SAN DIEGO ASSOCIATION OF GOVERNMENTS

BORDER TO BAYSHORE BIKEWAY

TRAFFIC & SAFETY IMPACT ASSESSMENT

FINAL
OCTOBER 29, 2018

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EXECUTIVE SUMMARY

This *Traffic and Safety Impact Assessment* analyzes the traffic and safety impacts of the proposed Border to Bayshore Bikeway ("project").

The project's 6.5-mile route consists of a variety of bicycle and pedestrian improvements in the cities of Imperial Beach and San Diego. The project is consistent with the mobility and safety goals of all applicable plans, policies and programs, and will help to implement—and provide connections to—many planned networks and projects.

TRAFFIC IMPACTS

The traffic analysis examines 20 roadway segments and 29 intersections under the following scenarios:

- **Existing Conditions:** Without project
- **Opening Day:** Without and with project
- **Horizon Year:** Without and with project

The evaluation of direct and cumulative significant impacts is based on the governing standards of each local jurisdiction.

On Opening Day, the analysis estimates the project will have the following direct impacts:

- **Roadways:** No significant direct impacts.
- **Intersections:** No significant direct impacts.

In the Horizon Year, the analysis estimates the project will have the following cumulative impacts:

- **Roadways:** One segment experiences a significant cumulative impact:
  - 11. Beyer Boulevard from Smythe Avenue to Caminito de los Niños
- **Intersections:** One intersection experiences a significant cumulative impact:
  - 20. Beyer Boulevard & Caminito de los Niños (PM peak hour only)

SAFETY IMPACTS

The project safety assessment evaluates the safety benefits of each proposed bikeway type, reviews the additional safety and traffic calming features that accompany the bikeways and describes how these safety features are integrated into each project segment.

The primary finding is that the project is expected to provide unambiguous, net safety benefits to all roadway users, including cyclists, pedestrians and motorists. All project features are designed in accordance with best practices to maximize roadway safety. Taken together, the suite of proposed improvements will improve safety in the project area by:

- Protecting cyclists by increasing separation from motorized traffic.
- Providing new and enhanced crossings for pedestrians.
- Upgrading intersections for safer operations through dedicated or advanced signal phasing for cyclists and pedestrians.
- Installing high-visibility striping and signage.
- Reducing conflicts with transit vehicles.
- Promoting safer vehicle speeds through a variety of traffic-calming features.

1 PROJECT DESCRIPTION

The proposed 6.5-mile Border to Bayshore Bikeway ("project") consists of a variety of bicycle and pedestrian improvements in the cities of Imperial Beach and San Diego. All bikeway features are aimed at achieving the project's primary goal to provide a bicycle facility suitable for people of all ages and abilities. Section 6 contains a more detailed analysis of the project's safety benefits.

1.1 FACILITIES & FEATURES

The project footprint is within existing street rights-of-way. As summarized in Table 1.1, the proposed facilities vary across the project route based on the context of existing conditions. Appendix A contains a full set of concept plans showing project limits and features.

Table 1.1 Project Route & Facility Types

Street	Facility
13th Street	Buffered Class II bike lanes
Grove Avenue/Halo Street/Ingrid Avenue	Enhanced Class III bike route/bike boulevard
Oro Vista Road	Enhanced Class III bike route/bike boulevard
Iris Avenue	Enhanced Class III bike route
Beyer Boulevard	Class IV two-way cycle track on the west side of the street
West Park Avenue, East Park Avenue, East Seaward Avenue, East Hall Avenue	Combination of Class IV cycle tracks, Class II buffered bike lanes and enhanced Class III bike routes
I-805 Pedestrian Bridge	Existing facility
East Beyer Boulevard	*I-805 pedestrian bridge to Center Street/Hill Street*: Class IV two-way cycle track on the west side of the street *Center Street/Hill Street to approximately 350 feet north of Bolton Hall Road:* Enhanced Class III bike route *Approximately 350 feet north of Bolton Hall Road to Camino de la Plaza/East San Ysidro Boulevard:* Buffered Class II bike lanes
East San Ysidro Boulevard	Enhanced Class III bike route

Figure 1.1 is a regional map showing the project location in southwest San Diego County. Figure 1.2 and Figure 1.3 are detail maps showing the proposed bikeway route and accompanying intersection treatments, roadway modifications and safety improvements.

Figure 1.1 Regional Map

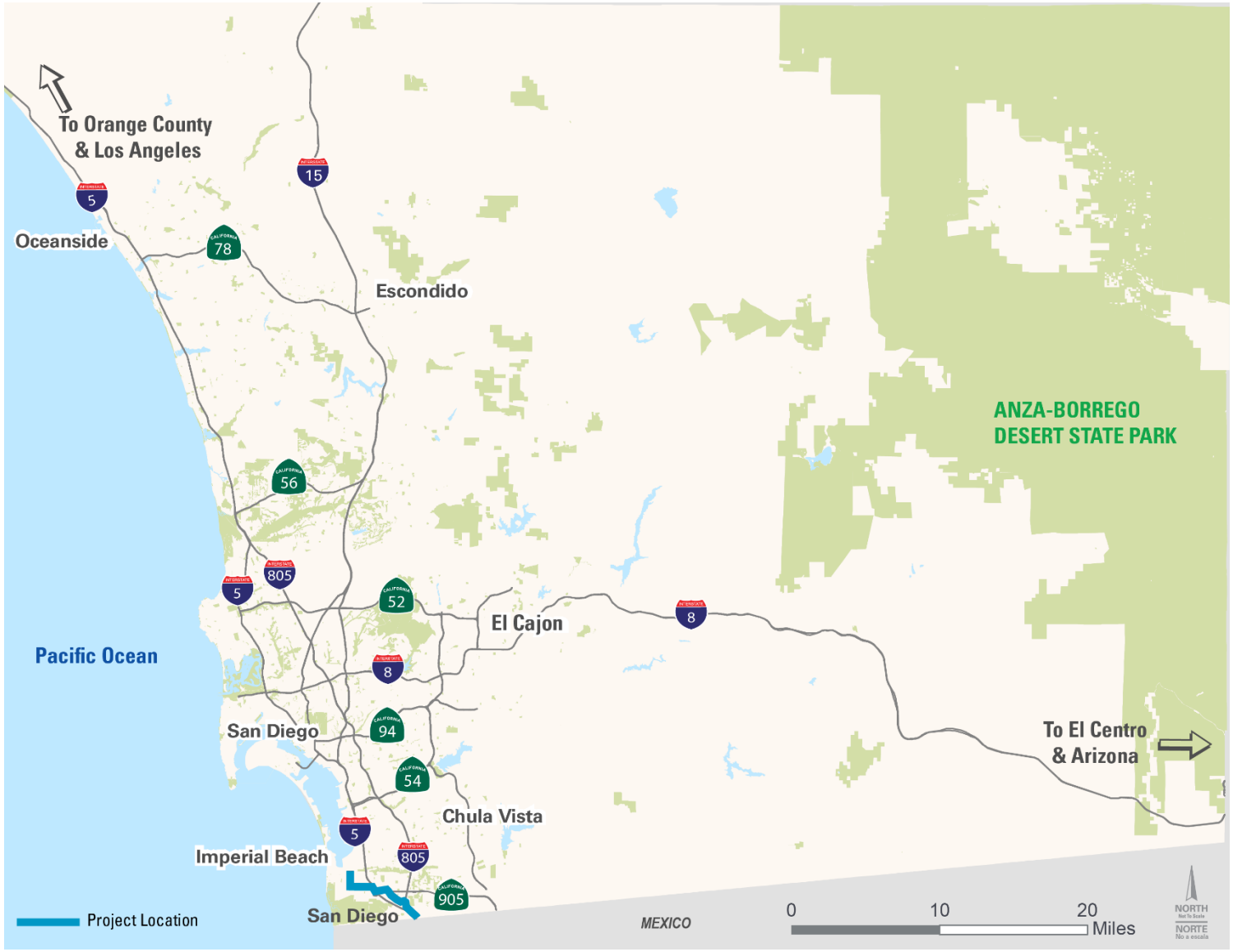

Figure 1.2 Project Features, North

Figure 1.3 Project Features, South

Table 1.2 summarizes the project's proposed signal modifications at intersections.

Table 1.2 Traffic Signal Modifications

	Main Roadway	Side Roadway	Control	*Signing and Striping*	*Physical Improvements (New Poles and/or Signal Heads)*	*Leading Pedestrian Indicator (LPI)*	*New Vehicular Phasing to Accommodate Cyclists*
1	13th Street	SR-75/Palm Avenue	TS	X	X	X	
3	13th Street	Imperial Beach Boulevard	TS	X	X	X	
11	Grove Avenue / Ingrid Avenue	Hollister Street	TS	X	X		
13	Iris Avenue	25th Street / 27th Street	TS	X	X		
14	Iris Avenue	Howard Avenue	TS	X			
15	Beyer Boulevard	Iris Avenue/SR-905 WB Ramps	TS	X	X		
16	Beyer Boulevard	Dairy Mart Road/SR-905 EB Ramps	TS	X	X		X
17	Beyer Boulevard	Del Sur Boulevard	TS	X	X		
19	Beyer Boulevard	Smythe Avenue East	TS	X	X		X
20	Beyer Boulevard	Caminito de los Niños	TS	X	X	X	
21	Beyer Boulevard	West Park Avenue/Alaquinas Drive	TS	X	X		
35	East San Ysidro Boulevard	East Beyer Boulevard/Camino de la Plaza	TS	X	X		
36	East San Ysidro Boulevard	Rail Court/I-5 NB Ramps	TS	X			

1.2 CONSISTENCY WITH PLANS & PROJECTS

The project is consistent with the mobility and safety goals of all applicable plans, policies and programs, including:

- *San Diego Forward: The Regional Plan* (SANDAG, 2015)
- *Riding to 2050: The San Diego Regional Bike Plan* (SANDAG, 2010)
- *City of San Diego General Plan* (City of San Diego, 2008)
- *Otay Mesa-Nestor Community Plan & Local Coastal Program* (City of San Diego, 1997)
- *San Ysidro Community Plan & Local Coastal Program* (City of San Diego, 1990 & 2016)
- *San Ysidro Historic Village Specific Plan* (City of San Diego, 2016)
- *City of San Diego Bicycle Master Plan* (City of San Diego, 2013)
- *City of Imperial Beach General Plan & Local Coastal Plan* (City of Imperial Beach, 2015)
- *City of Imperial Beach Bicycle Transportation Plan* (City of Imperial Beach, 2008)
- *Palm Avenue Master Plan* (City of Imperial Beach, 2014 Draft)

Table 1.3 summarizes the project's key consistencies with applicable plans, showing the locations where the project will help to implement—or provide connections to—planned networks and projects.

Table 1.3 Summary of Plan Consistency

Project Roadway	Applicable Plans
13th Street	– City of Imperial Beach *General Plan* – City of Imperial Beach *Bicycle Transportation Plan* – Planned connecting projects on Palm Avenue and Imperial Beach Boulevard
Iris Avenue	– City of San Diego *Otay Mesa-Nestor Community Plan* – City of San Diego *Bicycle Master Plan*
Beyer Boulevard, East Beyer Boulevard, East San Ysidro Boulevard	– City of San Diego *San Ysidro Community Plan* – City of San Diego *Bicycle Master Plan* – SANDAG *Riding to 2050: San Diego Regional Bike Plan*
West Park Avenue, East Park Avenue, East Seaward Avenue, East Hall Avenue, I-805 Pedestrian Bridge	– City of San Diego *San Ysidro Community Plan* – City of San Diego *Bicycle Master Plan*

2 METHODOLOGY

The statutory exemption pursuant to California Public Resources Code Section 21080.20.5 requires “an assessment of any traffic and safety impacts of the project.” This section describes the methods used to conduct that assessment.

2.1 SAFETY ASSESSMENT METHODOLOGY

The project safety assessment (Section 0) employed four steps:

- Confirmation that project features are consistent, and do not conflict, with any previously adopted plans or projects (summarized in Section 1.2).
- Evaluation of the safety benefits of each proposed bikeway type.
- Review of additional safety and traffic calming features that accompany the bikeways.
- Description of how these safety features are integrated into each segment of the project.

During initial planning, the project team also assessed the existing roadway network in terms of Level of Traffic Stress (LTS), a quantitative measure of cyclist comfort. The results of this analysis are in Appendix B. The potential to improve LTS conditions—and the accompanying safety benefits—helped inform the selection of the project route and the design of all features.

2.2 TRAFFIC ANALYSIS SCENARIOS & MEASURES

The project is anticipated to open between years 2020-2022. Due to the availability of data from the regional transportation model, the traffic analysis used 2020 model runs for Opening Day and 2040 model runs for Horizon Year. The following scenarios were analyzed:

- **Existing Conditions:** Without project
- **Opening Day:** Without and with project
- **Horizon Year:** Without and with project

The analysis results include several key measures, including:

- **Average Daily Traffic (ADT):** Mean volume of two-way traffic in a 24-hour period.
- **Volume-to-Capacity Ratio (V/C):** Degree of traffic saturation per lane, expressed as a ratio of volume (typically ADT) divided by capacity.
- **Level of Service (LOS):** Qualitative measure of traffic operating conditions, defined by national and local standards detailed in Sections 2.4 and 2.5.

2.3 TRAFFIC VOLUME METHODOLOGY

Developing volumes for roadway and intersection analysis involves different procedures depending on the study scenario being analyzed.

EXISTING CONDITIONS VOLUMES

For roadway segment volumes, pneumatic tubes were laid across predetermined study roadway segments to count the number vehicles crossing in each direction over a 24-hour period. For intersection turning movements, video detection cameras were set up to count the number of vehicles entering or exiting an intersection by movement (turning or through) during the morning

and evening peak periods: 7:00-9:00 AM and 4:00-6:00 PM. In addition to vehicular movements, the project team collected existing pedestrian and cyclist volumes during the peak periods.

All roadway and intersection counts were collected on Tuesday, May 8, 2018. Appendix C contains the individual counts for all intersections and roadway segments.

FUTURE-YEAR CONDITIONS VOLUMES

To determine the future roadway and intersection volumes in the Opening Day and Horizon Year scenarios involved the development of growth factors to grow existing volumes from 2018. To develop these growth factors, the project team compared unadjusted volumes along key roadway segments from SANDAG's *Activity Based Model (ABM)* for Year 2012 and Year 2040. The resulting growth factors were then applied to the 2018 volumes, growing them in a linear fashion to Opening Day and Horizon Year.

The final growth factors, resulting volumes and maps from the *ABM* are in Appendix D.

2.4 TRAFFIC ROADWAY SEGMENT CAPACITY ANALYSIS

The analysis includes 20 roadway segments covering the entire project route, listed in Table 2.1 and shown in Figure 2.1 and Figure 2.2.

Table 2.1 Study Roadway Segments

	Main Roadway	From	To	Jurisdiction	Level of Service Standards
1	13th Street	Cypress Avenue	Palm Avenue	Imperial Beach	SANTEC/ITE
2	13th Street	Palm Avenue	Imperial Beach Boulevard	Imperial Beach	SANTEC/ITE
3	13th Street	Imperial Beach Boulevard	Grove Avenue	Imperial Beach	SANTEC/ITE
4	Grove Avenue/Halo Street	13th Street	19th Street	Imperial Beach/ San Diego	San Diego
5	Grove Avenue/Ingrid Avenue	19th Street	Hollister Street/Oro Vista Road	San Diego	San Diego
6	Oro Vista Road	Grove Avenue/Ingrid Avenue	Iris Avenue	San Diego	San Diego
7	Iris Avenue	Oro Vista Road	Beyer Boulevard/SR-905 WB Ramps	San Diego	San Diego
8	Beyer Boulevard	Iris Avenue/SR-905 WB Ramps	Dairy Mart Road/SR-905 EB Ramps	San Diego	San Diego
9	Beyer Boulevard	Dairy Mart Road/SR-905 EB Ramps	Del Sur Boulevard	San Diego	San Diego
10	Beyer Boulevard	Del Sur Boulevard	Smythe Avenue	San Diego	San Diego
11	Beyer Boulevard	Smythe Avenue	Caminito de los Niños	San Diego	San Diego
12	Beyer Boulevard	Caminito de los Niños	West Park Avenue	San Diego	San Diego
13	West Park Avenue	Beyer Boulevard	East Seaward Avenue	San Diego	San Diego
14	East Seaward Avenue	West Park Avenue	East Park Avenue	San Diego	San Diego
15	West Park Avenue	East Seaward Avenue	East Hall Avenue	San Diego	San Diego
16	East Park Avenue	East Seaward Avenue	East Hall Avenue	San Diego	San Diego
17	East Hall Avenue	West Park Avenue	Olive Drive	San Diego	San Diego
18	East Beyer Boulevard	Filoi Avenue	Center Street	San Diego	San Diego
19	East Beyer Boulevard	Center Street	East San Ysidro Boulevard/ Camino de la Plaza	San Diego	San Diego
20	East San Ysidro Boulevard	East Beyer Boulevard/ Camino de la Plaza	Rail Court/I-5 Ramps	San Diego	San Diego

Roadway segment analysis is based on classifications and capacity thresholds defined by the governing jurisdiction. Within the study area, two standards apply depending on location:

- **City of Imperial Beach:** *SANTEC/ITE Guidelines for Traffic Impact Studies in the San Diego Region (2000),* published by the regional San Diego Traffic Engineers' Council (SANTEC) and the Institute of Transportation Engineers (ITE) California Border Section.
- **City of San Diego:** *Traffic Impact Study Manual (1998),* published by the City of San Diego.

Table 2.2 and Table 2.3 provide the daily LOS thresholds for roadway segments in each project jurisdiction.

Table 2.2 SANTEC/ITE LOS Thresholds for Roadway Segments

Classification/Lanes	LOS A	LOS B	LOS C	LOS D	LOS E
Prime Arterial/6	< 25,000	< 35,000	< 50,000	< 55,000	< 60,000
Major Arterial/5	< 18,000	< 25,000	< 35,000	< 40,000	< 45,000
Multi-Way Boulevard/4	< 16,800	< 25,200	< 31,500	< 37,800	< 42,000
Major Arterial/4	< 15,000	< 21,000	< 30,000	< 35,000	< 40,000
Secondary Arterial/5	< 12,500	< 17,500	< 25,000	< 31,300	< 37,500
Secondary Arterial/4	< 10,000	< 14,000	< 20,000	< 25,000	< 30,000
Collector/2 + Two Way Left Turn Lane (TWLTL)	< 5,000	< 7000	< 10,000	< 13,000	< 15,000
Collector/2 (with fronting commercial or residential property)	< 2,500	< 3000	< 5,000	< 6,500	< 8,000

Source: SANTEC/ITE Guidelines for Traffic Impact Studies in the San Diego Region (2000)

Table 2.3 City of San Diego LOS Thresholds for Roadway Segments

Classification/Lanes	# of Lanes	Cross Sections[1]	LOS A	LOS B	LOS C	LOS D	LOS E
Expressway	6		< 30,000	< 42,000	< 60,000	< 70,000	< 80,000
Primary Arterial	6	102/122	< 25,000	< 35,000	< 50,000	< 55,000	< 60,000
Major Arterial	6	102/122	< 20,000	< 28,000	< 40,000	< 45,000	< 50,000
Major Arterial	4	78/98	< 15,000	< 21,000	< 30,000	< 35,000	< 40,000
Collector	4	72/92	< 10,000	< 14,000	< 20,000	< 25,000	< 30,000
Collector (No Center Lane) **Collector (Continuous Left Turn Lane)**	4 2	64/84 50/70	< 5,000	< 7,000	< 10,000	< 13,000	< 15,000
Collector (No Fronting Property)	2	40/60	< 4,000	< 5,500	< 7,500	< 9,000	< 10,000
Collector (Commercial-Industrial Fronting)	2	50/70	< 2,500	< 3,500	< 5,000	< 6,500	< 8,000
Collector (Multi Family Residential Fronting)	2	40/60	< 2,500	< 3,500	< 5,000	< 6,500	< 8,000
Sub-Collector (Single Family Residential Fronting))	2	36/56	-	-	< 2,200	-	-

(1) Curb to Curb Width (feet)/Right of Way Width (feet): Based on City of San Diego *Street Design Manual*

Note: *The volumes and the average daily level of service listed above are only intended as general planning and do not contain all potential cross-sections within the City of San Diego.*

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

2.5 TRAFFIC INTERSECTION DELAY ANALYSIS

Twenty-nine intersections were selected for analysis based on the project's route and proposed intersection treatments. Figure 2.1 and Figure 2.2 show the studied intersections, which are further detailed in Table 2.4.

To analyze the average delay and LOS of individual intersections, procedures presented in the 2010 edition of the *Highway Capacity Manual (HCM)* were utilized. Due to limitations in the *HCM 2010* methodology for unique intersection configurations and overlap-phasing conditions, the *HCM 2000* methodology was applied to the following two intersections:

- 13. Iris Avenue & 25th Street/27th Street
- 16. Beyer Boulevard & Dairy Mart Road/SR-905 EB Ramps

The assumptions used to analyze intersection LOS are included in Appendix C and Appendix E.

Within the study area, both the *SANTEC/ITE Guidelines* and the *City of San Diego Traffic Impact Study Manual* use the same LOS criteria.

Figure 2.1 Study Roadway Segments & Intersections, North

Figure 2.2 Study Roadway Segments & Intersections, South

Table 2.4 Study Intersections

	Main Roadway	Side Roadway	Jurisdiction	Significance Threshold Criteria
1	13th Street	SR-75/Palm Avenue	Imperial Beach/Caltrans	SANTEC
2	13th Street	Elm Avenue	Imperial Beach	SANTEC
3	13th Street	Imperial Beach Boulevard	Imperial Beach	SANTEC
4	13th Street	Grove Avenue	Imperial Beach	SANTEC
5	Grove Avenue	14th Street	Imperial Beach	SANTEC
6	Grove Avenue	15th Street	Imperial Beach	SANTEC
7	Grove Avenue/Halo Street	Atwater Street	San Diego	City of San Diego
8	Halo Street	Thermal Street/17th Street	San Diego	City of San Diego
9	Grove Avenue/Halo Street	19th Street	San Diego	City of San Diego
10	Grove Avenue/Ingrid Avenue	Green Bay Street	San Diego	City of San Diego
11	Grove Avenue/Ingrid Avenue	Hollister Street	San Diego	City of San Diego
12	Oro Vista Road	Iris Avenue	San Diego	City of San Diego
13	Iris Avenue	25th Street/27th Street	San Diego	City of San Diego
14	Iris Avenue	Howard Avenue	San Diego	City of San Diego
15	Beyer Boulevard	Iris Avenue/SR-905 WB Ramps	San Diego/Caltrans	City of San Diego
16	Beyer Boulevard	Dairy Mart Road/SR-905 EB Ramps	San Diego/Caltrans	City of San Diego
17	Beyer Boulevard	Del Sur Boulevard	San Diego	City of San Diego
18	Beyer Boulevard	Smythe Crossing	San Diego	City of San Diego
19	Beyer Boulevard	Smythe Avenue	San Diego	City of San Diego
20	Beyer Boulevard	Caminito de los Niños	San Diego	City of San Diego
21	Beyer Boulevard	West Park Avenue/Alaquinas Drive	San Diego	City of San Diego
22	West Park Avenue	Seaward Avenue	San Diego	City of San Diego
23	East Park Avenue	Seaward Avenue	San Diego	City of San Diego
24	West Park Avenue	Hall Avenue	San Diego	City of San Diego
25	East Park Avenue	Hall Avenue	San Diego	City of San Diego
26	East Beyer Boulevard	Center Street	San Diego	City of San Diego
27	East Beyer Boulevard	Bolton Hall Road	San Diego	City of San Diego
28	East Beyer Boulevard	East San Ysidro Boulevard/Camino de la Plaza	San Diego	City of San Diego
29	East San Ysidro Boulevard	Rail Court/I-5 Ramps	San Diego/Caltrans	City of San Diego

SIGNALIZED INTERSECTIONS

The *HCM 2010* and *HCM 2000* methodologies for signalized intersections calculate the average control delay per vehicle at the intersection, with LOS criteria used by both cities described in Table 2.5. The computerized analysis of intersection operations was performed utilizing the *Synchro 9.0 (HCM 2010 and 2000 methodology)* traffic analysis software (by Trafficware, 2011).

Table 2.5 LOS Criteria for Signalized Intersections

Average Control Delay per Vehicle	Level of Service (LOS) Characteristics
<10.0	LOS A occurs when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.
10.1 – 20.0	LOS B occurs when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.
20.1 – 35.0	LOS C occurs when progression is favorable or the cycle length is moderate. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.
35.1 – 55.0	LOS D occurs when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.
55.1 – 80.0	LOS E occurs when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.
>80.0	LOS F occurs when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Source: Highway Capacity Manual, Transportation Research Board (2010)

UNSIGNALIZED INTERSECTIONS

Average control delay for unsignalized intersections also uses *2010 HCM* methodology and is based on the geometric design of the intersection and vehicular demand by movement. Table 2.6 displays the LOS criteria.

Table 2.6 LOS Criteria for Signalized Intersections

Average Control Delay per Vehicle	Level of Service (LOS) Characteristics
<10.0	LOS A occurs when there is little or no delay.
10.1 – 15.0	LOS B occurs when there is short traffic delay.
15.1 – 25.0	LOS C occurs when there is average traffic delay.
25.1 – 35.0	LOS D occurs when there is long traffic delay.
35.1 – 50.0	LOS E occurs when there is longer traffic delay.
>50.0	LOS F occurs when traffic delay is longest and intersection capacity is exceeded.

Source: Highway Capacity Manual, Transportation Research Board (2010)

ALL-WAY STOP CONTROL

For all-way stop controlled intersections, conflicting vehicular volumes at the intersection are the primary variable in calculating the approach delay in *HCM 2010* methodology. The average control delay is then calculated by weighting the average delays by volume distributed across all motor vehicles entering the intersection.

The computerized analysis of all-way stop control intersections was performed with the *Synchro 9.0 (HCM 2010 methodology)* traffic analysis software (by Trafficware, 2011).

TWO-WAY STOP CONTROL (SIDE-STREET STOP CONTROL)

For two-way stop controlled (side-street stop controlled) intersections, the primary principle in *HCM 2010* methodology is gap acceptance and the presence of conflicting traffic for motor vehicles stopped at the minor street approach. The greatest approach delay is reported instead of the average approach delay.

The computerized analysis of all-way stop control intersections was performed with the *Synchro 9.0 (HCM 2010 methodology)* traffic analysis software (by Trafficware, 2011).

ROUNDABOUT CONTROL & NEIGHBORHOOD TRAFFIC CIRCLES

For roundabout-controlled intersections, the *HCM 2010* LOS methodology calculates the average control delay which includes geometric delay and V/C. The average control delay is then calculated by weighting the average delays by volume distributed across all motor vehicles entering the intersection.

The computerized analysis of roundabout-control intersections was performed with the *SIDRA Intersection 7.0 (HCM 2010 methodology)* traffic analysis software (by Akcelik and Associates, 2017).

The project also includes several smaller neighborhood traffic circles (NTCs) that feature all-yield roundabout control (depicted in Figure 2.3):

- 5. Grove Avenue & 14th Street
- 6. Grove Avenue & 15th Street
- 7. Grove Avenue & Atwater Street
- 10. Grove Avenue/Ingrid Avenue & Green Bay Street
- 22. West Park Avenue & Seaward Avenue

To ensure the traffic analysis accounts for the maximum potential impact across all proposed NTCs, the project team selected the location with the highest volumes based on turning-movement counts—Grove Avenue/Ingrid Avenue and Green Bay Street—as a representative sample.

Figure 2.3 Neighborhood Traffic Circle with Roundabout Control

2.6 TRAFFIC ANALYSIS SIGNIFICANCE THRESHOLDS

The evaluation of direct and cumulative significant impacts is based on the governing standards of each local jurisdiction.

CITY OF IMPERIAL BEACH

In the City of Imperial Beach, the assessment of significant impacts is based on *SANTEC/ITE Guidelines for Traffic Impact Studies in the San Diego Region (2000),* with significance thresholds shown in Table 2.7.

In general, a significant impact is identified when the addition of project traffic results in LOS dropping from LOS D or better to a substandard LOS E or F; or if the thresholds for an already substandard facility per its LOS exceed what is allowed per the threshold guidelines.

Table 2.7 SANTEC/ITE Measures of Significant Project Traffic Impacts

LOS with Project	Allowable Change Due to Impact					
	Freeways		***Roadway Segments***		***Intersections***	***Ramp Metering***
	V/C	*Speed (mph)*	*V/C*	*Speed (mph)*	*Delay (sec)*	*Delay (min)*
E and F	0.01	1.0	0.02	1.0	2.0	2.0

Source: SANTEC/ITE Guidelines for Traffic Impact Studies in the San Diego Region (2000)

CITY OF SAN DIEGO

In the City of San Diego, the assessment of significant impacts is based on the City's *Traffic Impact Study Manual (1998)* and *Significance Determination Thresholds (2011),* with significance thresholds shown in Table 2.8.

Table 2.8 City of San Diego Measures of Significant Project Traffic Impacts

LOS with Project	Allowable Change Due to Impact					
	Freeways		***Roadway Segments***		***Intersections***	***Ramp Metering***
	V/C	*Speed (mph)*	*V/C*	*Speed (mph)*	*Delay (sec)*	*Delay (min)*
E	0.01	1.0	0.02	1.0	2.0	2.0
F	0.005	0.5	0.01	0.5	1.0	1.0

Sources: City of San Diego Traffic Impact Study Manual (1998) and Significance Determination Thresholds (2011)

3 EXISTING CONDITIONS

This section analyzes the study roadway segments and intersections under existing conditions, without the bikeway project.

3.1 ROADWAY SEGMENTS

The analysis of roadway segments included counts as discussed in Section 2.3 and LOS calculations per standards and methodologies discussed in Section 2.4. The study roadways along the proposed project alignment are described briefly in Appendix F.

Table 3.1 contains the analysis results in terms of existing LOS and V/C for all project roadway segments.

Table 3.1 Roadway Segment Analysis Results, Existing Conditions

Roadway Segment	Lanes/ Functional Class[1]	LOS E Maximum Capacity	ADT	V/C	LOS
13TH STREET					
1. Cypress Avenue to Palm Avenue	2C CL	15,000	6,919	0.461	B
2. Palm Avenue to Imperial Beach Boulevard	2C CL	15,000	9,197	0.613	C
3. Imperial Beach Boulevard to Grove Avenue	2C CL	15,000	10,329	0.689	D
GROVE AVENUE					
4. 13th Street to 19th Street	2C MFF	8,000	2,765	0.346	B
5. 19th Street to Hollister Street/Oro Vista Road	2C MFF	8,000	3,578	0.447	C
ORO VISTA ROAD					
6. Grove Avenue/Ingrid Avenue to Iris Avenue	2C MFF	8,000	5,032	0.629	D
IRIS AVENUE					
7. Oro Vista Road to Beyer Boulevard/SR-905 WB Ramps	2C MFF	8,000	5,933	0.742	D
BEYER BOULEVARD					
8. Iris Avenue/SR-905 WB Ramps to Dairy Mart Road/SR-905 EB Ramps	4MA	40,000	18,694	0.467	B
9. Dairy Mart Road/SR-905 EB Ramps to Del Sur Boulevard	4C NCL	15,000	7,946	0.530	C
10. Del Sur Boulevard to Smythe Avenue	4C NCL	15,000	7,983	0.532	C
11. Smythe Avenue to Caminito de los Niños	4C NCL*	20,000	9,977	0.499	B
12. Caminito de los Niños to West Park Avenue/Alaquinas Drive	4C	30,000	9,977	0.333	B
WEST PARK AVENUE					
13. Beyer Boulevard to East Seaward Avenue	2C MFF	8,000	4,073	0.509	C
EAST SEAWARD AVENUE					
14. West Park Avenue to East Park Avenue	2C MFF	8,000	2,090	0.261	A
WEST PARK AVENUE					
15. East Seaward Avenue to East Hall Avenue	1C MFF	4,000	2,163	0.541	C
EAST PARK AVENUE					
16. East Seaward Avenue to East Hall Avenue	1C MFF	4,000	1,910	0.478	C
EAST HALL AVENUE					
17. West Park Avenue to Olive Drive	2C MFF	8,000	2,197	0.275	A
EAST BEYER BOULEVARD					
18. Filoi Avenue to Center Street/Hill Street	2C MFF	8,000	6,083	0.760	D
19. Center Street/Hill Street to East San Ysidro Boulevard/Camino de la Plaza	2C NF	10,000	2,768	0.277	A
EAST SAN YSIDRO BOULEVARD					
20. East Beyer Boulevard/Camino de la Plaza to Rail Court/I-5 Ramps	2-1MA	30,000	14,712	0.490	B

(1) Functional Class Abbreviations: 1C MFF is a 1 lane Collector with multi-family residential fronting property. 2-1MA is a 2-lane in one direction, 1 lane in the other direction Major Arterial. 2C MFF: 2 lane Collector with multi-family residential fronting property; 2C NF: 2 lane Collector with no fronting property; 2C CL: 2 lane Collector with a continuous left-turn lane; 4C is a 4 lane Collector with a continuous left-turn lane. 4C NCL: 4 lane Collector with no center lane. 4C NCL is a 4 lane Collector with no continuous left-turn lane and minimal direct access. 4MA is a 4 lane Major Arterial.*

3.2 INTERSECTIONS

The analysis of intersections was consistent with the traffic volume methodology in Section 2.3 and included LOS calculations per standards and methodologies discussed in Section 2.4.

Table 3.2 contains the analysis results in terms of existing LOS and delay for all studied intersections.

Table 3.2 Intersection Analysis Results, Existing Conditions

				AM Peak Hour		PM Peak Hour	
	Main Roadway	**Side Roadway**	**Control[1]**	*Delay*	*LOS*	*Delay*	*LOS*
1	13th Street	SR-75/Palm Avenue	TS	38.6	D	38.0	D
2	13th Street	Elm Avenue	TWSC	22.3	C	37.5	E
3	13th Street	Imperial Beach Boulevard	TS	34.0	C	31.1	C
4	13th Street	Grove Avenue	TWSC	21.4	C	17.5	C
5	Grove Avenue	14th Street	TWSC	10.9	B	10.2	B
6	Grove Avenue	15th Street	AWS	8.7	A	7.7	A
7	Grove Avenue/Halo Street	Atwater Street	AWS	8.2	A	7.5	A
8	Halo Street	Thermal Street/17th Street	AWS	11.2	B	8.6	A
9	Grove Avenue/Halo Street	19th Street	AWS	41.1	E	14.0	B
10	Grove Avenue/Ingrid Avenue	Green Bay Street	AWS	17.4	C	8.7	A
11	Grove Avenue/Ingrid Avenue	Hollister Street	TS	14.1	B	8.0	A
12	Oro Vista Road	Iris Avenue	TWSC	145.9	F	27.6	D
13	Iris Avenue	25th Street/27th Street	TS	39.3	D	15.1	B
14	Iris Avenue	Howard Avenue	TS	25.0	C	22.6	C
15	Beyer Boulevard	Iris Avenue/SR-905 WB Ramps	TS	63.6	E	73.3	E
16	Beyer Boulevard	Dairy Mart Road/SR-905 EB Ramps	TS	32.6	C	27.0	C
17	Beyer Boulevard	Del Sur Boulevard	TS	8.4	A	7.8	A
18	Beyer Boulevard	Smythe Crossing	TWSC	32.3	D	33.5	D
19	Beyer Boulevard	Smythe Avenue	TS	18.1	B	12.7	B
20	Beyer Boulevard	Caminito de los Niños	TS	11.8	B	10.3	B
21	Beyer Boulevard	West Park Avenue/Alaquinas Drive	TS	17.8	B	12.7	B
22	West Park Avenue	Seaward Avenue	AWS	12.8	B	8.5	A
23	East Park Avenue	Seaward Avenue	AWS	10.6	B	7.9	A
24	West Park Avenue	Hall Avenue	AWS	8.6	A	8.3	A
25	East Park Avenue	Hall Avenue	AWS	9.4	A	7.9	A
26	East Beyer Boulevard	Center Street	AWS	12.3	B	10.0	A
27	East Beyer Boulevard	Bolton Hall Road	TWSC	9.3	A	10.3	B
28	East Beyer Boulevard	East San Ysidro Boulevard/Camino de la Plaza	TS	37.4	D	43.4	D
29	East San Ysidro Boulevard	Rail Court/I-5 Ramps	TS	63.5	E	256.0	F

(1) Control Abbreviations: TS: traffic signal; TWSC: two-way stop control; AWS: all-way stop.

4 OPENING DAY CONDITIONS

This section provides an analysis of the study roadway segments and intersections under Opening Day conditions, both without and with the bikeway project.

As shown in Appendix F, the *San Ysidro Community Plan & Local Coastal Program (2016)* envisions a road diet on Beyer Boulevard between Dairy Mart Road and Caminito de los Niños, which would reduce the number of lanes on Beyer Boulevard from four to two (plus two-way left turn lane). Intersection lane configurations also would also be modified to accommodate the road diet. To be conservative, this modification is assumed to be implemented in the Opening Day "With Project" scenario.

4.1 ROADWAY SEGMENTS

The analysis of roadway segments included model-grown volume counts as discussed in Section 2.3 and LOS calculations per standards and methodologies discussed in Section 2.4.

ANALYSIS RESULTS

Table 4.1 contains the analysis results in terms of Opening Day LOS and V/C for all project roadway segments. As shown in the table, the project is estimated to have the following effects on the operations of the 20 study roadway segments:

- 19 experience no change in operations
- 1 experiences an increase in congestion

DIRECT IMPACTS

Based on the thresholds of significance defined in Section 2.6, no roadway segments experience increases in V/C that constitute significant direct impacts on Opening Day.

Table 4.1 Roadway Segment Analysis Results, Opening Day

Roadway Segment	Opening Day Without Project				Opening Day With Project				Δ V/C	Sig. Impact
	Lanes/ Function Class[1]	*ADT*	*V/C*	*LOS*	*Lanes/ Function Class*[1]	*ADT*	*V/C*	*LOS*		
13TH STREET										
1. Cypress Avenue to Palm Avenue	2C CL	7,200	0.480	C	2C CL	7,200	0.480	C	0.000	No
2. Palm Avenue to Imperial Beach Boulevard	2C CL	9,220	0.615	C	2C CL	9,220	0.615	C	0.000	No
3. Imperial Beach Boulevard to Grove Avenue	2C CL	10,350	0.690	D	2C CL	10,350	0.690	D	0.000	No
GROVE AVENUE										
4. 13th Street to 19th Street	2C MFF	2,830	0.354	B	2C MFF	2,830	0.354	B	0.000	No
5. 19th Street to Hollister Street/Oro Vista Road	2C MFF	3,640	0.455	C	2C MFF	3,640	0.455	C	0.000	No
ORO VISTA ROAD										
6. Grove Avenue/Ingrid Avenue to Iris Avenue	2C MFF	5,130	0.641	D	2C MFF	5,130	0.641	D	0.000	No
IRIS AVENUE										
7. Oro Vista Road to Beyer Boulevard/ SR-905 WB Ramps	2C MFF	6,050	0.756	D	2C MFF	6,050	0.756	D	0.000	No
BEYER BOULEVARD										
8. Iris Avenue/SR-905 WB Ramps to Dairy Mart Road/SR-905 EB Ramps	4MA	19,180	0.480	B	4MA	19,180	0.480	B	0.000	No
9. Dairy Mart Road/SR-905 EB Ramps to Del Sur Boulevard	4C NCL	8,140	0.543	C	2C CL	8,140	0.543	C	0.000	No
10. Del Sur Boulevard to Smythe Avenue	4C NCL	8,210	0.547	C	2C CL	8,210	0.547	C	0.000	No
11. Smythe Avenue to Caminito de los Niños	4C NCL*	10,880	0.544	C	3C NCL*	10,880	0.725	D	0.181	No
12. Caminito de los Niños to West Park Avenue/Alaquinas Drive	4C	10,880	0.363	C	4C	10,880	0.363	C	0.000	No
WEST PARK AVENUE										
13. Beyer Boulevard to East Seaward Avenue	2C MFF	4,330	0.541	C	2C MFF	4,330	0.541	C	0.000	No
EAST SEAWARD AVENUE										
14. West Park Avenue to East Park Avenue	2C MFF	2,210	0.276	A	2C MFF	2,210	0.276	A	0.000	No
WEST PARK AVENUE										
15. East Seaward Avenue to East Hall Avenue	1C MFF	2,300	0.575	C	1C MFF	2,300	0.575	C	0.000	No
EAST PARK AVENUE										
16. East Seaward Avenue to East Hall Avenue	1C MFF	2,030	0.508	C	1C MFF	2,030	0.508	C	0.000	No
EAST HALL AVENUE										
17. West Park Avenue to Olive Drive	2C MFF	2,340	0.293	A	2C MFF	2,340	0.293	A	0.000	No
EAST BEYER BOULEVARD										
18. Filoi Avenue to Center Street/Hill Street	2C MFF	6,870	0.859	E	2C MFF	6,870	0.859	E	0.000	No
19. Center Street/Hill Street to East San Ysidro Boulevard/Camino de la Plaza	2C NF	3,120	0.312	A	2C NF	3,120	0.312	A	0.000	No
EAST SAN YSIDRO BOULEVARD										
20. East Beyer Boulevard/Camino de la Plaza to Rail Court/I-5 Ramps	2-1MA	15,710	0.524	B	2-1MA	15,710	0.524	B	0.000	No

(1) Functional Class Abbreviations: 1C MFF is a 1 lane Collector with multi-family residential fronting property. 2-1MA is a 2-lane in one direction, 1 lane in the other direction Major Arterial. 2C MFF: 2 lane Collector with multi-family residential fronting property; 2C NF: 2 lane Collector with no fronting property; 2C CL: 2 lane Collector with a continuous left-turn lane; 3C NCL is a 3 lane Collector with no continuous left-turn lane and minimal direct access. 4C is a 4 lane Collector with a continuous left-turn lane. 4C NCL: 4 lane Collector with no center lane. 4C NCL* is a 4 lane Collector with no continuous left-turn lane and minimal direct access. 4MA is a 4 lane Major Arterial.*

4.2 INTERSECTIONS

The analysis of intersections included model-grown volume counts as discussed in Section 2.3 and LOS calculations per standards and methodologies discussed in Section 2.4.

ANALYSIS RESULTS

Table 4.2 and Table 4.3 contain the analysis results in terms of Opening Day LOS and V/C for all studied intersections.

Among the 29 studied intersections, in the AM peak hour (Table 4.2):

- 12 experience no change in average control delay
- 8 experience an increase in average control delay
- 9 experience a decrease in average control delay

Among the 29 studied intersections, in the PM peak hour (Table 4.3):

- 12 experience no change in average control delay
- 9 experience an increase in average control delay
- 8 experience a decrease in average control delay

DIRECT IMPACTS

Based on the thresholds of significance defined in Section 2.6, no intersections experience increases in control delay that constitute significant direct impacts on Opening Day.

Table 4.2 Intersection Analysis Results, Opening Day, AM Peak Hour

	Main Roadway	Side Roadway	Opening Day Without Project		Opening Day With Project		Δ Delay	Sig Impact
			Delay	*LOS*	*Delay*	*LOS*		
AM Peak Hour								
1	13th Street	SR-75/Palm Avenue	38.6	D	37.9	D	-0.7	No
2	13th Street	Elm Avenue	23.3	C	23.3	C	0.0	No
3	13th Street	Imperial Beach Boulevard	34.7	C	38.8	D	4.1	No
4	13th Street	Grove Avenue	21.7	C	21.7	C	0.0	No
5	Grove Avenue	14th Street[1]	17.7	C	4.4	A	-13.3	No
6	Grove Avenue	15th Street[1]	17.7	C	4.4	A	-13.3	No
7	Grove Avenue/Halo Street	Atwater Street[1]	17.7	C	4.4	A	-13.3	No
8	Halo Street	Thermal Street/17th Street	11.5	B	11.5	B	0.0	No
9	Grove Avenue/Halo Street	19th Street	44.6	E	44.6	E	0.0	No
10	Grove Avenue/Ingrid Avenue	Green Bay Street[1]	17.7	C	4.4	A	-13.3	No
11	Grove Avenue/Ingrid Avenue	Hollister Street	13.8	B	35.9	D	22.1	No
12	Oro Vista Road	Iris Avenue[2]	158	F	7.3	A	-151	No
13	Iris Avenue	25th Street/27th Street	41.8	D	41.8	D	0.0	No
14	Iris Avenue	Howard Avenue	25.8	C	25.8	C	0.0	No
15	Beyer Boulevard	Iris Avenue/SR-905 WB Ramps	72.2	E	72.2	E	0.0	No
16	Beyer Boulevard	Dairy Mart Road/SR-905 EB Ramps	32.7	C	36.8	D	4.1	No
17	Beyer Boulevard	Del Sur Boulevard	8.4	A	9.3	A	0.9	No
18	Beyer Boulevard	Smythe Crossing	50.3	F	16.4	C	-33.9	No
19	Beyer Boulevard	Smythe Avenue	21.7	C	16.8	B	-4.9	No
20	Beyer Boulevard	Caminito de los Niños	12.9	B	19.5	B	6.6	No
21	Beyer Boulevard	West Park Avenue/Alaquinas Drive	18.1	B	18.1	B	0.0	No
22	West Park Avenue	East Seaward Avenue[1]	17.7	C	4.4	A	-13.3	No
23	East Park Avenue	East Seaward Avenue	11.1	B	11.9	B	0.8	No
24	West Park Avenue	East Hall Avenue	8.8	A	12.8	B	4.0	No
25	East Park Avenue	East Hall Avenue	9.8	A	12.7	B	2.9	No
26	East Beyer Boulevard	Center Street	14.6	B	14.6	B	0.0	No
27	East Beyer Boulevard	Bolton Hall Road	9.4	A	9.4	A	0.0	No
28	East Beyer Boulevard	East San Ysidro Boulevard/Camino de la Plaza	40.3	D	40.3	D	0.0	No
29	East San Ysidro Boulevard	Rail Court/I-5 Ramps	60.0	E	60.0	E	0.0	No

(1) These five intersections are planned as neighborhood traffic circles (NTCs) with roundabout control. The project team selected the NTC at Grove Avenue/Ingrid Avenue & Green Bay Street (#10) as representative of all five NTCs, as it has the highest volume of turning movements (see Appendix C).

(2) Roundabout

Table 4.3 Intersection Analysis Results, Opening Day, PM Peak Hour

	Main Roadway	Side Roadway	Opening Day Without Project		Opening Day With Project		Δ Delay	Sig Impact
			Delay	*LOS*	*Delay*	*LOS*		
PM Peak Hour								
1	13th Street	SR-75/Palm Avenue	36.8	D	39.5	D	2.7	No
2	13th Street	Elm Avenue	41.1	E	41.1	E	0.0	No
3	13th Street	Imperial Beach Boulevard	31.5	C	36.6	D	5.1	No
4	13th Street	Grove Avenue	17.6	C	17.6	C	0.0	No
5	Grove Avenue	14th Street[1]	8.7	A	2.7	A	-6.0	No
6	Grove Avenue	15th Street[1]	8.7	A	2.7	A	-6.0	No
7	Grove Avenue/Halo Street	Atwater Street[1]	8.7	A	2.7	A	-6.0	No
8	Halo Street	Thermal Street/17th Street	8.6	A	8.6	A	0.0	No
9	Grove Avenue/Halo Street	19th Street	14.1	B	14.1	B	0.0	No
10	Grove Avenue/Ingrid Avenue	Green Bay Street[1]	8.7	A	2.7	A	-6.0	No
11	Grove Avenue/Ingrid Avenue	Hollister Street	8.0	A	14.6	B	6.6	No
12	Oro Vista Road	Iris Avenue[2]	28.2	D	6.2	A	-22.0	No
13	Iris Avenue	25th Street/27th Street	14.5	B	14.5	B	0.0	No
14	Iris Avenue	Howard Avenue	23.1	C	23.1	C	0.0	No
15	Beyer Boulevard	Iris Avenue/SR-905 WB Ramps	75.7	E	75.7	E	0.0	No
16	Beyer Boulevard	Dairy Mart Road/SR-905 EB Ramps	26.9	C	44.7	D	17.8	No
17	Beyer Boulevard	Del Sur Boulevard	7.9	A	8.7	A	0.8	No
18	Beyer Boulevard	Smythe Crossing	49.2	E	14.0	B	-35.2	No
19	Beyer Boulevard	Smythe Avenue	14.1	B	12.3	B	-1.8	No
20	Beyer Boulevard	Caminito de los Niños	10.7	B	18.4	B	7.7	No
21	Beyer Boulevard	West Park Avenue/Alaquinas Drive	12.8	B	12.8	B	0.0	No
22	West Park Avenue	East Seaward Avenue[1]	8.7	A	2.7	A	-6.0	No
23	East Park Avenue	East Seaward Avenue	8.0	A	9.6	A	1.6	No
24	West Park Avenue	East Hall Avenue	8.5	A	13.0	B	4.5	No
25	East Park Avenue	East Hall Avenue	8.0	A	10.3	B	2.3	No
26	East Beyer Boulevard	Center Street	10.8	B	10.8	B	0.0	No
27	East Beyer Boulevard	Bolton Hall Road	10.6	B	10.6	B	0.0	No
28	East Beyer Boulevard	East San Ysidro Boulevard/Camino de la Plaza	67.6	E	67.6	E	0.0	No
29	East San Ysidro Boulevard	Rail Court/I-5 Ramps	> 180	F	> 180	F	0.0	No

(1) These five intersections are planned as neighborhood traffic circles (NTCs) with roundabout control. The project team selected the NTC at Grove Avenue/Ingrid Avenue & Green Bay Street (#10) as representative of all five NTCs, as it has the highest volume of turning movements (see Appendix C).

(2) Roundabout

5 HORIZON YEAR CONDITIONS

This section provides an analysis of the study roadway segments and intersections under Horizon Year conditions, both without and with the bikeway project.

As shown in Appendix F, the *San Ysidro Community Plan & Local Coastal Program (2016)* envisions a road diet on Beyer Boulevard between Dairy Mart Road and Caminito de los Niños, which would reduce the number of lanes on Beyer Boulevard from four to two (plus two-way left turn lane). Intersection lane configurations also would also be modified to accommodate the road diet. To be conservative, this modification is assumed to be implemented in the Horizon Year "With Project" scenario.

5.1 ROADWAY SEGMENTS

The analysis of roadway segments included model-grown volume counts as discussed in Section 2.3 and LOS calculations per standards and methodologies discussed in Section 2.4.

ANALYSIS RESULTS

Table 5.1 contains the analysis results in terms of Horizon Year LOS and V/C for all project roadway segments. As shown in the table, the project is estimated to have the following effects on the operations of the 20 study roadway segments:

- 19 experience no change in operations
- 1 experiences an increase in congestion

CUMULATIVE IMPACTS

Based on the thresholds of significance defined in Section 2.6, one roadway segment experiences an increase in V/C that constitutes a significant cumulative impact in the Horizon Year:

- 11. Beyer Boulevard from Smythe Avenue to Caminito de los Niños

Table 5.1 Roadway Segment Analysis Results, Horizon Year

Roadway Segment	Horizon Year Without Project				Horizon Year With Project				Δ V/C	Sig. Impact
	Lanes/ Function Class[1]	*ADT*	*V/C*	*LOS*	*Lanes/ Function Class[1]*	*ADT*	*V/C*	*LOS*		
13TH STREET										
1. Cypress Avenue to Palm Avenue	2C CL	9,960	0.664	C	2C CL	9,960	0.664	C	0.000	No
2. Palm Avenue to Imperial Beach Boulevard	2C CL	9,400	0.627	C	2C CL	9,400	0.627	C	0.000	No
3. Imperial Beach Boulevard to Grove Avenue	2C CL	10,560	0.704	D	2C CL	10,560	0.704	D	0.000	No
GROVE AVENUE										
4. 13th Street to 19th Street	2C MFF	3,430	0.429	B	2C MFF	3,430	0.429	B	0.000	No
5. 19th Street to Hollister Street/Oro Vista Road	2C MFF	4,290	0.536	C	2C MFF	4,290	0.536	C	0.000	No
ORO VISTA ROAD										
6. Grove Avenue/Ingrid Avenue to Iris Avenue	2C MFF	6,140	0.768	D	2C MFF	6,140	0.768	D	0.000	No
IRIS AVENUE										
7. Oro Vista Road to Beyer Boulevard/ SR-905 WB Ramps	2C MFF	7,240	0.905	E	2C MFF	7,240	0.905	E	0.000	No
BEYER BOULEVARD										
8. Iris Avenue/SR-905 WB Ramps to Dairy Mart Road/SR-905 EB Ramps	4MA	24,040	0.601	C	4MA	24,040	0.601	C	0.000	No
9. Dairy Mart Road/SR-905 EB Ramps to Del Sur Boulevard	4C NCL	10,040	0.669	D	2C CL	10,040	0.669	D	0.000	No
10. Del Sur Boulevard to Smythe Avenue	4C NCL	10,440	0.696	D	2C CL	10,440	0.696	D	0.000	No
11. Smythe Avenue to Caminito de los Niños	4C NCL*	28,860	1.443	F	3C NCL*	28,860	1.924	F	0.481	Yes
12. Caminito de los Niños to Park Avenue/Alaquinas Drive	4C	28,860	0.962	F	4C	28,860	0.962	F	0.000	No
WEST PARK AVENUE										
13. Beyer Boulevard to East Seaward Avenue	2C MFF	6,890	0.861	E	2C MFF	6,890	0.861	E	0.000	No
EAST SEAWARD AVENUE										
14. West Park Avenue to East Park Avenue	2C MFF	3,430	0.429	B	2C MFF	3,430	0.429	B	0.000	No
WEST PARK AVENUE										
15. East Seaward Avenue to East Hall Avenue	1C MFF	3,640	0.910	E	1C MFF	3,640	0.910	E	0.000	No
EAST PARK AVENUE										
16. East Seaward Avenue to East Hall Avenue	1C MFF	3,250	0.813	D	1C MFF	3,250	0.813	D	0.000	No
EAST HALL AVENUE										
17. West Park Avenue to Olive Drive	2C MFF	3,740	0.468	C	2C MFF	3,740	0.468	C	0.000	No
EAST BEYER BOULEVARD										
18. Filoi Avenue to Center Street/Hill Street	2C MFF	14,780	1.848	F	2C MFF	14,780	1.848	F	0.000	No
19. Center Street/Hill Street to East San Ysidro Boulevard/Camino de la Plaza	2C NF	6,670	0.667	C	2C NF	6,670	0.667	C	0.000	No
EAST SAN YSIDRO BOULEVARD										
20. East Beyer Boulevard/Camino de la Plaza to Rail Court/I-5 Ramps	2-1MA	25,720	0.857	D	2-1MA	25,720	0.857	D	0.000	No

(1) Functional Class Abbreviations: 1C MFF is a 1 lane Collector with multi-family residential fronting property. 2-1MA is a 2-lane in one direction, 1 lane in the other direction Major Arterial. 2C MFF: 2 lane Collector with multi-family residential fronting property; 2C NF: 2 lane Collector with no fronting property; 2C CL: 2 lane Collector with a continuous left-turn lane; 3C NCL is a 3 lane Collector with no continuous left-turn lane and minimal direct access. 4C is a 4 lane Collector with a continuous left-turn lane. 4C NCL: 4 lane Collector with no center lane. 4C NCL* is a 4 lane Collector with no continuous left-turn lane and minimal direct access. 4MA is a 4 lane Major Arterial.*

5.2 INTERSECTIONS

The analysis of intersections included model-grown volume counts as discussed in Section 2.3 and LOS calculations per standards and methodologies discussed in Section 2.4.

ANALYSIS RESULTS

Table 5.2 and Table 5.3 contain the analysis results in terms of Horizon Year LOS and V/C for all studied intersections.

Among the 29 studied intersections, in the AM peak hour (Table 5.2):

- 12 experience no change in operations
- 7 experience an increase in average control delay
- 10 experience a decrease in average control delay

Among the 29 studied intersections, in the PM peak hour (Table 5.3):

- 11 experience no change in operations
- 9 experience an increase in average control delay
- 9 experience a decrease in average control delay

CUMULATIVE IMPACTS

Based on the thresholds of significance defined in Section 2.6, one intersection experiences an increase in control delay in the PM peak hour that constitutes significant cumulative impact in the Horizon Year:

- 20. Beyer Boulevard & Caminito de los Niños (PM peak hour only)

Table 5.2 Intersection Analysis Results, Horizon Year, AM Peak Hour

	Main Roadway	Side Roadway	Horizon Year Without Project		Horizon Year With Project		Δ Delay	Sig Impact
			Delay	*LOS*	*Delay*	*LOS*		
AM Peak Hour								
1	13th Street	SR-75/Palm Avenue	61.7	E	49.0	D	-12.7	No
2	13th Street	Elm Avenue	28.9	D	28.9	D	0.0	No
3	13th Street	Imperial Beach Boulevard	36.2	D	38.1	D	1.9	No
4	13th Street	Grove Avenue	18.5	C	18.5	C	0.0	No
5	Grove Avenue	14th Street[1]	12.4	B	4.0	A	-8.4	No
6	Grove Avenue	15th Street[1]	12.4	B	4.0	A	-8.4	No
7	Grove Avenue/Halo Street	Atwater Street[1]	12.4	B	4.0	A	-8.4	No
8	Halo Street	Thermal Street/17th Street	10.9	B	10.9	B	0.0	No
9	Grove Avenue/Halo Street	19th Street	23.9	C	23.9	C	0.0	No
10	Grove Avenue/Ingrid Avenue	Green Bay Street[1]	12.4	B	4.0	A	-8.4	No
11	Grove Avenue/Ingrid Avenue	Hollister Street	17.4	B	36.4	D	19.0	No
12	Oro Vista Road	Iris Avenue[2]	66.6	F	6.0	A	-60.6	No
13	Iris Avenue	25th Street/27th Street	31.8	C	31.8	C	0.0	No
14	Iris Avenue	Howard Avenue	23.7	C	23.7	C	0.0	No
15	Beyer Boulevard	Iris Avenue/SR-905 WB Ramps	67.0	E	67.0	E	0.0	No
16	Beyer Boulevard	Dairy Mart Road/SR-905 EB Ramps	44.6	D	41.3	D	-3.3	No
17	Beyer Boulevard	Del Sur Boulevard	9.1	A	10.3	B	1.2	No
18	Beyer Boulevard	Smythe Crossing	> 180	F	82.2	F	< -180	No
19	Beyer Boulevard	Smythe Avenue	119.5	F	76.1	E	-43.4	No
20	Beyer Boulevard	Caminito de los Niños	18.8	B	43.5	D	24.7	No
21	Beyer Boulevard	West Park Avenue/Alaquinas Drive	46.1	D	46.1	D	0.0	No
22	West Park Avenue	East Seaward Avenue[1]	12.4	B	4.0	A	-8.4	No
23	East Park Avenue	East Seaward Avenue	11.7	B	12.5	B	0.8	No
24	West Park Avenue	East Hall Avenue	10.1	B	15.0	B	4.9	No
25	East Park Avenue	East Hall Avenue	11.1	B	16.2	C	5.1	No
26	East Beyer Boulevard	Center Street	164.8	F	164.8	F	0.0	No
27	East Beyer Boulevard	Bolton Hall Road	10.2	B	10.2	B	0.0	No
28	East Beyer Boulevard	East San Ysidro Boulevard/Camino de la Plaza	175.0	F	175.0	F	0.0	No
29	East San Ysidro Boulevard	Rail Court/I-5 Ramps	> 180	F	> 180	F	0.0	No

(1) These five intersections are planned as neighborhood traffic circles (NTCs) with roundabout control. The project team selected the NTC at Grove Avenue/Ingrid Avenue & Green Bay Street (#10) as representative of all five NTCs, as it has the highest volume of turning movements (see Appendix C).

(2) Roundabout

Table 5.3 Intersection Analysis Results, Horizon Year, PM Peak Hour

	Main Roadway	Side Roadway	Horizon Year Without Project		Horizon Year With Project		Δ Delay	Sig. Impact
			Delay	*LOS*	*Delay*	*LOS*		
PM Peak Hour								
1	13th Street	SR-75/Palm Avenue	47.8	D	49.8	D	2.0	No
2	13th Street	Elm Avenue	65.1	F	65.1	F	0.0	No
3	13th Street	Imperial Beach Boulevard	35.3	D	40.8	D	5.5	No
4	13th Street	Grove Avenue	14.9	B	14.9	B	0.0	No
5	Grove Avenue	14th Street[1]	8.5	A	2.8	A	-5.7	No
6	Grove Avenue	15th Street[1]	8.5	A	2.8	A	-5.7	No
7	Grove Avenue/Halo Street	Atwater Street[1]	8.5	A	2.8	A	-5.7	No
8	Halo Street	Thermal Street/17th Street	8.6	A	8.6	A	0.0	No
9	Grove Avenue/Halo Street	19th Street	14.0	B	14.0	B	0.0	No
10	Grove Avenue/Ingrid Avenue	Green Bay Street[1]	8.5	A	2.8	A	-5.7	No
11	Grove Avenue/Ingrid Avenue	Hollister Street	9.2	A	16.8	B	7.6	No
12	Oro Vista Road	Iris Avenue[2]	28.0	D	6.0	A	-22.0	No
13	Iris Avenue	25th Street/27th Street	16.3	B	16.3	B	0.0	No
14	Iris Avenue	Howard Avenue	23.5	C	23.3	C	-0.2	No
15	Beyer Boulevard	Iris Avenue/SR-905 WB Ramps	94.3	F	94.3	F	0.0	No
16	Beyer Boulevard	Dairy Mart Road/SR-905 EB Ramps	28.7	C	53.8	D	25.1	No
17	Beyer Boulevard	Del Sur Boulevard	8.9	A	10.0	A	1.1	No
18	Beyer Boulevard	Smythe Crossing	> 180	F	58.3	F	< -180	No
19	Beyer Boulevard	Smythe Avenue	57.0	E	44.3	D	-12.7	No
20	Beyer Boulevard	Caminito de los Niños	16.9	B	70.5	E	53.6	Yes
21	Beyer Boulevard	West Park Avenue/Alaquinas Drive	20.3	C	20.3	C	0.0	No
22	West Park Avenue	East Seaward Avenue[1]	8.5	A	2.8	A	-5.7	No
23	East Park Avenue	East Seaward Avenue	8.7	A	10.1	B	1.4	No
24	West Park Avenue	East Hall Avenue	9.6	A	16.4	C	6.8	No
25	East Park Avenue	East Hall Avenue	9.4	A	12.7	B	3.3	No
26	East Beyer Boulevard	Center Street	114.8	F	114.8	F	0.0	No
27	East Beyer Boulevard	Bolton Hall Road	13.1	B	13.1	B	0.0	No
28	East Beyer Boulevard	East San Ysidro Boulevard/Camino de la Plaza	154.8	F	154.8	F	0.0	No
29	East San Ysidro Boulevard	Rail Court/I-5 Ramps	> 180	F	> 180	F	0.0	No

(1) These five intersections are planned as neighborhood traffic circles (NTCs) with roundabout control. The project team selected the NTC at Grove Avenue/Ingrid Avenue & Green Bay Street (#10) as representative of all five NTCs, as it has the highest volume of turning movements (see Appendix C).

(2) Roundabout

6 PROJECT SAFETY ASSESSMENT

This section assesses the project's safety impacts. It describes the safety benefits of each proposed bikeway type (Section 6.1), reviews the additional safety and traffic calming features that accompany the bikeways (Section 6.2) and finally describes how these features are integrated into each segment of the project (Section 6.3).

The primary finding is that the project is expected to provide unambiguous, net safety benefits to all roadway users, including cyclists, pedestrians, transit users and motorists. All project features are designed in accordance with best practices to maximize roadway safety. Taken together, the suite of proposed improvements will improve safety in the project area by:

- Protecting cyclists by increasing separation from motorized traffic
- Providing new and enhanced crossings for pedestrians
- Upgrading intersections for safer operations through dedicated or advanced signal phasing for cyclists and pedestrians
- Installing high-visibility striping and signage
- Reducing conflicts with transit vehicles
- Promoting safer vehicle speeds through a variety of traffic-calming features

During initial planning, the project team assessed the existing roadway network in terms of Level of Traffic Stress (LTS), a quantitative measure of cyclist comfort. The results of this existing conditions analysis are in Appendix B. The potential to improve LTS conditions helped inform the selection of the project route and safety features. As such, the project will increase comfort for cyclists relative to existing conditions along every planned segment.

6.1 SAFETY BENEFITS BY BIKEWAY TYPE

Each of the project's four primary types of bikeway facilities provides safety benefits compared to existing conditions.

CLASS I BIKEWAYS/MULTI-USE PATHS

Class I bikeways, sometimes called bike paths or multi-use paths, are located off the roadway and therefore completely separated from motorized traffic.

They are generally located in separate rights-of-way apart from the street network, including bridges (Figure 6.1), boardwalks, recreational areas and repurposed rail corridors.

Figure 6.1 Class I Bikeway/Multi-Use Path on Bridge

CLASS IV BIKEWAYS/CYCLE TRACKS/PROTECTED BIKE LANES

Class IV bikeways, also called cycle tracks or protected bike lanes, are facilities located on the roadway and separated from high-speed traffic lanes with a physical barrier, such as raised curbs, flexible posts or parked cars (Figure 6.2). Class IV bikeways can be either one-way or two-way facilities.

Within the roadway environment, Class IV bikeways provide the maximum amount of safety and separation from motor vehicles.

Figure 6.2 Class IV Bikeway/Cycle Track

CLASS II BUFFERED BIKE LANES

Class II bike lanes are facilities located in the roadway right-of-way and separated from vehicle lanes with a painted stripe. When "buffered," the bike lanes also provide a two- to three-foot painted buffer on one or both sides (Figure 6.3).

These facilities lower traffic stress by providing designated space for cyclists.

Figure 6.3 Class II Buffered Bike Lanes

ENHANCED CLASS III BIKE ROUTES/BIKE BOULEVARDS

Enhanced Class III bike routes are facilities located in the roadway travel lanes in where cyclists and motor vehicles share a lane marked by "sharrows" and signage (Figure 6.4).

Bike boulevards are streets with low car traffic volumes and speeds, designated and designed to give people riding bikes priority. They use signs, pavement markings, and speed and volume management measures—like neighborhood traffic circles, mid-block curb extensions and raised crosswalks—to discourage through-trips by cars and create safe, convenient bike crossings of busy arterial streets.

Figure 6.4 Class III Bike Route/Bike Boulevard

6.2 SAFETY & TRAFFIC CALMING FEATURES

The project also provides safety benefits through additional features including intersection improvements, pedestrian crossings, transit enhancements and traffic calming measures.

PROTECTED INTERSECTIONS

A protected intersection directs one-way cycle tracks or bike lanes through large curb extensions or other treatments that make cyclists more visible to drivers (Figure 6.5). They also shorten crossing distances for pedestrians.

In some cases, cyclists may cross protected intersections during a leading signal phase—which gives them a head start prior to the green phase for motorized traffic—or a dedicated, bike-only signal phase during which no other movements are allowed.

Figure 6.5 Protected Intersection

ROUNDABOUTS & NEIGHBORHOOD TRAFFIC CIRCLES

Roundabouts—and similar, smaller facilities called neighborhood traffic circles—improve intersection safety by slowing traffic speeds and reducing conflict points, directing traffic of all modes in a steady directional flow (Figure 6.6). They also tend to include new curb ramps and crosswalks for pedestrian safety.

Figure 6.6 Roundabout

CURB EXTENSIONS

Curb extensions, also known as pop-outs or bulb-outs, are extensions of the curb line into the roadway (Figure 6.7). They improve pedestrian safety by shortening the length of crosswalks and providing higher visibility to drivers. For turning drivers, the shape of the curb extension also forces a tighter turn and therefore encourages slower speeds.

Figure 6.7 Curb Extension

SPEED HUMPS

Speed humps are slight elevations in the roadway surface that calm traffic in residential areas, near schools or wherever speed control is desired. They are generally 3-4 inches high and 12-14 feet long, a design that provides slower traffic speeds while remaining comfortable to cyclists.

RAISED CROSSWALKS

Raised crosswalks combine speed humps with pedestrian crossings to improve safety for multiple modes (Figure 6.8). They calm traffic, improve visibility between pedestrians and drivers and provide new links in the pedestrian network.

ENHANCED PEDESTRIAN CROSSINGS

Beyond raised crosswalks that create new pedestrian crossings, existing crossings may be enhanced through a variety of treatments including continental crosswalk striping, additional signage and intersection control.

Pedestrian-activated crossing signals—sometimes called high-intensity activated crosswalks (HAWK)—stop traffic when activated at the curb by pedestrians (Figure 6.9). These provide safer crossing points for pedestrians and improve visibility for drivers.

CHICANES

A chicane is a slight bend in the roadway designed to slow traffic speeds and provide increased comfort for cyclists and pedestrians (Figure 6.10).

Chicanes are generally created by offsetting curb extensions. Their installation on existing roadways typically provides additional space that can be allocated to the pedestrian/bicycle realm, landscaping or urban design elements.

BIKE BOXES

A bike box is a designated area at the head of a traffic lane at a signalized intersection (Figure 6.11). It allows cyclists to move ahead of queuing traffic during the red signal phase, which increases visibility and safety for all roadway users.

Bike boxes are sometimes paired with a leading signal phase, which gives cyclists a head start prior to the green phase for motorized traffic.

Figure 6.8 Raised Crosswalk

Figure 6.9 Pedestrian-Activated Crossing Signal

Figure 6.10 Chicane

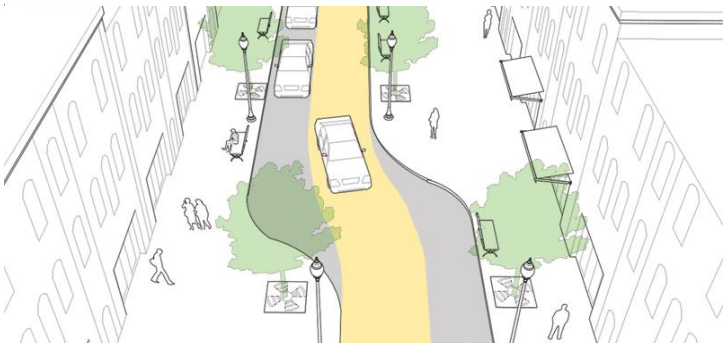

Figure 6.11 Bike Box

REVERSE-ANGLE PARKING

In reverse-angle parking, vehicles "back in" to an angled parking stall, rather than driving forward into the stall (Figure 6.12). This provides significantly more visibility for motorists exiting parking stalls to see bicyclists and other traffic. It also eliminates the risk of car doors opening into a bikeway, which can occur in parallel-parking situations.

Figure 6.12 Reverse-Angle Parking

BUS ISLANDS

Bus islands eliminate one of the most dangerous conflicts between motorized traffic and cyclists: transit buses moving across the bikeway to make stops. By routing the bikeway behind the transit stop, bus islands create separation from motorized traffic and greatly increase roadway safety for cyclists and buses (Figure 6.13). They also increase transit safety and efficiency by reducing the distances required for pull-outs.

Figure 6.13 Bus Island

LANE NARROWING & REPURPOSING

Many vehicular travel lanes are wider than required for safe and efficient operation. Narrowing lanes, or implementing a "lane diet," can make the street function more equitably and provides dual safety benefits: not only does it free additional space for infrastructure, but its effect on driver perception also reduces driving speeds.

Similarly, many roadways have more lanes than are needed to accommodate vehicular demand. Repurposing lanes, or implementing a "road diet," is also effective in reducing driving speeds and freeing up space for infrastructure or other modes of travel. Studies across the nation have shown that both lane narrowing and repurposing can help to reduce speeds and increase safety.

6.3 SAFETY ASSESSMENT BY SEGMENT

The project provides clear safety benefits to all roadway users—cyclists, pedestrians, transit users and drivers. As described below, the facilities and features are built into each project segment in a context-sensitive manner that maximizes roadway safety along the entire route.

13TH STREET

The City of Imperial Beach has already installed Class II buffered bike lanes on most of the project route along 13th Street. The project's additional improvements and safety features include:

- Completion of buffered bike lanes and associated road diet (from four lanes to two lanes plus two-way left-turn lane) through the approaches to the intersections at Palm Avenue and Imperial Beach Boulevard

- Protected intersection treatments at Palm Avenue and Imperial Beach Boulevard including bend outs, bike boxes and supporting signal phasing
- Installation/improvement of continental crosswalks at the following cross streets:
  - Palm Avenue (all crossings)
  - Elder Avenue (all crossings)
  - Ebony Avenue (northbound, southbound, and westbound crossings)
  - Imperial Beach Boulevard (all crossings)
  - Fern Avenue (all crossings)
  - Grove Avenue (northbound and southbound crossings)

GROVE AVENUE/HALO STREET/INGRID AVENUE

The enhanced Class III bike route—or bike boulevard—along the Grove Avenue/Halo Street/Ingrid Avenue corridor augments the existing traffic-calming already installed on this corridor, which is adjacent to several schools and parks. Additional safety features include:

- Neighborhood traffic circles at 14th Street, 15th Street, Atwater Street/Triton Avenue and Green Bay Street, including new curb ramps & continental crosswalks
- Intersection reconfiguration at Hollister Street with bike boxes
- Signal modifications at Hollister Street to give priority to bicycle through travel.
- Eight new speed humps, augmenting 10 existing humps
- Curb extensions at 17th Street/Thermal Avenue, Switzerland Drive and Hollister Street, including new curb ramps and continental crosswalks in key locations
- Installation/improvement of continental crosswalks at Georgia Street, Granger Street, Transite Avenue, Signal Avenue and 19thStreet/Saturn Boulevard

ORO VISTA ROAD

The project facility on Oro Vista Road is an enhanced Class III bike route or bike boulevard, with the following safety features:

- A series of six chicanes
- Reverse-angle parking on alternate sides of the street, integrated with the chicanes
- One new speed hump
- A roundabout at Iris Avenue
- New sidewalks, curb ramps and continental crosswalks accompanying the roundabout

IRIS AVENUE

On Iris Avenue between Oro Vista Road and 25th Street, the project will add Class II buffered bike lanes to provide a separated bicycle route across I-5. Additional safety features include:

- Extension of eastbound Class II buffered bike lane through the intersection to 27th Street
- New curb extension and ramps on the north side of the intersection at 25th Street/27th Street
- Installation/improvement of continental crosswalks at 25th Street/27th Street

On Iris Avenue between 27th Street and Beyer Boulevard, the project facility is an enhanced Class III bike route, with several additional features to increase the safety of all users:

- Three new speed humps
- Two new raised crosswalks at Southwest Middle School and the Iris Ave Trolley Station

- Installation/improvement of continental crosswalks at Monterey Pine Drive, Howard Avenue and 30th Street

BEYER BOULEVARD

The project facility along Beyer Boulevard is a two-way Class IV cycle track, physically separated from motorized traffic via a raised curb. This provides maximum separation between cyclists and motor vehicles within the roadway environment. Additional safety benefits include:

- Between Dairy Mart Road and Caminito De Los Niños, reduction in traffic lanes from four to two (plus two-way left turn lane) in accordance with the *San Ysidro Community Plan and Local Coastal Program (2016)*
- Protected intersection treatments at Iris Avenue and Dairy Mart Road including curb extensions, ramps and supporting signal phasing
- Signal modifications at Del Sur Boulevard, Smythe Avenue and West Park Avenue
- New pedestrian-activated crossing signal (HAWK) at Precision Park Lane
- Installation/improvement of continental crosswalks and curb ramps at Iris Avenue, Dairy Mart Road, Precision Park Lane, Del Sur Boulevard, Smythe Crossing, Smythe Avenue, and Caminito De Los Niños
- Three new bus islands providing separation between cyclists and transit buses at Dairy Mart Road, Precision Park Lane, and Del Sur Boulevard

WEST PARK AVENUE, EAST PARK AVENUE & EAST SEAWARD AVENUE

On West Park Avenue (north of East Seaward Avenue) and on East Seaward Avenue, the project facility is an enhanced Class III bike route or bike boulevard. Additional safety features include:

- One new speed hump
- Neighborhood traffic circle at West Park Avenue and Seaward Avenue, including new curb ramps & continental crosswalks
- Curb extensions at East Park Avenue and Seaward Avenue, including new curb ramps & continental crosswalk

South of Seaward Avenue, the project splits into a “couplet” of one-way routes on West Park Avenue (southbound) and East Park Avenue (northbound). The planned facilities are a combination of one-way Class IV cycle tracks and Class II buffered bike lanes. Additional safety features include:

- A large curb extension at Hall Avenue including new curb ramps and sidewalks
- Installation/improvement of continental crosswalks at both intersections with Hall Avenue

HALL AVENUE

On Hall Avenue, the project facility is an enhanced Class III bike route. Additional safety features include:

- A marked bike crossing at Olive Drive, providing a pathway for eastbound cyclists to reach the I-805 pedestrian bridge
- An adjacent speed hump on Olive Drive approaching the marked bike crossing

EAST BEYER BOULEVARD

On East Beyer Boulevard between the I-805 pedestrian bridge and Center Street/Hill Street, the project is a two-way Class IV cycle track, physically separated from motorized traffic via a raised

curb. This provides maximum separation between cyclists and motor vehicles within the roadway environment. Additional safety features include:

- Improved all-way stop at Center Street/Hill Street with bikeway markings

From Center Street/Hill Street to approximately 350 feet north of Bolton Hall Road, the project is an enhanced Class III bike route, including:

- Two new speed humps

From approximately 350 feet north of Bolton Hall Road East San Ysidro Boulevard/Camino de la Plaza, the project facility is Class II bike buffered lanes. Additional safety benefits include:

- Protected intersection treatments at East Beyer Boulevard/Camino de la Plaza including curb extensions, cyclist and pedestrian refuge areas and supporting signal phasing
- Installation/improvement of continental crosswalks at East San Ysidro Boulevard/Camino de la Plaza