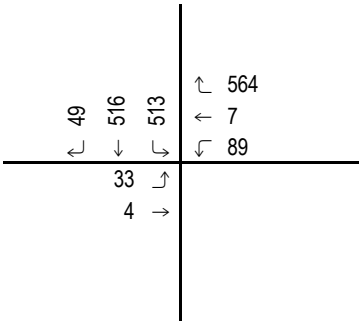
Approved June 2011 Traffic Impact Study



Phase 1 Volumes

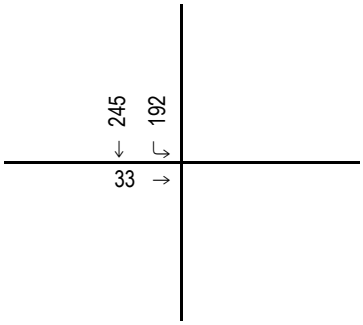


Phase 2 Volumes

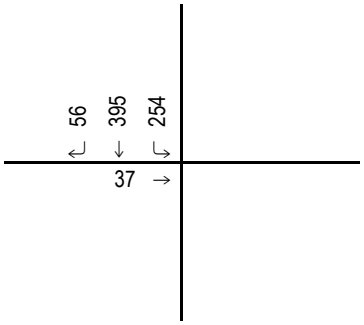


Phase 3 Volumes

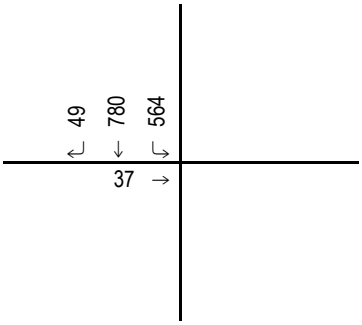
Adjusted for One-Way Circulation



Phase 1 Volumes



Phase 2 Volumes



Phase 3 Volumes

LSA

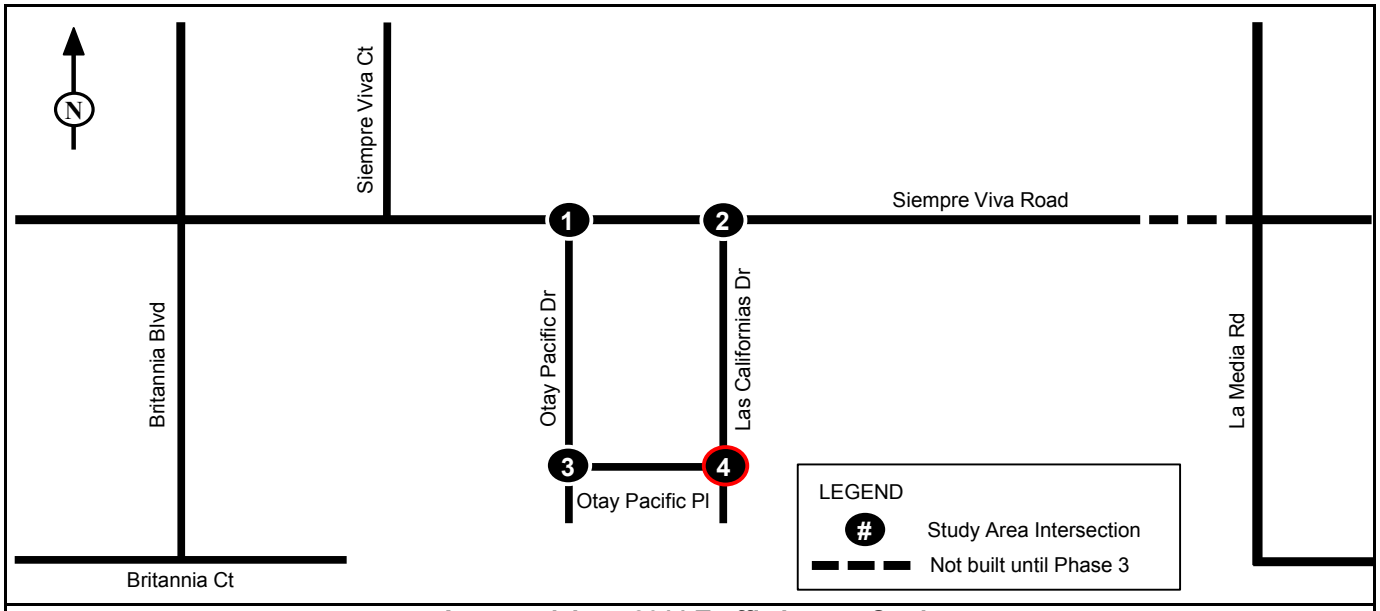
FIGURE 8

LEGEND

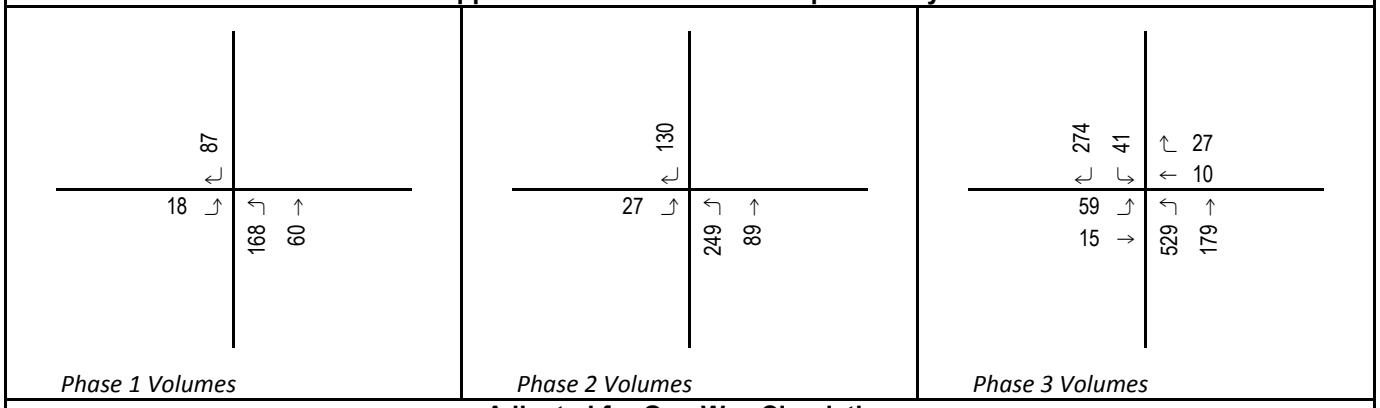
XXX Midday Volume

Cross Border Facility

Intersection #3
Approved and Adjusted Otay Pacific Drive/Otay Pacific Place
Intersection Volumes (Project Trips Only)

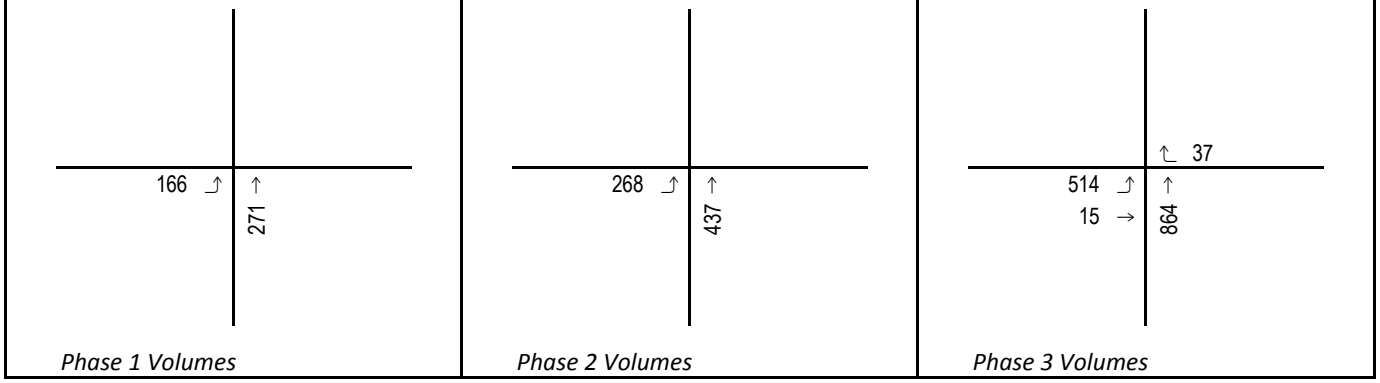


Approved June 2011 Traffic Impact Study



Phase 1 Volumes *Phase 2 Volumes* *Phase 3 Volumes*

Adjusted for One-Way Circulation



Phase 1 Volumes *Phase 2 Volumes* *Phase 3 Volumes*

FIGURE 9

LSA

LEGEND

XXX Midday Volume

Cross Border Facility

Intersection #4

Approved and Adjusted Las Californias Drive/Otay Pacific Place Intersection Volumes (Project Trips Only)

P:\TST1501\Figures\Figure 9 intersection volumes.xlsx (3/14/2019)

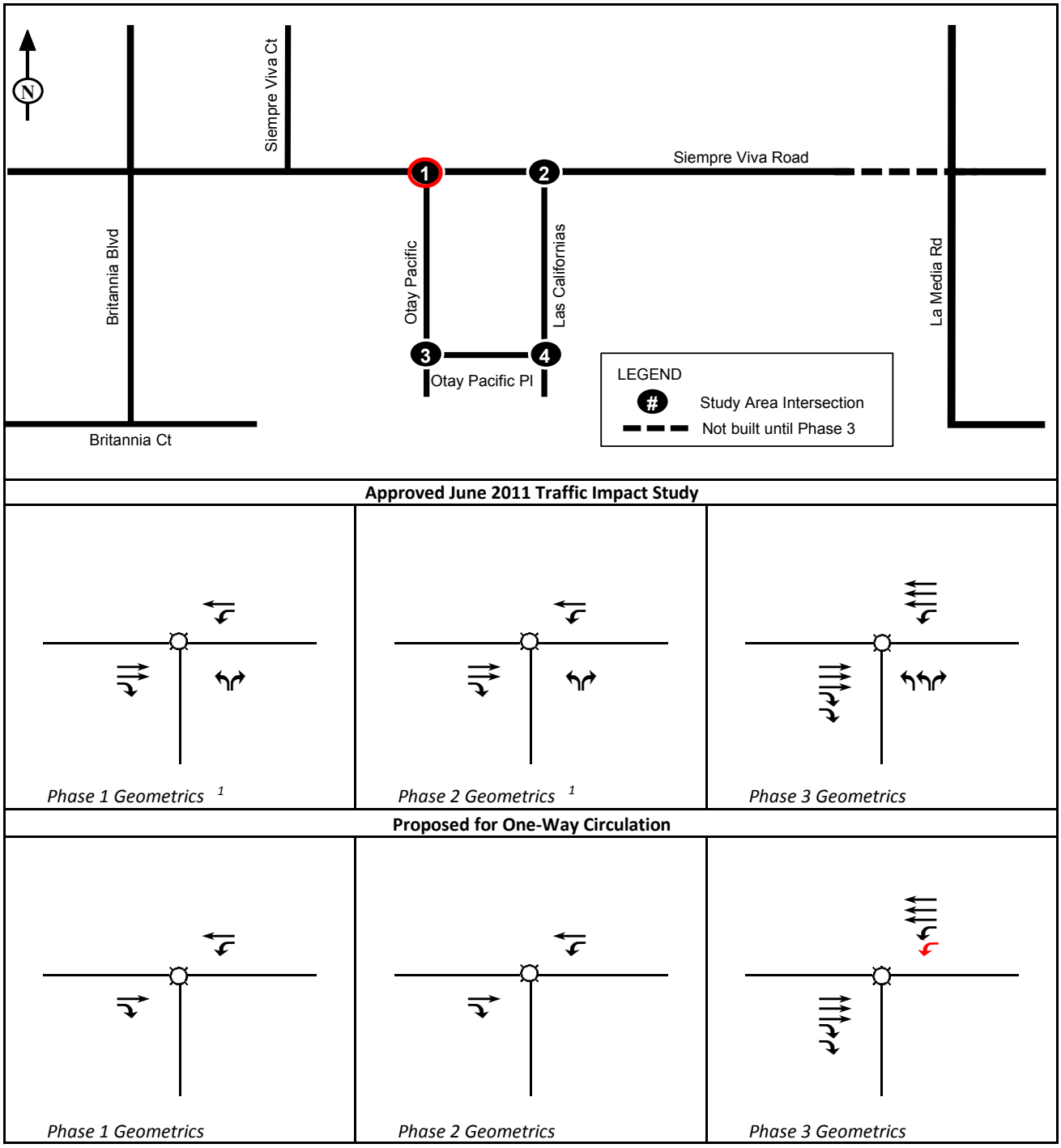


FIGURE 10

LSA

LEGEND

Signal

Additional Lane in the Build-Out Condition

Cross Border Facility

Intersection #1

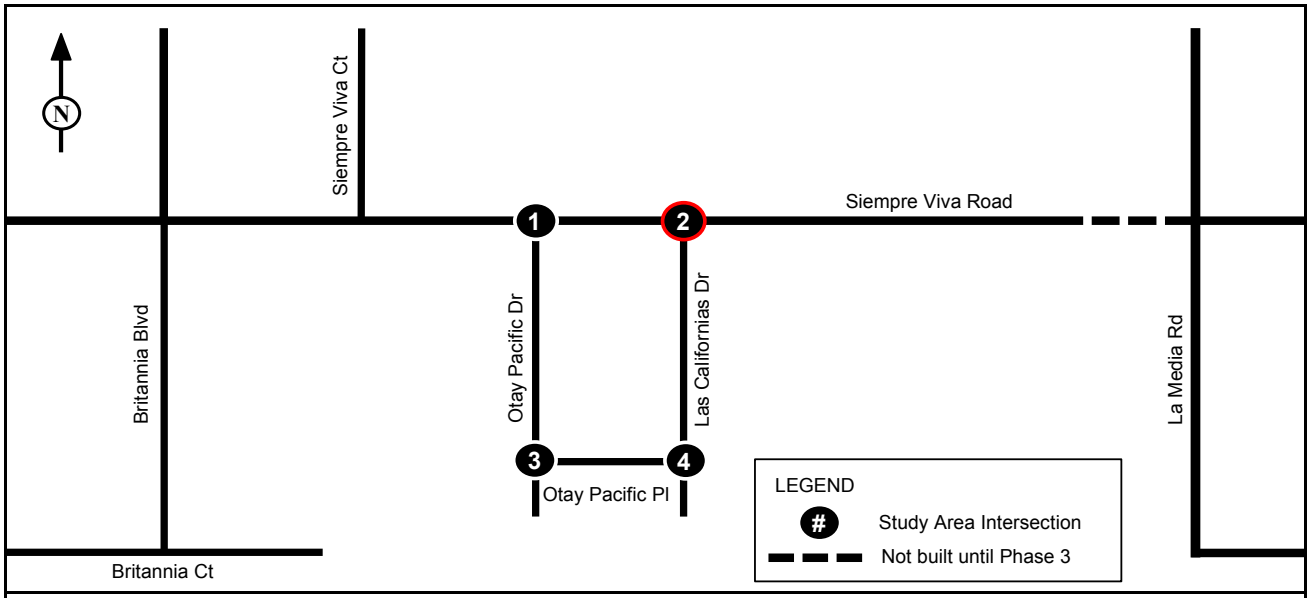
Approved and Proposed Otay Pacific Drive/Siempre Viva Road

Intersection Geometrics

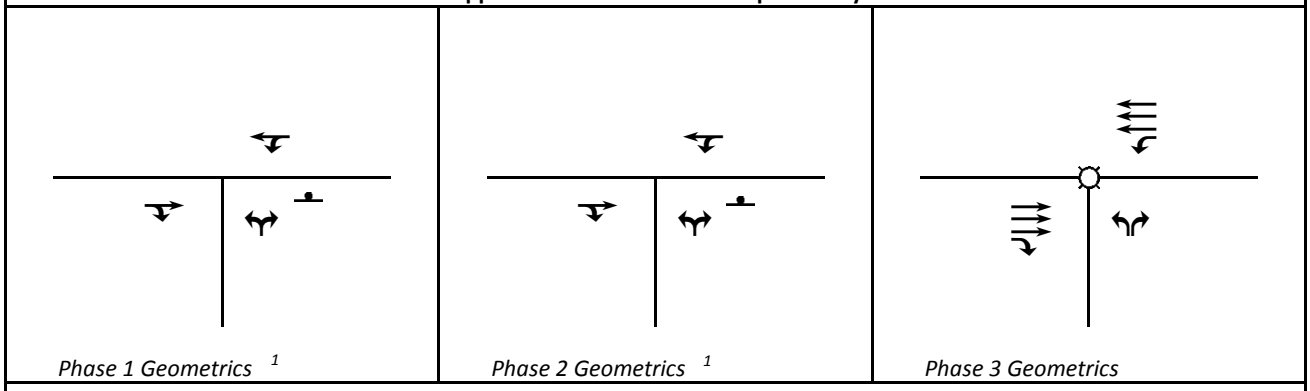
[1] The current intersection geometrics are different than what was assumed in the 2011 Traffic Impact Study.

The existing northbound approach is: . The existing westbound approach is: and eastbound is: .

P:\TST1501\Figures\1. March 2019\Figure 10 geometrics.xlsx 3/29/2019



Approved June 2011 Traffic Impact Study



Proposed for One-Way Circulation

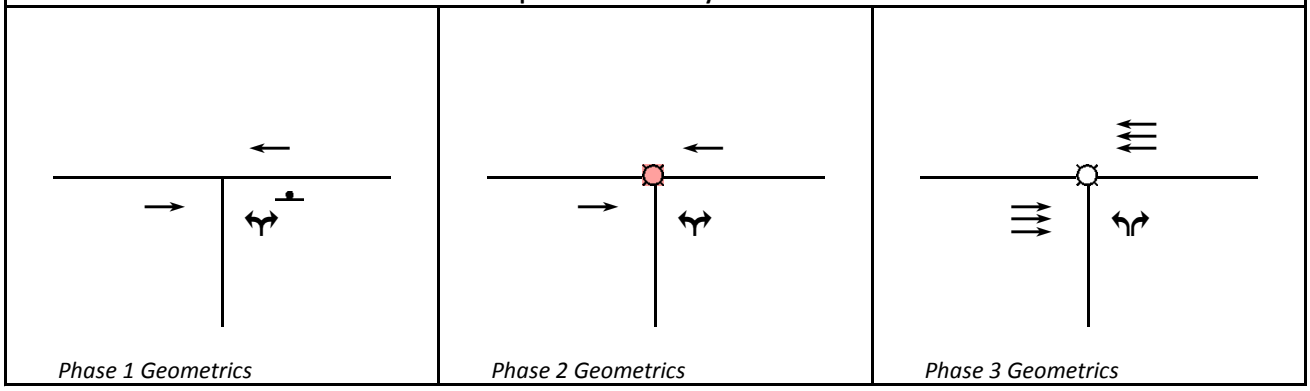


FIGURE 11

LSA

LEGEND

- Signal (Approved Under 2011 Study)
- Stop Sign
- Additional Signal Required

Cross Border Facility

Intersection #2

Approved and Proposed Las Californias Drive/Siempre Viva Road Intersection Geometrics

1 The current intersection geometrics are different than what was assumed in the 2011 Traffic Impact Study.

The existing eastbound approach is: .

P:\TST1501\Figures\1. March 2019\Figure 11 geometrics 2.0.xlsx 3/29/2019

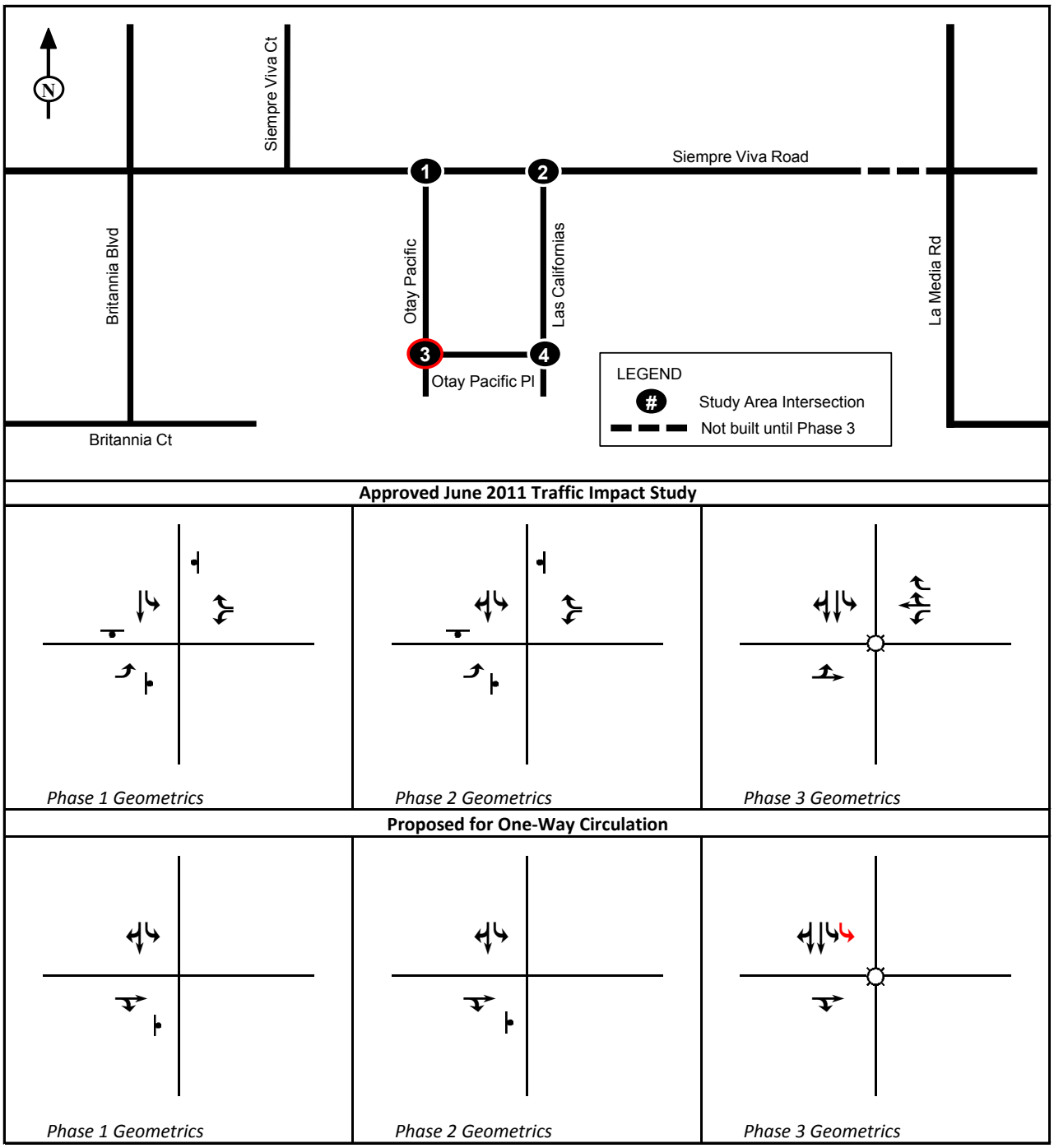


FIGURE 12

LSA

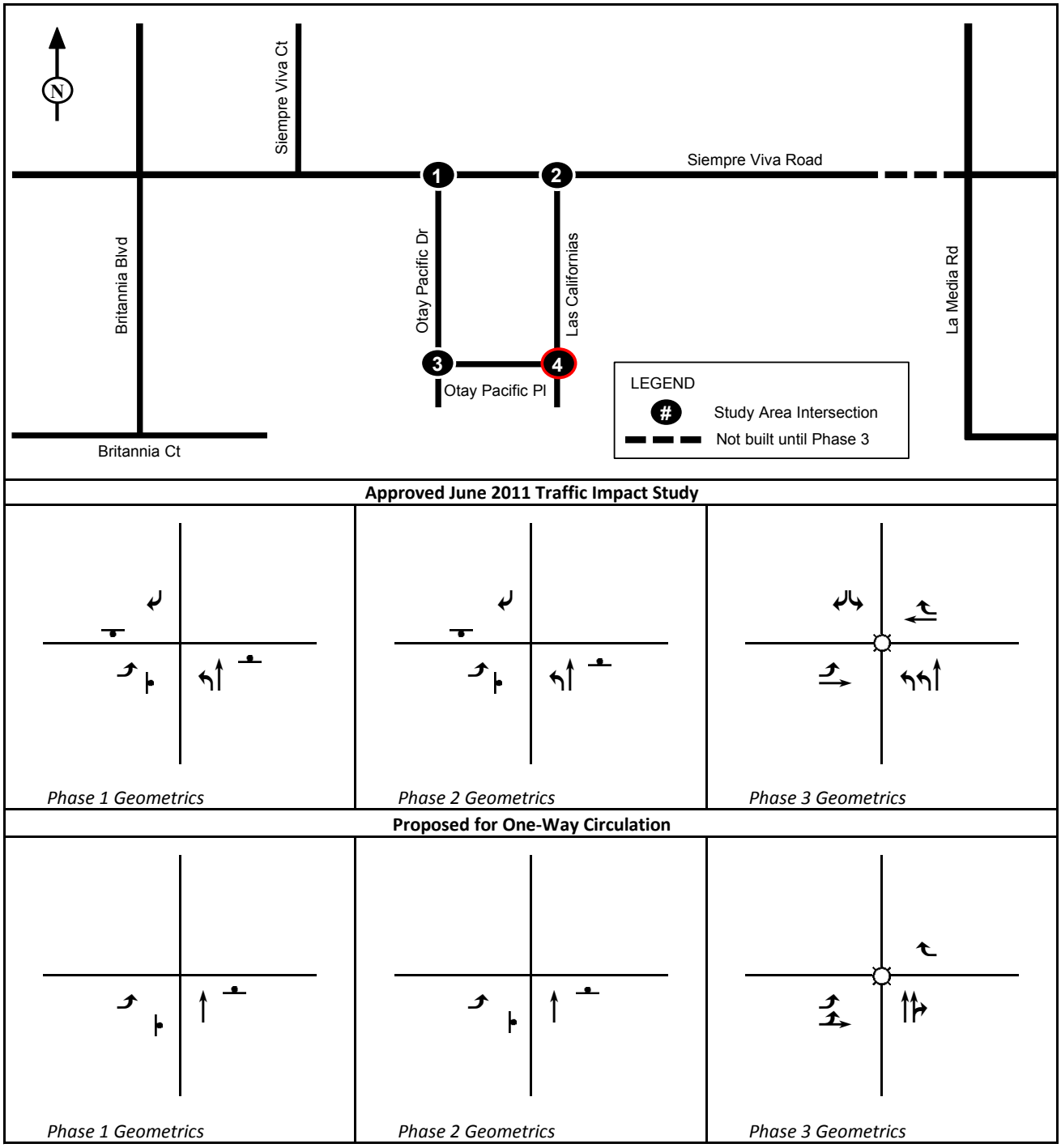
LEGEND
- Signal
- Stop Sign
- Additional Lane

Cross Border Facility

Intersection #3
Approved and Proposed Otay Pacific Drive/Otay Pacific Place
Intersection Geometrics

[1] The current intersection geometrics are different than what was assumed in the 2011 Traffic Impact Study.

The 2011 TIS assumed an eastbound driveway with left turn access, the existing eastbound apporach does not have a driveway.



LSA

LEGEND

Signal

Stop Sign

FIGURE 13

Cross Border Facility

Intersection #4

Approved and Proposed Las Californias Drive/Otay Pacific Place

Intersection Geometrics

[1] The current intersection geometrics are different than what was assumed in the 2011 Traffic Impact Study.
The 2011 TIS assumed a 1 northbound left and 1 northbound through. The existing northbound approach is: .

The internal roadway segments require fewer travel lanes with the one-way, counter-clockwise reconfiguration as compared to the configuration analyzed in the approved TIS (LSA 2011) because Otay Pacific Drive will not have northbound lanes, Las Californias Drive will not have southbound lanes, and Otay Pacific Place will not have westbound lanes.

Although fewer travel lanes would be required overall, the proposed reconfiguration would require dual westbound left-turn lanes at Otay Pacific Drive/Siempre Viva Road during Phase 3, as shown on Figure 10. The approved TIS (LSA 2011) assumed a single westbound left-turn lane at this intersection for all three CBF development phases.

In addition, Las Californias Drive/Siempre Viva Road would require installation of a traffic signal during Phase 2 with the proposed configuration, as shown on Figure 11. The approved TIS assumed a traffic signal at this intersection during Phase 3. Signal warrants for the midday peak hour were performed and are attached in Appendix D.

Lastly, the proposed reconfiguration would require dual southbound left-turn lanes at Otay Pacific Drive/Otay Pacific Place during Phase 3, as shown on Figure 12. The approved TIS assumed a single southbound left-turn lane at this intersection for all three CBF development phases.

The provision of a traffic signal at Las Californias Drive/Siempre Viva Road during Phase 2, as well as the additional turn lanes at Otay Pacific Drive/Siempre Viva Road and Otay Pacific Drive/Otay Pacific Place during Phase 3, would be included as project mitigations. The project Civil Engineer, Latitude 33, reviewed the turn pocket lengths and found the existing right-of-way able to accommodate these turn lanes.

Level of Service Analysis

A midday intersection LOS analysis was conducted for the study area intersections using the HCM 2000 methodology because the approved TIS assumed that the CBF would generate approximately 42 percent more traffic in the midday peak hour as opposed to the a.m. peak hour. In addition, an a.m. and p.m. peak-hour LOS analysis was conducted for intersections #1: Otay Pacific Drive/ Siempre Viva Road and #2: Las Californias Drive/Siempre Viva Road to evaluate the proposed circulation changes when the adjacent street traffic is typically at its highest.

The proposed volume adjustments and geometric reconfiguration of the four intersections were analyzed for all three CBF development phases. The LOS worksheets are provided in Appendix B. Table B summarizes the intersection LOS and delay results for each of the three CBF development phases.

As shown in Table B, all four study area intersections are anticipated to operate at satisfactory LOS D or better under all three development phases of the CBF with the mitigation measures in place. Intersection #2 Las Californias Drive/Siempre Viva Road is forecast to operate at unsatisfactory LOS F as a two-way stop-controlled intersection in Phase 2. Installation of a traffic signal would result in satisfactory LOS C at this intersection in Phase 2.

LSA

Table B: Midday Peak-Hour Intersection LOS Summary

	Intersection	Stop Control	Phase 1			
			Approved June 2011 TIS		Reconfiguration[1]	
			Delay (seconds)	LOS	Delay (seconds)	LOS
1	Otay Pacific Drive/Siempre Viva Road	Signal	22.2	C	0.1	A
2	Las Californias Drive/Siempre Viva Road	TWSC	9.6	A	8.5	A
3	Otay Pacific Drive/Otay Pacific Place	TWSC	9.2	A	4.3	A
4	Las Californias Drive/Otay Pacific Place	AWSC	7.9	A	9.5	A

	Intersection	Internal Control	Phase 2			
			Approved June 2011 TIS		Reconfiguration[1]	
			Delay (seconds)	LOS	Delay (seconds)	LOS
1	Otay Pacific Drive/Siempre Viva Road	Signal	18.5	B	0.1	A
2	Las Californias Drive/Siempre Viva Road	TWSC[2]	17.8	C	>80.0	F
		Signal	-	-	22.5	C
3	Otay Pacific Drive/Otay Pacific Place	TWSC	14.0	B	27.6	D
4	Las Californias Drive/Otay Pacific Place	AWSC	8.8	A	13.7	B

	Intersection	Internal Control	Phase 3			
			Approved June 2011 TIS		Reconfiguration[1]	
			Delay (seconds)	LOS	Delay (seconds)	LOS
1	Otay Pacific Drive/Siempre Viva Road	Signal	23.1	C	7.4	A
2	Las Californias Drive/Siempre Viva Road	Signal	7.1	A	15.8	B
3	Otay Pacific Drive/Otay Pacific Place	Signal	16.2	B	2.4	A
4	Las Californias Drive/Otay Pacific Place	Signal	28.2	C	13.4	B

= exceeds City's Level of Service (LOS) criteria

[1] One-way counter-clockwise reconfigured geometrics

[2] Las Californias Drive/Siempre Viva Road is shown as TWSC to reflect the LOS prior to mitigation.

TWSC = two-way stop control

AWSC = all-way stop control

It should be noted that Otay Pacific Drive/Siempre Viva Road would operate at satisfactory LOS A during Phases 1 and 2, because the Siempre Viva Road extension from east of the project site to La Media Road has not yet been constructed and, therefore, there is very little eastbound through traffic. Under Phase 3, this intersection would still operate at satisfactory LOS A with the Siempre Viva Road extension.

As shown in Table C, intersections #1: Otay Pacific Drive/Siempre Viva Road and #2: Las Californias Drive/Siempre Viva Road in the a.m. and p.m. peak hours are anticipated to operate at satisfactory LOS C or better under all three development phases of the CBF with the mitigation measures in place.

In addition to LOS, turn-pocket lengths were evaluated for the proposed reconfiguration of the four study intersections based on the HCM 95th percentile queue criteria used in the approved TIS. These 95th percentile queues were obtained from averaging multiple iterations of traffic simulations in SimTraffic, which is a microsimulation tool that builds upon the operational data used in the intersection LOS analysis and produces a simulation of the study area by mirroring the behavior of discrete vehicles. Table D summarizes the 95th percentile queues at turn pockets from these simulations. Appendix C provides SimTraffic queuing worksheets.

As shown on Tables D and E, minimal queuing in the midday and a.m. and p.m. peak hours, respectively, were simulated in all of the turn pockets at the four study intersections under Phases 1 and 2 of the CBF development. The queuing analysis was performed for intersection #2 because the one-way configuration would not permit left turns into Las Californias Drive from Siempre Viva Road. The minimal queueing at intersection #1 Otay Pacific Drive/Siempre Viva Road under Phases 1 and 2 is because the Siempre Viva Road extension has not yet been constructed (i.e., there is very little traffic to and from the east of the CBF). The minimal queuing at Otay Pacific Drive/Otay Pacific Place and Las Californias Drive/Otay Pacific Place under Phases 1 and 2 is attributed to the lack of vehicular conflicts at these intersections due to the proposed one-way, counter-clockwise circulation for the internal CBF roadways (i.e., no opposing traffic for eastbound right-turning vehicles onto Otay Pacific Drive from Siempre Viva Road).

It should be noted that 95th percentile queues (and subsequent storage length recommendations) have not been reported or made at various turning movements because these movements are trap lanes where storage would be limited only by the distance to the next upstream intersection (i.e., northbound left turns made at Las Californias Drive/Siempre Viva Road) and potential future driveway locations.

Adopted Otay Mesa Community Plan Update ADT Volumes

As previously described, the ADT volumes in the 1981 Otay Mesa Community Plan are higher than the 2014 Otay Mesa Community Plan Update. As such, this Transportation Impact Study presents a conservative, worst-case analysis by using traffic volumes that were developed based on the previous 1981 Otay Mesa Community Plan. The ADT volumes along Siempre Viva Road for the previous 1981 Otay Mesa Community Plan and the 2014 Otay Mesa Community Plan Update have been provided for comparison.

LSA

Table C: AM and PM Peak-Hour Intersection LOS Summary

	Intersection	Stop Control	Reconfiguration[1]: Phase 1			
			AM Peak Hour		PM Peak Hour	
			Delay (seconds)	LOS	Delay (seconds)	LOS
1	Otay Pacific Drive/Siempre Viva Road	Signal	0.0	A	0.1	A
2	Las Californias Drive/Siempre Viva Road	TWSC	11.0	B	11.8	B

	Intersection	Internal Control	Reconfiguration[1]: Phase 2			
			AM Peak Hour		PM Peak Hour	
			Delay (seconds)	LOS	Delay (seconds)	LOS
1	Otay Pacific Drive/Siempre Viva Road	Signal	0.7	A	0.1	A
2	Las Californias Drive/Siempre Viva Road	Signal	19.3	B	23.5	C

	Intersection	Internal Control	Reconfiguration[1]: Phase 3			
			AM Peak Hour		PM Peak Hour	
			Delay (seconds)	LOS	Delay (seconds)	LOS
1	Otay Pacific Drive/Siempre Viva Road	Signal	8.2	A	5.8	A
2	Las Californias Drive/Siempre Viva Road	Signal	7.1	A	11.9	B

[1] One-way counter-clockwise reconfigured geometrics

TWSC = two-way stop control

AWSC = all-way stop control

LSA

Table D: Midday Peak Hour Intersection Queues and Recommended Turn Pocket Lengths Summary

	Intersection	Lane	95th Percentile Queues (ft)			Recommended Turn Pocket Length (ft)
			Phase 1	Phase 2	Buildout	
1	Otay Pacific Drive/Siempre Viva Road	EBR 1	57	59	251	275
		EBR 2	--	--	234	275
		WBL 1	--	--	154	175
		WBL 2	0	0	163	175
2	Las Californias Drive/Siempre Viva Road	NBL	--	--	348	350
		NBR	--	--	157	175
3	Otay Pacific Drive/Otay Pacific Place	SBL 1	--	--	63	100
		SBL 2	0	0	85	100
4	Las Californias Drive/Otay Pacific Place	EBL	--	--	159	175

ft = feet; -- = turn pocket does not exist for this phase; EBR 1 = inside eastbound right-turn lane; EBR 2 = outside eastbound right-turn lane; WBL 1= outside westbound left-turn lane; WBL 2= inside westbound left-turn lane; SBL 1 = outside southbound left-turn lane; SBL 2 = inside southbound left-turn lane; EBL = eastbound left-turn lane. NBL = northbound left-turn lane; NBR = northbound right-turn lane.

LSA

Table E: AM and PM Peak Hour Intersection Queues and Recommended Turn Pocket Lengths Summary

	Intersection	Lane	95th Percentile Queues (ft)						Recommended Turn Pocket Length (ft)
			Phase 1		Phase 2		Buildout		
			AM	PM	AM	PM	AM	PM	
1	Otay Pacific Drive/Siempre Viva Road	EBR 1	47	54	73	34	259	137	300
		EBR 2	--	--	--	--	280	126	300
		WBL 1	--	--	--	--	136	109	175
		WBL 2	0	0	0	0	164	79	175
2	Las Californias Drive/Siempre Viva Road	NBL	--	--	--	--	238	349	350
		NBR	--	--	--	--	63	213	75

ft = feet; -- = turn pocket does not exist for this phase; EBR 1 = inside eastbound right-turn lane; EBR 2 = outside eastbound right-turn lane; WBL 1= outside westbound left-turn lane; WBL 2= inside westbound left-turn lane; NBL = northbound left-turn lane; NBR = northbound right-turn lane.

The approved TIS (LSA 2011) for the CBF was prepared prior to adoption of the 2014 Otay Mesa Community Plan Update. At this time, the previously adopted (1981) Otay Mesa Community Plan did not include the CBF facility. Siempre Viva Road between Britannia Boulevard and La Media Road was evaluated as a six-lane Primary Arterial at build out. The forecasted ADT volumes (and LOS) along Siempre Viva Road were 52,500 ADT (satisfactory LOS D) east of Britannia Boulevard and 41,500 ADT (satisfactory LOS C) west of La Media Road.

Urban Systems, Inc. prepared the Otay Mesa Community Plan Update Transportation Analysis (2012) for the approved Otay Mesa Community Plan Update. The CBF is included in this plan. Similar to the previously adopted Otay Mesa Community Plan, the currently adopted Otay Mesa Community Plan Update evaluates Siempre Viva Road between Britannia Boulevard and La Media Road as a six-lane Primary Arterial at buildout. The forecasted ADT volumes (and LOS) along Siempre Viva Road are 42,500 ADT (and satisfactory LOS C) east of Britannia Boulevard and 40,000 ADT (and satisfactory LOS C) west of La Media Road. Based on the forecasted satisfactory operations of Siempre Viva Road between Britannia Boulevard and La Media Road, which includes ADT volumes for the CBF, the recommended mitigation measure of the approved TIS of an eight-lane Primary Arterial is not recommended based on the current Otay Mesa Community Plan that includes the CBF.

Table F summarizes the roadway segment LOS for Siempre Viva Road between Britannia Boulevard and La Media Road for the previously adopted Otay Mesa Community Plan (with and without the CBF) and the currently adopted Otay Mesa Community Plan Update (with the CBF).

The “Without La Media Road” alternative deletes this extension of La Media Road across the Otay River Valley, and was the adopted scenario. Siempre Viva Road between Britannia Boulevard and La Media Road would operate at satisfactory LOS C for under build-out conditions.

IMPACTS AND MITIGATIONS

Intersection Geometrics

As previously described, the proposed one-way, counter-clockwise circulation of the CBF would require installation of a traffic signal at an intersection during Phase 2, which is earlier than identified in the approved TIS. Additional turn lanes would be required for two intersections when compared to the approved TIS for Phase 3. A summary of these additional mitigations is provided below.

- **Intersection #1 - Otay Pacific Drive/Siempre Viva Road:** Dual westbound left-turn lanes in Phase 3 (the approved TIS assumed a single westbound left-turn lane)

- **Intersection #2 - Las Californias Drive/Siempre Viva Road:** Installation of a traffic signal in Phase 2 (the approved TIS required a traffic signal in Phase 3)

- **Intersection #3 - Otay Pacific Drive/Otay Pacific Place:** Dual southbound left-turn lanes in Phase 3 (the approved TIS requires a single southbound left-turn lane)

Intersection Turn-Pocket Storage Lengths

Turn-pocket storage length recommendations have been made based on the highest 95th percentile queues simulated under each development phase of the CBF in the a.m., midday, and p.m. peak hours, including build out of the Otay Mesa Community Plan. As expected, the highest 95th percentile queues are anticipated to occur once the CBF is built out in Phase 3.

The intersection turn pocket recommendations based on the forecasted 95th percentile queues for project build out conditions are shown in Tables D and E and summarized below.

- **Intersection #1 - Otay Pacific Drive/Siempre Viva Road:** 300-foot (ft) dual eastbound right-turn lanes and 175 ft dual westbound left-turn lanes
- **Intersection #3 - Otay Pacific Drive/Otay Pacific Place:** 100 ft dual southbound left-turn lanes
- **Intersection #4 - Las Californias Drive/Otay Pacific Place:** 175 ft eastbound left-turn lane

Consistent with the approved TIS and current engineering analysis, all of the turn pockets at these study intersections will provide 120 ft transitions.

CONCLUSIONS

Based on the results of this TIS, the proposed project could be implemented without causing a significant impact to the surrounding roadway system. The proposed one-way, counter-clockwise CBF circulation is anticipated to provide acceptable operations during all three development phases, including build out of the CBF and the current Otay Mesa Community Plan, with additional intersection mitigations.

The proposed reconfiguration would require dual westbound left-turn lanes (as opposed to a single left-turn lane) at Otay Pacific Drive/Siempre Viva Road in Phase 3, installation of a traffic signal at Las Californias Drive/Siempre Viva Road in Phase 2 (as opposed to Phase 3), and dual southbound left-turn lanes (as opposed to a single left-turn lane) at Otay Pacific Drive/Otay Pacific Place in Phase 3.

LSA

Table F: Siempre Viva Road ADT Volumes and LOS Summary

San Diego-Tijuana Cross Border Facilty Project Traffic Impact Study (LSA, June 28, 2011)

Adopted Buildout Community Plan No Project	# of Lanes	Classification	Capacity	ADT	V/C	LOS
Siempre Viva Rd east of Britannia Blvd	6	Primary Arterial	60,000	52,500	0.88	D
Siempre Viva Rd west of La Media Rd	6	Primary Arterial	60,000	41,500	0.69	C

Adopted Buildout Community Plan Plus CBF	# of Lanes	Classification	Capacity	ADT	V/C	LOS
Siempre Viva Rd east of Britannia Blvd	6	Primary Arterial	60,000	82,700	1.38	**F**
Siempre Viva Rd west of La Media Rd	6	Primary Arterial	60,000	58,000	0.97	**E**

With Mitigation	# of Lanes	Classification	Capacity	ADT	V/C	LOS
Siempre Viva Rd east of Britannia Blvd[1]	8	Primary Arterial	70,000	82,700	1.18	F
Siempre Viva Rd west of La Media Rd[2]	8	Primary Arterial	70,000	58,000	0.83	C

Otay Mesa Community Plan Update Traffic Analysis (Urban Systems Associates, Inc., June 14, 2012)

Scenario 3B Without La Media Rd[3]	# of Lanes	Classification	Capacity	ADT	V/C	LOS
Siempre Viva Rd east of Britannia Blvd[4]	6	Primary Arterial	60,000	42,500	0.71	C
Siempre Viva Rd west of La Media Rd[5]	6	Primary Arterial	60,000	40,000	0.67	C

[1] Partially mitigated

[2] Mitigated to LOS D or better

[3] Includes the Cross Border Facility (CBF)

[4] Includes 30,200 CBF ADT

[5] Includes 16,500 CBF ADT

Bolded and shaded values represent unsatisfactory level of service E or F.

ADT = average daily traffic volumes

CBF = Cross Border Facility

LOS = level of service

V/C = volume-to-capacity ratio

REFERENCES

City of San Diego. 1981. *Otay Mesa Community Plan*. April 27.

_____. 1998. *Traffic Impact Study Manual*. July.

_____. 2014a. *Otay Mesa Community Plan Update Environmental Impact Report*. February 21.

_____. 2014b. *Otay Mesa Community Plan Update*. March 11.

LSA Associates, Inc. (LSA). 2011. *San Diego-Tijuana Cross Border Facility Project Traffic Impact Study*. San Diego. June 28.

San Diego Municipal Code Land Development Code. 2003. "Trip Generation Manual," May 2003.

San Diego International Airport Master Plan EIR. 2008. April 2008 (Proposed Airport Land Use Plan, Year 2030).

Transportation Research Board. 2000. *Highway Capacity Manual*.

Urban Systems Associates, Inc. 2012. *Otay Mesa Community Plan Update Transportation Analysis*. San Diego. June 14.

APPENDIX A

INTERSECTION VOLUME REDISTRIBUTION WORKSHEETS

Cross Border Facility Volume Redistribution for One-Way Circulation
Midday Peak-Hour Traffic Volumes

1. Otay Pacific Drive (NS) / Siempre Viva Road (EW)

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
San Diego-Tijuana Cross Border Facility Project TIS June 28, 2011 Volumes													
Phase 1:	232	0	0	0	0	0	0	201	350	0	91	0	**874**
Phase 2:	459	0	0	0	0	0	0	689	655	0	179	0	**1982**
Phase 3:	611	0	115	0	0	0	0	1212	874	343	580	0	**3735**
Adjusted (One-Way Private Streets) Volumes													
Phase 1:	0	0	0	0	0	0	0	114	437	0	323	0	**874**
Phase 2:	0	0	0	0	0	0	0	559	785	0	638	0	**1982**
Phase 3:	0	0	0	0	0	0	0	906	1180	590	1191	0	**3867**

2. Las Californias Drive (NS) / Siempre Viva Road (EW)

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
San Diego-Tijuana Cross Border Facility Project TIS June 28, 2011 Volumes													
Phase 1:	79	0	0	0	0	0	0	114	87	0	12	0	**292**
Phase 2:	117	0	0	0	0	0	0	559	130	0	62	0	**868**
Phase 3:	100	0	191	0	0	0	0	906	306	247	823	0	**2573**
Adjusted (One-Way Private Streets) Volumes													
Phase 1:	311	0	0	0	0	0	0	114	0	0	12	0	**437**
Phase 2:	576	0	0	0	0	0	0	559	0	0	62	0	**1197**
Phase 3:	711	0	306	0	0	0	0	791	0	0	1070	0	**2878**

3. Otay Pacific Drive (NS) / Otay Pacific Place (EW)

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
San Diego-Tijuana Cross Border Facility Project TIS June 28, 2011 Volumes													
Phase 1:	0	0	0	153	197	0	33	0	0	44	0	232	**659**
Phase 2:	0	0	0	227	292	56	37	0	0	65	0	345	**1022**
Phase 3:	0	0	0	513	516	49	33	4	0	89	7	564	**1775**
Adjusted (One-Way Private Streets) Volumes													
Phase 1:	0	0	0	192	245	0	0	0	33	0	0	0	**470**
Phase 2:	0	0	0	254	395	56	0	0	37	0	0	0	**742**
Phase 3:	0	0	0	564	780	49	0	37	0	0	0	0	**1430**

4. Las Californias Drive (NS) / Otay Pacific Place (EW)

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
San Diego-Tijuana Cross Border Facility Project TIS June 28, 2011 Volumes													
Phase 1:	168	60	0	0	0	87	18	0	0	0	0	0	**333**
Phase 2:	249	89	0	0	0	130	27	0	0	0	0	0	**495**
Phase 3:	529	179	0	41	0	274	59	15	0	0	10	27	**1134**
Adjusted (One-Way Private Streets) Volumes													
Phase 1:	0	271	0	0	0	0	166	0	0	0	0	0	**437**
Phase 2:	0	437	0	0	0	0	268	0	0	0	0	0	**705**
Phase 3:	0	864	0	0	0	0	514	15	0	0	0	37	**1430**

Cross Border Facility Volume Redistribution for One-Way Circulation
AM Peak Hour Traffic Volumes

1. Otay Pacific Drive (NS) / Siempre Viva Road (EW)

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
San Diego - Tijuana Cross Border Facility Project TIA June 28, 2011 Volumes													
Phase 1:	164	0	0	0	0	0	0	186	246	0	68	0	**664**
Phase 2:	368	0	0	0	0	0	0	700	514	0	149	0	**1731**
Build Out:	455	0	109	0	0	0	0	380	698	280	95	0	**2017**
Adjusted (One-Way Private Streets) Volumes													
Phase 1:	0	0	0	0	0	0	0	124	308	0	232	0	**664**
Phase 2:	0	0	0	0	0	0	0	609	605	0	517	0	**1731**
Build Out:	0	0	0	0	0	0	0	109	969	537	550	0	**2165**

2. Las Californias Drive (NS) / Siempre Viva Road (EW)

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
San Diego - Tijuana Cross Border Facility Project TIA June 28, 2011 Volumes													
Phase 1:	55	0	0	0	0	0	0	124	62	0	13	0	**254**
Phase 2:	82	0	0	0	0	0	0	609	91	0	67	0	**849**
Build Out:	95	0	149	0	0	0	0	109	271	257	280	0	**1161**
Adjusted (One-Way Private Streets) Volumes													
Phase 1:	219	0	0	0	0	0	0	124	0	0	13	0	**356**
Phase 2:	450	0	0	0	0	0	0	609	0	0	67	0	**1126**
Build Out:	550	0	258	0	0	0	0	0	0	0	537	0	**1345**

Cross Border Facility Volume Redistribution for One-Way Circulation
PM Peak Hour Traffic Volumes

1. Otay Pacific Drive (NS) / Siempre Viva Road (EW)

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
San Diego - Tijuana Cross Border Facility Project TIA June 28, 2011 Volumes													
Phase 1:	209	0	0	0	0	0	0	82	208	0	185	0	**684**
Phase 2:	484	0	0	0	0	0	0	225	510	0	686	0	**1905**
Build Out:	671	0	241	0	0	0	0	394	583	232	239	0	**2360**
Adjusted (One-Way Private Streets) Volumes													
Phase 1:	0	0	0	0	0	0	0	30	260	0	394	0	**684**
Phase 2:	0	0	0	0	0	0	0	148	587	0	1170	0	**1905**
Build Out:	0	0	0	0	0	0	0	241	736	380	910	0	**2267**

2. Las Californias Drive (NS) / Siempre Viva Road (EW)

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
San Diego - Tijuana Cross Border Facility Project TIA June 28, 2011 Volumes													
Phase 1:	65	0	0	0	0	0	0	30	52	0	120	0	**267**
Phase 2:	96	0	0	0	0	0	0	148	77	0	590	0	**911**
Build Out:	239	0	280	0	0	0	0	241	153	148	232	0	**1293**
Adjusted (One-Way Private Streets) Volumes													
Phase 1:	274	0	0	0	0	0	0	30	0	0	120	0	**424**
Phase 2:	580	0	0	0	0	0	0	148	0	0	590	0	**1318**
Build Out:	910	0	521	0	0	0	0	0	0	0	380	0	**1811**

APPENDIX B

LOS WORKSHEETS

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	114	437	0	323	0	0
Future Volume (vph)	114	437	0	323	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0		
Lane Util. Factor	1.00	1.00		1.00		
Frt	1.00	0.85		1.00		
Flt Protected	1.00	1.00		1.00		
Satd. Flow (prot)	1827	1760		1827		
Flt Permitted	1.00	1.00		1.00		
Satd. Flow (perm)	1827	1760		1827		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	120	460	0	340	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	120	460	0	340	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	4		3	8		
Permitted Phases		4				
Actuated Green, G (s)	40.0	40.0		40.0		
Effective Green, g (s)	40.0	40.0		40.0		
Actuated g/C Ratio	1.00	1.00		1.00		
Clearance Time (s)	4.0	4.0		4.0		
Vehicle Extension (s)	3.0	3.0		3.0		
Lane Grp Cap (vph)	1827	1760		1827		
v/s Ratio Prot	0.07			0.19		
v/s Ratio Perm		c0.26				
v/c Ratio	0.07	0.26		0.19		
Uniform Delay, d1	0.0	0.0		0.0		
Progression Factor	1.00	1.00		1.00		
Incremental Delay, d2	0.0	0.1		0.0		
Delay (s)	0.0	0.1		0.0		
Level of Service	A	A		A		
Approach Delay (s)	0.1			0.0	0.0	
Approach LOS	A			A	A	

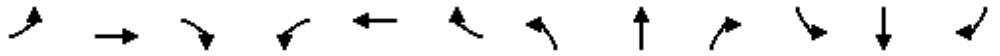
Intersection Summary			
HCM 2000 Control Delay	0.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	114	0	0	12	311	0
Future Volume (Veh/h)	114	0	0	12	311	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	124	0	0	13	338	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	653					
pX, platoon unblocked						
vC, conflicting volume			124		137	124
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			124		137	124
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		60	100
cM capacity (veh/h)			1450		852	921

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	124	13	338
Volume Left	0	0	338
Volume Right	0	0	0
cSH	1700	1700	852
Volume to Capacity	0.07	0.01	0.40
Queue Length 95th (ft)	0	0	48
Control Delay (s)	0.0	0.0	12.0
Lane LOS			B
Approach Delay (s)	0.0	0.0	12.0
Approach LOS			B

Intersection Summary			
Average Delay	8.5		
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	33	0	0	0	0	0	0	0	192	245	0
Future Volume (Veh/h)	0	33	0	0	0	0	0	0	0	192	245	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	35	0	0	0	0	0	0	0	202	258	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											1150	
pX, platoon unblocked												
vC, conflicting volume	662	662	258	680	662	0	258			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	662	662	258	680	662	0	258			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	90	100	100	100	100	100			88		
cM capacity (veh/h)	339	335	781	304	335	1085	1307			1623		

Direction, Lane #	EB 1	SB 1	SB 2
Volume Total	35	202	258
Volume Left	0	202	0
Volume Right	0	0	0
cSH	335	1623	1700
Volume to Capacity	0.10	0.12	0.15
Queue Length 95th (ft)	9	11	0
Control Delay (s)	17.0	7.5	0.0
Lane LOS	C	A	
Approach Delay (s)	17.0	3.3	
Approach LOS	C		

Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	30.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	166	0	0	271	0	0
Future Volume (vph)	166	0	0	271	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	175	0	0	285	0	0

Direction, Lane #	EB 1	NB 1
Volume Total (vph)	175	285
Volume Left (vph)	175	0
Volume Right (vph)	0	0
Hadj (s)	0.23	0.03
Departure Headway (s)	4.8	4.4
Degree Utilization, x	0.23	0.35
Capacity (veh/h)	706	794
Control Delay (s)	9.3	9.7
Approach Delay (s)	9.3	9.7
Approach LOS	A	A

Intersection Summary			
Delay	9.5		
Level of Service	A		
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	559	785	0	638	0	0
Future Volume (vph)	559	785	0	638	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0		
Lane Util. Factor	1.00	1.00		1.00		
Frt	1.00	0.85		1.00		
Flt Protected	1.00	1.00		1.00		
Satd. Flow (prot)	1827	1760		1827		
Flt Permitted	1.00	1.00		1.00		
Satd. Flow (perm)	1827	1760		1827		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	588	826	0	672	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	588	826	0	672	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	4		3	8		
Permitted Phases		4				
Actuated Green, G (s)	40.0	40.0		40.0		
Effective Green, g (s)	40.0	40.0		40.0		
Actuated g/C Ratio	1.00	1.00		1.00		
Clearance Time (s)	4.0	4.0		4.0		
Vehicle Extension (s)	3.0	3.0		3.0		
Lane Grp Cap (vph)	1827	1760		1827		
v/s Ratio Prot	0.32			0.37		
v/s Ratio Perm		c0.47				
v/c Ratio	0.32	0.47		0.37		
Uniform Delay, d1	0.0	0.0		0.0		
Progression Factor	1.00	1.00		1.00		
Incremental Delay, d2	0.1	0.2		0.1		
Delay (s)	0.1	0.2		0.1		
Level of Service	A	A		A		
Approach Delay (s)	0.2			0.1	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

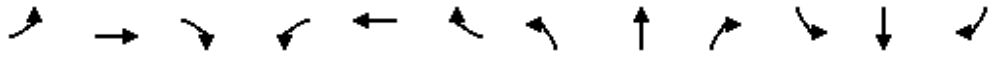
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	559	0	0	62	576	0
Future Volume (Veh/h)	559	0	0	62	576	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	608	0	0	67	626	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	653					
pX, platoon unblocked						
vC, conflicting volume			608		675	608
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			608		675	608
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		0	100
cM capacity (veh/h)			961		416	492

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	608	67	626
Volume Left	0	0	626
Volume Right	0	0	0
cSH	1700	1700	416
Volume to Capacity	0.36	0.04	1.50
Queue Length 95th (ft)	0	0	832
Control Delay (s)	0.0	0.0	263.7
Lane LOS			F
Approach Delay (s)	0.0	0.0	263.7
Approach LOS			F

Intersection Summary			
Average Delay	126.9		
Intersection Capacity Utilization	105.2%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	559	0	0	62	576	0
Future Volume (vph)	559	0	0	62	576	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	1.00			1.00	1.00	
Flt Protected	1.00			1.00	0.95	
Satd. Flow (prot)	1827			1827	1736	
Flt Permitted	1.00			1.00	0.95	
Satd. Flow (perm)	1827			1827	1736	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	608	0	0	67	626	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	608	0	0	67	626	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA			NA	Prot	
Protected Phases	4			8	2	
Permitted Phases						
Actuated Green, G (s)	23.2			23.2	28.8	
Effective Green, g (s)	23.2			23.2	28.8	
Actuated g/C Ratio	0.39			0.39	0.48	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	706			706	833	
v/s Ratio Prot	c0.33			0.04	c0.36	
v/s Ratio Perm						
v/c Ratio	0.86			0.09	0.75	
Uniform Delay, d1	16.9			11.7	12.7	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	10.5			0.1	6.2	
Delay (s)	27.4			11.8	18.9	
Level of Service	C			B	B	
Approach Delay (s)	27.4			11.8	18.9	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	105.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	37	0	0	0	0	0	0	0	254	395	56
Future Volume (Veh/h)	0	37	0	0	0	0	0	0	0	254	395	56
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	40	0	0	0	0	0	0	0	276	429	61
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											1150	
pX, platoon unblocked												
vC, conflicting volume	1012	1012	460	1001	1042	0	490			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1012	1012	460	1001	1042	0	490			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	80	100	100	100	100	100			83		
cM capacity (veh/h)	189	199	602	164	191	1085	1073			1623		

Direction, Lane #	EB 1	SB 1	SB 2
Volume Total	40	276	490
Volume Left	0	276	0
Volume Right	0	0	61
cSH	199	1623	1700
Volume to Capacity	0.20	0.17	0.29
Queue Length 95th (ft)	18	15	0
Control Delay (s)	27.6	7.7	0.0
Lane LOS	D	A	
Approach Delay (s)	27.6	2.8	
Approach LOS	D		

Intersection Summary				
Average Delay	4.0			
Intersection Capacity Utilization	47.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	268	0	0	437	0	0
Future Volume (vph)	268	0	0	437	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	282	0	0	460	0	0

Direction, Lane #	EB 1	NB 1
Volume Total (vph)	282	460
Volume Left (vph)	282	0
Volume Right (vph)	0	0
Hadj (s)	0.23	0.03
Departure Headway (s)	5.3	4.7
Degree Utilization, x	0.42	0.60
Capacity (veh/h)	640	730
Control Delay (s)	12.0	14.7
Approach Delay (s)	12.0	14.7
Approach LOS	B	B

Intersection Summary			
Delay	13.7		
Level of Service	B		
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	906	1180	590	1191	0	0
Future Volume (vph)	906	1180	590	1191	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	10	12	12	12
Total Lost time (s)	4.0	4.0	4.0	4.0		
Lane Util. Factor	0.91	0.88	0.97	0.91		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	4988	2733	3143	4988		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	4988	2733	3143	4988		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	954	1242	621	1254	0	0
RTOR Reduction (vph)	0	40	0	0	0	0
Lane Group Flow (vph)	954	1202	621	1254	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	4		3	8		
Permitted Phases		4				
Actuated Green, G (s)	36.4	36.4	15.6	60.0		
Effective Green, g (s)	36.4	36.4	15.6	60.0		
Actuated g/C Ratio	0.61	0.61	0.26	1.00		
Clearance Time (s)	4.0	4.0	4.0	4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	3026	1658	817	4988		
v/s Ratio Prot	0.19		c0.20	0.25		
v/s Ratio Perm		c0.44				
v/c Ratio	0.32	0.72	0.76	0.25		
Uniform Delay, d1	5.7	8.3	20.5	0.0		
Progression Factor	1.00	1.00	0.84	1.00		
Incremental Delay, d2	0.1	1.6	2.8	0.0		
Delay (s)	5.8	9.9	20.0	0.0		
Level of Service	A	A	B	A		
Approach Delay (s)	8.1			6.6	0.0	
Approach LOS	A			A	A	

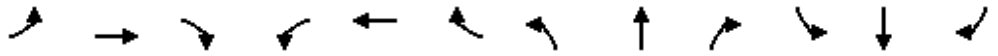
Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	906	0	0	1070	711	306
Future Volume (vph)	906	0	0	1070	711	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	10	12	12	16
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.91			0.91	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	4988			4988	1736	1760
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	4988			4988	1736	1760
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	954	0	0	1126	748	322
RTOR Reduction (vph)	0	0	0	0	0	6
Lane Group Flow (vph)	954	0	0	1126	748	316
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	18.4			18.4	33.6	33.6
Effective Green, g (s)	18.4			18.4	33.6	33.6
Actuated g/C Ratio	0.31			0.31	0.56	0.56
Clearance Time (s)	4.0			4.0	4.0	4.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1529			1529	972	985
v/s Ratio Prot	0.19			c0.23	c0.43	
v/s Ratio Perm						0.18
v/c Ratio	0.62			0.74	0.77	0.32
Uniform Delay, d1	17.8			18.6	10.2	7.1
Progression Factor	0.67			1.00	1.00	1.00
Incremental Delay, d2	0.8			1.9	5.9	0.9
Delay (s)	12.7			20.5	16.1	7.9
Level of Service	B			C	B	A
Approach Delay (s)	12.7			20.5	13.6	
Approach LOS	B			C	B	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

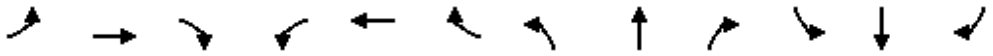
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	37	0	0	0	0	0	0	0	564	780	49
Future Volume (vph)	0	37	0	0	0	0	0	0	0	564	780	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0								4.0	4.0	
Lane Util. Factor		1.00								0.97	0.95	
Frt		1.00								1.00	0.99	
Flt Protected		1.00								0.95	1.00	
Satd. Flow (prot)		1863								3433	3508	
Flt Permitted		1.00								0.95	1.00	
Satd. Flow (perm)		1863								3433	3508	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	39	0	0	0	0	0	0	0	594	821	52
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	145	4	0
Lane Group Flow (vph)	0	39	0	0	0	0	0	0	0	449	869	0
Turn Type		NA								Prot	NA	
Protected Phases		4								1	6	
Permitted Phases												
Actuated Green, G (s)		3.0								34.0	34.0	
Effective Green, g (s)		3.0								34.0	34.0	
Actuated g/C Ratio		0.07								0.76	0.76	
Clearance Time (s)		4.0								4.0	4.0	
Vehicle Extension (s)		3.0								3.0	3.0	
Lane Grp Cap (vph)		124								2593	2650	
v/s Ratio Prot		c0.02								0.13	c0.25	
v/s Ratio Perm												
v/c Ratio		0.31								0.17	0.33	
Uniform Delay, d1		20.0								1.5	1.8	
Progression Factor		1.00								1.00	1.00	
Incremental Delay, d2		1.5								0.0	0.3	
Delay (s)		21.5								1.6	2.1	
Level of Service		C								A	A	
Approach Delay (s)		21.5			0.0			0.0			1.9	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	2.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	514	15	0	0	0	37	0	864	0	0	0	0
Future Volume (vph)	514	15	0	0	0	37	0	864	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0		4.0				
Lane Util. Factor	0.95	0.95				1.00		0.95				
Frt	1.00	1.00				0.86		1.00				
Flt Protected	0.95	0.95				1.00		1.00				
Satd. Flow (prot)	1681	1690				1611		3539				
Flt Permitted	0.95	0.95				1.00		1.00				
Satd. Flow (perm)	1681	1690				1611		3539				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	541	16	0	0	0	39	0	909	0	0	0	0
RTOR Reduction (vph)	99	99	0	0	0	38	0	0	0	0	0	0
Lane Group Flow (vph)	177	182	0	0	0	1	0	909	0	0	0	0
Turn Type	Split	NA				Prot		NA				
Protected Phases	4	4				3		2				
Permitted Phases												
Actuated Green, G (s)	11.6	11.6				1.6		29.8				
Effective Green, g (s)	11.6	11.6				1.6		29.8				
Actuated g/C Ratio	0.21	0.21				0.03		0.54				
Clearance Time (s)	4.0	4.0				4.0		4.0				
Vehicle Extension (s)	3.0	3.0				3.0		3.0				
Lane Grp Cap (vph)	354	356				46		1917				
v/s Ratio Prot	0.11	c0.11				c0.00		c0.26				
v/s Ratio Perm												
v/c Ratio	0.50	0.51				0.02		0.47				
Uniform Delay, d1	19.1	19.2				25.9		7.8				
Progression Factor	1.00	1.00				1.00		1.00				
Incremental Delay, d2	1.1	1.2				0.2		0.8				
Delay (s)	20.3	20.4				26.2		8.6				
Level of Service	C	C				C		A				
Approach Delay (s)		20.4			26.2			8.6			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	124	308	0	232	0	0
Future Volume (vph)	124	308	0	232	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0		
Lane Util. Factor	1.00	1.00		1.00		
Frt	1.00	0.85		1.00		
Flt Protected	1.00	1.00		1.00		
Satd. Flow (prot)	1827	1760		1827		
Flt Permitted	1.00	1.00		1.00		
Satd. Flow (perm)	1827	1760		1827		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	131	324	0	244	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	131	324	0	244	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	4		3	8		
Permitted Phases		4				
Actuated Green, G (s)	40.0	40.0		40.0		
Effective Green, g (s)	40.0	40.0		40.0		
Actuated g/C Ratio	1.00	1.00		1.00		
Clearance Time (s)	4.0	4.0		4.0		
Vehicle Extension (s)	3.0	3.0		3.0		
Lane Grp Cap (vph)	1827	1760		1827		
v/s Ratio Prot	0.07			0.13		
v/s Ratio Perm		c0.18				
v/c Ratio	0.07	0.18		0.13		
Uniform Delay, d1	0.0	0.0		0.0		
Progression Factor	1.00	1.00		1.00		
Incremental Delay, d2	0.0	0.1		0.0		
Delay (s)	0.0	0.1		0.0		
Level of Service	A	A		A		
Approach Delay (s)	0.0			0.0	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	124	0	0	13	219	0
Future Volume (Veh/h)	124	0	0	13	219	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	135	0	0	14	238	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	653					
pX, platoon unblocked						
vC, conflicting volume			135		149	135
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			135		149	135
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		72	100
cM capacity (veh/h)			1437		838	909

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	135	14	238
Volume Left	0	0	238
Volume Right	0	0	0
cSH	1700	1700	838
Volume to Capacity	0.08	0.01	0.28
Queue Length 95th (ft)	0	0	29
Control Delay (s)	0.0	0.0	11.0
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.0
Approach LOS			B

Intersection Summary			
Average Delay	6.8		
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	609	605	0	517	0	0
Future Volume (vph)	609	605	0	517	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0		
Lane Util. Factor	1.00	1.00		1.00		
Frt	1.00	0.85		1.00		
Flt Protected	1.00	1.00		1.00		
Satd. Flow (prot)	1827	1760		1827		
Flt Permitted	1.00	1.00		1.00		
Satd. Flow (perm)	1827	1760		1827		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	641	637	0	544	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	641	637	0	544	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	4		3	8		
Permitted Phases		4				
Actuated Green, G (s)	40.0	40.0		40.0		
Effective Green, g (s)	40.0	40.0		40.0		
Actuated g/C Ratio	1.00	1.00		1.00		
Clearance Time (s)	4.0	4.0		4.0		
Vehicle Extension (s)	3.0	3.0		3.0		
Lane Grp Cap (vph)	1827	1760		1827		
v/s Ratio Prot	0.35			0.30		
v/s Ratio Perm		c0.36				
v/c Ratio	0.35	0.36		0.30		
Uniform Delay, d1	0.0	0.0		0.0		
Progression Factor	1.00	1.00		1.00		
Incremental Delay, d2	0.1	0.1		0.1		
Delay (s)	0.1	0.1		0.1		
Level of Service	A	A		A		
Approach Delay (s)	0.1			0.1	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	609	0	0	67	450	0
Future Volume (vph)	609	0	0	67	450	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	1.00			1.00	1.00	
Flt Protected	1.00			1.00	0.95	
Satd. Flow (prot)	1827			1827	1736	
Flt Permitted	1.00			1.00	0.95	
Satd. Flow (perm)	1827			1827	1736	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	662	0	0	73	489	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	662	0	0	73	489	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA			NA	Prot	
Protected Phases	4			8	2	
Permitted Phases						
Actuated Green, G (s)	23.8			23.8	23.2	
Effective Green, g (s)	23.8			23.8	23.2	
Actuated g/C Ratio	0.43			0.43	0.42	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	790			790	732	
v/s Ratio Prot	c0.36			0.04	c0.28	
v/s Ratio Perm						
v/c Ratio	0.84			0.09	0.67	
Uniform Delay, d1	13.9			9.2	12.8	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	7.8			0.1	4.8	
Delay (s)	21.6			9.3	17.6	
Level of Service	C			A	B	
Approach Delay (s)	21.6			9.3	17.6	
Approach LOS	C			A	B	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	109	969	537	550	0	0
Future Volume (vph)	109	969	537	550	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	10	12	12	12
Total Lost time (s)	4.0	4.0	4.0	4.0		
Lane Util. Factor	0.91	0.88	0.97	0.91		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	4988	2733	3143	4988		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	4988	2733	3143	4988		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	115	1020	565	579	0	0
RTOR Reduction (vph)	0	52	0	0	0	0
Lane Group Flow (vph)	115	968	565	579	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	4		3	8		
Permitted Phases		4				
Actuated Green, G (s)	36.9	36.9	15.1	60.0		
Effective Green, g (s)	36.9	36.9	15.1	60.0		
Actuated g/C Ratio	0.61	0.61	0.25	1.00		
Clearance Time (s)	4.0	4.0	4.0	4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	3067	1680	790	4988		
v/s Ratio Prot	0.02		c0.18	0.12		
v/s Ratio Perm		c0.35				
v/c Ratio	0.04	0.58	0.72	0.12		
Uniform Delay, d1	4.6	6.9	20.5	0.0		
Progression Factor	1.00	1.00	0.78	1.00		
Incremental Delay, d2	0.0	0.5	2.8	0.0		
Delay (s)	4.6	7.4	18.7	0.0		
Level of Service	A	A	B	A		
Approach Delay (s)	7.1			9.2	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	537	550	258
Future Volume (vph)	0	0	0	537	550	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	10	12	12	16
Total Lost time (s)				4.0	4.0	4.0
Lane Util. Factor				0.91	1.00	1.00
Frt				1.00	1.00	0.85
Flt Protected				1.00	0.95	1.00
Satd. Flow (prot)				4988	1736	1760
Flt Permitted				1.00	0.95	1.00
Satd. Flow (perm)				4988	1736	1760
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	565	579	272
RTOR Reduction (vph)	0	0	0	0	0	95
Lane Group Flow (vph)	0	0	0	565	579	177
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type				NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)				13.0	39.0	39.0
Effective Green, g (s)				13.0	39.0	39.0
Actuated g/C Ratio				0.22	0.65	0.65
Clearance Time (s)				4.0	4.0	4.0
Vehicle Extension (s)				3.0	3.0	3.0
Lane Grp Cap (vph)				1080	1128	1144
v/s Ratio Prot				c0.11	c0.33	
v/s Ratio Perm						0.10
v/c Ratio				0.52	0.51	0.15
Uniform Delay, d1				20.8	5.5	4.1
Progression Factor				1.00	1.00	1.00
Incremental Delay, d2				0.5	1.7	0.3
Delay (s)				21.2	7.2	4.4
Level of Service				C	A	A
Approach Delay (s)	0.0			21.2	6.3	
Approach LOS	A			C	A	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	30	260	0	394	0	0
Future Volume (vph)	30	260	0	394	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0		
Lane Util. Factor	1.00	1.00		1.00		
Frt	1.00	0.85		1.00		
Flt Protected	1.00	1.00		1.00		
Satd. Flow (prot)	1827	1760		1827		
Flt Permitted	1.00	1.00		1.00		
Satd. Flow (perm)	1827	1760		1827		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	274	0	415	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	32	274	0	415	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	4		3	8		
Permitted Phases		4				
Actuated Green, G (s)	40.0	40.0		40.0		
Effective Green, g (s)	40.0	40.0		40.0		
Actuated g/C Ratio	1.00	1.00		1.00		
Clearance Time (s)	4.0	4.0		4.0		
Vehicle Extension (s)	3.0	3.0		3.0		
Lane Grp Cap (vph)	1827	1760		1827		
v/s Ratio Prot	0.02			c0.23		
v/s Ratio Perm		0.16				
v/c Ratio	0.02	0.16		0.23		
Uniform Delay, d1	0.0	0.0		0.0		
Progression Factor	1.00	1.00		1.00		
Incremental Delay, d2	0.0	0.0		0.1		
Delay (s)	0.0	0.0		0.1		
Level of Service	A	A		A		
Approach Delay (s)	0.0			0.1	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	28.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	30	0	0	120	274	0
Future Volume (Veh/h)	30	0	0	120	274	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	0	0	130	298	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	653					
pX, platoon unblocked						
vC, conflicting volume			33		163	33
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			33		163	33
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		64	100
cM capacity (veh/h)			1566		823	1035

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	33	130	298
Volume Left	0	0	298
Volume Right	0	0	0
cSH	1700	1700	823
Volume to Capacity	0.02	0.08	0.36
Queue Length 95th (ft)	0	0	42
Control Delay (s)	0.0	0.0	11.8
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.8
Approach LOS			B

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	28.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	148	587	0	1170	0	0
Future Volume (vph)	148	587	0	1170	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0		
Lane Util. Factor	1.00	1.00		1.00		
Frt	1.00	0.85		1.00		
Flt Protected	1.00	1.00		1.00		
Satd. Flow (prot)	1827	1760		1827		
Flt Permitted	1.00	1.00		1.00		
Satd. Flow (perm)	1827	1760		1827		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	156	618	0	1232	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	156	618	0	1232	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	4		3	8		
Permitted Phases		4				
Actuated Green, G (s)	40.0	40.0		40.0		
Effective Green, g (s)	40.0	40.0		40.0		
Actuated g/C Ratio	1.00	1.00		1.00		
Clearance Time (s)	4.0	4.0		4.0		
Vehicle Extension (s)	3.0	3.0		3.0		
Lane Grp Cap (vph)	1827	1760		1827		
v/s Ratio Prot	0.09			c0.67		
v/s Ratio Perm		0.35				
v/c Ratio	0.09	0.35		0.67		
Uniform Delay, d1	0.0	0.0		0.0		
Progression Factor	1.00	1.00		1.00		
Incremental Delay, d2	0.0	0.1		1.0		
Delay (s)	0.0	0.1		1.0		
Level of Service	A	A		A		
Approach Delay (s)	0.1			1.0	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	109.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	148	0	0	590	580	0
Future Volume (vph)	148	0	0	590	580	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	1.00			1.00	1.00	
Flt Protected	1.00			1.00	0.95	
Satd. Flow (prot)	1827			1827	1736	
Flt Permitted	1.00			1.00	0.95	
Satd. Flow (perm)	1827			1827	1736	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	161	0	0	641	630	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	161	0	0	641	630	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA			NA	Prot	
Protected Phases	4			8	2	
Permitted Phases						
Actuated Green, G (s)	23.7			23.7	28.3	
Effective Green, g (s)	23.7			23.7	28.3	
Actuated g/C Ratio	0.39			0.39	0.47	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	721			721	818	
v/s Ratio Prot	0.09			c0.35	c0.36	
v/s Ratio Perm						
v/c Ratio	0.22			0.89	0.77	
Uniform Delay, d1	12.0			16.9	13.2	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.2			12.9	6.9	
Delay (s)	12.2			29.8	20.1	
Level of Service	B			C	C	
Approach Delay (s)	12.2			29.8	20.1	
Approach LOS	B			C	C	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	109.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	241	736	380	910	0	0
Future Volume (vph)	241	736	380	910	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	10	12	12	12
Total Lost time (s)	4.0	4.0	4.0	4.0		
Lane Util. Factor	0.91	0.88	0.97	0.91		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	4988	2733	3143	4988		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	4988	2733	3143	4988		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	254	775	400	958	0	0
RTOR Reduction (vph)	0	104	0	0	0	0
Lane Group Flow (vph)	254	671	400	958	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	4		3	8		
Permitted Phases		4				
Actuated Green, G (s)	39.2	39.2	12.8	60.0		
Effective Green, g (s)	39.2	39.2	12.8	60.0		
Actuated g/C Ratio	0.65	0.65	0.21	1.00		
Clearance Time (s)	4.0	4.0	4.0	4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	3258	1785	670	4988		
v/s Ratio Prot	0.05		c0.13	0.19		
v/s Ratio Perm		c0.25				
v/c Ratio	0.08	0.38	0.60	0.19		
Uniform Delay, d1	3.8	4.8	21.3	0.0		
Progression Factor	1.00	1.00	0.98	1.00		
Incremental Delay, d2	0.0	0.1	1.1	0.0		
Delay (s)	3.8	4.9	22.0	0.0		
Level of Service	A	A	C	A		
Approach Delay (s)	4.6			6.5	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	380	910	521
Future Volume (vph)	0	0	0	380	910	521
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	10	12	12	16
Total Lost time (s)				4.0	4.0	4.0
Lane Util. Factor				0.91	1.00	1.00
Frt				1.00	1.00	0.85
Flt Protected				1.00	0.95	1.00
Satd. Flow (prot)				4988	1736	1760
Flt Permitted				1.00	0.95	1.00
Satd. Flow (perm)				4988	1736	1760
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	400	958	548
RTOR Reduction (vph)	0	0	0	0	0	168
Lane Group Flow (vph)	0	0	0	400	958	380
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type				NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)				10.4	41.6	41.6
Effective Green, g (s)				10.4	41.6	41.6
Actuated g/C Ratio				0.17	0.69	0.69
Clearance Time (s)				4.0	4.0	4.0
Vehicle Extension (s)				3.0	3.0	3.0
Lane Grp Cap (vph)				864	1203	1220
v/s Ratio Prot				c0.08	c0.55	
v/s Ratio Perm						0.22
v/c Ratio				0.46	0.80	0.31
Uniform Delay, d1				22.3	6.3	3.6
Progression Factor				1.00	1.00	1.00
Incremental Delay, d2				0.4	5.5	0.7
Delay (s)				22.7	11.8	4.3
Level of Service				C	B	A
Approach Delay (s)	0.0			22.7	9.1	
Approach LOS	A			C	A	

Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX C

QUEUEING WORKSHEETS

Intersection: 1: Otay Pacific Dr & Siempre Viva Rd

Movement	EB	EB	WB
Directions Served	T	R	T
Maximum Queue (ft)	24	72	43
Average Queue (ft)	2	31	8
95th Queue (ft)	14	57	28
Link Distance (ft)	1118		615
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		350	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Las Californias Dr & Siempre Viva Rd

Movement	NB
Directions Served	LR
Maximum Queue (ft)	89
Average Queue (ft)	55
95th Queue (ft)	80
Link Distance (ft)	1094
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Otay Pacific Dr & Otay Pacific Pl

Movement	EB
Directions Served	R
Maximum Queue (ft)	54
Average Queue (ft)	26
95th Queue (ft)	50
Link Distance (ft)	199
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Las Californias Dr & Otay Pacific Pl

Movement	EB	NB
Directions Served	L	T
Maximum Queue (ft)	71	101
Average Queue (ft)	43	53
95th Queue (ft)	65	77
Link Distance (ft)	610	472
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

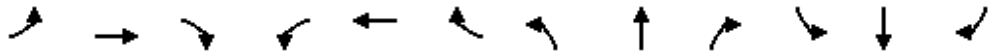
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	559	785	0	638	0	0
Future Volume (vph)	559	785	0	638	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0		
Lane Util. Factor	1.00	1.00		1.00		
Frt	1.00	0.85		1.00		
Flt Protected	1.00	1.00		1.00		
Satd. Flow (prot)	1827	1760		1827		
Flt Permitted	1.00	1.00		1.00		
Satd. Flow (perm)	1827	1760		1827		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	588	826	0	672	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	588	826	0	672	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	4		3	8		
Permitted Phases		4				
Actuated Green, G (s)	40.0	40.0		40.0		
Effective Green, g (s)	40.0	40.0		40.0		
Actuated g/C Ratio	1.00	1.00		1.00		
Clearance Time (s)	4.0	4.0		4.0		
Vehicle Extension (s)	3.0	3.0		3.0		
Lane Grp Cap (vph)	1827	1760		1827		
v/s Ratio Prot	0.32			0.37		
v/s Ratio Perm		c0.47				
v/c Ratio	0.32	0.47		0.37		
Uniform Delay, d1	0.0	0.0		0.0		
Progression Factor	1.00	1.00		1.00		
Incremental Delay, d2	0.1	0.2		0.1		
Delay (s)	0.1	0.2		0.1		
Level of Service	A	A		A		
Approach Delay (s)	0.2			0.1	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	0.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	559	0	0	62	576	0
Future Volume (vph)	559	0	0	62	576	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	1.00			1.00	1.00	
Flt Protected	1.00			1.00	0.95	
Satd. Flow (prot)	1827			1827	1736	
Flt Permitted	1.00			1.00	0.95	
Satd. Flow (perm)	1827			1827	1736	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	608	0	0	67	626	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	608	0	0	67	626	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA			NA	Prot	
Protected Phases	4			8	2	
Permitted Phases						
Actuated Green, G (s)	23.2			23.2	28.8	
Effective Green, g (s)	23.2			23.2	28.8	
Actuated g/C Ratio	0.39			0.39	0.48	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	706			706	833	
v/s Ratio Prot	c0.33			0.04	c0.36	
v/s Ratio Perm						
v/c Ratio	0.86			0.09	0.75	
Uniform Delay, d1	16.9			11.7	12.7	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	10.5			0.1	6.2	
Delay (s)	27.4			11.8	18.9	
Level of Service	C			B	B	
Approach Delay (s)	27.4			11.8	18.9	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	105.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	37	0	0	0	0	0	0	254	395	56
Future Volume (Veh/h)	0	0	37	0	0	0	0	0	0	254	395	56
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	40	0	0	0	0	0	0	276	429	61
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											1150	
pX, platoon unblocked												
vC, conflicting volume	1012	1012	460	1021	1042	0	490			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1012	1012	460	1021	1042	0	490			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	93	100	100	100	100			83		
cM capacity (veh/h)	189	199	602	174	191	1085	1073			1623		

Direction, Lane #	EB 1	SB 1	SB 2
Volume Total	40	276	490
Volume Left	0	276	0
Volume Right	40	0	61
cSH	602	1623	1700
Volume to Capacity	0.07	0.17	0.29
Queue Length 95th (ft)	5	15	0
Control Delay (s)	11.4	7.7	0.0
Lane LOS	B	A	
Approach Delay (s)	11.4	2.8	
Approach LOS	B		

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	47.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	268	0	0	437	0	0
Future Volume (vph)	268	0	0	437	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	282	0	0	460	0	0

Direction, Lane #	EB 1	NB 1
Volume Total (vph)	282	460
Volume Left (vph)	282	0
Volume Right (vph)	0	0
Hadj (s)	0.23	0.03
Departure Headway (s)	5.3	4.7
Degree Utilization, x	0.42	0.60
Capacity (veh/h)	640	730
Control Delay (s)	12.0	14.7
Approach Delay (s)	12.0	14.7
Approach LOS	B	B

Intersection Summary			
Delay	13.7		
Level of Service	B		
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

Intersection: 1: Otay Pacific Dr & Siempre Viva Rd

Movement	EB	EB	EB	EB	EB	WB	WB
Directions Served	T	T	T	R	R	L	L
Maximum Queue (ft)	178	174	1140	283	228	161	164
Average Queue (ft)	105	69	97	189	138	113	125
95th Queue (ft)	161	130	555	251	234	154	163
Link Distance (ft)	1106	1106	1106				
Upstream Blk Time (%)			1				
Queuing Penalty (veh)			0				
Storage Bay Dist (ft)				350	350	250	250
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: Las Californias Dr & Siempre Viva Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	T	T	L	R
Maximum Queue (ft)	160	159	147	471	408	192	423	216
Average Queue (ft)	91	104	82	282	213	80	221	70
95th Queue (ft)	135	160	150	388	335	167	348	157
Link Distance (ft)	615	615	615	1167	1167	1167	1070	1070
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 3: Otay Pacific Dr & Otay Pacific Pl

Movement	EB	SB	SB	SB	SB
Directions Served	TR	L	L	T	TR
Maximum Queue (ft)	93	127	152	71	77
Average Queue (ft)	26	26	51	23	46
95th Queue (ft)	59	87	118	63	85
Link Distance (ft)	121			1039	1039
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		350	350		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: Las Californias Dr & Otay Pacific Pl

Movement	EB	EB	WB	NB	NB
Directions Served	L	LT	R	T	TR
Maximum Queue (ft)	221	160	78	226	190
Average Queue (ft)	99	63	28	114	63
95th Queue (ft)	159	128	59	201	139
Link Distance (ft)	268	268	73	449	449
Upstream Blk Time (%)			2		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Otay Pacific Dr & Siempre Viva Rd

Movement	EB	EB	WB
Directions Served	T	R	T
Maximum Queue (ft)	24	50	21
Average Queue (ft)	5	33	4
95th Queue (ft)	21	47	18
Link Distance (ft)	1118		615
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		350	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Las Californias Dr & Siempre Viva Rd

Movement	NB
Directions Served	LR
Maximum Queue (ft)	102
Average Queue (ft)	66
95th Queue (ft)	106
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 1: Otay Pacific Dr & Siempre Viva Rd

Movement	EB	EB	WB
Directions Served	T	R	T
Maximum Queue (ft)	23	68	25
Average Queue (ft)	5	29	14
95th Queue (ft)	20	73	33
Link Distance (ft)	1118		615
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		350	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Las Californias Dr & Siempre Viva Rd

Movement	EB	WB	NB
Directions Served	T	T	LR
Maximum Queue (ft)	356	74	188
Average Queue (ft)	236	21	130
95th Queue (ft)	365	68	205
Link Distance (ft)	615	1183	1094
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 1: Otay Pacific Dr & Siempre Viva Rd

Movement	EB	EB	EB	WB	WB
Directions Served	T	R	R	L	L
Maximum Queue (ft)	73	258	254	120	151
Average Queue (ft)	27	212	157	96	123
95th Queue (ft)	71	259	280	136	164
Link Distance (ft)	1106				
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		350	350	250	250
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Las Californias Dr & Siempre Viva Rd

Movement	WB	WB	NB	NB
Directions Served	T	T	L	R
Maximum Queue (ft)	183	53	228	56
Average Queue (ft)	151	38	182	49
95th Queue (ft)	196	72	238	63
Link Distance (ft)	1167	1167	1070	1070
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 1: Otay Pacific Dr & Siempre Viva Rd

Movement	EB	WB
Directions Served	R	T
Maximum Queue (ft)	51	23
Average Queue (ft)	27	5
95th Queue (ft)	54	20
Link Distance (ft)		615
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	350	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Las Californias Dr & Siempre Viva Rd

Movement	NB
Directions Served	LR
Maximum Queue (ft)	79
Average Queue (ft)	59
95th Queue (ft)	89
Link Distance (ft)	1094
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 1: Otay Pacific Dr & Siempre Viva Rd

Movement	EB	EB	WB
Directions Served	T	R	T
Maximum Queue (ft)	24	31	47
Average Queue (ft)	5	11	19
95th Queue (ft)	20	34	48
Link Distance (ft)	1118		615
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		350	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Las Californias Dr & Siempre Viva Rd

Movement	EB	WB	NB
Directions Served	T	T	LR
Maximum Queue (ft)	73	421	179
Average Queue (ft)	42	282	145
95th Queue (ft)	83	460	185
Link Distance (ft)	615	1183	1094
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 1: Otay Pacific Dr & Siempre Viva Rd

Movement	EB	EB	EB	WB	WB
Directions Served	T	R	R	L	L
Maximum Queue (ft)	74	144	129	97	75
Average Queue (ft)	36	92	69	63	62
95th Queue (ft)	78	137	126	109	79
Link Distance (ft)	1106				
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		350	350	250	250
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Las Californias Dr & Siempre Viva Rd

Movement	WB	WB	WB	NB	NB
Directions Served	T	T	T	L	R
Maximum Queue (ft)	136	123	30	318	221
Average Queue (ft)	94	67	12	223	103
95th Queue (ft)	134	118	37	349	213
Link Distance (ft)	1167	1167	1167	1070	1070
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

APPENDIX D

SIGNAL WARRANT ANALYSIS WORKSHEETS

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

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

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

APPROACH LANES	One	2 or More				Hour
Both Approaches - Major Street						
Higher Approach - Minor Street						

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

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

PART A **SATISFIED YES ☐ NO ☐**

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

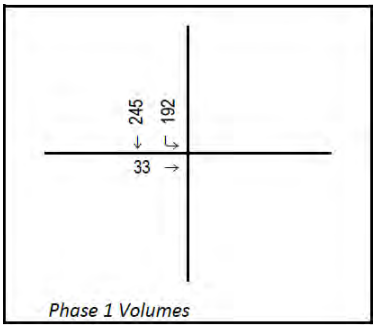
1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐ No ☐
2. The volume on the same minor street approach (one direction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

PART B **SATISFIED YES ☐ NO ☒**

APPROACH LANES	One	2 or More		Hour Midday
Both Approaches - Major Street		X		437
Higher Approach - Minor Street	X			33

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

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



Phase 1 Volumes

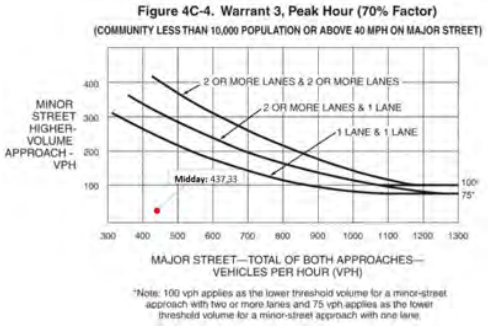


Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

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

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

APPROACH LANES	One	2 or More					Hour
Both Approaches - Major Street							
Higher Approach - Minor Street							

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

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

PART A **SATISFIED YES ☐ NO ☐**

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

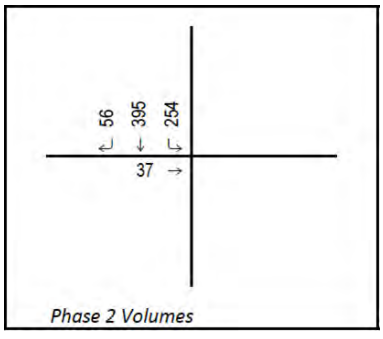
1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐ No ☐
2. The volume on the same minor street approach (one direction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

PART B **SATISFIED YES ☐ NO ☒**

APPROACH LANES	One	2 or More		Hour Midday
Both Approaches - Major Street		X		705
Higher Approach - Minor Street	X			37

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

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



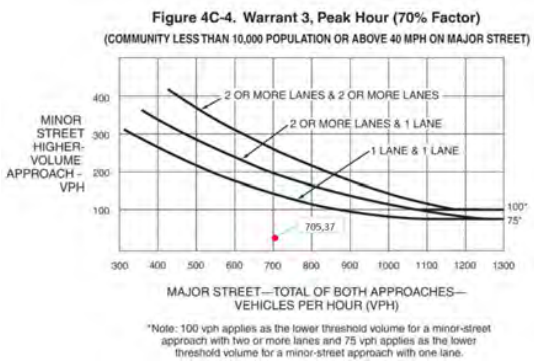


Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

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

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

APPROACH LANES	One	2 or More					Hour
Both Approaches - Major Street							
Higher Approach - Minor Street							

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

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

PART A **SATISFIED YES ☐ NO ☐**

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

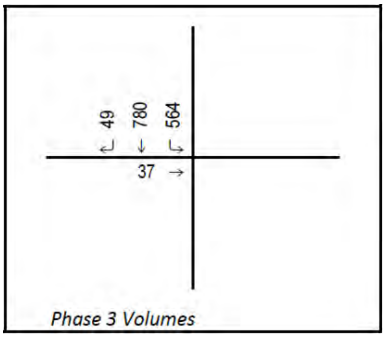
1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐ No ☐
2. The volume on the same minor street approach (one direction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

PART B **SATISFIED YES ☐ NO ☒**

APPROACH LANES	One	2 or More		Hour Midday
Both Approaches - Major Street		X		1393
Higher Approach - Minor Street	X			37

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

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



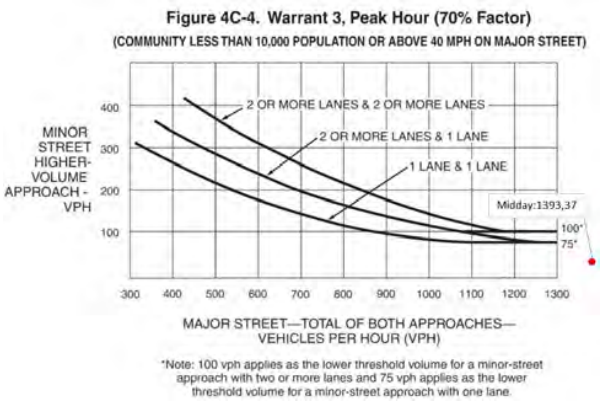


Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

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

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

APPROACH LANES	One	2 or More					Hour
Both Approaches - Major Street							
Higher Approach - Minor Street							

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

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

PART A **SATISFIED YES ☐ NO ☐**

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

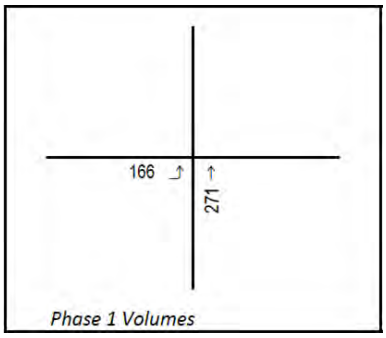
1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐ No ☐
2. The volume on the same minor street approach (one direction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

PART B **SATISFIED YES ☐ NO ☒**

APPROACH LANES	One	2 or More		Hour Midday
Both Approaches - Major Street	X			271
Higher Approach - Minor Street	X			166

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

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



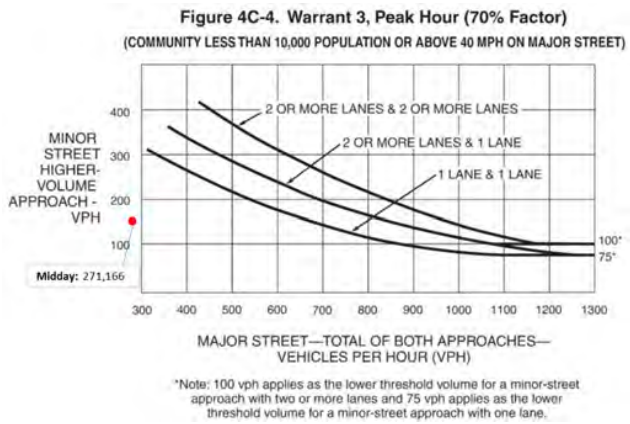


Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

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

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

APPROACH LANES	One	2 or More				Hour
Both Approaches - Major Street						
Higher Approach - Minor Street						

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

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

PART A **SATISFIED YES ☐ NO ☐**

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

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

PART B **SATISFIED YES ☒ NO ☐**

APPROACH LANES	One	2 or More		Hour Midday
Both Approaches - Major Street		X		864
Higher Approach - Minor Street	X			566

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

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

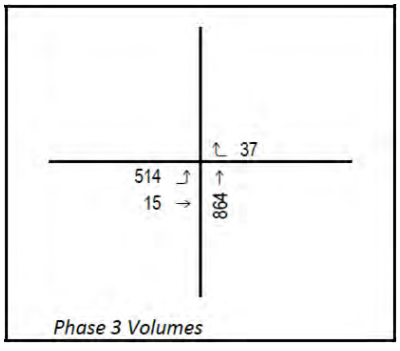
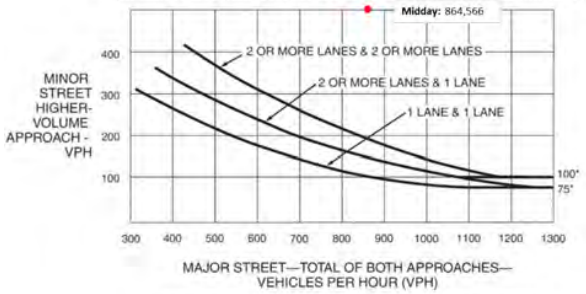


Figure 4C-4. Warrant 3, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

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

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

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

APPROACH LANES	One	2 or More	Hour			
Both Approaches - Major Street						
Higher Approach - Minor Street						

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

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

PART A **SATISFIED YES ☐ NO ☐**

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

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

PART B **SATISFIED YES ☒ NO ☐**

APPROACH LANES	One	2 or More	Hour Midday
Both Approaches - Major Street	X		864
Higher Approach - Minor Street	X		566

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

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