ENCINITAS LOCAL ROADWAY SAFETY PLAN

FINAL REPORT

FEBRUARY 2022

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1.0 INTRODUCTION

In 2016, California established the Systematic Safety Analysis Report Program (SSARP) in response to a growing need to address transportation safety at a citywide level. The objective of the SSAR program was to identify low cost, systemic countermeasures that could be incorporated into an overall master plan of improvements that could be funded through local and grant funding, specifically the Highway Safety Improvement (HSIP) grant program. In 2020, the SSARP process was amended and renamed Local Roadway Safety Plans (LRSP), which is now required for Highway Safety Improvement (HSIP) grant funding applications. The LRSP is a data driven safety plan prepared through coordination with a range of organizations, to identify strategies that will lead to a reduction of collisions.

An LRSP analyzes collision data, assesses infrastructure deficiencies through an inventory of roadway system elements, and identifies roadway safety solutions on a citywide basis. The LRSP was created by the State to help local agencies develop safety projects that can be submitted for funding by the Highway Safety Improvement Program (HSIP). HSIP Cycle 11, expected around April 2022, and subsequent cycles will require an LRSP or equivalent plans such as a Vision Zero Plan or System Safety Analysis Report.

The LRSP focuses on engineering improvements to mitigate crashes. The LRSP also addresses the other safety improvements in other areas such as enforcement, education, and emergency services. Making roadways safer requires the four E's to be involved (Engineering, Enforcement, Education, and Emergency Services). Working together with the four E's at the city level will help make city roads safer.

This report has been prepared per Caltrans LRSP guidelines and the *Caltrans Local Roadway Safety Manual* (LRSM) version 1.5 dated June 2020. The general content of this LRSP includes these items:

- Crash data source and analysis techniques
- Crash data analysis results and highest occurring crash types
- High-risk corridor and intersection analysis and safety countermeasures
- Cost estimates of recommended improvements
- Prioritization of projects based on cost-benefit ratio and effectiveness of safety improvement
- Strategies for safety project implementation

The LRSP systematically identifies and analyzes safety problems and recommends safety improvements. Preparing the LRSP facilitates collaboration through the development of partnerships between Encinitas and stakeholders. The results of the LRSP are summarized with a prioritized list of improvements and actions.

STAKEHOLDER INVOLVEMENT

This project has been completed with input from key stakeholders who provided input on the project mission and goals, key safety issues and non-engineering strategies and countermeasures. Stakeholders included:

- City of Encinitas representatives
- Mobility and Traffic Safety Commission
- Sheriff Department
- Cardiff School District
- San Diego Unified School District
- City of Encinitas Development Services Department

The stakeholders provided the following input:

1) Key traffic safety issues facing the City of Encinitas
   - Age group of bicycle incidents
   - Safety related to E-bikes
   - Travel speeds and posted speeds too high
   - Speed of vehicles, speed of vehicles and areas around school
   - Cost effective solutions

2) Areas of concern based on the data. Others areas of concern that should also be considered:
   - Vehicle speeds around schools.
     - Locations mentioned were the area around the Olivernhain Pioneer Elementary School (which is in Carlsbad) and the Diegueno Middle School (in Encinitas) and particular the intersection of Rancho Santa Fe Rd and Calle Acervo (in both cities)
   - Increasing bike safety education both motorized and non-motorized travel
   - Rancho Santa Fe, El Camino, Leucadia major entrances to the city should be enforced and speed limit reduced

3) Policies or programs (such as education to students, city public information or public announcements, etc.) should be considered
   - Better signage or outside delivery takeout establishments
   - Continuing education on safety and more enforcement of speed limits

4) Emergency response issues
   - Consideration of emergency response time is needed to make sure reduced speed doesn't impact rating of fire department

PROCESS USED TO COMPLETE THE LRSP

The LRSP project includes four primary tasks. The following sections include a brief description of the tasks associated with this project, with a more detailed description of each task in subsequent sections of this document.

Data Collection

A comprehensive Geographic Information Systems (GIS) project database was developed by utilizing the following data:

- Ten-years (1/1/2011 to 12/31/2020) of collision data collected via the SWITRS collision database
- Location of signalized intersections
- GIS files of roadway, bicycle and pedestrian facilities

Safety Data Analysis

Following collection of data, the collision data was analyzed. Collisions were compared to the safety emphasis areas as defined in the California SHSP. The safety data analysis is summarized in Section 4 of this document. The transportation emphasis areas are identified based on the collision data analysis and are discussed in Section 5 of this document.

Identify Safety Measures

In coordination with city staff, a list of engineering-related safety countermeasures and non-engineering safety measures were developed for use as recommendations in this LRSP. These countermeasures are discussed in Section 3 and Section 4 of this document.

Develop Safety Projects and Cost Estimation

Roadways and intersections were ranked based on the collision frequency. The top locations of interest were investigated for further evaluation and potential safety improvements. Planning-level cost estimation are provided for each safety project. The list of safety projects are prioritized based on the following considerations:

- Benefit/Cost Ratio (for engineering solutions only)
- Funding availability for engineering and non-engineering programs
- Other factors recommended by city staff

The safety projects and cost estimates are discussed in Section 5 of this document.

2.0 COLLISION DATA ANALYSIS

CITYWIDE COLLISION DATA

Collision patterns were analyzed using ten years of collision data collected from the Statewide Integrated Traffic Records System) (SWITRS) for the period from **January 1, 2011 through December 31, 2020**. The University of California Berkeley's Transportation Injury Mapping System (TIMS) provided comparative information on collisions in Encinitas and San Diego County.

Collisions by Year (2011-2020)

The total number of collisions have been trending downward since 2011. In 2020, the number of collisions declined further, given less vehicle activity associated with COVID-19 closures. During this 10-year period there were 2,833 collisions recorded. There were 233 collisions that involved bicycles. There were also 124 pedestrian involved collisions that occurred during the study period. The number of pedestrian collisions per year has declined since 2013. There were also 141 collisions that were fatal or involved serious injury (KSI). Overall, the number of killed, serious injury (KSI) collisions per year have declined over the 10-year period.

Figure 2-1 Total and KSI Collisions by Year

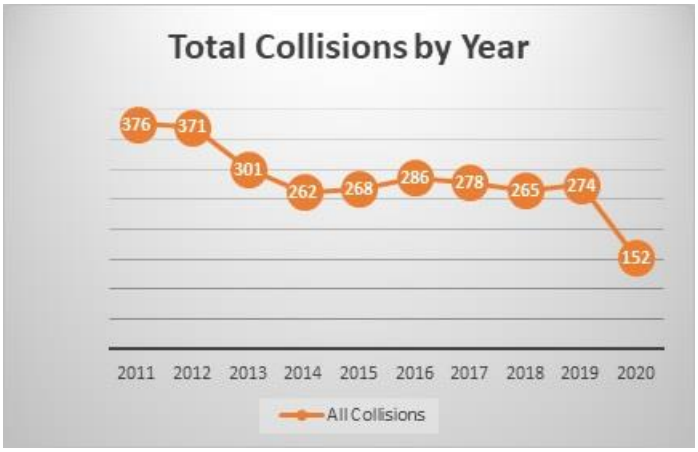
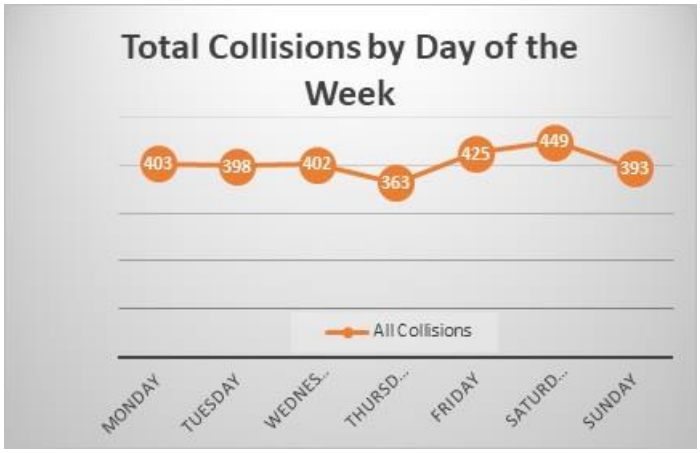


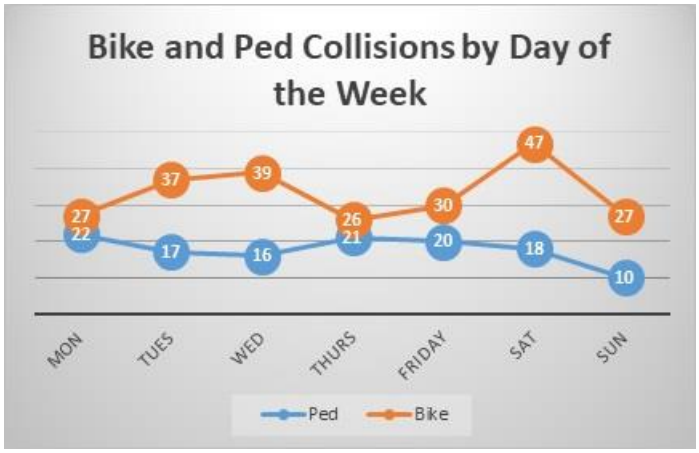
Figure 2-2 Bicycle and Pedestrian Collisions by Year

Collisions by Day of the Week

The number of recorded total collisions has been highest on Friday and Saturday. The number of bicycle collisions has been highest on Saturday. The number of pedestrian collisions by day was consistent throughout the week, but showed a decline on Sunday.

Figure 2-3 Total, Bicycle, and Pedestrian Collisions by Day of the Week

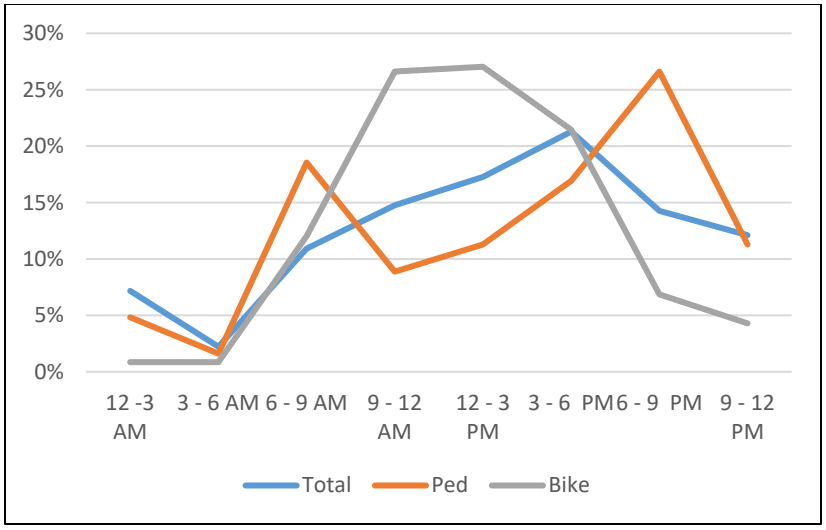




Collisions by Time of Day

The percentage of total collisions has been highest during the p.m. commuter peak period between 3 p.m. and 6 p.m. Pedestrian collisions have been highest during the evening hours, while bicycle collisions have been highest during the mid-day.

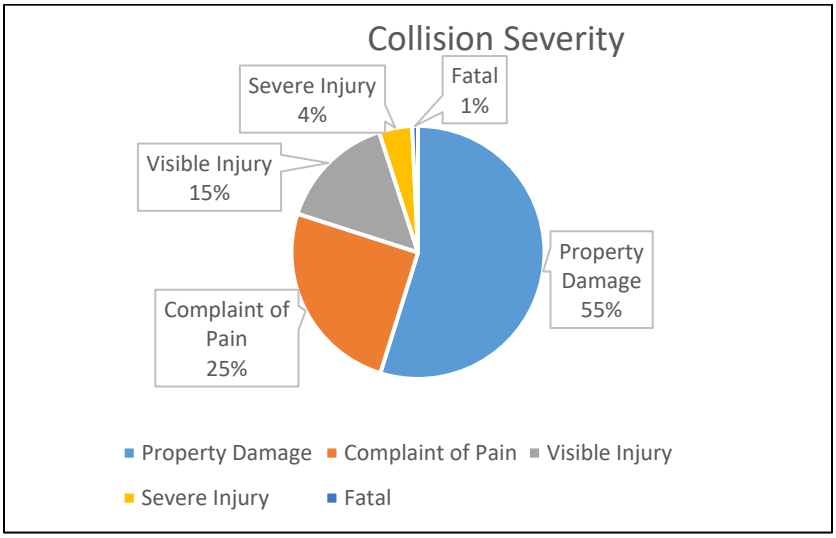
Figure 2-4 Collisions by Time of Day



Collision Severity

Over half (55%) of the collisions reported during the time-period resulted in property damage only. Fatalities and severe injuries (KSI) were 5% of all collisions.

Figure 2-5 Collision Severity

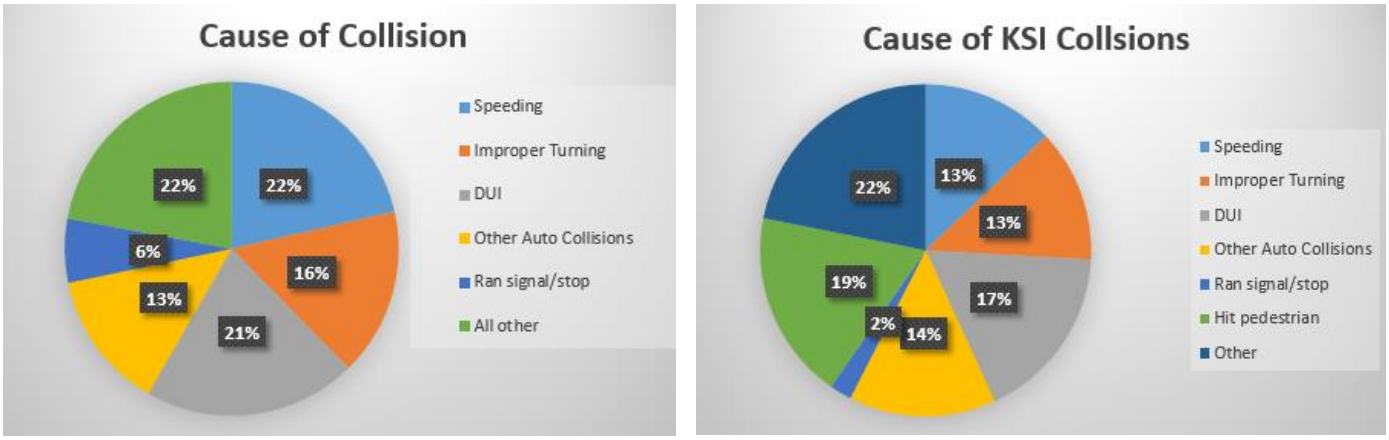


Cause of Collisions

The most frequent cause of collisions in Encinitas has been unsafe speed (21.4%), followed by driving under the influence at (20.7%), and improper turning (16.2%). The major contributing factors for KSI collisions were driving under the influence (17.3%) and pedestrian struck by vehicles 16.5%).

The reported cause of KSI collisions shows that at intersections, KSI collisions were caused by unsafe speed, by pedestrians crossing outside the crosswalk, by not crossing during the walk cycle, as a result of DUI, and other causes. For mid-blocks, the causes were improper turning, pedestrians crossing at mid-block, and other causes.

Figure 2-6 Total and KSI Cause of Collisions

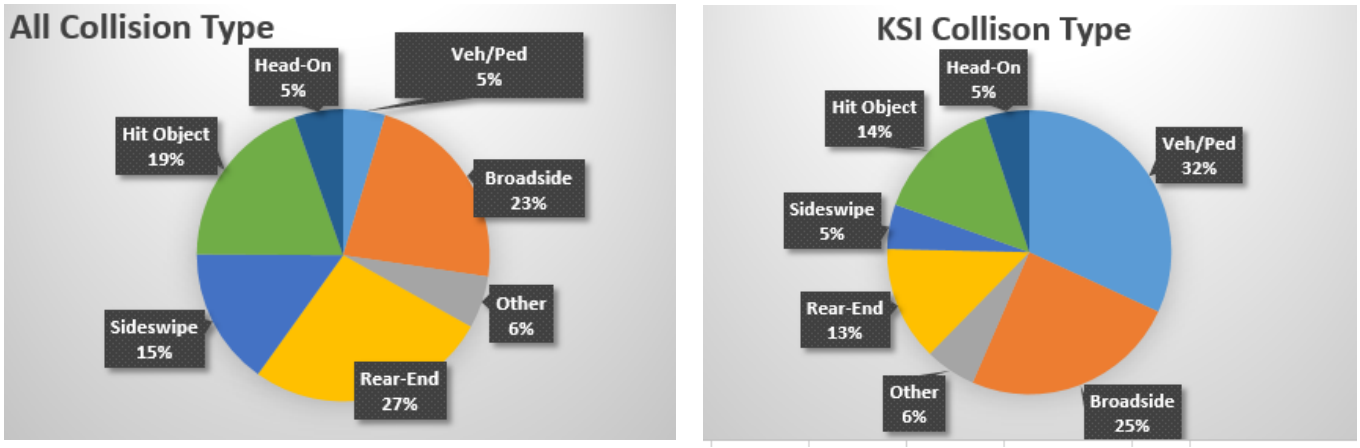


Types of Collisions

Figure 2-11 describes the total collisions and KSI collisions by collision type. The rear-end crash pattern was the most common collision type for all the collisions (27%), Broadside crashes accounted for 23% of the collisions, and hit-object crashes accounted for 20% of the total collisions. Vehicle/pedestrian collisions accounted for 31% of the KSI collisions.

The KSI collisions have been separated for mid-block and for intersections. The KSI collision type data shows the highest percentage of KSI collisions involved pedestrians. The data was compiled to include bicycles as vehicles in this category. By looking at other data categories, it can be determined that 18 bicycle KSI collisions occurred at intersections and 9 occurred at mid-block locations.

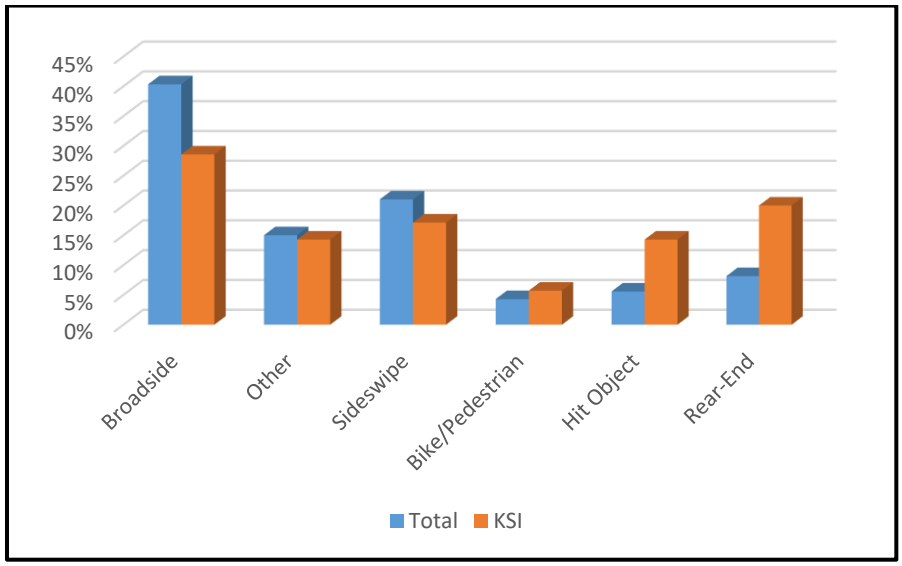
Figure 2-7 Total and KSI Collision Type



Bicycle and Pedestrian Collisions

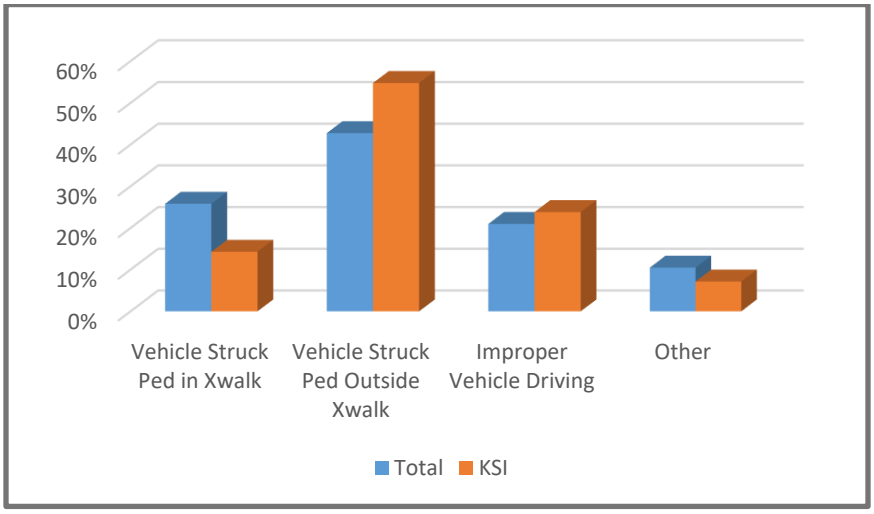
During the study period, 233 collisions involving bicycles were reported. Of these, 35 resulted in fatal or severe injuries. The primary pattern of KSI bicycle collisions were broadside (29%), rear-end (20%) and sideswipe (17%).

Figure 2-8 Bicycle Collision Cause



There were 124 pedestrian-involved collisions that occurred during the study period, which included 42 KSI collisions. Approximately 1/4 of the total pedestrian collisions occurred while the pedestrian was crossing in the crosswalk; 2/3 occurred outside the crosswalk; and the remained occurred as a result of improper driving where the crosswalk location was not specified.

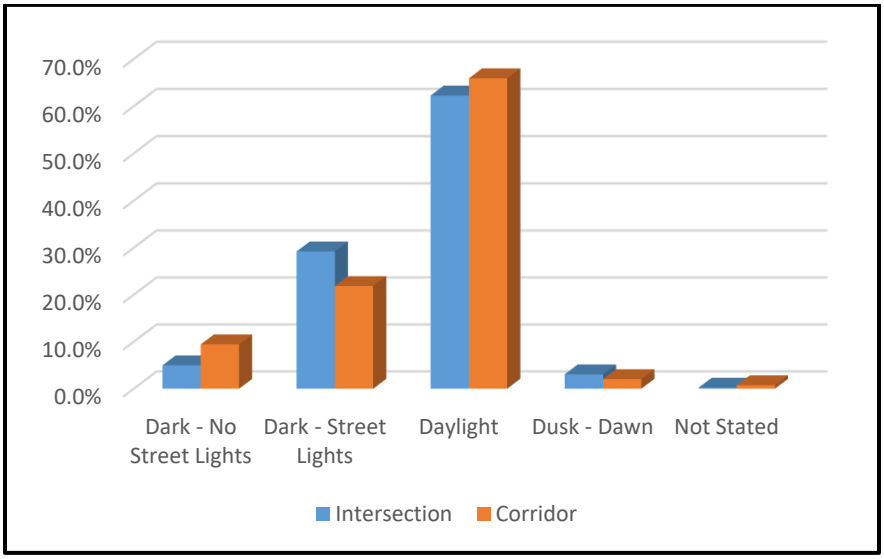
Figure 2-9 Pedestrian Collision Cause



Lighting Conditions

Approximately 1/3 of the collisions occurred at night. Less than 6% of collisions occurred on unlit streets. Nearly 10% of pedestrian collisions occurred in unlit dark conditions while only 3% of bicycle collisions occurred in unlit dark conditions.

Figure 2-10 Collisions by Lighting Condition



INVOLVED PARTY INFORMATION

For many collisions, information was collected about the parties causing the collision (At-Fault Party) and the people that were involved in the accident (not at fault). The reported information is summarized below for age, gender and race.

Age Distribution of At-Fault Parties

In Encinitas, younger drivers (under 25 years) accounted for 29.5% of collisions. Older drivers (65+) accounted for a small percentage (4%) of collisions.

Table 2-1 Age of At-Fault Party

Age Range	Count	Percent
<18	96	5.7%
18-25	401	23.8%
46-55	274	16.3%
>75	200	11.9%
26-35	221	13.1%
36-45	273	16.2%
56-65	154	9.1%
66+	65	3.9%
Total	**1684**	**100.0%**

Gender of At-Fault Parties

Males accounted for 61.5% of the collisions.

Table 2-2 Gender of At-Fault Party

Gender	Count	Percent
Male	1024	61.5%
Female	640	38.5%
Total	**1664**	**100.0%**

Race of At-Fault Parties

Nearly 70% of the at-fault party were white. Just over 20% of at-fault parties were Hispanic.

Table 2-3 Race of At-Fault Party

Gender	Count	Percent
White	1158	69.6%
Hispanic	342	20.6%
Asian	46	2.8%
Black	37	2.2%
Other	40	2.4%
Not Spec.	41	2.5%
Total	**1664**	**100.0%**

COMPARISON WITH CITIES OF SIMILAR SIZE

In the State of California's Office of Transportation Safety (OTS) Crash Ranking system, Encinitas falls under Group C. This group consists of 58 cities in the state of California with a population between 50,000 and 100,000. **Table 2-4** shows Encinitas' crash ranking among the cities in Group C (1 being the highest or worst and 102 being the lowest or best). This data is for the most recent year that data was available, which is 2018. Overall the City's traffic safety performance ranges from average to good. Of note:

- The City ranked 38th for killed or injured pedestrians over 65 years old
- The City ranked 24th in bicyclist collisions

Table 2-4 OTS Rankings

Type of Crash	Victims Kill and Injured	OTS Ranking
Total Fatal and Injury	164	97/102
Alcohol Involved	32	55/102
Had Been Drinking Driver < 21	1	57/102
Had Been Drinking Driver 21 - 34	11	49/102
Motorcycles	13	61/102
Pedestrians	9	93/102
Pedestrians < 15	0	93/103
Pedestrians 65+	4	38/102
Bicyclists	26	24/102
Bicyclists < 15	1	62/102
Composite	98	78/102
Type of Crash	**Victims Kill and Injured**	**OTS Ranking**
Speed Related	29	92/102
Nighttime (9:00 PM - 2:59 AM)	13	95/102
Hit and Run	12	80/102

Location of Collisions

Figure 2-11 shows the locations of intersection and mid-block collisions based on the intensity count. The locations of intersection and mid-block KSI collisions are in **Figure 2-12,** and the locations of intersection and mid-block bicycle and pedestrian collisions are in **Figure 2-13**.

Figure 2-11 Location of Collisions

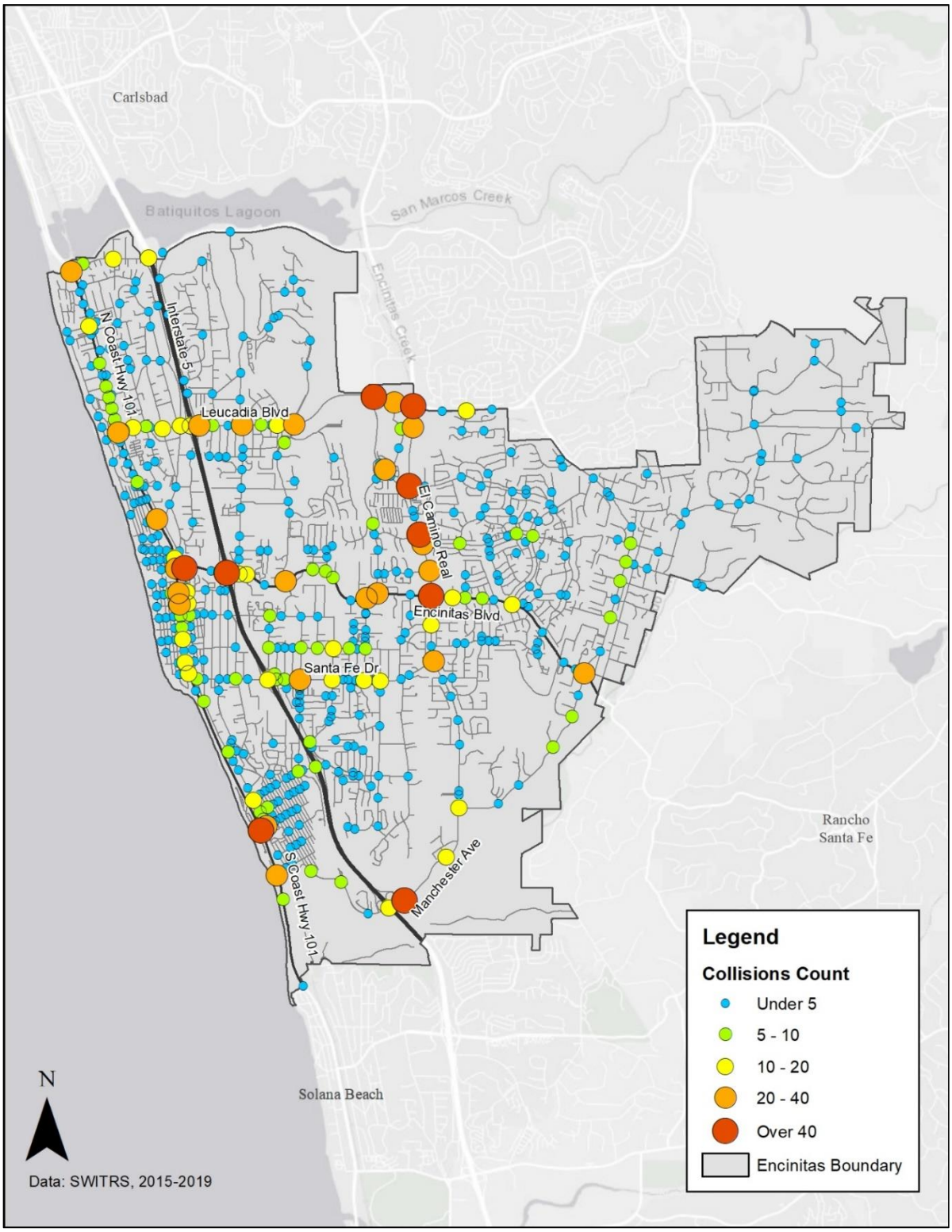


Figure 2-12 Location of KSI Collisions

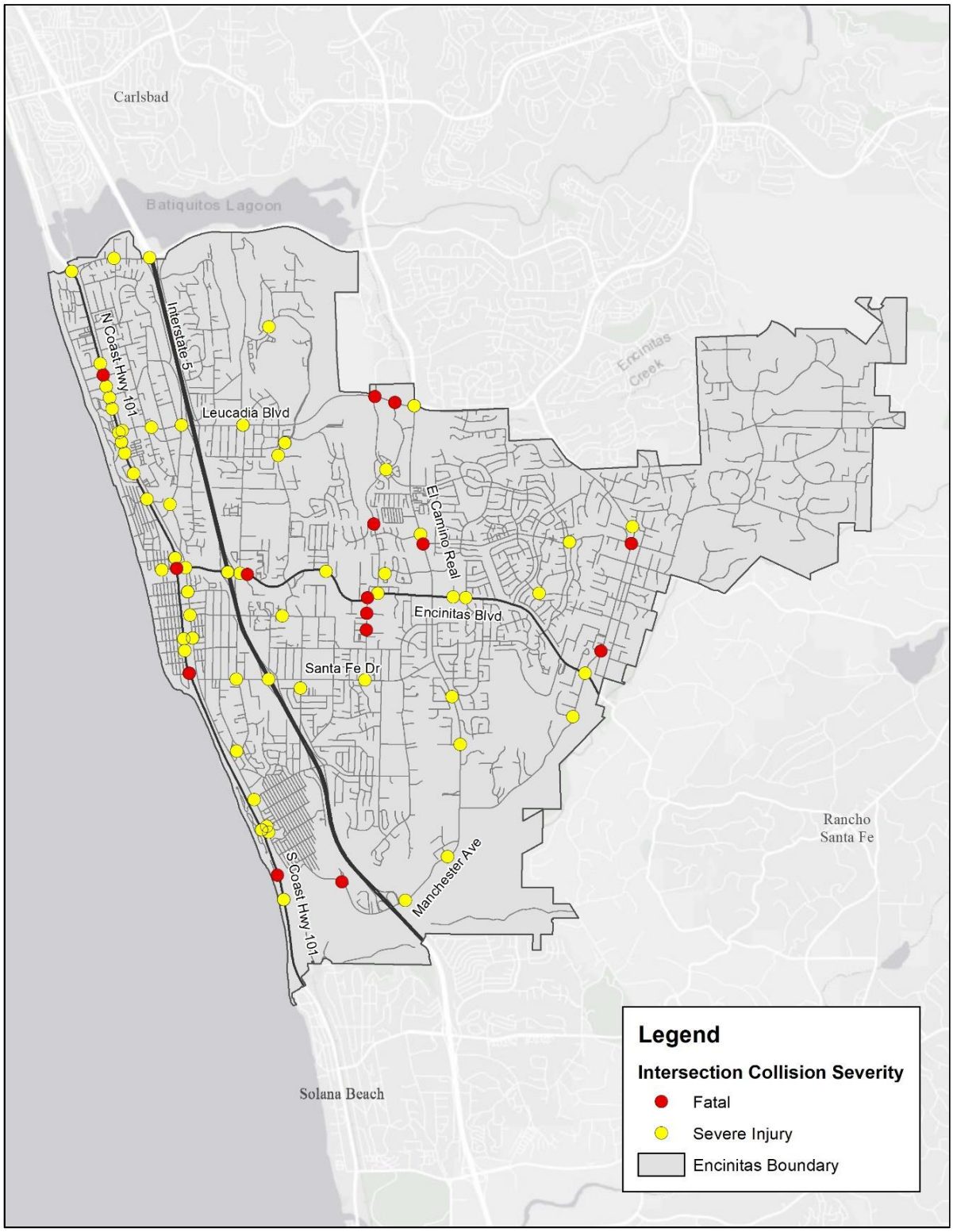
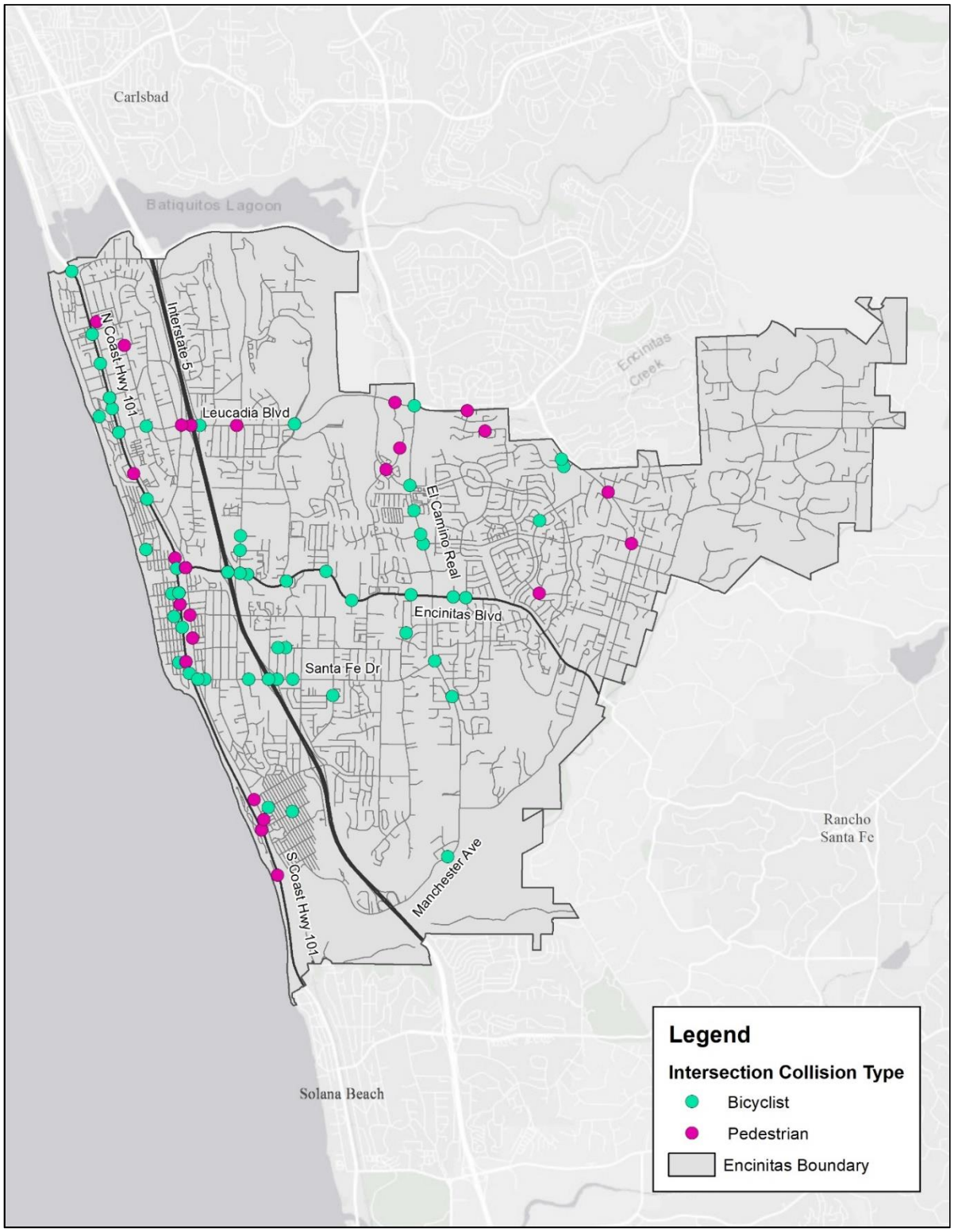


Figure 2-13 Location of Bicycle and Pedestrian Collisions (2011-2020)



HIGH CRASH INTERSECTIONS AND MIDBLOCK LOCATIONS

High priority collision locations were determined by identifying prominent collision patterns. Three ranking methods used to identify the high-collision intersections and roadway segments were: Crash Frequency, Crash Rate, and Equivalent Property Damage Only (EPDO) scores.

EPDO Scores

Equivalent Property Damage Only (EPDO) scores provide an estimate of crash cost and are calculated by assigning weighting factors to crashes by severity relative to property damage only (PDO) crashes. The weights reflect estimated societal costs of fatal, severe injury crashes and less-severe injury crashes. Below are the weights by crash severity, based on the 2020 HSIP manual.

Table 2-5 Weights by Crash Severity

Crash Severity"	Location Type	Crash Cost***
**Fatality and Severe Injury Combined (KA)	Signalized Intersection	$1,590,000
	Non-Signalized Intersection	$2,530,000
	Roadway	$2,190,000
Evident Injury - Other Visible (B)	All	$142,300
Possible Injury - Complaint of Pain (C)	All	$80,900
Property Damage Only (O)	All	$13,300

EPDO scores are useful for benefit-cost analysis as collision costs can be translated into measurable benefits from installing improvements should the improvements prevent the collisions in question.

INTERSECTIONS

Collisions that occurred **within 250 feet** of an intersection are considered intersection collisions. The locations of KSI collisions are shown in Figure 4.1. The 30 highest frequency intersection collision locations are listed by frequency and by collision type in **Table 2-6**. The 30 highest intersection collision locations listed by crash costs are shown in **Table 2-7.**

Table 2-6 Highest Intersection Collision Locations by Crash Frequency

Intersection		Number of Crashes								
		Total	Broadside	Head-On	Hit Object	Over-turned	Rear End	Sideswipe	Vehicle/ Pedestrian	Other
1	EL CAMINO RL & ENCINITAS BL	45	10	2	7	1	16	6		3
2	ENCINITAS BL & RT 5	42	6	1	6		16	7	5	1
3	ENCINITAS BL & VULCAN AV	41	16	3	1	1	12	3	4	1
4	D ST & S COAST HWY 101	35	13	4			9	1	5	3
5	MANCHESTER AV & VIA POCO	34	19	2	1		10	1		1
6	CHESTERFIELD DR & S COAST HWY 101	24	4		4	1	6	7	2	
7	LEUCADIA BL & PIRAEUS ST	24	11		5		3	5		
8	E ST & S COAST HWY 101	23	7	1	1	1	3	8	1	1
9	GARDEN VIEW RD & LEUCADIA BL	23	5	1	4		12	1		
10	CHESTERFIELD DR & SAN ELIJO AV	22	7	5	3		1	4		2
11	LEUCADIA BL & QUAIL GARDENS DR	22	5	4	3		8	1	1	
12	LEUCADIA BL & SAXONY RD	22	4	1	4	1	9	3		
13	BALOUR DR & ENCINITAS BL	20	2		2	1	13	1	1	
14	GARDEN VIEW RD & VIA CANTEBRIA	20	8	1	4	1	2	3	1	
15	ENCINITAS BL & VIA CANTEBRIA	19	2		4		10	2		1
16	LEUCADIA BL & N COAST HWY 101	18	2	1	3		8	3		1
17	D ST & SOUTH VULCAN AV	17	12	1	1				2	1
18	ENCINITAS BL & SAXONY RD	17	2	1	2		9	3		
19	LEUCADIA BL & N EL CAMINIO REAL	17	4				13			
20	LEUCADIA BL & ORPHEUS AV	17	4	2	2		4	2	2	1
21	LEUCADIA BL & RT 5	17	7	1	2		3	3	1	
22	MOUNTAIN VISTA DR & N EL CAMINIO REAL	17	4				11	2		
23	CALLE MAGDALENA & ENCINITAS BL	16	2	2	1		8	2	1	
24	E ST & SOUTH VULCAN AV	16	3	1	2	1	7	1	1	
25	LEUCADIA BL & NORTH VULCAN AV	16		3	2		4	3	3	1
26	LEUCADIA BL & TOWN CENTER PL	16	6	1	2		1	3	3	
27	MARCHETA ST & N COAST HWY 101	16	2		3	1	8	1	1	
28	N EL CAMINIO REAL & TOWN CENTER DR	16	2		2		10	2		
29	N EL CAMINO REAL & OLIVENHAIN RD	16	2	1	2	2	8	1		
30	S EL CAMINO REAL & SANTA FE DR	16	3		5		5	2	1	

Table 2-7 Highest Intersection Collision Locations by Severity (EPDO)

	Intersection	Number of Crashes						Crash Costs
		Total Collisions	Fatal	Severe Injury	Visible Injury	Complaint of Pain	PDO	
1	ENCINITAS BL & RT 5	42		3	5	12	22	$6,744,900
2	CHESTERFIELD DR & S COAST HWY 101	24		3	6	7	8	$6,296,500
3	K ST & S COAST HWY 101	9	1	2	2	2	2	$5,243,000
4	LEUCADIA BL & SAXONY RD	22		2	5	6	9	$4,496,600
5	COAST HWY 101 & ENCINITAS BL	14	1	1	3	5	4	$4,064,600
6	ENCINITAS BL & VULCAN AV	41		1	7	15	18	$4,039,000
7	D ST & SOUTH VULCAN AV	17		2	3	3	9	$3,969,300
8	A ST & N COAST HWY 101	11		2	3	4	2	$3,957,100
9	LEUCADIA BL & TOWN CENTER PL	16	1	1	2	4	8	$3,894,600
10	LAS OLAS TRAFFIC LIGHT & S COAST HWY 101	4		2	2			$3,464,600
11	EUROPA ST & N COAST HWY 101	5		2	1	1	1	$3,416,500
12	MANCHESTER AV & VIA POCO	34		1	2	16	15	$3,368,500
13	ALEXANDRA LN & QUAIL GARDENS DR	6		2	1		3	$3,362,200
14	GARDEN VIEW RD & LEUCADIA BL	23	1		6	9	7	$3,265,000
15	LONE JACK RD & N RANCHO SANTA FE RD	5	1	1			3	$3,219,900
16	H ST & SOUTH VULCAN AV	3		2			1	$3,193,300
17	MOUNTAIN VISTA DR & N WILLOWSPRING DR	3		2			1	$3,193,300
18	N EL CAMINO REAL & OLIVENHAIN RD	16		1	5	5	5	$2,772,500
19	GARDEN VIEW RD & VIA CANTEBRIA	20		1	4	5	10	$2,696,700
20	LEUCADIA BL & N EL CAMINIO REAL	17		1	2	9	5	$2,669,200
21	BALOUR DR & ENCINITAS BL	20	1		4	4	11	$2,629,100
22	LEUCADIA BL & N COAST HWY 101	18		1	5	1	11	$2,528,700
23	ENCINITAS BL & VILLAGE SQUARE DR	15		1	3	5	6	$2,501,200
24	ENCINITAS BL & VIA CANTEBRIA	19		1	1	8	9	$2,499,200
25	LA COSTA AV & N COAST HWY 101	13		1	4	3	5	$2,468,400
26	ENCINITAS BL & SAXONY RD	17		1	2	6	8	$2,466,400
27	D ST & S COAST HWY 101	35			9	12	14	$2,437,700
28	N EL CAMINIO REAL & VIA MONTORO	15		1	2	5	7	$2,372,200
29	CALLE MAGDALENA & ENCINITAS BL	16	1		1	6	8	$2,324,100
30	LEUCADIA BL & ORPHEUS AV	17		1	2	3	11	$2,263,600

MID-BLOCK

Collisions that occurred **farther than 250 feet** from an intersection are considered mid-block collisions. The 20 highest frequency corridors showing midblock collision are listed by frequency and by collision type in **Table 2-8**. The 20 highest corridors showing midblock collisions as listed by crash costs are shown in **Table 2-9.**

Table 2-8 Highest Mid-Block Collision Locations by Crash Frequency

Corridor		Number of Crashes							
		Total	Broadside	Head-On	Hit Object	Rear End	Sideswipe	Vehicle/ Pedestrian	Other
1	N EL CAMINIO REAL	66	16		3	35	8	2	2
2	ENCINITAS BL	58	24	2	9	11	7	3	1
3	S COAST HWY 101	57	6	1	9	15	14	5	7
4	MANCHESTER AV	47	3	2	19	12	6		2
5	LEUCADIA BL	30		1	13	13	2		1
6	N COAST HWY 101	20			6	6	5	1	2
7	SAN ELIJO AV	18	2		4	4	4	2	2
8	VIA CANTEBRIA	17		1	10	6			
9	S EL CAMINO REAL	15	10	1	1	2	1		
10	EL CAMINO REAL	13	8				3	2	
10	NORTH VULCAN AV	13	3	2	2	2	3	1	
12	SANTA FE DR	10	4		2	3	1		
13	QUAIL GARDENS DR	9	1	2	4	1	1		
14	GARDEN VIEW RD	8	1		6				
14	MELBA RD	8			1	1	5	1	
16	OLIVENHAIN RD	7			1	5			
16	LA COSTA AV	7	4		3				
16	LONE JACK RD	7			4	1			
16	SAXONY RD	7	2	1	2				1
20	REGAL RD	6		1	2	1	1		1
20	VIA MONTORO	5	3				1	1	
20	N EL CAMINO REAL	5			4	1			
20	VIA MOLENA	5	3	1		1			

Table 2-9 Highest Mid-Block Collision Locations by Severity (EPDO)

Mid-block Segments		Number of Crashes						Crash Costs
		Total Collisions	Fatal	Severe Injury	Visible Injury	Complaint of Pain	PDO	
1	S COAST HWY 101	57	1	9	12	17	18	$25,222,300
2	ENCINITAS BL	58		4	11	17	26	$12,046,400
3	N EL CAMINIO REAL	66		3	11	23	29	$10,381,700
4	LEUCADIA BL	30		4	4	5	17	$9,959,800
5	MANCHESTER AV	47		3	7	12	25	$8,869,400
6	S EL CAMINO REAL	15	1	2	3	5	4	$7,454,600
7	EL CAMINO REAL	13	2	1	3	3	4	$7,292,800
8	QUAIL GARDENS DR	9		2	2	1	4	$4,798,700
9	N COAST HWY 101	20		1	3	8	8	$3,370,500
10	VIA CANTEBRIA	17		1	2	7	7	$3,134,000
11	SANTA FE DR	10		1	1	4	4	$2,709,100
12	OLIVENHAIN RD	7		1	1	2	3	$2,534,000
13	NEPTUNE AV	3		1	1		1	$2,345,600
14	10TH AV	2	1		1			$2,332,300
15	LONE HILL LN	3		1			2	$2,216,600
16	BIRMINGHAM DR	1	1					$2,190,000
17	BONITA DR	1		1				$2,190,000
18	VALLEDA LN	1		1				$2,190,000
19	SAN ELIJO AV	18			3	4	11	$896,800
20	NORTH VULCAN AV	13			2	6	5	$836,500

3.0 SYSTEMIC ASSESSMENT

INTRODUCTION

This section describes the systemic analysis element of the project. It describes how the systemic database was created, how the information was compiled and evaluated, and how the results were used to define segment and intersection rankings.

To conduct systemic analysis, databases were created summarizing the characteristics of the arterial and collector segments and intersections. This process included collecting information on variables that may explain crashes on the road elements, and aggregating crash totals for each high-level crash type (e.g., pedestrian, bicycle) onto the road elements.

Information was collected to identify potential system collision factors related to each of the safety emphasis areas. Data collected included:

- Collisions from the Statewide Integrated Traffic Records System (SWITRS) which geocodes collision data from the California Highway Patrol.
- Posted speeds
- Number of travel lanes
- Bicycle facilities inventory
- Pedestrian crossing information

SYSTEMIC APPROACH

In addition to identifying locations with a history of collisions, this plan evaluates the systemic nature of crashes in the Encinitas, focusing on trying to understand where crashes are likely to occur in the future, in addition to where they have occurred in the past. This section of the document evaluates trends associated with each emphasis area. Summary tables of the data analysis have been provided in the appendix. Based on the review total collisions with a focus on fatal and severe injury collisions (KSI), contributing factors were identified for each safety emphasis area. System collision causes have been summarized in Table 3-1.

Pedestrian Collisions

KSI pedestrian collisions were more likely to occur on higher speed than lower speed roadways. KSI pedestrian collisions were also more likely to occur in the area of Encinitas closer to the coast, which typically has more pedestrian activity.

Bicycle Collisions

Vehicle-bicycle collisions are a result of vehicles striking bicycles. They have occurred along corridors or at intersections. KSI bicycle collisions occurred independent of speed, as illustrated by the collisions

occurring on Cost Highway 101, which has a range of posted speeds. KSI bicycle collisions also occurred throughout the city, in coastal, suburban and low density areas. Bicycle collisions occurred at both mid-block and at intersection locations. They also occurred where bicycle lanes or sharrows were present. Further review indicated that a common bicycle-vehicle collision pattern occurred at along arterial routes at side street stop locations where drivers failed to see bicycles before entering traffic.

Broadside Collisions

Broadside collisions were shown to be related to roadway speed. KSI broadside collisions were just as likely to occur at signalized intersection as at two-way stop control intersections.

Rear End Collisions

No clear causal pattern was observed by reviewing rear end collision data. KSI rear end collisions occurred at differing roadway speeds, as KSI collisions occurred on roadways with both lower and higher speed limits. KSI broadside collisions were shown to occur at both signalized intersections as at two-way stop controlled intersections.

Table 3-1: Systemic Factors Related to Safety Emphasis Areas

Safety Emphasis	Systemic Contributing Factors
Bicycle	
	Sideswipe/Bike lane buffers/high speed roadways
	At intersections where Class II lanes transition
	Bike lane or sharrow crossing two-way side street stops (majority on Highway 101)
Pedestrian	
	Posted travel speeds 35 mph and higher
	Pedestrian crossings in the Coastal area
	Both signal and stop control
	Mid-Block crossing of multi-lane roadways
Broadside	
	Posted speed over 35 mph
	Signalized intersection
	Left turns from side street stop across multiple lanes
Rear End	
	Where posted speed are over 35 mph
	At signalized intersections
DUI	
	Concentrations in entertainment areas, but also throughout city

TRANSPORTATION SAFETY EMPHASIS AREAS

Transportation safety emphasis areas provide a focus for developing projects and programs. Based on the collision data analysis conducted for the City of Encinitas, these are the transportation safety emphasis areas to be emphasized in addressing the goals of the LRSP.

- Bicyclists
- Pedestrians
- Aggressive Driving
- Driving under Influence (DUI)
- Improper Turning and Broadside Collisions
- Distracted Driving
- Young Drivers

TIMS data was used to compare emphasis areas in Encinitas with San Diego County, as shown in Table 3-2.

Table 3-2 Emphasis Areas - County Comparison

Emphasis Area	Encinitas	San Diego County
KSI	9.3%	7.8%
Bicyclists	10.4%	6.3%
Pedestrians	6.1%	7.9%
Aggressive Driving	43.8%	35.3%
Driving or Bicycling Under the Influence of Alcohol or Drug	11.8%	7.4%
Improper Turning	11.7%	17.6%
Rear End Collisions	45.0%	33.0%
Broadside Collisions	19.3%	21.9%

Bicyclists

The City of Encinitas has an active recreational cyclist community. According to the 2011-2020 SWITRS data, bicycle-related collisions accounted for 8% of total collisions, and 19% of KSI collisions. 15% of the bicycle related collisions resulted in a severe injury or fatality.

Pedestrians

Pedestrians have been involved in a disproportionate share of KSI collisions in Encinitas. From 2010 to 2019, pedestrian collisions accounted for 5% of total collisions, but more than 24% of KSI collisions. Nearly 35% of pedestrian collisions resulted in fatalities or severe injuries, a higher percentage than for

any other collision type. Nearly 40% of pedestrian collisions occurred while crossing in the crosswalk at an intersection. Nearly 27% of pedestrian collisions occurred in the road, including those where pedestrians were walking along the shoulder.

Aggressive Driving

Twenty-three percent of the crashes were primarily caused by drivers traveling at unsafe speed or following too closely. Rear-end crashes constituted the most frequent collision type in Encinitas, with speeding the primary factor in 52% of the rear-end collisions.

Driving Under Influence

Driving under the influence (DUI) was a frequent collision factor. DUI was the primary factor for 14% of KSI collisions.

Broadside, Hit-Object and Sideswipe Collisions

Improper turning can result from driver error or aggressive driving. Motorists that speed through or abruptly turn at intersections are more likely to collide with other vehicles, pedestrians, or bicyclists. Broadside collisions were the second highest collision type, with improper turning also noted as the primary collision factor in 16 % of total collisions. Broadside collisions were the second highest crash type (24%) in KSI collisions.

Distracted Driving

Distracted driving refers to any activity that diverts the driver's attention, thereby preventing them from driving safely. Common examples of distracted driving activities include non-hand-free mobile phone use, eating and drinking, and conversation. Although it is difficult to obtain distracted driving statistics from SWITRS data, this area of emphasis will be included in the LRSP.

Young Drivers

Young drivers can be more likely to be involved in a collision due to insufficient experience in operating a motor vehicle when they are first licensed. Furthermore, young drivers tend to engage in risky driving behaviors, including speeding and distracted driving. According to the SWITRS data, drivers under 24 years old were responsible for roughly 30 % of total collisions and 27 % of DUI crashes.

COUNTERMEASURES

The safety countermeasures considered to address systemic collisions are those identified by Caltrans and described in the Caltrans Local Roadway Safety Manual (CA-LRSM). Caltrans has used information from the Crash Modification Factor (CMF) Clearinghouse and three other FHWA published safety manuals — Roadway Departure Safety, Intersection Safety, and Roadways Safety Information Analysis — in conjunction with its own research with the Safe Transportation Research and Education Center (SafeTREC) to develop the Caltrans Local Roadway Safety Manual (CA-LRSM).

The countermeasures listed address the high crash intersections and roadway segments. The countermeasure list indicates the crash type, crash reduction factors (CRF), federal funding eligibility for HSIP projects and the systemic opportunity.

The information included in the countermeasures are:

- Crash Types - "All", "P & B" (Pedestrian and Bicycle), "Night", "Emergency Vehicle", or "Animal".
- CRF - Crash Reduction Factor used for HSIP calls-for-projects.
- Expected Life - 10 years or 20 years.
- Federal Funding Eligibility – the maximum federal reimbursement ratio.
- Systemic Approach Opportunity - Opportunity to Implement Using a Systemic Approach: "Very High", "High", "Medium" or "Low"

The countermeasure description refers to each countermeasure with an identification letter and number. The letters refer to the following:

- 'S' countermeasures apply to signalized intersections.
- 'NS countermeasures apply to non-signalized intersections
- 'R' countermeasures apply to roadways.

The list of HSIP approved countermeasure is provided in Appendix D. This list is not an all-inclusive list and only consists of thoroughly researched countermeasures used by Caltrans that apply to signalized intersections and roadways. Using this list, the Caltrans safety countermeasures were identified that respond to the collision patterns for the identified high crash intersections and segments. The locations to apply the countermeasures are also listed.

Based on review of the collision data and collision locations, the following countermeasures were identified as having the highest potential for collision reduction in Encinitas. The countermeasures are presented for a) signalized intersections, b) unsignalized intersections and c) roadway segments.

Signalized Intersection Countermeasures

S2. Improve Signal Hardware: lenses, back-plates with retroflective borders, mounting new signals, increasing signal head size and number of signal heads.

Install at signalized intersections with broadside and rear-end crashes occurring where drivers have difficulty seeing traffic signals sufficiently in advance. This countermeasure can include new LED lighting, signal back plates, retro-reflective tape outlining the back plates, or visors to increase signal visibility, larger signal heads, relocation of the signal heads, additional signal heads, providing near side signals, or high mount signals at locations where intersection visibility may be affected.

Crash Type	All
CRF	15%
Expected Life (Years)	10
Federal Funding Eligibility	100%
Systemic Approach opportunity	Very High

S3. Improve signal timing (coordination, phases, red, yellow, or operation)

Install at locations that have a crash history at multiple signalized intersections along a corridor. Signalization improvements may include adding phases, lengthening clearance intervals, eliminating or restricting higher-risk movements, and coordinating signals at multiple locations.

Crash Type	All
CRF	15%
Expected Life (Years)	10
Federal Funding Eligibility	50%
Systemic Approach Opportunity	Very High

S4. Provide advanced dilemma zone detection for high speed approaches

Effective at remote areas that have a high frequency of right-angle and rear end crashes. The Advanced Dilemma-Zone Detection system enhances safety at signalized intersections by modifying traffic control signal timing to reduce the number of drivers that may have difficulty deciding whether to stop or proceed during a yellow phase. This may reduce rear-end crashes associated with unsafe stopping and angle crashes due to running red light. This is accomplished by adjusting the start time of the yellow-signal phase either earlier or later, based on observed vehicle locations and speeds.

Crash Type	All
CRF	30%
Expected Life (Years)	20
Federal Funding Eligibility	100%
Systemic Approach Opportunity	Medium

S8. Install raised pavement markers and striping (through intersection)

Applicable at intersections where the lane designations are not clearly visible to approaching motorists and/or intersections noted as being complex and experiencing crashes that could be attributed to a driver's unsuccessful attempt to navigate the intersection.

Crash Type	All
CRF	10%
Expected Life (Years)	10
Federal Funding Eligibility	100%
Systemic Approach Opportunity	Very High

S20PB Install advance stop bar before crosswalk (Bicycle Box)

Adding advance stop bar before the striped crosswalk has the opportunity to enhance both pedestrian and bicycle safety. Stopping cars well before the crosswalk provides a buffer between the vehicles and the crossing pedestrians. It also allows for a dedicated space for cyclists, making them more visible to drivers (This dedicated space is often referred to as a bike-box.) *This can include providing conflict striping at intersection approaches.*

Crash Type	P&B
CRF	15%
Expected Life (Years)	10
Federal Funding Eligibility	100%
Systemic Approach opportunity	Very High

S21PB Modify signal phasing to implement of Leading Pedestrian Interval (LPI)

A leading pedestrian interval (LPI) gives pedestrians the opportunity to enter an intersection 3-7 seconds before vehicles are given a green indication. With this head start, pedestrians can better establish their presence in the crosswalk before vehicles have priority to turn left. LPIs provide (1) increased visibility of crossing pedestrians; (2) reduced conflicts between pedestrians and vehicles; (3) Increased likelihood of motorists yielding to pedestrians; and (4) enhanced safety for pedestrians who may be slower to start into the intersection.

Crash Type	P&B
CRF	60%
Expected Life (Years)	10
Federal Funding Eligibility	100%
Systemic Approach opportunity	Very High

Non-Signalized Intersection Countermeasures

NS02 Convert to all-way STOP control (from 2-way or Yield control)

All-way stop control can reduce right-angle and turning collisions at unsignalized intersections by providing more orderly movement at an intersection, reducing through and turning speeds, and minimizing the safety effect of any sight distance restrictions that may be present. All-way stop control is suitable only at intersections with moderate and relatively balanced volume levels on the intersection approaches.

Crash Type	All
CRF	50%
Expected Life (Years)	10
Federal Funding Eligibility	100%
Systemic Approach Opportunity	High

NS05. Install/upgrade larger or additional stop signs or other intersection warning/regulatory signs

This strategy can be used on approaches to unsignalized intersections with patterns of rear-end, right-angle, or turning collisions related to lack of driver awareness of the presence of the intersection.

Crash Type	All
CRF	15%
Expected Life (Years)	10
Federal Funding Eligibility	100%
Systemic Approach Opportunity	Very High

NS06. Upgrade intersection pavement markings

Install at unsignalized intersections that are not clearly visible to approaching motorists, particularly approaching motorists on the major road. The strategy is appropriate for intersections with patterns of rear-end, right-angle, or turning crashes related to lack of driver awareness of the presence of the intersection, also at minor road approaches where conditions allow the stop bar to be seen by an approaching driver at a significant distance from the intersection. Typical improvements include "Stop Ahead" markings and the addition of Centerlines and Stop Bars.

Crash Type	All
CRF	25%

Expected Life (Years)	10
Federal Funding Eligibility	100%
Systemic Approach Opportunity	Very High

NS20PB, Install pedestrian crossing at uncontrolled locations (signs and markings only)

This countermeasure is used at non-signalized intersections without a marked crossing, where pedestrians are known to be crossing intersections that involve significant vehicular traffic. Pedestrian crossings are especially important at school crossings and intersections with right and/or left turns pockets. Pavement markings delineate a portion of the roadway that is designated for pedestrian crossing. These markings will often be different for controlled verses uncontrolled locations. The use of "ladder", "zebra" or other enhanced markings at uncontrolled crossings can increase both pedestrian and driver awareness to the increased exposure at the crossing.

Crash Type	P&B
CRF	25%
Expected Life (Years)	20
Federal Funding Eligibility	90%
Systemic Approach Opportunity	High

NS21PB, Install/upgrade pedestrian crossing at uncontrolled locations

This countermeasure includes flashing beacons, curb extensions, advanced "stop" or "yield" markings, and other safety features should be added to complement the standard crossing elements.

Crash Type	P&B
CRF	35%
Expected Life (Years)	20
Federal Funding Eligibility	100%
Systemic Approach Opportunity	Medium

NS22PB, Install Rectangular Rapid Flashing Beacon (RRFB)

Rectangular Rapid Flashing Beacon (RRFB) includes pedestrian-activated flashing lights and additional signage that enhance the visibility of marked crosswalks and alert motorists to pedestrian crossings. It uses an irregular flash pattern that is similar to emergency flashers on police vehicles. RRFBs are installed at unsignalized intersections and mid-block pedestrian crossings.

Crash Type	P&B
CRF	35%
Expected Life (Years)	20
Federal Funding Eligibility	100%
Systemic Approach Opportunity	Medium

NS23PB, Install Pedestrian Signal (including Pedestrian Hybrid Beacon (HAWK))

Intersections noted as having a history of pedestrian vs. vehicle crashes and in areas where the likelihood of the pedestrian presence is high. Corridors should also be assessed to determine if there are adequate safe opportunities for non-motorists to cross and if a pedestrian signal, or a Pedestrian Hybrid Beacon (PHB) (also called High-Intensity Activated crosswalk beacon (HAWK)) provides an active warning to motorists when a pedestrian is in the crosswalk.

Crash Type	P&B
CRF	55%
Expected Life (Years)	20
Federal Funding Eligibility	100%
Systemic Approach Opportunity	Low

R8. Install raised median

Areas experiencing head-on collisions and right-angle collisions that may be affected by both the number of vehicles that cross the centerline and by the speed of oncoming vehicles. Installing a raised median is a more restrictive approach in that it represents a more rigid barrier between opposing traffic. Adding raised medians is a particularly effective strategy as it adds to or reallocates the existing cross section to incorporate a buffer between the opposing travel lanes and reinforces the limits of the travel lane. Raised median may also be used to limit unsafe turning movements along a roadway.

Crash Type	All
CRF	25%
Expected Life (Years)	20
Federal Funding Eligibility	90%
Systemic Approach Opportunity	Medium

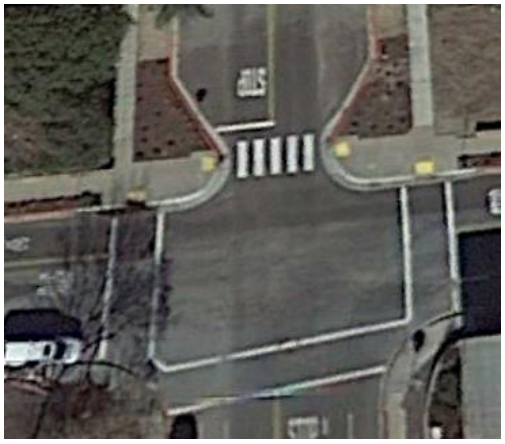
SAFETY PROJECTS

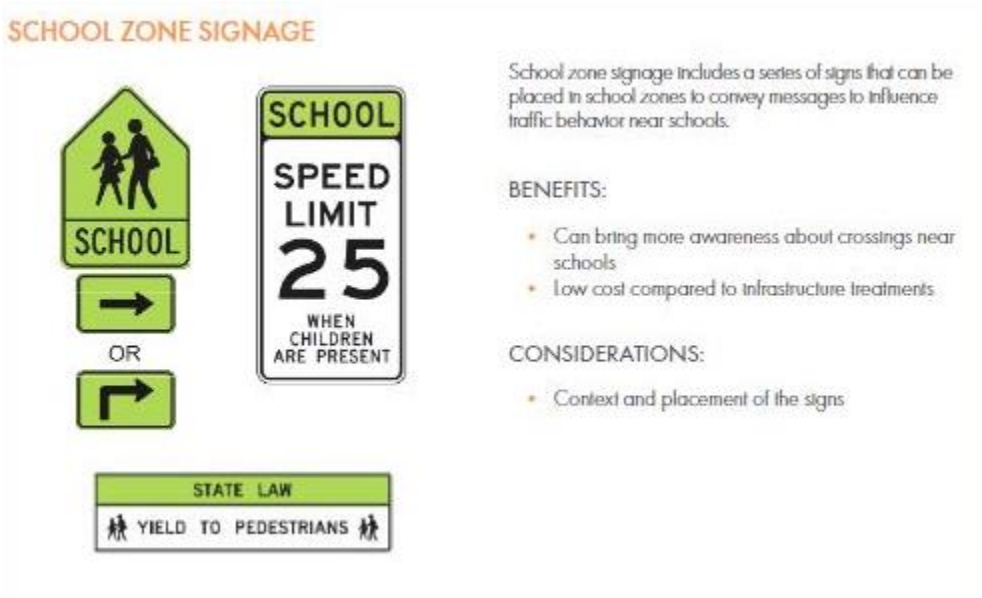
Seven systemic project groups were identified for application of Caltrans engineering countermeasures through the review of collision records for severity, collision type and collision factor. The project groups address the safety emphasis areas defined for this project. These project groups are described below and include identifying the locations to apply the countermeasure based on collision experience and systemic factors. Systemic locations are those locations which have the same characteristics as locations with collision experience, and so are identified for potential application of the identified countermeasure. The identified locations do not include those locations in which the City has initiated or recently completed a safety project. Current City projects include study of N. Coast Highway 101, S. Coast Highway 101, Vulcan Avenue Traffic Calming Study and other signalization projects.

A. Pedestrian Projects – Non-Signalized Intersections

This project group includes intersection locations were pedestrian collisions have occurred at non-signalized intersections as well as other non-signalized locations throughout the city and includes locations near schools.

Countermeasures: NS21PB, Install/upgrade pedestrian crossing at uncontrolled locations (with enhanced safety features) to include possible bulb outs at 3rd Street and B Street.





Locations:

Following review of collision data and review of intersection conditions, five intersections were identified from the review of collision data and three additional intersections located near high pedestrian travel locations. Systemic applications for pedestrian safety improvements at non-signalized intersection locations can be applied to other locations to address locations where pedestrian travel occurs with the following systemic conditions:

- At intersections or mid-block crossings near schools
- Midblock crossings of multi-lane roadways
- Where high pedestrian movements occur in the coastal area

These project locations are listed in Table 3-3. Collision data for the collision data locations are included in Appendix H.

Table 3-3 Pedestrian Improvements at Non-Signalized Intersections

Collision Data Locations	Systemic Locations
N Coast Hwy 101 & Marcheta St	3rd St & J St
N Rancho Santa Fe Rd & Lone Jack Rd	3rd St & F St
3rd St & B St	3rd St & G St
Parkdale Ln & Countryhaven Rd	3rd St & H St
	3rd St & I St
	Coast Hwy 101 and I St

B. Pedestrian Projects – Signalized Intersections

This project group includes intersection locations where pedestrian collisions have occurred at signalized intersections.

Countermeasures: S21. Add Leading pedestrian interval, or check walk times. Provide high visibility crosswalks where needed. This provides a red signal for vehicles combined with walk for pedestrians.

The seven intersections below have collision experience and could be addressed by this countermeasure. Three additional locations are identified that have high pedestrian movements and are potential applications of this countermeasure. The review of pedestrian walk times and pedestrian signal infrastructure can be completed for all signalized intersections. LPI should be applied to those intersections with heavy pedestrian movements. The project locations are listed in Table 3-4. Collision data for the collision data locations are included in Appendix H.

Table 3-4 Pedestrian Improvements at Signalized Intersections

Collision Data Locations	Systemic Locations
Birmingham Dr. & San Elijo Ave	Leucadia Blvd & N Coast Hwy 101
Encinitas Blvd & Vulcan Ave	Coast Hwy 101 & Encinitas Blvd
Leucadia Blvd & North Vulcan Ave	San Elijo Ave & Chesterfield Dr.
Leucadia Blvd & Town Center Place	
Encinitas & Moonlit Marketplace	
Mountain Vista Dr. & N El Camino Real	
Encinitas Blvd & Smart & Final	

C. Bicycle Projects

This project group includes intersection locations where Class II bicycle lanes intersect and where bicycle turning movements occur.

Countermeasures: S20PB Install advance stop bar before crosswalk (Bicycle Box). This countermeasure can include adding bicycle lane markings such as these below:

Additional systematic locations are identified where Class II bicycle routes intersect and where this countermeasure could be applied. The City has been adding conflict striping and bicycle boxes at numerous intersections. There are locations where additional conflict striping and bike boxes would improve bicycle safety. Broadly, these systemic locations include signalized intersections of streets with Class II bicycle lanes. These project locations are listed in Table 3-5. Collision data for the collision data locations are included in Appendix H.

Table 3-5 Bicycle Improvement Locations

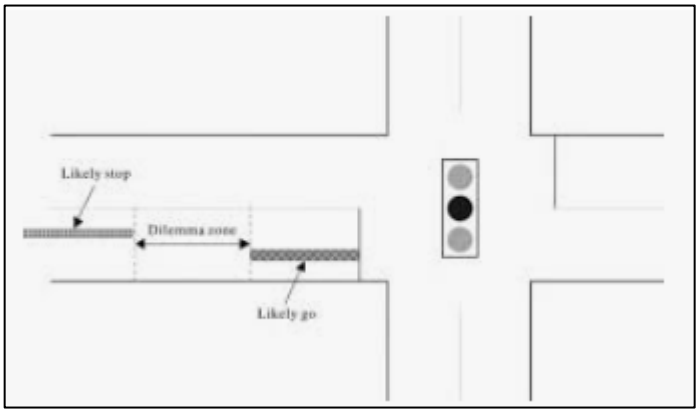
Collision Data Locations
Coast Hwy 101 & Encinitas Blvd
El Camino Real & Encinitas Blvd
Leucadia Blvd & N Coast Hwy 101
Encinitas Blvd & Vulcan Ave
S Coast Hwy 101 & Chesterfield Dr.
El Camino Real & Mountain View
Leucadia Blvd & Quail Gardens

Systemic Locations
La Costa & N Coast Hwy 101
Leucadia Blvd & Piraeus St
Leucadia Blvd & Garden View Rd
Leucadia Blvd & El Camino Real
Garden View Rd & Via Cantebria
El Camino Real & Garden View Rd
Encinitas Blvd & Via Cantebria
Encinitas Blvd & Balour
Encinitas Blvd & Quail Garden
El Camino Real & Santa Fe Dr
Manchester Ave and Santa Fe

D. Signalized Intersections with High Speed Approaches

Signalized intersection locations where high approach speeds can lead to rear end and other are addressed in this group.

Countermeasures: S4. Provide advanced dilemma zone detection for high speed approaches. Advance dilemma zone would be added to the high speed approaches.



Advanced dilemma zone detection can be implemented at signalized intersections where travel speeds are 35 mph or higher. This can include signalized intersections along the following corridors:

- Manchester Avenue
- El Camino Real
- Encinitas Boulevard, east of I-5
- S. Coast Highway 101, south of K Street
- Leucadia Boulevard, east of I-5
- Piraeus Street, north of Leucadia Blvd
- Via Cantebria

Table 3-6 lists locations where advance dilemma zone detection would be an appropriate countermeasure strategy based on collision experience and systemic factors. Collision data for the collision data locations are included in Appendix H.

Table 3-6 Signalized Intersections for Dilemma Zones Application

Collision Data Locations
Las Olas Traffic Light & S Coast Hwy 101
Garden View Rd & Leucadia Blvd
Encinitas Blvd & Via Cantebria
Encinitas Blvd & Village Square Dr
Garden View Rd & Via Cantebria
Leucadia Blvd & Town Center Pl
N El Camino Real & Olivenhain Rd
La Costa Av & N Coast Hwy 101
Leucadia Blvd & Saxony Rd
Chesterfield Dr & S Coast Hwy 101
Encinitas Blvd & El Camino Real

Systemic Locations
Via Poco & Manchester Ave
Manchester Ave & Mira Coasta College
Manchester Ave & El Camino Real
El Camino Real & Encinitas Blvd
Leucadia Blvd & Quail Gardens Dr
Encinitas Blvd & Balour
Encinitas Blvd & Delphinium St
Encinitas & Quail Gardens Dr

E. Signalized Intersections with Double Left Turn Lanes

The presence of double left turns can lead to sideswipe collisions if the left turn movements are not well marked through the intersection. In most cases, the left turns were well marked through the intersection. The few number of intersections that that could be addressed were identified through visible inspection and are identified in this group.

Countermeasures: S8. Install raised pavement markers and striping (through intersection). This countermeasure is provided through the intersection where there are double left turn lanes.

Without striping through intersect

With striping through intersection

The following intersections were identified from collision experience or from systemic condition as having double left turn lanes with the need for striping. Table 3-7 lists locations where striping through the intersection would be an appropriate countermeasure strategy. Collision data for the collision data locations are included in Appendix H.

Table 3-7 Signalized Intersections for Striping Through Intersection

Collision Data Locations
Garden View Rd & Leucadia Blvd
Encinitas Blvd & Via Cantebria
Leucadia Blvd & N Coast Hwy 101
Leucadia Blvd & Town Center Place
N El Camino Real & Olivenhain Rd
N El Caminio Real & Via Montoro

Systemic Locations
El Camino Real & Town Center Dr
El Camino Real & Mountain Vista Dr
Encinitas Blvd & El Camino Real

F. Improve Visibility or Signal Timing at Signalized Intersections

In some cases, traffic safety can be enhanced at signalized intersections by improving the visibility of the intersection or by changes in signal timing.

Countermeasure S2. Improve Signal Hardware: lenses, back-plates with retroflective borders, mounting new signals, increasing signal head size and number of signal heads.

Countermeasure: S3. Improve signal timing (coordination, phases, red, yellow, or operation). Signal time changes can include improved coordination, additional red or yellow times, and pedestrian walk times.

Table 3-8 lists systemic locations to improve signal visibility or timing. Systemic locations include signalized intersections along major travel corridors. Intersections with higher collision experience are indicated in the table. Collision data for these intersections is presented in Appendix H.

Table 3-8 Signalized Intersections for Signal Countermeasures

Collision Locations
Las Olas & S Coast Hwy 101
Calle Magdalena & Encinitas Blvd
Cardiff State Beach & S Coast Hwy 101
Coast Hwy 101 & Encinitas Blvd
D St & South Vulcan Ave
El Camino Real & Encinitas Blvd
Encinitas Blvd & Via Cantebria
Encinitas Blvd & Village Square Dr
Encinitas Blvd & Saxony Rd
Encinitas Blvd & Via Cantebria
Encinitas Blvd & Vulcan Av
Garden View Rd & Leucadia Blvd
Garden View Rd & Via Cantebria
La Costa Av & N Coast Hwy 101
Leucadia Blvd & Saxony Rd
Leucadia Blvd & Town Center Pl
Leucadia Blvd & N Coast Hwy 101
Leucadia Blvd & Town Center Pl
N El Camino Real & Leucadia Blvd
N El Camino Real & Via Montoro
Chesterfield Dr & S Hwy 101

Systemic Locations
Manchester Ave at:
Via Poco
Mira Coasta College
El Caminio Real
El Caminio Real at:
Santa Fe Dr
Willowspring Dr
Crest Dr
Via Molena
Mountain Vista Dr
Garden View
Town Center
Olivehain Rd at:
Amergosa Dr
Leucadia Blvd at:
Quail Gardens Dr
Sidonia St
Urania Ave
Piranus St
Vulcan Ave
Encinitas Blvd at:
Moonlight Market Place
Quail Gardens Rd
Delphininum St
Balour Dr

Systemic Locations
Mall Entrance
Cerro St
Willowspring Dr
Rancho Sante Fe
Via Cantebria at:
Via Montoro
Via Molena
Santa Fe Dr at:
Scripps Memorial
Nardo/Mackinnon
Bonita/Windsor
Lake Dr
Birmingham Dr at:
San Elijo Ave
MacKinnon
Carol View Dr
Chesterfield Dr at:
San Elijo Ave
Manchester Ave at:
San Elijo Lagoon
Mira Costa College
El Camino Real
Rancho Santa Fe Rd at:
Avenida La Posta

G. Mid-block Locations

Mid-block collision locations can also be locations of traffic conflict and collisions. Many of the midblock collision locations are at driveway entrances to shopping areas.

Countermeasure: R8. Install raised median. Raised median can be constructed to limit unsafe turning movements along a roadway.

Table 3-8 lists systemic locations to restricting left turn access for specific minor intersection approaches. This list is based on collision experience and the collision data is shown in Appendix H. This countermeasure can be applied to unsignalized side streets intersections with multi-lane arterial streets. This can include unsignalized retail driveways to arterial streets. To address, information on midblock collisions and concerns should be monitored.

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Table 3-9 Locations for Mid-block Countermeasures

Collision Locations	Systemic Locations
Encinitas Blvd & Princehouse Ln (340 East)	(multiple locations along arterial corridors to be monitored from collision experience)
El Camino Real & Encinitas Blvd (360 West)	
El Camino Real & Encinitas Blvd (525 North)	
Encinitas Blvd & Quail Gardens Dr (340 West)	
Encinitas Blvd & Westlake St (330 West)	
N El Camino Real & Via Montoro (330 North)	
K St & S Coast Hwy 101 (330 South)	
Crest Dr & S El Camino Real (334 North)	

4.0 NON-ENGINEERING SAFETY SOLUTIONS

The Encinitas Local Roadway Safety Plan (LRSP) strives to make Encinitas's roads safer for all roadway users. The comprehensive approach to safety incorporates all elements of the "4 E's of Safety": Engineering, Enforcement, Education and Emergency Medical Services. This approach recognizes that not all locations can be addressed solely by infrastructure improvements. Incorporating the 4 E's of Safety is often required to achieve significant safety improvements and reduce the severity and frequency of collisions throughout a jurisdiction.

Some of the common violation types that may require a comprehensive approach are speeding, red light running, aggressive driving, unsafe lane changes, failure-to-yield to pedestrians, distracted driving, and driving while impaired. When locations are identified as having these types of violations, coordination with the appropriate law enforcement agencies is needed to arrange visible targeted enforcement to reduce the potential for future driving violations and related crashes and injuries. To improve safety, education efforts can also be used to supplement enforcement. Education efforts can also supplement enforcement to improve the efficiency of safety projects.

This section presents non-infrastructure solutions to Encinitas roadway safety needs. The programs will promote safe behavior in each of the plan's identified transportation safety emphasis areas through education, police enforcement, and encouragement.

YOUNG DRIVERS

Younger drivers' relative lack of experience and judgment makes them more likely to engage in risky behaviors, such as speeding or distracted driving. Therefore, educating young drivers on the importance of safe driving practices is a key pillar of the city's LRSP. While youth drunk driving is a problem in many communities, data reported by the California Office of Traffic Safety for Encinitas shows that the number of youth collisions involving drinking is low. Even so, the city may consider implementing programs, warning youth about the dangers of drinking and driving. The following non-engineering programs or program elements could address safety risks for young drivers.

Education

- Continue to coordinate with schools through the City of Encinitas School District Liaison Committee
- Expand school safety programs to bring police officers to Elementary School, Middle School and High Schools.
- Start a social media campaign at local middle and high schools, encouraging students to post videos on the danger of using their phones while driving.

BICYCLISTS

The City of Encinitas is committed to becoming a more bicycle-friendly community, to reduce the environmental impacts of vehicle travel and improve community health and equity. In the 2018 OTS Rankings, Encinitas ranked 24th among the 102 peer cities in California (higher number is best) for the bicycle safety, indicating some challenges within the bicycle environment. In addition to engineering measures, the followings are programs that can be considered or are currently underway to also improve bicycle safety.

Education

- Provide Bike Safe programs for persons of all ages and training courses for first-time adult riders. The City in partnership with San Diego County Bicycle Coalition offers free classes on bicycle safety at the Encinitas Community Center.
- The City has developed an E-Bike program that includes a webpage and a Road Rules pocket brochure to provide information about E-Bike safety. Activities also include virtual meetings to learn about safety rules and guidelines. An E-Bike video has been developed to illustrate rules of the road and riding tips.
- Other activities can include hosting interactive Bicycle Education programs at local schools. These programs can include bicycle rodeos, enclosed training courses with challenges addressing different skill areas (e.g., helmet fitting, starting and stopping, and rules of the road).
- Coordinate with the Sherriff's Department on bicycle rules and safety considerations, so that enforcement of bicycle-related traffic violations can occur.
- Continue to hold live events such as the Cyclovia Encinitas Virtual 2021 which provides social media content on bicycle health and safety.

Enforcement

- Implement targeted enforcement programs to focus police resources to areas where bicyclists face a high risk of collision or tend to engage in unsafe practices. Programs should be designed to both educate and enforce.
- Implement targeted referral programs. These programs encourage parents to report bicycle or pedestrian collisions or near misses that occur on the way to school.
- Use mobile photo enforcement, at peak hours in high-collision areas, to catch cars encroaching on bicycle lanes or aggressively changing lanes. Mobile photo enforcement uses van-mounted cameras to capture traffic rule violators

PEDESTRIANS

Like bicyclists, pedestrians can bear an excessively high risk of severe injury in collisions. In the 2018 OTS Rankings, Encinitas ranked 93th among the 102 peer cities in California (higher number is best) for the pedestrian safety, indicating a relatively safe pedestrian environment. For young students walking to school, there were 0 fatalities or injury collisions in 2018, placing Encinitas at the best ranking for all similar-sized communities.

Walking is perhaps the most universal form of transportation. All drivers have to travel on foot between their parking spot and the store or office. Therefore, pedestrian safety risks pose a crucial challenge to any local roadway safety plan. Programs to support walking should be considered in order to maintain or even enhance the pedestrian walking environment. The followings are programs that can be considered:

Education

- Incorporate pedestrian safety education into Physical Education classes in the Encinitas Union School District.
- Host hands-on pedestrian safety events at local schools. These can include pedestrian safety skills programs-teaching students how to cross the street safely and walk/bike to school days, carnival-like events featuring interactive educational activities about bicycling.
- Host interactive pedestrian education programs at local schools. These include pedestrian rodeos, enclosed training courses with challenges addressing different skill areas (e.g., rules of the road, blind spots, and directions to look in when crossing the street).

Enforcement

- Periodically employ mobile photo enforcement at locations with high crossing activity to monitor and cite traffic law violations by motorists and pedestrians.

SPEEDING

Speeding contributes significantly to crash frequency and severity. For instance, a car hitting a pedestrian is more likely to injure or kill a pedestrian when moving at 40 miles per hour than when moving at 20 miles per hour. In the local context, speeding is the most common Primary Collision Factor and the most frequent cause of rear-end crashes. Driving at unsafe speeds causes a majority of rear-end crashes. Reducing rear-end and other speeding-related collisions includes educating drivers on the dangers of speeding and stepping enforcement at intersections. Programs that can help with reducing speeding include:

Education

- As part of other outreach efforts on bicycle and pedestrian safety, include information related to driving at safe travel speeds, with emphasis around schools and areas of concentrated activity.

Enforcement

- Continue utilizing radar speed feedback signs at periodic intervals along arterials with reported speeding. These technologies display passing drivers' travel speed below a sign with the posted speed limit, thus showing whether drivers are traveling over the speed limit.
- Continue to deploy Sherriff officers equipped with radar or LIDAR technology at strategic locations to ticket speeding drivers.

DRIVING UNDER THE INFLUENCE

Driving under the influence of alcohol and drugs is dangerous since alcohol and drug use impair judgment and perception. Encinitas ranked 55th out of 102 peer cities of similar size in collisions involving alcohol in the 2018 OTS Rankings, indicating that drunk driving is moderately prevalent as compared to other cities of similar size. Programs that can be considered include:

Education

- Re-establish or stage an interactive simulation program for high school students. The interactive simulation program aims to challenge high school juniors and seniors about drinking, driving, and mature decision making.

Encouragement

- Partner with Uber/Lyft and alcohol-serving restaurants and bars in Encinitas to encourage use of rideshare usage to restaurant and bar patrons.

Enforcement

- Utilize a Checkpoint Program to provide enforcement.
- Monitor local liquor stores and bars suspected of selling alcohol to minors.

DISTRACTED DRIVING

Distracted driving refers to any activity that diverts the driver's attention. Common examples of distracted driving activities include non-hand-free mobile phone use, eating and drinking, and conversation. Texting on the phone or talking to another passenger, even for a moment, can have significant consequences when driving at full speed. Many of the traffic tickets issued in Encinitas pertained to distracted driving, with non-hand-free mobile phones use a common cause of ticket citation. Programs that can be considered include:

Education

- Start an Anti-Distracted Driving educational program in local high schools. The program can feature events, safety assemblies, and education material. The program can parallel with the drunk driving program (discussed under the Young Drivers and driving under the Influence sections).

Encouragement

- Set up portable changeable message signs to display messages to discourage drinking and driving, distracted driving, speeding, and other factors.

EMERGENCY RESPONSE MANAGEMENT

Emergency medical services help reduce crash-related injuries and fatalities through high-quality medical care at the scene and during transport to a trauma center. It is recommended that the City of Encinitas continue to coordinate with the Sherriff's Department and local hospitals and medical centers to continue to improve the emergency response to collisions. Efforts to calm traffic should be balanced with considerations of the impact to emergency response times.

5.0 PROJECT EVALUATION

INTRODUCTION

Four priority projects were identified for illustrating the evaluation used by Caltrans to determine HSIP funding. In addition, three other project groups that could be implemented using local funds are described. This section provides the project scope, collision reduction benefits calculation, cost estimation and Benefit to Cost Ratio (BCR) analysis for each of these safety project groups. The resulting benefit-cost information has been used list project priorities. High collision locations were used to obtain the benefit-cost values. A discussion of systemic project applications follows for each project group.

Project Benefits

The development of projects involved identifying one or more specific countermeasures at potential locations for safety improvement. Crash Reduction Factor (CRFs) were applied to each counter measure. The monetized value of the expected reduction in crashes was calculated. These steps include:

- Identifying the current number of crashes without treatment
- Applying CRFs by type and severity
- Applying a benefit value by crash severity
- Calculating the annual collision reduction benefits and multiplying by the number of years in the project life

The next step in estimating the overall benefit of a proposed improvement project is to multiply the expected reduction in crashes by a generally accepted value for the "cost" of crashes. The expected "benefit" value for a project is the expected "reduction in costs" value from reducing future crashes. The 2020 HSIP Manual provided the source for the costs to be used in benefit-cost analysis by collision severity level:

- Fatal - $7,219,800
- Severe Injury - $389,000
- Other Visible Injury - $142.300
- Complaint of Pain - $80,900
- Property Damage Only - $13,330

The final step in calculating the total safety project benefits is to divide the benefits by the number of years the collision data was collected and to then multiply this quotient by the number of years in the project life. The project scopes are listed as follows, including the applicable countermeasure category for each improvement and monetary benefit calculated according to the method just described.

Cost Estimates

Planning-level cost estimates were developed for each countermeasure and project costs were estimated based on the countermeasures applied to the safety project locations. KOA applied market construction costs for the proposed improvements to the quantities measured. Cost estimates were derived from a

combination of available sources including Caltrans published data and recent bid prices from other local projects. The grand total also includes a 30 percent construction contingency, and 20 percent administration/ engineering contingency which includes a four percent administration fee, a 10 percent design fee, and an additional six percent fee for construction engineering.

B/C Ratio

A Benefit-to-Cost Ratio (BCR) is the ratio of the benefits of a project relative to its costs, both expressed in monetary terms. The BCR is calculated by taking a project's overall benefit and dividing it by the overall project cost. For projects with a BCR greater than 1, the value of project benefits exceeds the value of project costs: Hence, they have positive net benefits. The higher the BCR, the greater the value of benefits the project has relative to the costs, and the lower the BCR, the lower the value of benefits relative to the costs.

HSIP PROJECT PRIORITIZATION

Systemic HSIP project groups were evaluated in order to determine the potential for funding from the Caltrans Highway Safety Improvement Program (HSIP). KOA used a systemic approach to address the systemic project locations countermeasures having the highest BCR potential. The following presents project recommendations for HSIP grant applications and for projects to be completed using local funding.

A number of the systemic project types can be considered for HSIP grant applications. Projects for HSIP Cycle 11 application anticipated in 2022. In general, selecting locations with the highest number of crashes first and then identifying projects for those locations is the preferred method in identifying potential safety projects. Conversely, identifying the project and then justifying the project with crashes is not recommended, as this method is unlikely to produce a high cost benefit ratio.

The minimum project cost and B/C ratio requirement was a minimum project reimbursement of $100,000 and a project that achieves a minimum B/C ratio of 3.5 for HSIP Cycle 10. The average BCR of the approved projects in the past HSIP cycles is 12.3. Project groups 1 through 4 presented below are above this threshold. Three additional project groups have been identified that can be provided at a cost level using local funds. These project groups are listed in order of priority Table 5-1. The table includes recommendations for project groups to be considered for HSIP funding and other project groups to be funded using local funds. Additional detail and explanation follows.

Table 5-1 Project Group Recommendations by Priority

#	Countermeasure	Benefit	Cost ($)	Benefit/Cost Ratio	HSIP Max Share	HSIP Amount	Local Amount
HSIP - 1	Advanced Dilemma-Zone Detection (10 intersections)	$20,559,840	$702,000	29.29	100%	$702,000	$0
HSIP-2	High visibility crosswalks, stop signs, advanced signage (4 intersections)	$14,679,700	$292,509	50.19	100%	$292,509	$0
HSIP - 3	Bike box, conflict striping at intersections (8 intersections)	$2,165,701	$249,600	8.68	100%	$249,600	$0
HSIP - 4	Signal timing (21 intersections)	$14,630,881	$327,600	44.66	50%	$163,800	$163,800
Local - A	Pedestrian signal enhancements - Leading Pedestrian Interval (7 intersections)	$11,715,840	$109,200	107.30	100%	$109,200	$0
Local - B	Raised pavement Markings through intersection (7 intersections)	N/A	$21,380	N/A	N/A	N/A	$21,380
Local - C	Provide signs to prohibit left turns from minor side streets (7 locations)	N/A	$32,760	N/A	N/A	N/A	$32,760

HSIP Grant Application #1 - Advanced Dilemma Zone Detection

The Advanced Dilemma-Zone Detection system enhances safety at signalized intersections by modifying traffic control signal timing to reduce the number of drivers that may have difficulty deciding whether to stop or proceed during a yellow phase.

- Las Olas Traffic Light & S. Coast Hwy 101 (advance loops present)
- Garden View Rd & Leucadia Blvd
- Encinitas Blvd & Via Cantebria
- Encinitas Blvd & Village Square Dr
- Garden View Rd & Via Cantebria
- Leucadia Blvd & Town Center Place
- La Costa Av & N Coast Hwy 101 (advance loops present)
- Leucadia Blvd & Saxony Rd
- Chesterfield Dr & S Coast Hwy 101 (advance loops present)
- El Camino Real & Encinitas Blvd (advance loops present)

Crash Data Table:

Total	Fatality	Severe	Visible	Complaint of Pain	PDO
124	2	10	23	32	57

Cost Estimate Table:

Item	Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	20% Admin/Engr Contingency	Project Total
Advanced Dilemma-Zone Detection	10	$45,000	$450,000	$135,000	$585,000	$117,000	$702,000

Benefit/Cost Ratio:

Countermeasure	Collision Type	CRF	Project Life (years)	Number of Preventable Collisions	Total Collision Costs	Benefit	Cost ($)	Benefit/ Cost Ratio	HSIP Max Share	HSIP Amount	Local Amount
Advanced Dilemma-Zone Detection	All	40%	10	124	$24,949,400	$20,559,840	$702,000	29.29	100%	$702,000	$0

HSIP Grant #2 - Pedestrian Projects at Non-Signalized Intersections

This project group includes intersection locations were pedestrian collisions have occurred at non-signalized intersections. This group includes non-signalized locations throughout the city and includes locations near schools.

Countermeasures: NS20PB, Install/upgrade pedestrian crossing at uncontrolled locations (with enhanced safety features) to include two additional bulb outs at 3rd Street and B Street, advance signage, upgraded crosswalks and larger/flashing stop signs.

Locations:

- N Coast Hwy 101 & Marcheta St – large stop signs (this may be addressed by on-going City project)
- N Rancho Santa Fe Rd & Lone Jack Rd – crosswalk
- 3rd St & B St – 2 bulb outs south approach of intersection and high visibility crosswalk
- Parkdale Lane & Countryhaven Rd – provide signage for school zone along Parkdale Lane

Crash Data Table:

Total	Fatality	Severe	Visible	Complaint of Pain	PDO
7	1	3	2	1	0

Cost Estimate Table:

Item	Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	20% Admin/Engr Contingency	Project Total
Bulbout, south side 3rd St & B	2	75,000	150,000	45,000	195,000	39,000	$234,000
Crosswalk, 4 at Lone Jack & Rancho Santa Fe Rd, high visibility crosswalk 3 legs 3rd and B St	7	1,500	10,500	3,150	13,650	2,730	$16,380
Signs advanced signage in school zone, Parkdale Ln at Countryhaven and Glen Arbor Dr.	12	1,500	18,000	5,400	23,400	4,680	$28,080
Large stop signs, 1. N Coast Hwy 101 & Marcheta St (2); 2. N Rancho Santa Fe Rd & Lone Jack Rd (4)	6	1,501	9,006	2,702	11,708	2,342	$14,049
Total			187,506	56251.8	243757.8	46,410	$292,509

Benefit/Cost Ratio:

Countermeasure	Collision Type	CRF	Project Life (years)	Number of Preventable Collisions	Total Collision Costs	Benefit	Cost ($)	Benefit/ Cost Ratio	HSIP Max Share	HSIP Amount	Local Amount
High visibility crosswalks, stop signs, advanced signage	All	35%	20	7	$8,752,300	$14,679,700	$292,509	50.19	100%	$292,509	$0

HSIP Grant #3 - Bicycle Markings through Intersections

This project group includes intersection locations where bicycle collisions have occurred at or near signalized intersections.

Countermeasures: S20PB Install advance stop bar before crosswalk (Bicycle Box) and bicycle lane markings approaching and through the intersection.

Locations:

- Coast Hwy 101 & Encinitas Blvd
- El Camino Real & Encinitas Blvd
- Leucadia Blvd & N Coast Hwy 101
- Encinitas Blvd & Vulcan Av
- S Coast Hwy 101 & Chesterfield Dr
- El Camino Real & Via Montoro
- Leucadia Bl & Quail Gardens

Crash Data Table:

Total	Fatality	Severe	Visible	Complaint of Pain	PDO
25	0	3	12	9	1

Cost Estimate Table:

Item	Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	20% Admin/Engr Contingency	Project Total
Bike box and/or conflict striping at intersections	20	$8,000	$160,000	$48,000	$208,000	$41,600	$249,600

Benefit/Cost Ratio:

Countermeasure	Collision Type	CRF	Project Life (years)	Number of Preventable Collisions	Total Collision Costs	Benefit	Cost ($)	Benefit/ Cost Ratio	HSIP Max Share	HSIP Amount	Local Amount
Bike box, conflict striping at intersections	Bike	15%	10	25	$3,616,000	$2,165,701	$249,600	8.68	100%	$249,600	$0

HSIP Grant #4 – Signal Timing

This project group includes higher collision locations at signalized intersections where collisions may be reduced through adjustments in signal timing.

Countermeasures: S3. Improve signal timing (coordination, phases, red, yellow, or operation). Signal time changes can include improved coordination, additional red or yellow times, and pedestrian walk times.

Locations:

- Las Olas & S Coast Hwy 101
- Calle Magdalena & Encinitas Blvd
- Cardiff State Beach & S Coast Hwy 101
- Coast Hwy 101 & Encinitas Blvd
- D St & South Vulcan Ave
- El Camino Real & Encinitas Blvd
- Encinitas Blvd & Via Cantebria
- Encinitas Blvd & Village Square Dr
- Encinitas Blvd & Saxony Rd
- Encinitas Blvd & Via Cantebria
- Encinitas Blvd & Vulcan Av
- Garden View Rd & Leucadia Blvd
- Garden View Rd & Via Cantebria

- La Costa Av & N Coast Hwy 101
- Leucadia Blvd & Saxony Rd
- Leucadia Blvd & Town Center Pl
- Leucadia Blvd & N Coast Hwy 101
- Leucadia Blvd & Town Center Pl
- N El Camino Real & Leucadia Blvd
- N El Camino Real & Via Montoro
- Chesterfield Dr & S Hwy 101

Crash Data Table:

Total	Fatality	Severe	Visible	Complaint of Pain	PDO
227	5	18	40	64	100

Cost Estimate Table:

Item	Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	20% Admin/Engr Contingency	Project Total
Signal timing	21	10,000	210,000	63,000	273,000	54,600	$327,600

Benefit/Cost Ratio:

Countermeasure	Collision Type	CRF	Project Life (years)	Number of Preventable Collisions	Total Collision Costs	Benefit	Cost ($)	Benefit/ Cost Ratio	HSIP Max Share	HSIP Amount	Local Amount
Signal timing	All	15%	10	227	$55,300,600	$14,630,881	$327,600	44.66	50%	$163,800	$163,800

LOCAL PROJECT PRIORITIZATION

The following describes additional safety countermeasures that can be implemented by the City.

A - Leading Pedestrian Interval (LPI) and other Pedestrian Signal Timing Changes

This project group includes intersection locations where pedestrian collisions have occurred at signalized intersections. Costs for implementing LPIs are very low, since only minor signal timing alteration is required. This makes it an easy and inexpensive countermeasure that can be incorporated into pedestrian safety action plans or policies and can become routine agency practice. Many of the locations identified are near parks, near schools, near shopping or are locations uses by pedestrians to access beach activities.

Countermeasures: Pedestrian crossing issues can be addressed by City staff by check walk times and obtaining information on walk volumes. The project has a low cost of just over $100,000 so for this project, the City may wish to address these locations using local funds.

Locations:

- Birmingham Dr & San Elijo Ave
- Encinitas & Vulcan
- Leucadia Blvd & North Vulcan Ave
- Leucadia Blvd & Town Center Place
- Encinitas & Moonlit Marketplace Driveway
- Mountain Vista Dr & N El Camino Real
- Encinitas & Smart & Final

Crash Data Table:

Total	Fatality	Severe	Visible	Complaint of Pain	PDO
8	1	5	1	1	0

Cost Estimate Table:

Item	Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	20% Admin/Engr Contingency	Project Total
Leading Pedestrian Interval	7	10,000	70,000	21,000	91,000	18,200	$109,200

Benefit/Cost Ratio

Given that the cost estimate for LPI for these collision locations is approximately the minimum HSIP cost threshold of $100,000, it is recommended that this project group be funded using local funds.

B. Pavement Marking Through Intersections

Adding clear pavement markings can guide motorists through complex intersections. When drivers approach and traverse through complex intersections, drivers may be required to perform unusual or unexpected maneuvers. Providing more effective guidance through an intersection will minimize the likelihood of a vehicle leaving its appropriate lane and encroaching upon an adjacent lane.

Countermeasures: Update striping (through intersection). This countermeasure provides raises pavement markings for left turn lanes through the intersection where there are double left turn lanes. As the cost for this project is below the HSIP funding threshold, it is recommended that local funds be used to provide the needed striping through the listed intersections.

Locations:

- Garden View Rd & Leucadia Blvd
- Encinitas Blvd & Via Cantebria
- Leucadia Blvd & N Coast Hwy 101
- Leucadia Blvd & Town Center Place
- N El Camino Real & Olivenhain Rd
- N El Camino Real & Via Montoro
- Encinitas Boulevard and El Camino Real

Crash Data Table:

Total	Fatality	Severe	Visible	Complaint of Pain	PDO
60	2	4	13	18	23

Cost Estimate Table:

Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	Admin/Engr and Mobilization	Project Total
7	1,500	10,500	3,150	13,650	7,730	$21,380

Note: Given small project size, a mobilization cost has been added

Benefit/Cost Ratio:

Given that the cost estimate for the pavement markings for these collision locations is below the minimum HSIP cost threshold of $100,000, it is recommended that this project group be funded using local funds.

C. Midblock Locations

High collision midblock or driveway/side street collision locations were identified that can be addressed by countermeasures.

Countermeasure: One option is to construct a raised median to effectively prohibit left turns. However, a lower cost alternative that provides signage prohibiting left turns to eliminate left turn conflicting movements is the recommended alternative.

Raised median can be constructed to limit unsafe turning movements along a roadway. For these locations, cases, median openings would be modified to restrict movements. Another strategy is to provide signage limiting left turn movements on side streets. This is a low-cost strategy and could be completed using local funds.

Locations:

- Encinitas Blvd & Princehouse Lane (340 East)
- El Camino Real & Encinitas Blvd (360 West)
- El Camino Real & Encinitas Blvd (525 North)
- Encinitas Blvd & Quail Gardens Dr (340 West)
- Encinitas Blvd & Westlake St (330 West)
- K St & S Coast Hwy 101 (330 South)
- Crest Dr & S El Camino Real (330 N)
- N El Camino Real & Via Montoro (330 North)

Crash Data Table:

Total	Fatality	Severe	Visible	Complaint of Pain	PDO
61	2	4	16	21	18

Cost Estimate Table:

If medians constructed

Item	Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	20% Admin/Engr Contingency	Project Total
Raised Median	4900	$270	$1,323,000	$396,900	$1,719,900	$343,980	$2,063,880

If signage used:

Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	20% Admin/Engr Contingency	Project Total
14	1,500	21,000	6,300	27,300	5,460	$32,760

Benefit/Cost Ratio (for raised median):

Countermeasure	Collision Type	CRF	Project Life (years)	Number of Preventable Collisions	Total Collision Costs	Benefit	Cost ($)	Benefit/ Cost Ratio	HSIP Max Share	HSIP Amount	Local Amount
Install raised median	All	25%	20	61	$20,210,700	$17,355,100	$2,063,880	8.41	90%	$1,857,492	$206,388

Benefit/Cost Ratio (for signage)

Given that the cost estimate for the signage alternative for these collision locations is below the minimum HSIP cost threshold of $100,000, it is recommended that this project group be funded using local funds.

FUNDING SOURCES

Several state and federal grant programs offer to fund non-engineering roadway safety projects. The California Department of Transportation's (Caltrans) Active Transportation Program (ATP) encourages bicycle and pedestrian use in the state by funding programs that increase bike or pedestrian mode share or improve bicycle or pedestrian safety. Caltrans also administers the Sustainable Communities Grant Program, which awards grants to municipal projects that reduce greenhouse gas emissions and support Multi-modal transportation. The Sustainable Communities Program prioritizes projects that solicit stakeholder and community engagement and support state policies like the 2040 California Transportation Plan. The California Office of Traffic Safety awards grants for projects addressing any one or more of ten priority areas, including Driving Under the Influence, Distracted Driving, Pedestrian and Bicycle Safety, Police Enforcement, Safety Data Collection, and Marketing/Publicity Campaigns.

At the federal level, the Advanced Transportation and Congestion Management Technologies Deployment Program funds technology to promote safety and efficiency in the transportation system. The Highway Safety Improvement Program (HSIP) funds roadway improvements on any public roadway. **Table 5.2** provides a list of eligible programs and the funding sources for related to transportation safety.

Table 5.2 Transportation Safety Funding Sources Summary

Agency	Source	Eligible Programs	Areas Addressed
Federal Highway Administration (FHWA)	Highway Safety Improvement Program (HSIP)	Any work on public roads, bikeways and pedestrian paths/trails. For the most part, only engineering projects are eligible.	Safety projects
Federal Highway Administration (FHWA)	Advanced Transportation and Congestion Management Technologies Deployment Program	Funds advanced transportation and congestion management technologies to improve safety, efficiency and performance. Examples of funded project types include advanced traveler information systems and data collection and analysis efforts[3].	Digital Enforcement; Technology Partnerships
California Department of Transportation (Caltrans)	Active Transportation Program (ATP)	Local government projects that improve the safety or increase the mode share of bicycling and walking. Additional program objectives include reducing emissions and enhancing public health[4].	Bicycle and Pedestrian Engineering projects, Education and Enforcement

Agency	Source	Eligible Programs	Areas Addressed
California Department of Transportation (Caltrans)	Sustainable Communities Grant Program	The program awards "Competitive Grants" to local governments. These grants prioritize projects that reduce Greenhouse Gas Emissions, support multi-modal transportation, involve stakeholder/ community engagement and support related plans like the California Transportation Plan and California Complete Streets Framework[5] .	Active Transportation
			Education
California Office of Traffic Safety	Office of Traffic Safety (OTS) Grants	Programs should address one of ten priority areas (six relevant ones listed to the right). Grant recipients should expect to wait up to 90 days before being reimbursed/funded, and should be able to provide traffic safety data to justify funded programs[6].	Driving under the influence of Drugs/Alcohol (DUI)
			Distracted Driving
			Ped/Bike Safety
			Police Enforcement
			Roadway Safety and Data Collection
			Social Media/Marketing

Sources:

1. *Highway Safety Improvement Program Guidelines, April 2016*
2. *Highway safety improvement program, Pub. L. No. 148, 23 US Code (2015). https://www.law.cornell.edu/uscode/text/23/148.*
3. *Advanced Transportation and Congestion Management Technologies Deployment. February 2016. https://www.fhwa.dot.gov/fastact/factsheets/advtranscongmgmtfs.cfm.*
4. *2021 Active Transportation Program Guidelines. March 25, 2020. Resolution G-20-31.*
5. *California Department of Transportation. Sustainable Transportation Planning Grant Program. December 2019.*
6. *California Office of Traffic Safety Grant Manual for Federal Fiscal Year 2020. December 2019.*

6.0 LOCAL ROADWAY SAFETY PLAN (LRSP) EVALUATION

Since the Local Roadway Safety Plan aims to reduce collision risk, the Plan's effectiveness should be evaluated in terms of collision reduction. To this end, the City of Encinitas should secure annual collision data from the California Office of Traffic Safety[1] collision ranking system and California Highway Patrol's Statewide Integrated Traffic Records System (SWITRS)[2] on an annual basis. The collision trends following the LRSP's adoption provide indicators of the plan's success. The collision analysis should break out collisions by the following categories.

- Total collisions
- Fatality and severe injury collisions
- Pedestrian collisions
- Bicyclist collisions
- Collisions that involved bicyclists and pedestrians that are over 65 or under 15
- Collisions that are caused by drunk drivers

These categories are included in both the OTS and SWITRS statistics. For each category, consider calculating an average for the most recent three years every year. The City can then plot the three-year average against the averages for past years to derive a general trend line. A downward-sloping trend line indicates an improvement in safety conditions. An upward sloping trend line suggests that additional safety measures should be considered. In the latter instance, the City should conduct further review and update the plan.

[1] *California Office of Traffic and Safety.* https://www.ots.ca.gov/ots-and-traffic-safety/
[2] *UC Berkeley Transportation Injury and Safety Mapping System.* https://tims.berkeley.edu/help/SWITRS.php#Intro_to_SWITRS

APPENDIX A - TOTAL COLLISION DATA SUMMARY TABLES

Total Collisions

Collision Type	Intersection	Corridor
Broadside	23.7%	18.3%
Head-On	5.8%	3.9%
Hit Object	18.4%	24.1%
Other	3.2%	4.3%
Overturned	1.9%	1.9%
Rear End	26.7%	26.9%
Sideswipe	15.0%	16.3%
Vehicle/Pedestrian	4.8%	4.1%
Not Stated	0.5%	0.4%

PCF Violation	Intersection	Corridor
Automobile Right of Way	13.3%	13.3%
Driving or Bicycling Under the Influence of Alcohol or Drug	20.8%	19.6%
Following Too Closely	2.1%	1.9%
Impeding Traffic	0.0%	0.2%
Improper Passing	1.3%	1.1%
Improper Turning	15.1%	20.6%
Other Hazardous Violation	2.0%	1.7%
Other Improper Driving	1.7%	1.9%
Other Than Driver (or Pedestrian)	1.9%	2.2%
Pedestrian Right of Way	1.3%	0.6%
Pedestrian Violation	1.7%	2.4%
Traffic Signals and Signs	7.3%	1.5%
Unknown	2.7%	2.4%
Unsafe Lane Change	1.1%	1.3%
Unsafe Speed	20.8%	23.3%
Unsafe Starting or Backing	4.1%	2.8%
Wrong Side of Road	2.0%	2.6%

MVIW	Intersection	Corridor
Bicycle	7.4%	7.6%
Fixed Object	17.0%	23.0%
Motor Vehicle on Other Roadway	0.7%	0.2%
Non-Collision	1.4%	1.5%
Not Stated	0.4%	0.6%
Other Motor Vehicle	55.4%	46.5%
Other Object	1.2%	2.8%
Parked Motor Vehicle	12.0%	13.7%
Pedestrian	4.2%	4.1%

Lighting	Intersection	Corridor
Dark - No Street Lights	5.0%	9.4%
Dark - Street Lights	29.2%	21.9%
Daylight	62.3%	65.9%
Dusk - Dawn	3.1%	2.0%
Not Stated	0.2%	0.7%

Ped Collisions by Type of Lighting		
Lighting Type	**Count**	**Percent**
Daylight	68	54.8%
Dark - Street Lights	36	29.0%
Dark - No Street Lights	12	9.7%
Dark - Street Lights Not Functioning	2	1.6%
Dusk - Dawn	5	4.0%
Not Stated	1	0.8%
Total	**124**	**100.0%**

Bike Collisions by Type of Lighting		
Lighting Type	**Count**	**Percent**
Daylight	201	86.3%
Dark - Street Lights	21	9.0%
Dark - No Street Lights	6	2.6%
Dark - Street Lights Not Functioning	0	0.0%
Dusk - Dawn	4	1.7%
Not Stated	1	0.4%
Total	**233**	**100.0%**

APPENDIX B - KSI COLLISION DATA SUMMARY TABLES

KSI Collisions

Collision Type	Intersection		Mid-Block	
Vehicle/Pedestrian	34	34.3%	10	23.8%
Broadside	24	24.2%	10	23.8%
Rear End	13	13.1%	5	11.9%
Hit Object	12	12.1%	8	19.0%
Head-On	6	6.1%	1	2.4%
Sideswipe	5	5.1%	2	4.8%
Other	3	3.0%	5	11.9%
Overturned	1	1.0%	1	2.4%
Not Stated	1	1.0%	0	0.0%
Total	99	100.0%	42	100.0%

KSI Collision Type

Collision Type	Intersection		Mid-Block	
Vehicle/Pedestrian	34	34.3%	10	23.8%
Broadside	24	24.2%	10	23.8%
Rear End	13	13.1%	5	11.9%
Hit Object	12	12.1%	8	19.0%
Head-On	6	6.1%	1	2.4%
Sideswipe	5	5.1%	2	4.8%
Other	3	3.0%	5	11.9%
Overturned	1	1.0%	1	2.4%
Not Stated	1	1.0%	0	0.0%
Total	99	100.0%	42	100.0%

KSI Collision Cause

Cause	Intersection		Mid-Block	
Unsafe Speed	20	20.2%	4	9.5%
Pedestrian Violation	15	15.2%	8	19.0%
Automobile Right of Way	13	13.1%	5	11.9%
Driving or Bicycling Under the Influence of Alcohol or Drug	13	13.1%	7	16.7%
Improper Turning	8	8.1%	10	23.8%
Pedestrian Right of Way	6	6.1%	0	0.0%
Other Hazardous Violation	4	4.0%	2	4.8%
Other Improper Driving	4	4.0%	2	4.8%

Traffic Signals and Signs	3	3.0%	0	0.0%
Unsafe Lane Change	3	3.0%	0	0.0%
Unknown	5	5.1%	1	2.4%
Wrong Side of Road	2	2.0%	0	0.0%
Following Too Closely	1	1.0%	0	0.0%
Improper Passing	1	1.0%	0	0.0%
Other Than Driver (or Pedestrian)	1	1.0%	3	7.1%
Impeding Traffic	0	0.0%	0	0.0%
Unsafe Starting or Backing	0	0.0%	0	0.0%
Total	99	100.0%	42	100.0%

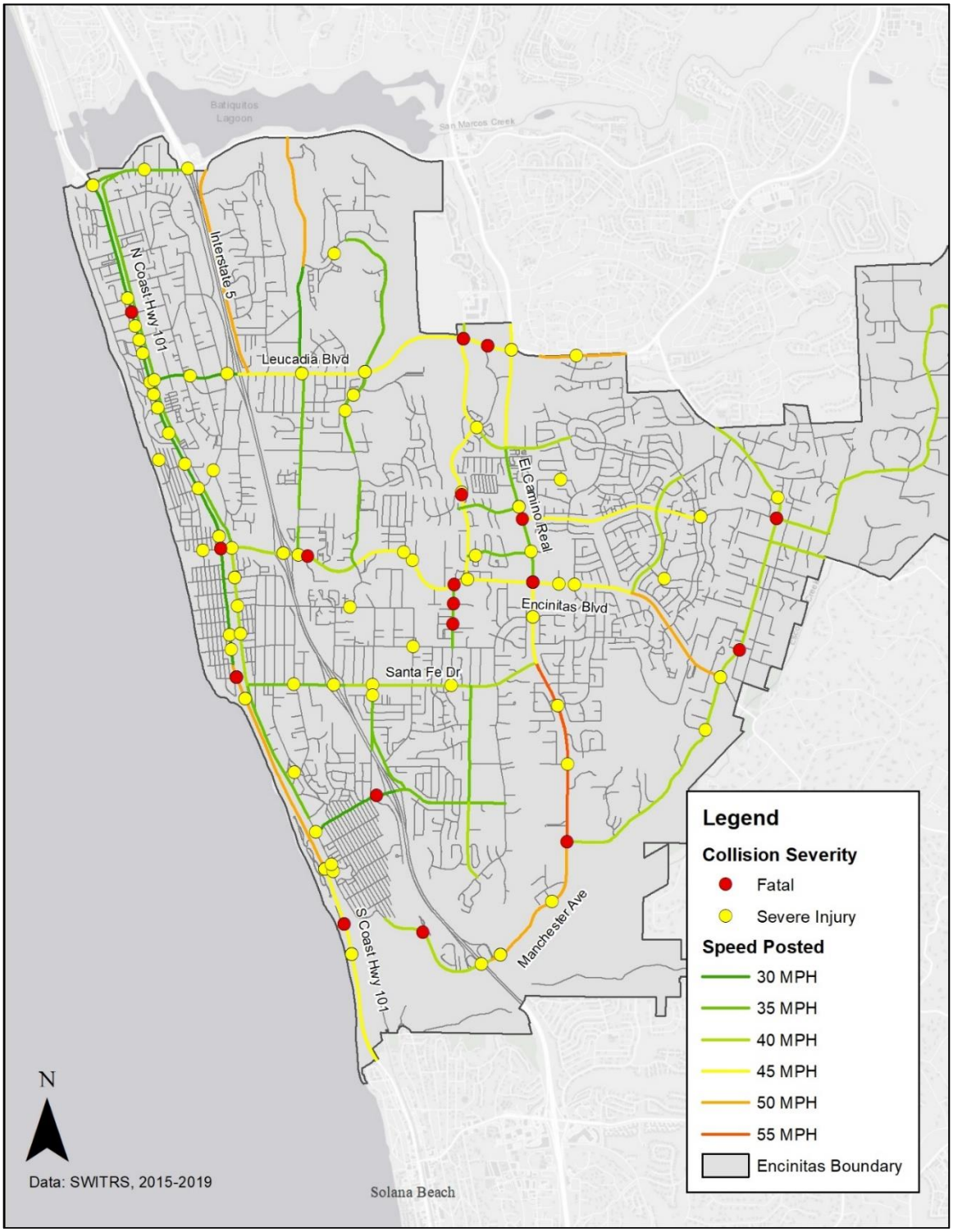
F&S PCF Violation	Intersection		Corridor	
Unsafe Speed	20	20.2%	4	9.5%
Pedestrian Violation	15	15.2%	8	19.0%
Automobile Right of Way	13	13.1%	5	11.9%
Driving or Bicycling Under the Influence of Alcohol or Drug	13	13.1%	7	16.7%
Improper Turning	8	8.1%	10	23.8%
Pedestrian Right of Way	6	6.1%	0	0.0%
Other Hazardous Violation	4	4.0%	2	4.8%
Other Improper Driving	4	4.0%	2	4.8%
Traffic Signals and Signs	3	3.0%	0	0.0%
Unsafe Lane Change	3	3.0%	0	0.0%
Unknown	5	5.1%	1	2.4%
Wrong Side of Road	2	2.0%	0	0.0%
Following Too Closely	1	1.0%	0	0.0%
Improper Passing	1	1.0%	0	0.0%
Other Than Driver (or Pedestrian)	1	1.0%	3	7.1%
Impeding Traffic	0	0.0%	0	0.0%
Unsafe Starting or Backing	0	0.0%	0	0.0%
Total	99	100.0%	42	100.0%

F&S Lighting	Intersection		Corridor	
Dark - No Street Lights	8	8.1%	6	14.3%
Dark - Street Lights	24	24.2%	11	26.2%
Daylight	57	57.6%	25	59.5%
Dusk - Dawn	8	8.1%	0	0.0%
Not Stated	0	0.0%	0	0.0%

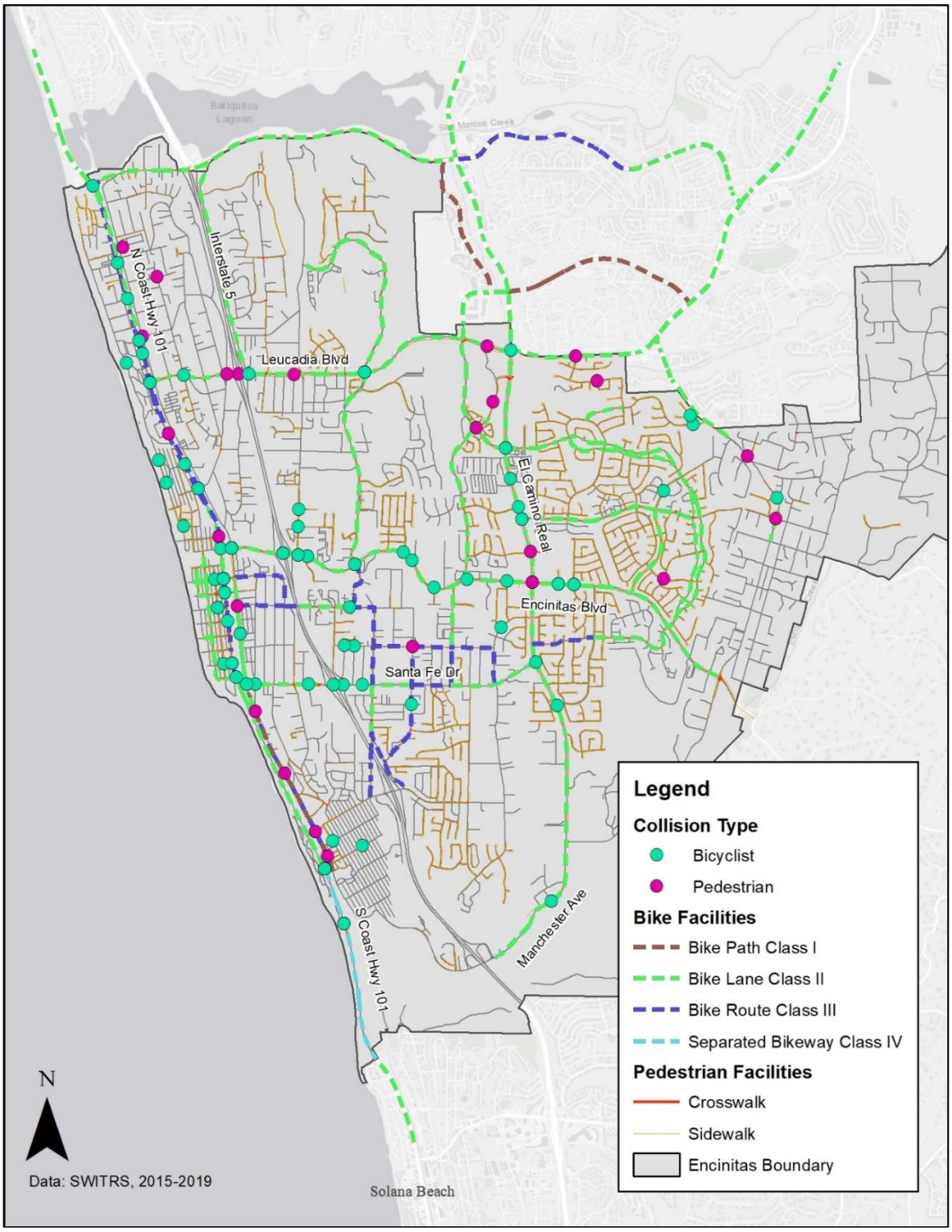
F&S MVIW	Intersection		Corridor	
Bicycle	18	18.2%	9	21.4%
Fixed Object	8	8.1%	9	21.4%
Motor Vehicle on Other Roadway	0	0.0%	0	0.0%
Non-Collision	1	1.0%	1	2.4%
Not Stated	0	0.0%	1	2.4%
Other Motor Vehicle	33	33.3%	9	21.4%
Other Object	1	1.0%	1	2.4%
Parked Motor Vehicle	5	5.1%	2	4.8%
Pedestrian	33	33.3%	9	21.4%
Animal	0	0.0%	1	2.4%

APPENDIX C - COLLISION MAPS

Location of KSI Collisions with Speed



Location of Collisions Involving Bicycle or Pedestrians with Facilities



APPENDIX D - INTERSECTION COLLISIONS

	Intersection	Number of Crashes						Crash Costs
		Total Collisions	Fatal	Severe Injury	Visible Injury	Complaint of Pain	PDO	
1	ENCINITAS BL & RT 5	42		3	5	12	22	$6,744,900
2	CHESTERFIELD DR & S COAST HWY 101	24		3	6	7	8	$6,296,500
3	K ST & S COAST HWY 101	9	1	2	2	2	2	$5,243,000
4	LEUCADIA BL & SAXONY RD	22		2	5	6	9	$4,496,600
5	COAST HWY 101 & ENCINITAS BL	14	1	1	3	5	4	$4,064,600
6	ENCINITAS BL & VULCAN AV	41		1	7	15	18	$4,039,000
7	D ST & SOUTH VULCAN AV	17		2	3	3	9	$3,969,300
8	A ST & N COAST HWY 101	11		2	3	4	2	$3,957,100
9	LEUCADIA BL & TOWN CENTER PL	16	1	1	2	4	8	$3,894,600
10	LAS OLAS TRAFFIC LIGHT & S COAST HWY 101	4		2	2			$3,464,600
11	EUROPA ST & N COAST HWY 101	5		2	1	1	1	$3,416,500
12	MANCHESTER AV & VIA POCO	34		1	2	16	15	$3,368,500
13	ALEXANDRA LN & QUAIL GARDENS DR	6		2	1		3	$3,362,200
14	GARDEN VIEW RD & LEUCADIA BL	23	1		6	9	7	$3,265,000
15	LONE JACK RD & N RANCHO SANTA FE RD	5	1	1			3	$3,219,900
16	H ST & SOUTH VULCAN AV	3		2			1	$3,193,300
17	MOUNTAIN VISTA DR & N WILLOWSPRING DR	3		2			1	$3,193,300
18	N EL CAMINO REAL & OLIVENHAIN RD	16		1	5	5	5	$2,772,500
19	GARDEN VIEW RD & VIA CANTEBRIA	20		1	4	5	10	$2,696,700
20	LEUCADIA BL & N EL CAMINIO REAL	17		1	2	9	5	$2,669,200
21	BALOUR DR & ENCINITAS BL	20	1		4	4	11	$2,629,100
22	LEUCADIA BL & N COAST HWY 101	18		1	5	1	11	$2,528,700
23	ENCINITAS BL & VILLAGE SQUARE DR	15		1	3	5	6	$2,501,200
24	ENCINITAS BL & VIA CANTEBRIA	19		1	1	8	9	$2,499,200
25	LA COSTA AV & N COAST HWY 101	13		1	4	3	5	$2,468,400
26	ENCINITAS BL & SAXONY RD	17		1	2	6	8	$2,466,400
27	D ST & S COAST HWY 101	35			9	12	14	$2,437,700
28	N EL CAMINIO REAL & VIA MONTORO	15		1	2	5	7	$2,372,200
29	CALLE MAGDALENA & ENCINITAS BL	16	1		1	6	8	$2,324,100
30	LEUCADIA BL & ORPHEUS AV	17		1	2	3	11	$2,263,600
31	LA COSTA AV & SHERIDAN RD	9		1	2	4	2	$2,224,800
32	LA COSTA AV & RT 5	13		1	1	5	6	$2,216,600
33	BASIL ST & N COAST HWY 101	5		1	4			$2,159,200
34	LEUCADIA BL & NORTH VULCAN AV	16		1	1	3	11	$2,121,300
35	RT 5 & SANTA FE DR	15		1	1	3	10	$2,108,000
36	H ST & S COAST HWY 101	11		1	1	3	6	$2,054,800

37	ENCINITAS BL & RANCHO SANTA FE RD	11		1	2	1	7	$2,048,600
38	BALOUR DR & SANTA FE DR	8		1	1	3	3	$2,014,900
39	ENCINITAS BL & ROSEBAY DR	10		1	1	2	6	$1,973,900
40	CARDIFF STATE BEACH & S COAST HWY 101	9	1		1	2	5	$1,960,600
41	MANCHESTER AV & MIRA COSTA COLLEGE RD	8		1	1	2	4	$1,947,300
42	MOUNTAIN VISTA DR & N EL CAMINO REAL	6	1			4	1	$1,926,900
43	F ST & SOUTH VULCAN AV	6		1	1	2	2	$1,920,700
44	N COAST HWY 101 & W GLAUCUS ST	6		1	1	2	2	$1,920,700
45	CERRO ST & S EL CAMINO REAL	5		1	1	2	1	$1,907,400
46	DIANA ST & N COAST HWY 101	9		1	1	1	6	$1,893,000
47	JUPITER ST & N COAST HWY 101	4		1	2		1	$1,887,900
48	MACKINNON RANCH RD & MANCHESTER AV	5	1		1	1	2	$1,839,800
49	COLONY TER & MANCHESTER AV	4		1	1	1	1	$1,826,500
50	BIRMINGHAM DR & SAN ELIJO AV	8		1	1		6	$1,812,100
51	3RD ST & B ST	4		1	1		2	$1,758,900
52	CAMINO DE LAS FLORES & ENCINITAS BL	3		1		1	1	$1,684,200
53	EL PORTAL ST & N COAST HWY 101	3		1		1	1	$1,684,200
54	S EL CAMINO REAL & TENNIS CLUB DR	3		1		1	1	$1,684,200
55	COUNTRYHAVEN RD & PARKDALE LN	2		1		1		$1,670,900
56	EL CAMINO REAL & ENCINITAS BL	45			2	12	31	$1,667,700
57	VIA CANTEBRIA & WEST BLUFF DR	4	1				3	$1,629,900
58	CHESTERFIELD AV & SAN ELIJO AV	4		1			3	$1,629,900
59	N RANCHO SANTA FE RD & PEPPERTREE LN	3	1				2	$1,616,600
60	DEVONSHIRE DR & SANTA FE DR	3		1			2	$1,616,600
61	I ST & S COAST HWY 101	3		1			2	$1,616,600
62	BALOUR DR & OAKCREST PARK DR	2	1				1	$1,603,300
63	JASON ST & N COAST HWY 101	2	1				1	$1,603,300
64	FAITH AV & MACKINNON AV	2		1			1	$1,603,300
65	REQUEZA ST & WESTLAKE ST	2		1			1	$1,603,300
66	BALOUR DR & SAN ABELLA DR	1	1					$1,590,000
67	BIRMINGHAM DR & BIRMINGHAM DR 300 BLK	1		1				$1,590,000
68	CALLE SANTA CATALINA & RANCHO SANTA FE RD	1		1				$1,590,000
69	CHANNEL ISLAND DR & QUAIL GARDENS DR	1		1				$1,590,000
70	D ST & NORTH VULCAN AV	1		1				$1,590,000
71	DAPHNE ST & N COAST HWY 101	1		1				$1,590,000
72	ENCINITAS BL & ENCINITAS BL 479	1		1				$1,590,000
73	FULVIA ST & LEUCADIA BL	1		1				$1,590,000
74	HAYDN DR & LISZT AV	1		1				$1,590,000
75	KILDEER CT & QUAIL HOLLOR DR	1		1				$1,590,000
76	N COAST HWY 101 & NORTH COAST HWY 1700	1		1				$1,590,000

77	NORTH COAST HWY 101 & PHOEBE ST	1		1				$1,590,000
78	ORINDA LN & SAN ELIJO AV	1		1				$1,590,000
79	ORPHEUS AV & SUNSET	1		1				$1,590,000
80	RT 101 & RT 101 2500 BLK	1		1				$1,590,000
81	RT 101 & SOUTH COAST HWY 101 1300	1		1				$1,590,000
82	RT 101 & SOUTH COAST HWY 101 1800	1		1				$1,590,000
83	S COAST HWY 101 & SEASIDE STATE BEACH	1		1				$1,590,000
84	VIA MOLENA & VIA MORELLA	1		1				$1,590,000
85	E ST & S COAST HWY 101	23			5	9	9	$1,559,300
86	LEUCADIA BL & QUAIL GARDENS DR	22			4	10	8	$1,484,600
87	LEUCADIA BL & PIRAEUS ST	24			4	8	12	$1,376,000
88	MARCHETA ST & N COAST HWY 101	16			3	8	5	$1,140,600
89	MOUNTAIN VISTA DR & N EL CAMINIO REAL	17			2	9	6	$1,092,500
90	GARDEN VIEW RD & N EL CAMINIO REAL	14			4	5	5	$1,040,200
91	CHESTERFIELD DR & SAN ELIJO AV	22			3	5	14	$1,017,600
92	N EL CAMINIO REAL & TOWN CENTER DR	16			3	6	7	$1,005,400
93	S EL CAMINO REAL & SANTA FE DR	16			3	5	8	$937,800
94	AMARGOSA DR & OLIVENHAIN RD	14			4	2	8	$837,400
95	J ST & S COAST HWY 101	12			4	1	7	$743,200
96	LAKE DR & SANTA FE DR	13			1	6	6	$707,500
97	N EL CAMINO REAL & VIA MONTORO	12			1	6	5	$694,200
98	LEUCADIA BL & RT 5	17			1	5	11	$693,100
99	G ST & S COAST HWY 101	7			3	3	1	$682,900
100	LEUCADIA BL & SIDONIA ST	11			2	4	5	$674,700
101	MANCHESTER AV & RT 5	13			1	5	7	$639,900
102	GRANDVIEW ST & N COAST HWY 101	8			3	2	3	$628,600
103	ENCINITAS BL & VILLAGE PARK WY	12			2	3	7	$620,400
104	HYMETTUS AV & LEUCADIA BL	11			2	3	6	$607,100
105	N EL CAMINIO REAL & OLIVENHAIN RD	11			2	3	6	$607,100
106	E ST & SOUTH VULCAN AV	16			2	2	12	$606,000
107	MANCHESTER AV & S EL CAMINO REAL	10			2	3	5	$593,800
108	GARDEN VIEW RD & N EL CAMINO REAL	9			1	5	3	$586,700
109	CHESTERFIELD DR & OXFORD AV	4			4			$569,200
110	GARDEN VIEW RD & MONTEREY PL	4			4			$569,200
111	LA COSTA AV & NORTH VULCAN AV	7			2	3	2	$553,900
112	HYGEIA AV & LEUCADIA BL	6			2	3	1	$540,600
113	MOUNTAIN VISTA DR & WANDERING RD	6			3	1	2	$534,400
114	ENCINITAS BL & WESTLAKE ST	10			1	4	5	$532,400
115	ENCINITAS BL & QUAIL GARDENS DR	10			2	2	6	$526,200
116	B ST & S COAST HWY 101	5			3	1	1	$521,100
117	N EL CAMINIO REAL & VIA MOLENA	9			1	4	4	$519,100

118	LEUCADIA BL & N EL CAMINO REAL	12				5	7	$497,600
119	N COAST HWY 101 & PHOEBE ST	7			2	2	3	$486,300
120	MELBA RD & NARDO RD	8			2	1	5	$432,000
121	CERRO ST & ENCINITAS BL	7			2	1	4	$418,700
122	ATHENA ST & N COAST HWY 101	6			1	3	2	$411,600
123	GARDENDALE RD & MOUNTAIN VISTA DR	6			1	3	2	$411,600
124	BIRMINGHAM DR & RT 5	10				4	6	$403,400
125	LEUCADIA BL & QUAIL GARDENS RD	5			1	3	1	$398,300
126	EVERGREEN DR & SANTA FE DR	5			2	1	2	$392,100
127	N COAST HWY 101 & NORTH CT	5			2	1	2	$392,100
128	TARGET DRIVEWAY & VIA CANTEBRIA	4			2	1	1	$378,800
129	GARDENA RD & SANTA FE DR	8			1	2	5	$370,600
130	ENCINITAS BL & ENCINITAS BL 135	3			2	1		$365,500
131	REGAL RD & SANTA FE DR	7				4	3	$363,500
132	BRACERO RD & MELBA RD	7			1	2	4	$357,300
133	DELPHINIUM ST & ENCINITAS BL	6			1	2	3	$344,000
134	MANCHESTER AV & SAN ELIJO AV	6			1	2	3	$344,000
135	REGAL RD & REQUEZA ST	6			1	2	3	$344,000
136	HERMES AV & LEUCADIA BL	11			1	1	9	$342,900
137	2ND ST & J ST	4			1	2	1	$317,400
138	EVERGREEN DR & MELBA RD	4			1	2	1	$317,400
139	CREST DR & S EL CAMINO REAL	4			2		2	$311,200
140	AVOCADO ST & N COAST HWY 101	3			1	2		$304,100
141	ENCINITAS BL & TURNER AV	7				3	4	$295,900
142	2ND ST & D ST	7			1	1	5	$289,700
143	9TH ST & N RANCHO SANTA FE RD	7			1	1	5	$289,700
144	ANDREW AV & NORTH VULCAN AV	2			2			$284,600
145	MANCHESTER AV & MANCHESTER AV 2710	2			2			$284,600
146	S COAST HWY 101 & SOUTH COAST HWY 101 2655	2			2			$284,600
147	S EL CAMINO REAL & S EL CAMINO REAL 201	2			2			$284,600
148	BEECHTREE DR & ENCINITAS BL	5				3	2	$269,300
149	7TH ST & N RANCHO SANTA FE RD	5			1	1	3	$263,100
150	CAMINO DEL NORTE & N RANCHO SANTA FE RD	4				3	1	$256,000
151	DUBLIN DR & SAN ELIJO AV	4				3	1	$256,000
152	LEUCADIA BL & PASSIFLORA AV	4				3	1	$256,000
153	2ND ST & F ST	4			1	1	2	$249,800
154	BIRMINGHAM DR & LAKE DR	4			1	1	2	$249,800
155	MANCHESTER AV & SIENNA CANYON DR	4			1	1	2	$249,800
156	SAN ELIJO AV & SANTA FE DR	4			1	1	2	$249,800
157	ENCINITAS BL & WILLOWSPRING DR	3				3		$242,700

158	CATHY LN & MACKINNON AV	3			1	1	1	$236,500
159	LA COSTA AV & PIRAEUS ST	3			1	1	1	$236,500
160	MANCHESTER AV & MANCHESTER AV 3333	3			1	1	1	$236,500
161	QUAIL GARDENS DR & VIA ZAMIA	3			1	1	1	$236,500
162	ABERDEEN DR & SAN ELIJO AV	8			1		7	$235,400
163	NARDO RD & SANTA FE DR	7				2	5	$228,300
164	ARCADIA RD & SANTA FE DR	2			1	1		$223,200
165	BIRMINGHAM DR & NEWCASTLE AV	2			1	1		$223,200
166	EL CAMINO DEL NORTE & VAL SERENO DR	2			1	1		$223,200
167	ENCINITAS BL & RODNEY AV	2			1	1		$223,200
168	G ST & SOUTH VULCAN AV	2			1	1		$223,200
169	S COAST HWY 101 & SWAMIS STATE BEACH	2			1	1		$223,200
170	BONITA DR & SANTA FE DR	6				2	4	$215,000
171	LEUCADIA BL & TOWN CENTER DR	6				2	4	$215,000
172	LEUCADIA BL & URANIA AV	6				2	4	$215,000
173	JASPER ST & N COAST HWY 101	6			1		5	$208,800
174	LIVERPOOL DR & NEWCASTLE AV	6			1		5	$208,800
175	GARDENA RD & MELBA RD	5				2	3	$201,700
176	N EL CAMINO REAL & VIA MOLENA	5				2	3	$201,700
177	2ND ST & E ST	5			1		4	$195,500
178	VILLA CARDIFF DR & WINDSOR RD	5			1		4	$195,500
179	CADMUS ST & N COAST HWY 101	4				2	2	$188,400
180	VIA CANTEBRIA & VIA MONTORO	4				2	2	$188,400
181	MACKINNON AV & SANTA FE DR	9				1	8	$187,300
182	NORTH VULCAN AV & ORPHEUS AV	4			1		3	$182,200
183	GLAUCUS ST & NORTH VULCAN AV	3				2	1	$175,100
184	BIRMINGHAM DR & MACKINNON AV	8				1	7	$174,000
185	LIVERPOOL DR & SAN ELIJO AV	8				1	7	$174,000
186	3RD ST & C ST	3			1		2	$168,900
187	DEL RIO AV & LEUCADIA BL	3			1		2	$168,900
188	EL CAMINO CT & S EL CAMINO REAL	3			1		2	$168,900
189	LISZT AV & SAN ELIJO AV	3			1		2	$168,900
190	AVENIDA DE LAS ADELSAS & S EL CAMINO REAL	2				2		$161,800
191	MANCHESTER AV & TRABERT RANCH RD	2				2		$161,800
192	N EL CAMINO REAL & SANTA FE DR	2				2		$161,800
193	ENCINITAS BL & MANCHESTER AV	7				1	6	$160,700
194	BIRMINGHAM DR & CREST DR	2			1		1	$155,600
195	CREST DR & WITHAM RD	2			1		1	$155,600
196	GARDENVIEW RD & LEUCADIA BL	2			1		1	$155,600
197	LONE JACK RD & LONE JACK RD 2703	2			1		1	$155,600
198	LONE JACK RD & WILDFLOWER VALLEY RD	2			1		1	$155,600

199	PARK LN & REGAL RD	2			1		1	$155,600
200	WINDSOR CREEK CT & WINDSOR RD	2			1		1	$155,600
201	223 MARCHETA ST & MARCHETA ST	1			1			$142,300
202	2655 COAST HIGHWAY 101 & COAST HWY 101	1			1			$142,300
203	2790 S RT101 & S RT 101	1			1			$142,300
204	5TH ST & SYLVIA ST	1			1			$142,300
205	ABERDEEN DR & LIVERPOOL DR	1			1			$142,300
206	AVENIDA DE LAS ADELSAS & OAKBRANCH DR	1			1			$142,300
207	AVENIDA ESTEBAN & AVENIDA JOAQUIN	1			1			$142,300
208	AVENIDA ESTEBAN & AVENIDA LA POSTA	1			1			$142,300
209	B ST & N COAST HWY 101	1			1			$142,300
210	B ST & RT 101 N COAST	1			1			$142,300
211	BALOUR DR & SANTA FE AV	1			1			$142,300
212	BIRMINGHAM DR & VILLA CARDIFF	1			1			$142,300
213	BISHOPS GATE RD & N COAST HWY 101	1			1			$142,300
214	BULRUSH LN & SEA VILLAGE DR	1			1			$142,300
215	CADMUS ST & NORTH COAST HWY 101	1			1			$142,300
216	CEREUS ST & HYGEIA AV	1			1			$142,300
217	CLEAR VALLEY RD & VILLAGE PARK WY	1			1			$142,300
218	COLONY TERRACE & MANCHESTER AV	1			1			$142,300
219	CRESTVIEW DR & LAKE DR	1			1			$142,300
220	DELPHINIUM ST & SUNFLOWER ST	1			1			$142,300
221	EL CAMINIO REAL 400 BLOCK & N EL CAMINO REAL	1			1			$142,300
222	EL CAMINIO REAL 600 & N EL CAMINO REAL	1			1			$142,300
223	EL CAMINO REAL & VIA MOLENA	1			1			$142,300
224	ENCINITAS BL & HUMMINGBIRD HILL	1			1			$142,300
225	ENCINITAS BL & LA VIA SAN JUAN	1			1			$142,300
226	ENTRANCE TO THE SHOPPING CENTER & N EL CAMINO REAL	1			1			$142,300
227	ENTRANCE TO TRADER JOES & VILLAGE SQUARE DR	1			1			$142,300
228	EOLUS AV & PARKWOOD LN	1			1			$142,300
229	HYGEIA AV & LEUCADIA CT	1			1			$142,300
230	HYGEIA AV & SANFORD ST	1			1			$142,300
231	JASPER AV & NEPTUNE AV	1			1			$142,300
232	LA COSTA AV & LA COSTA CT	1			1			$142,300
233	LA COSTA AV & RT 5	1			1			$142,300
234	LAKE DR & LAKE DR 1753	1			1			$142,300
235	LUX CANYON DR & S EL CAMINO REAL	1			1			$142,300
236	MACKINNON AV & MACKINNON CT	1			1			$142,300
237	MANCHESTER AV & MANCHESTER AV 4078	1			1			$142,300

238	MANCHESTER AV & N EL CAMINO REAL	1			1			$142,300
239	MELROSE AV & SYLVIA ST	1			1			$142,300
240	N COAST HWY 204 & NORTH COAST HWY 101	1			1			$142,300
241	N RANCHO SANTA FE RD & OLIVE CREST DR	1			1			$142,300
242	N VULCAN AV 993 & NORTH VULCAN AV	1			1			$142,300
243	N VULCAN AV 1201 & NORTH VULCAN AV	1			1			$142,300
244	N VULCAN AV 1549 & NORTH VULCAN AV	1			1			$142,300
245	N WILLOWSPRING DR & SUMMERHILL DR	1			1			$142,300
246	N WILLOWSPRING DR & WANDERING RD	1			1			$142,300
247	NEPTUNE AV & W GLAUCUS ST	1			1			$142,300
248	NEWCASTLE AV & SAN ELIJO RD	1			1			$142,300
249	ORCHARD GLEN CIR & ORCHARD WOOD ST	1			1			$142,300
250	PARKING LOT ENTRANCE TO CARDIFF STATE BEACH & S COAST HWY 101	1			1			$142,300
251	PIRAEUS ST & PLATO PL	1			1			$142,300
252	QUAIL GARDENS DR & SWALLOWTAIL RD	1			1			$142,300
253	RITE AID PRIVATE DRIVE & SANTA FE DR	1			1			$142,300
254	RT 101 & RT 101 2571	1			1			$142,300
255	S COAST HWY 101 & S COAST HWY 101 1163	1			1			$142,300
256	S COAST HWY 101 & S COAST HWY 101 449	1			1			$142,300
257	S COAST HWY 101 & SEA SIDE STATE BEACH ENTRANCE	1			1			$142,300
258	S COAST HWY 101 & SOUTH COAST HIGHWAY 101 2790	1			1			$142,300
259	S EL CAMINO REAL & S EL CAMINO REAL 100	1			1			$142,300
260	SAN ELIJO AV 1615 & SAN ELIJO AV	1			1			$142,300
261	SAN ELIJO AV 2081 & SAN ELIJO AV	1			1			$142,300
262	SAN ELIJO AV & SAN ELIJO AV 2100	1			1			$142,300
263	SAXONY RD & SEA CREST WY	1			1			$142,300
264	BONITA DR & MELBA RD	5				1	4	$134,100
265	BALOUR DR & MELBA RD	4				1	3	$120,800
266	BIRMINGHAM DR & OXFORD AV	4				1	3	$120,800
267	CORNISH DR & SANTA FE DR	3				1	2	$107,500
268	DIAMOND HEAD DR & SANTA FE DR	3				1	2	$107,500
269	E JASON ST & NORTH VULCAN AV	3				1	2	$107,500
270	EL PORTAL ST & LA VETA AV	3				1	2	$107,500
271	LAKE DR & WOODGROVE DR	3				1	2	$107,500
272	MARCHETA ST & MELROSE AV	3				1	2	$107,500
273	NARDO RD & REQUEZA ST	3				1	2	$107,500
274	ROSEBAY DR & SNAPDRAGON ST	3				1	2	$107,500
275	SANTA FE DR & SOUTH VULCAN AV	3				1	2	$107,500
276	TOWN CENTER DR & TOWN CENTER PL	3				1	2	$107,500
277	F ST & S COAST HWY 101	8					8	$106,400

278	3RD ST & F ST	2				1	1	$94,200
279	BIRMINGHAM DR & VILLA CARDIFF DR	2				1	1	$94,200
280	CORNISH DR & D ST	2				1	1	$94,200
281	EL CAMINO DEL NORTE & N RANCHO SANTA FE RD	2				1	1	$94,200
282	EL PORTAL ST & NEPTUNE AV	2				1	1	$94,200
283	ENCINITAS BL & ENCINITAS BL 479	2				1	1	$94,200
284	ENCINITAS BL & QUAIL GARDENS RD	2				1	1	$94,200
285	ENCINITAS BL & WESTLAKE DR	2				1	1	$94,200
286	GLASGOW AV & LIVERPOOL DR	2				1	1	$94,200
287	GLEN ARBOR DR & WANDERING RD	2				1	1	$94,200
288	HILLCREST DR & NORTH VULCAN AV	2				1	1	$94,200
289	I ST & SOUTH VULCAN AV	2				1	1	$94,200
290	LA GRAN AV & N EL CAMINO REAL	2				1	1	$94,200
291	MACKINNON & SANTA FE DR	2				1	1	$94,200
292	MACKINNON AV & MUNEVAR RD	2				1	1	$94,200
293	MORNING SUN DR & N RANCHO SANTA FE RD	2				1	1	$94,200
294	NORMANDY RD & PIRAEUS ST	2				1	1	$94,200
295	NORTH VULCAN AV & UNION ST	2				1	1	$94,200
296	SANTA FE DR & STRATFORD DR	2				1	1	$94,200
297	VIA CANTEBRIA & VIA MOLENA	2				1	1	$94,200
298	127 SOUTH EL CAMINO REAL & S EL CAMINO REAL	1				1		$80,900
299	1575 SAN ELIO AV & SAN ELIJO AV	1				1		$80,900
300	3RD ST & H ST	1				1		$80,900
301	ALOHA DR & SANTA FE DR	1				1		$80,900
302	ANDREW AV & LEUCADIA SCENIC CT	1				1		$80,900
303	AVENIDA LA POSTA & N RANCHO SANTA FE RD	1				1		$80,900
304	AVOCADO ST & NORTH COAST HWY 101	1				1		$80,900
305	BIRMINGHAM DR & VIA CARDIFF DR	1				1		$80,900
306	BONITA RD & MELBA RD	1				1		$80,900
307	BRIDGE & S COAST HWY 101	1				1		$80,900
308	BRIDOON TER & CANTLE LN	1				1		$80,900
309	BURGUNDY RD & SKY LOFT RD	1				1		$80,900
310	CALLE BARCELONA & LEUCADIA BL	1				1		$80,900
311	CANTON CT & LAKE DR	1				1		$80,900
312	CEREUS ST & HERNES AV	1				1		$80,900
313	CERRO ST & S WILLOWWOOD DR	1				1		$80,900
314	CERRO ST & WILLOW SPRING DR	1				1		$80,900
315	CHESTERFIELD DR & CHESTERFIELD DR 126	1				1		$80,900
316	CIRCUIT CITY DRIVEWAY & N EL CAMINO REAL	1				1		$80,900

317	COLE RANCH RD & COLE RANCH RD 703	1				1		$80,900
318	CORAL COVE WY & SHOREBREAK WY	1				1		$80,900
319	COUNTRY WOOD LN & COUNTRY WOOD LN 318	1				1		$80,900
320	DEL RIO A 858 & DEL RIO AV	1				1		$80,900
321	DRIVEWAY TO MICHAELS CRAFT STORE & N EL CAMINO REAL	1				1		$80,900
322	E JASON ST & HYGEIA AV	1				1		$80,900
323	ENCINITAS BL & LAKE DR	1				1		$80,900
324	ENCINITAS BL & N WILLOWSPRINGS DR	1				1		$80,900
325	ENCINITAS BL & OAK PARK DR	1				1		$80,900
326	ENCINITAS BL & SMART AND FINAL PARKING LOT	1				1		$80,900
327	ENCINITAS BL & VIA CANTABRIA	1				1		$80,900
328	ENTRANCE TO SHOPPING CENTER & S EL CAMINO REAL	1				1		$80,900
329	FORREST BLUFF DR & VIA CANTEBRIA	1				1		$80,900
330	FREDA LN & NOLBEY ST	1				1		$80,900
331	GARDENA RD & GARDENA RD 1135	1				1		$80,900
332	GARDENVIEW RD & VIA CANTEBRIA	1				1		$80,900
333	LA COSTA & RT 5	1				1		$80,900
334	LA FITNES SHOPPING CENTER DR & S EL CAMINO REAL	1				1		$80,900
335	LEUCADIA BL & LEUCADIA BL 1385	1				1		$80,900
336	LEUCADIA BL & LEUCADIA BL 1400	1				1		$80,900
337	LEUCADIA BL & QUAIL GARDEN DR	1				1		$80,900
338	LEUCADIA BL & QUAIL GARDENS	1				1		$80,900
339	LEUCADIA CT & SIDONIA ST	1				1		$80,900
340	LEUCADIA RD & QUAIL GARDENS DR	1				1		$80,900
341	LITTLE OAK PLAZA & N EL CAMINO REAL	1				1		$80,900
342	LITTLE OAKS RD & PARK DALE LN	1				1		$80,900
343	LONE JACK RD & LONE JACK RD 2500	1				1		$80,900
344	LONE JACK RD & RANCHO ENCINITAS DR	1				1		$80,900
345	LOS OLAS & S COAST HWY 101	1				1		$80,900
346	MANCHESTER AV & MANCHESTER AV 3575	1				1		$80,900
347	MANCHESTER AV & NORFOLK DR	1				1		$80,900
348	MANCHESTER AV & PACIFIC RANCH DR	1				1		$80,900
349	MARCHETTA ST & N COAST HWY 101	1				1		$80,900
350	MILEPOST & N COAST HWY 101	1				1		$80,900
351	MONTGOMERY AV & SAN ELIJO AV	1				1		$80,900
352	MUNEVAR RD & WINDSOR RD	1				1		$80,900
353	N EL CAMINIO REAL & N EL CAMINO REAL 131	1				1		$80,900
354	N EL CAMINIO REAL & SHOPPING CENTER ENTRANCE	1				1		$80,900
355	N EL CAMINO REAL & VIA MOLINA	1				1		$80,900

356	N RANCHO SANTA FE RD & S RANCHO SANTA FE RD	1				1		$80,900
357	NARDO RD & NARDO RD 1000	1				1		$80,900
358	NORTH VULCAN AV & SUNSET ST	1				1		$80,900
359	OLIVEHAIN RD & PASEO ALISO	1				1		$80,900
360	ORPHEUS AV & UNION ST	1				1		$80,900
361	PIRAEUS ST & SPARTA DR	1				1		$80,900
362	QUAIL GARDENS DR & RAVEAN CT	1				1		$80,900
363	QUAIL GARDENS RD & RANCH RD	1				1		$80,900
364	REGAL RD & SANTA FE AV	1				1		$80,900
365	RT 101 & S COAST HWY 101 2655	1				1		$80,900
366	S COAST HWY 101 & S COAST HWY 1300	1				1		$80,900
367	S COAST HWY 101 & S COAST HWY 2600	1				1		$80,900
368	S COAST HWY 101 & SOUTH COAST HIGHWAY 101 2500	1				1		$80,900
369	S COAST HWY 101 & SOUTH COAST HWY 101 2526	1				1		$80,900
370	S EL CAMINO REAL & S EL CAMINO REAL 200	1				1		$80,900
371	S EL CAMINO REAL & WILLOWSPRING DR	1				1		$80,900
372	SAN ELIJO AV 2567 & SAN ELIJO AV	1				1		$80,900
373	SANTA FE DR & SANTA FE PLAZA	1				1		$80,900
374	SANTA FE DR & WINDSOR DR	1				1		$80,900
375	SAXONY LN & SAXONY RD	1				1		$80,900
376	SAXONY RD & SIDONIA ST	1				1		$80,900
377	TOWN CENTER DR & VIA CANTEBRIA	1				1		$80,900
378	LOS PINOS CIR & OLIVENHAIN RD	5					5	$66,500
379	MELBA RD & REGAL RD	5					5	$66,500
380	MOUNTAIN VISTA DR & VILLAGE PARK WY	5					5	$66,500
381	RUBENSTEIN AV & SANTA FE DR	5					5	$66,500
382	LIVERPOOL DR & MONTGOMERY AV	4					4	$53,200
383	SAXONY RD & SEACREST WY	4					4	$53,200
384	2ND ST & K ST	3					3	$39,900
385	ABERDEEN DR & NEWCASTLE AV	3					3	$39,900
386	CAMBRIDGE AV & CHESTERFIELD DR	3					3	$39,900
387	EOLUS AV & LEUCADIA BL	3					3	$39,900
388	GOLDEN RD & REGAL RD	3					3	$39,900
389	MANCHESTER AV & OCEAN COVE DR	3					3	$39,900
390	N EL CAMINIO REAL & N EL CAMINO REAL 1000	3					3	$39,900
391	NORFOLK DR & OXFORD AV	3					3	$39,900
392	SAXONY RD & SILVER BERRY PL	3					3	$39,900
393	3RD ST & A ST	2					2	$26,600
394	4TH ST & A ST	2					2	$26,600
395	ALOHA DR & MELBA RD	2					2	$26,600

396	ARDEN DR & D ST	2					2	$26,600
397	ASHBURY ST & NORTH VULCAN AV	2					2	$26,600
398	BIRMINGHAM DR & FREDA LN	2					2	$26,600
399	BIRMINGHAM DR & LEGAYE DR	2					2	$26,600
400	C ST & MOONLIGHT LN	2					2	$26,600
401	CALLE DE MADERA & HYGEIA AV	2					2	$26,600
402	CERRO ST & S WILLOWSPRING DR	2					2	$26,600
403	CLARK AV & LEUCADIA BL	2					2	$26,600
404	CORNISH DR & REQUEZA ST	2					2	$26,600
405	CREST DR & SANTA FE DR	2					2	$26,600
406	D ST & D ST 105	2					2	$26,600
407	EL CAMINO REAL & OLIVENHAIN RD	2					2	$26,600
408	ENCINITAS BL & ENCINITAS BL 500	2					2	$26,600
409	FLORITA ST & MELROSE AV	2					2	$26,600
410	FORTUNA RANCH RD & LONE JACK RD	2					2	$26,600
411	FRAXINELLA ST & PERIWINKLE ST	2					2	$26,600
412	GARDENDALE RD & VILLAGE CENTER DR	2					2	$26,600
413	GRANDVIEW ST & NEPTUNE AV	2					2	$26,600
414	KILKENNY DR & SAN ELIJO RD	2					2	$26,600
415	LA COSTA AV & SAXONY RD	2					2	$26,600
416	LA VETA AV & MARCHETA ST	2					2	$26,600
417	LAKE DR & SEA VILLAGE WY	2					2	$26,600
418	LEUCADIA BL & PIRAEUS	2					2	$26,600
419	MACKINNON AV & OCEAN CREST RD	2					2	$26,600
420	MANCHESTER AV & RANCHO SANTA FE RD	2					2	$26,600
421	N COAST HWY 101 & W JASON ST	2					2	$26,600
422	N EL CAMINO REAL & TOWN CENTER DR	2					2	$26,600
423	OLIVENHAIN RD & OLIVENHAIN RD 1600	2					2	$26,600
424	PACIFIC VIEW LN & SEACREST WY	2					2	$26,600
425	PIRAEUS ST & SKY LOFT RD	2					2	$26,600
426	QUAIL HOLLOW RD & SAXONY RD	2					2	$26,600
427	SANDCASTLE DR & WOODGROVE DR	2					2	$26,600
428	SANTA FE DR & WINDSOR RD	2					2	$26,600
429	SAXONY RD & SAXONY RD 200	2					2	$26,600
430	SAXONY RD & UNION ST	2					2	$26,600
431	SOUTH VULCAN AV & VISTA DEL REY DR	2					2	$26,600
432	VIA CANTEBRIA & VIA MONTECITO	2					2	$26,600

APPENDIX E - SEGMENT COLLISIONS

Mid-block Segments		Number of Crashes						Crash Costs
		Total Collisions	Fatal	Severe Injury	Visible Injury	Complaint of Pain	PDO	
1	S COAST HWY 101	57	1	9	12	17	18	$25,222,300
2	ENCINITAS BL	58		4	11	17	26	$12,046,400
3	N EL CAMINIO REAL	66		3	11	23	29	$10,381,700
4	LEUCADIA BL	30		4	4	5	17	$9,959,800
5	MANCHESTER AV	47		3	7	12	25	$8,869,400
6	S EL CAMINO REAL	15	1	2	3	5	4	$7,454,600
7	EL CAMINO REAL	13	2	1	3	3	4	$7,292,800
8	QUAIL GARDENS DR	9		2	2	1	4	$4,798,700
9	N COAST HWY 101	20		1	3	8	8	$3,370,500
10	VIA CANTEBRIA	17		1	2	7	7	$3,134,000
11	SANTA FE DR	10		1	1	4	4	$2,709,100
12	OLIVENHAIN RD	7		1	1	2	3	$2,534,000
13	NEPTUNE AV	3		1	1		1	$2,345,600
14	10TH AV	2	1		1			$2,332,300
15	LONE HILL LN	3		1			2	$2,216,600
16	BIRMINGHAM DR	1	1					$2,190,000
17	BONITA DR	1		1				$2,190,000
18	VALLEDA LN	1		1				$2,190,000
19	SAN ELIJO AV	18			3	4	11	$896,800
20	NORTH VULCAN AV	13			2	6	5	$836,500
21	VIA MONTORO	5			1	4		$465,900
22	N RANCHO SANTA FE RD	4			3		1	$440,200
23	LA COSTA AV	7			2	1	4	$418,700
24	GARDEN VIEW RD	8			1	2	5	$370,600
25	LONE JACK RD	7			1	2	4	$357,300
26	N EL CAMINO REAL	5			2		3	$324,500
27	RT 101	2			2			$284,600
28	MELBA RD	8				2	6	$241,600
29	SAXONY RD	7				2	5	$228,300
30	RANCHO SANTA FE RD	3			1		2	$168,900
31	WESTLAKE ST	3			1		2	$168,900
32	EL CAMINO DEL NORTE	2				2		$161,800
33	BALOUR DR	2			1		1	$155,600
34	HERMES AV	2			1		1	$155,600
35	MOUNTAIN VISTA DR	2			1		1	$155,600
36	ORPHEUS AV	2			1		1	$155,600

37	ARDEN DR	1			1			$142,300
38	GOLDEN RD	1			1			$142,300
39	N WILLOWSPRING DR	1			1			$142,300
40	QUAIL GARDENS RD	1			1			$142,300
41	S RANCHO SANTA FE RD	1			1			$142,300
42	VIA MOLENA	5				1	4	$134,100
43	CALLE BARCELONA	2				1	1	$94,200
44	EVERGREEN DR	2				1	1	$94,200
45	GARDENA RD	2				1	1	$94,200
46	GLEN ARBOR DR	2				1	1	$94,200
47	COAST HWY 101	1				1		$80,900
48	PASEO DE LAS VERDES	1				1		$80,900
49	REQUEZA ST	1				1		$80,900
50	RT 58	1				1		$80,900
51	SEA VILLAGE DR	1				1		$80,900
52	URANIA AV	1				1		$80,900
53	REGAL RD	6					6	$79,800
54	GRANDVIEW ST	3					3	$39,900
55	SUMMIT AV	3					3	$39,900
56	EOLUS AV	2					2	$26,600
57	LAKE DR	2					2	$26,600
58	S WILLOWSPRING DR	2					2	$26,600
59	13TH ST	1					1	$13,300
60	AMARGOSA DR	1					1	$13,300
61	ARCADIA RD	1					1	$13,300
62	AVENIDA JOAQUIN	1					1	$13,300
63	CAMBRIDGE AV	1					1	$13,300
64	CHAPALITA DR	1					1	$13,300
65	CLARK AV	1					1	$13,300
66	CONEFLOWER ST	1					1	$13,300
67	D ST	1					1	$13,300
68	DOVE HOLLOW DR	1					1	$13,300
69	EDINBURG AV	1					1	$13,300
70	FORESTDALE DR	1					1	$13,300
71	FORTUNA RANCH RD	1					1	$13,300
72	GLASGOW AV	1					1	$13,300
73	HYGEIA AV	1					1	$13,300
74	JOLINA WY	1					1	$13,300
75	LA MIRADA AV	1					1	$13,300
76	LUECADIA BL	1					1	$13,300
77	MACKINNON AV	1					1	$13,300

78	MONTGOMERY AV	1					1	$13,300
79	NARDO RD	1					1	$13,300
80	OCEAN VIEW AV	1					1	$13,300
81	PARKDALE LN	1					1	$13,300
82	PASEO DE LAS FLORES	1					1	$13,300
83	PASSIFLORA AV	1					1	$13,300
84	PIRAEUS ST	1					1	$13,300
85	RAINTREE DR	1					1	$13,300
86	SAN DIEGUITO DR	1					1	$13,300
87	SEA VIEW CT	1					1	$13,300
88	SEALANE DR	1					1	$13,300
89	SOUTH VULCAN AV	1					1	$13,300
90	SPLITRAIL DR	1					1	$13,300
91	SUNSET DR	1					1	$13,300
92	VIA DI FELICITA	1					1	$13,300
93	VILLA CARDIFF DR	1					1	$13,300
94	VILLAGE VIEW RD	1					1	$13,300
95	WANDERING RD	1					1	$13,300
96	WINDSOR RD	1					1	$13,300

APPENDIX F - CALTRANS COUNTERMEASURE LIST

Table 1. Countermeasures for Signalized Intersections

No.	Type	Countermeasure Name	Crash Type	CRF	Expected Life (Years)	HSIP Funding Eligibility	Systemic Approach Opportunity?
S01	Lighting	Add intersection lighting (S.I.)	Night	40%	20	100%	Medium
S02	Signal Mod.	Improve signal hardware: lenses, back-plates with retroreflective borders, mounting, size, and number	All	15%	10	100%	Very High
S03	Signal Mod.	Improve signal timing (coordination, phases, red, yellow, or operation)	All	15%	10	50%	Very High
S04	Signal Mod.	Provide Advanced Dilemma Zone Detection for high speed approaches	All	40%	10	100%	High
S05	Signal Mod.	Install emergency vehicle pre-emption systems	Emergency Vehicle	70%	10	100%	High
S06	Signal Mod.	Install left-turn lane and add turn phase (signal has no left-turn lane or phase before)	All	55%	20	90%	Low
S07	Signal Mod.	Provide protected left turn phase (left turn lane already exists)	All	30%	20	100%	High
S08	Signal Mod.	Convert signal to mast arm (from pedestal-mounted)	All	30%	20	100%	Medium
S09	Operation/ Warning	Install raised pavement markers and striping (Through Intersection)	All	10%	10	100%	Very High
S10	Operation/ Warning	Install flashing beacons as advance warning (S.I.)	All	30%	10	100%	Medium
S11	Operation/ Warning	Improve pavement friction (High Friction Surface Treatments)	All	55%	10	100%	Medium
S12	Geometric Mod.	Install raised median on approaches (S.I.)	All	25%	20	90%	Medium
S13PB	Geometric Mod.	Install pedestrian median fencing on approaches	P & B	35%	20	90%	Low
S14	Geometric Mod.	Create directional median openings to allow (and restrict) left-turns and u-turns (S.I.)	All	50%	20	90%	Medium
S15	Geometric Mod.	Reduced Left-Turn Conflict Intersections (S.I.)	All	50%	20	90%	Medium
S16	Geometric Mod.	Convert intersection to roundabout (from signal)	All	Varies	20	100%	Low
S17PB	Ped and Bike	Install pedestrian countdown signal heads	P & B	25%	20	100%	Very High
S18PB	Ped and Bike	Install pedestrian crossing (S.I.)	P & B	25%	20	100%	High
S19PB	Ped and Bike	Pedestrian Scramble	P & B	40%	20	100%	High
S20PB	Ped and Bike	Install advance stop bar before crosswalk (Bicycle Box)	P & B	15%	10	100%	Very High
S21PB	Ped and Bike	Modify signal phasing to implement a Leading Pedestrian Interval (LPI)	P & B	60%	10	100%	Very High

Table 3. Countermeasures for Roadways

No.	Type	Countermeasure Name	Crash Type	CRF	Expected Life (Years)	HSIP Funding Eligibility	Systemic Approach Opportunity?
R01	Lighting	Add segment lighting	Night	35%	20	100%	Medium
R02	Remove/ Shield Obstacles	Remove or relocate fixed objects outside of Clear Recovery Zone	All	35%	20	90%	High
R03	Remove/ Shield Obstacles	Install Median Barrier	All	25%	20	100%	Medium
R04	Remove/ Shield Obstacles	Install Guardrail	All	25%	20	100%	High
R05	Remove/ Shield Obstacles	Install impact attenuators	All	25%	10	100%	High
R06	Remove/ Shield Obstacles	Flatten side slopes	All	30%	20	90%	Medium
R07	Remove/ Shield Obstacles	Flatten side slopes and remove guardrail	All	40%	20	90%	Medium
R08	Geometric Mod.	Install raised median	All	25%	20	90%	Medium
R09	Geometric Mod.	Install median (flush)	All	15%	20	90%	Medium
R10PB	Geometric Mod.	Install pedestrian median fencing on approaches	P & B	35%	20	90%	Low
R11	Geometric Mod.	Install acceleration/ deceleration lanes	All	25%	20	90%	Low
R12	Geometric Mod.	Widen lane (initially less than 10 ft)	All	25%	20	90%	Medium
R13	Geometric Mod.	Add two-way left-turn lane (without reducing travel lanes)	All	30%	20	90%	Medium
R14	Geometric Mod.	Road Diet (Reduce travel lanes from 4 to 3 and add a two way left-turn and bike lanes)	All	30%	20	90%	Medium
R15	Geometric Mod.	Widen shoulder	All	30%	20	90%	Medium
R16	Geometric Mod.	Curve Shoulder widening (Outside Only)	All	45%	20	90%	Medium
R17	Geometric Mod.	Improve horizontal alignment (flatten curves)	All	50%	20	90%	Low
R18	Geometric Mod.	Flatten crest vertical curve	All	25%	20	90%	Low
R19	Geometric Mod.	Improve curve superelevation	All	45%	20	90%	Medium
R20	Geometric Mod.	Convert from two-way to one-way traffic	All	35%	20	90%	Medium
R21	Geometric Mod.	Improve pavement friction (High Friction Surface Treatments)	All	55%	10	100%	High

APPENDIX G - COST ESTIMATES

#4	Item	Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	20% Admin/Engr Contingency	Project Total
S3	**Signal timing**	21	10,000	210,000	63,000	273,000	54,600	$327,600

#1	Item	Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	20% Admin/Engr Contingency	Project Total
S4	**Advanced Dilemma-Zone Detection**	10	$45,000	$450,000	$135,000	$585,000	$117,000	$702,000

#3	Item	Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	20% Admin/Engr Contingency	Project Total
S20PB	**Bike box and/or conflict striping at intersections**	20	$8,000	$160,000	$48,000	$208,000	$41,600	$249,600

A	Item	Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	20% Admin/Engr Contingency	Project Total
S21PB	**Leading Pedestrian Interval**	7	10,000	$70,000	$21,000	$91,000	$18,200	$109,200

B	Item	Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	Admin/Engr and Mobilization	Project Total
	Raised pavement markings	7	1,500	10,500	3,150	13,650	7,730	$21,380

B	Item	Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	20% Admin/Engr Mobilization	Project Total
	Standard pavement markings	6	200	1,200	360	1,560	5,312	$6,872

C	Item	Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	20% Admin/Engr Contingency	Project Total
	Raised Median	4900	$270	$1,323,000	$396,900	$1,719,900	$343,980	$2,063,880

#2	Item	Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	20% Admin/Engr Contingency	Project Total
	Bulbout, south side 3rd St & B	2	75,000	150,000	45,000	195,000	39,000	$234,000
	Crosswalk, 4 at Lone Jack & Rancho Santa Fe Rd, high visibility crosswalk 3 legs 3rd and B St	7	1,500	10,500	3,150	13,650	2,730	$16,380
	Signs advanced signage in school zone, Parkdale Ln at Countryhaven and Glen Arbor Dr.	12	1,500	18,000	5,400	23,400	4,680	$28,080
	Large stop signs, 1. N Coast Hwy 101 & Marcheta St (2); 2. N Rancho Santa Fe Rd & Lone Jack Rd (4)	6	1,501	9,006	2,702	11,708	2,342	$14,049
	Total			187,506	56251.8	243757.8	46,410	$292,509

	Item	Quantity	Average Price Per Unit	Const. Cost	30% Construction Contingency	Construction Total	20% Admin/Engr Contingency	Project Total
	Signs	14	1,500	21,000	6,300	27,300	5,460	$32,760

APPENDIX H – COLLISIONS BY SEVERITY FOR HSIP PROJECT GROUPS

Pedestrian Collisions at Non-Signalized Intersections

		Collision Severity				
Location	**Pedestrian Collisions**	Fatal	Severe Injury	Visible Injury	Complaint of Pain	PDO
N Coast Hwy 101 & Marcheta St	2		1	1		
N Rancho Santa Fe Rd & Lone Jack Rd	1	1				
3rd St & B St	2		1	1		
Parkdale Ln & Countryhaven Rd	2		1		1	
Total	7	1	3	2	1	0

Pedestrian Collisions at Signalized Intersections

		Collision Severity				
Location	**Pedestrian Collisions**	Fatal	Severe Injury	Visible Injury	Complaint of Pain	PDO
Birmingham Dr. & San Elijo Ave	1		1			
Encinitas Blvd & Vulcan Ave	2			1	1	
Leucadia Blvd & North Vulcan Ave	1		1			
Leucadia Blvd & Town Center Place	1		1			
Encinitas & Moonlit Marketplace Driveway	1		1			
Mountain Vista Dr. & N El Camino Real	1	1				
Encinitas Blvd & Smart & Final	1		1			
Total	8	1	5	1	1	0

Bicycle Collisions at Intersections

		Collision Severity				
Location	**Bicycle Collisions**	Fatal	Severe Injury	Visible Injury	Complaint of Pain	PDO
Coast Hwy 101 & Encinitas Blvd	2			2		
El Camino Real & Encinitas Blvd	7		1	3	2	1
Leucadia Blvd & N Coast Hwy 101	3			2	1	
Encinitas Blvd & Vulcan Ave	2				2	
S Coast Hwy 101 & Chesterfield Dr.	4			3	1	

El Camino Real & Via Montoro	2		1		1	
Leucadia Blvd & Quail Gardens	3		1	1	1	
Total	25	0	3	12	9	1

Collisions at Signalized Intersections for Dilemma Zones Application

		Collision Severity				
Location	**Collisions**	Fatal	Severe Injury	Visible Injury	Complaint of Pain	PDO
Las Olas Traffic Light & S Coast Hwy 101	3		2	1		
Garden View Rd & Leucadia Blvd	15	1		5	5	4
Encinitas Blvd & Via Cantebria	12		1	1	4	6
Encinitas Blvd & Village Square Dr	11		1	2	2	6
Garden View Rd & Via Cantebria	9		1	2	2	4
Leucadia Blvd & Town Center Pl	9	1		2	2	4
N El Camino Real & Olivenhain Rd	8		1	1	4	2
La Costa Av & N Coast Hwy 101	6		1	1	2	2
Leucadia Blvd & Saxony Rd	6		1	1	2	2
Cardiff State Beach & S Coast Hwy 101	5	1		1		3
El Camino Real & Encinitas Blvd	28			1	6	21
Balour Dr & Encinitas Blvd	10			1	3	6
	122	3	8	19	32	60

Collisions at Signalized Intersections for Striping Through Intersection

		Collision Severity				
Location	**Collisions**	Fatal	Severe Injury	Visible Injury	Complaint of Pain	PDO
Garden View Rd & Leucadia Blvd	15	1		5	5	4
Encinitas Blvd & Via Cantebria	12		1	1	4	6
Leucadia Blvd & N Coast Hwy 101	7		1	3	1	2
Leucadia Blvd & Town Center Place	9	1		2	2	4
N El Camino Real & Olivenhain Rd	8		1	1	4	2
N El Caminio Real & Via Montoro	9		1	1	2	5
Total	60	2	4	13	18	23

Collisions at Signalized Intersections for Signal Timing Application

		Collision Severity

Location	Collisions	Fatal	Severe Injury	Visible Injury	Complaint of Pain	PDO
Las Olas Traffic Light & S Coast Hwy 101	3		2	1		
Garden View Rd & Leucadia Blvd	15	1		5	5	4
Encinitas Blvd & Via Cantebria	12		1	1	4	6
Encinitas Blvd & Village Square Dr	11		1	2	2	6
Garden View Rd & Via Cantebria	9		1	2	2	4
Leucadia Blvd & Town Center Place	9	1		2	2	4
N El Camino Real & Olivenhain Rd	8		1	1	4	2
La Costa Av & N Coast Hwy 101	6		1	1	2	2
Leucadia Blvd & Saxony Rd	6		1	1	2	2
Cardiff State Beach & S Coast Hwy 101	5	1		1		3
Encinitas Blvd & Vulcan Ave	21		1	5	7	8
Encinitas Blvd & Saxony Rd	9		1	2	4	2
Calle Magdalena & Encinitas Blvd	12	1		1	4	6
N El v Real & Via Montoro	9		1	1	2	5
Coast Hwy 101 & Encinitas Blvd	7		1		4	2
D St & South Vulcan Ave	5		1	1		3
Garden View Rd & Leucadia Blvd	15	1		5	5	4
Encinitas Blvd & Via Cantebria	12		1	1	4	6
Leucadia Blvd & N Coast Hwy 101	7		1	3	1	2
Leucadia Blvd & Town Center Place	9	1		2	2	4
N El Camino Real & Olivenhain Rd	8		1	1	4	2
El Camino Real & Encinitas Blvd	28			1	6	21
N El Camino Real & Via Montoro	9		1	1	2	5
Total	235	6	17	41	68	103

Mid-Block Collisions

		Collision Severity				
Location	**Collisions**	Fatal	Severe Injury	Visible Injury	Complaint of Pain	PDO
Encinitas Blvd & Princehouse Ln (340 East)	9		1	2	3	3
El Camino Real & Encinitas Blvd (360 West)	5			2	2	1
El Camino Real & Encinitas Blvd (525 North)	6	2		3	1	
Encinitas Blvd & Quail Gardens Dr (340 West)	4				2	2
Encinitas Blvd & Westlake St (330 West)	8			3	4	1
N El Camino Real & Via Montoro (330 North)	6		1	1	1	3

K St & S Coast Hwy 101 (330 South)	7		1	2	2	2
Crest Dr & S El Camino Real (334 North)	7		1	2	2	2
Total	61	2	4	16	21	18