City of Costa Mesa
Local Road Safety Plan (LRSP)

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Executive Summary

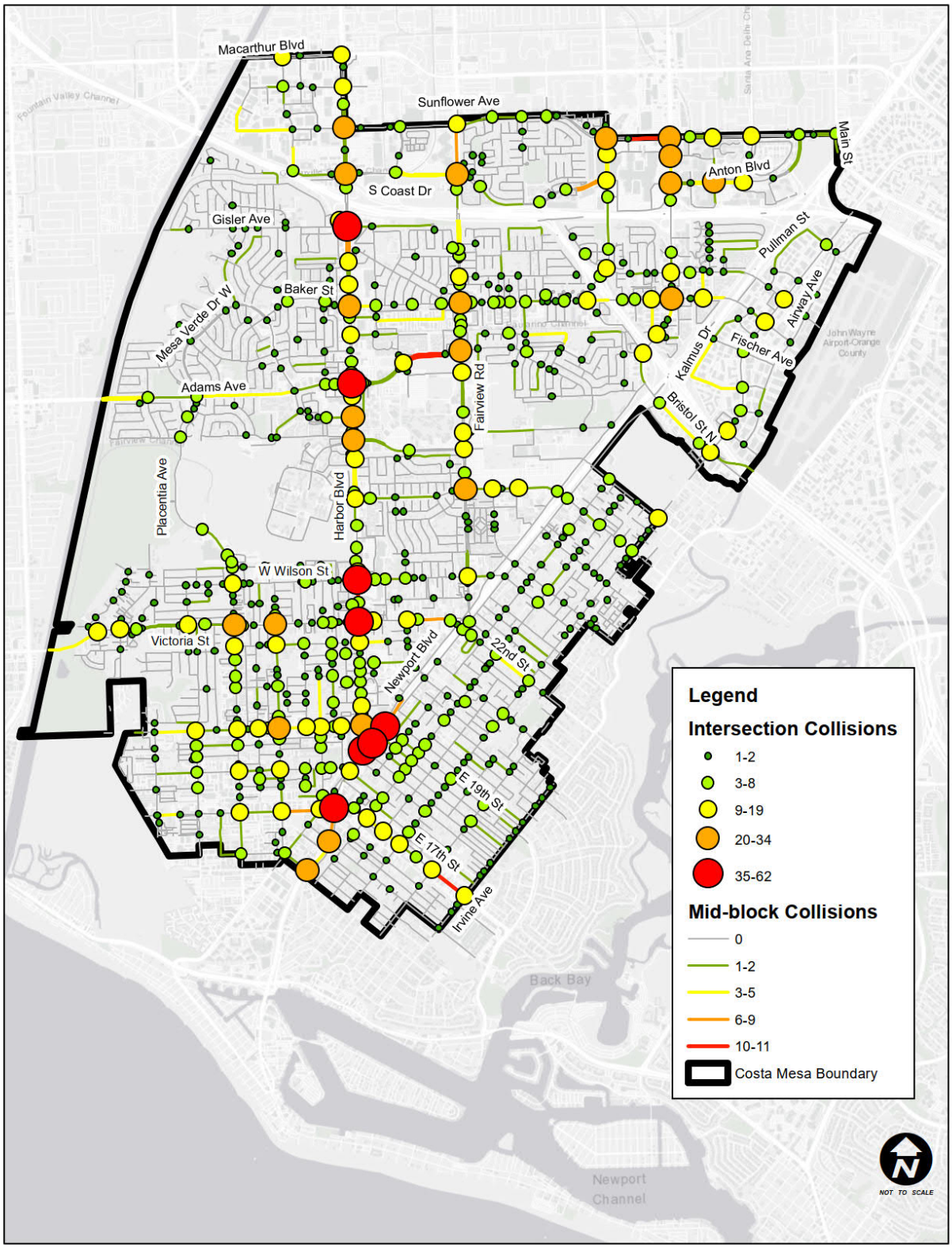
Costa Mesa has created a local roadway safety plan (LRSP), which identifies a framework to identify, analyze, and develop traffic safety enhancements on the City's roadway network. The LRSP was developed in response to local issues and needs. Through the analysis, this report has identified emphasis areas to inform and further guide safety evaluation and planning for the City's transportation network. The LRSP also analyzes collision data on an aggregate basis as well as at specific locations to identify high-crash locations, high-risk locations, and citywide trends and patterns. The analysis of collision history on the City's transportation network allows for opportunities to: 1) identify factors in the transportation network that inhibit safety for all roadway users, 2) improve safety at specific high-collision locations, and 3) develop safety measures using the 5E's of transportation safety: Engineering, Enforcement, Education, Emergency Services, and Emerging Technologies, to encourage safer driver behavior and better severity outcomes.

Costa Mesa has been successful at taking steps to enhance traffic safety throughout the City, but can take additional steps in improving roadway safety citywide. This is demonstrated in its California Office of Traffic Safety (OTS) rankings which identify the City as belonging to the 60th percentile for safety compared to peer cities in most categories, with the City performing better than 60% of its peer cities. The City is continuing these safety efforts through this plan by identifying areas of emphasis and opportunities for system improvement that can be implemented to enhance safety. This LRSP analyzes the most recent range of collision data (January 1, 2015 to December 31, 2020) and recent roadway improvements to assess historic trends, patterns, and areas of concern.
During the LRSP development process, the City has drafted a vision for traffic safety and outlined the goals that will help mark plan success. The vision is to enhance the transportation network to achieve zero traffic fatalities and serious injury related collisions. The goals were identified as:

- Identify areas with a high risk for collisions.
- Illustrate the value of a comprehensive safety program and the systemic process.
- Plan future safety improvements for near-, mid- and long-term implementation.
- Define safety projects for Highway Safety Improvement Program (HSIP) and other program funding consideration.

Costa Mesa's collision history was analyzed to identify locations with elevated risk of collisions either through their collision histories or their similarities to other locations that have more active collision patterns. Using a network screening process, locations within the City that will most likely benefit from safety enhancements were identified. Using historic collision data, collision risk factors for the entire network were derived. The outcomes informed the identification and prioritization of engineering and non-infrastructure safety measures that address certain roadway characteristics and related behaviors that contribute to motor vehicle collisions with active transportation users. The figure below shows the results of collision analysis, including the number of crashes that occurred at each intersection and along each roadway segment in the City.

Number of Collisions per Intersection and Roadway Segment



Emphasis areas were developed by revisiting the vision and goals developed at the onset of the planning process and comparing them with the trends and patterns identified in the crash analysis. Where these areas aligned, or major challenges were observed, the following emphasis areas were developed:

1. Speeding
2. Vulnerable Road Users
3. Signal Improvements
4. Aging Drivers (65+)
5. Impaired Driving

The LRSP identified countermeasures for both infrastructure and non- infrastructure improvements. The report then applies Crash Modification Factors (CMFs), which are used to estimate the safety effects of safety improvements to compare and prioritize the improvements. This provides a planning level cost/benefit estimate that the City can use to prioritize improvements.

Site-specific opportunities for improvement were identified for the following 9 case study locations. The case study locations were chosen to be representative of the corridor and intersection designs throughout the City.

1. Segment: 17th Street (Tustin Ave to Irvine Ave)
2. Segment: Hamilton Street (Thurin Ave to Harbor Bl)
3. Segment: Wilson Street (Columbia Dr to Fairview Rd)
4. Segment: Harbor Boulevard (Gisler Ave to Date Pl)
5. Segment: Baker Street (Bear St to Century Pl)
6. Segment: Arlington Drive (Fairview Rd to Newport Bl)
7. Signalized Intersection: Newport Bl & Broadway + Newport Bl & 19th St
8. Signalized Intersection: Pomona Ave & Victoria St
9. Unsignalized Intersection: Harbor Bl & Village Way

The report also identifies opportunities that can be implemented systemically throughout the City. These opportunities were assembled into the "countermeasure toolbox" shown below and include both engineering-based and non-engineering countermeasures. Additionally, this information can be used to help the City apply for grants and other funding opportunities to implement these safety improvements.

Citywide Countermeasure Toolbox (Engineering Opportunities)

LRSM/ CMF ID	Potential Countermeasures	Crash Reduction Factor (CRF)	Per Unit Cost	Unit
NS02	Convert to all-way stop control (from 2-way or Yield Control)	50%	$10,000	per location
NS05	Convert intersection to roundabout (from 2-way stop or yield control)	35%	$80,000	per intersection
NS06	Install/upgrade larger or additional stop signs/other intersections warning/regulatory signs (stop signs with LED borders)	15%	$1,500	per sign

LRSM/ CMF ID	Potential Countermeasures	Crash Reduction Factor (CRF)	Per Unit Cost	Unit
NS15	Create direction median openings to allow/restrict left-turns and U-turns (right-in/right-out)	50%	$15,000	per structure
NS17	Install right-turn lane (N.S.I)	20%	$15,000	per location
R02	Remove or relocate fixed objects outside of Clear Recovery Zone	35%	$10,000	per location
R03	Install Barrier on Median	25%	$20,000	per location
R08	Install Median	25%	$75,000	per mile
R22	Install retroreflective stripes on stop signs	15%	$5,000	per location
R26	Install dynamic/variable speed warning systems	30%	$16,000	per sign
R28	Install edge-lines and centerlines	25%	$8,000	per mile
R32PB	Install green paint in bicycle lanes and/or conflict areas	35%	$15,000	per intersection
S02	Install retroreflective backplates	15%	$12,000	per intersection
S03	Improve signal timing (coordination, phasing, red, yellow, operation)	15%	$8,000	per intersection
S04	Install advanced dilemma zone detection	40%	$34,000	per intersection
S07	Provide protected left-turn phase	30%	$40,000	per intersection
S09	Install enhanced freeway lane marking	10%	$5,000	per intersection
S18PB	Install improved pedestrian crossing	25%	$50,000	per intersection
S20PB	Install bicycle box	15%	$10,000	per location
S21PB	Modify signal phasing to implement a Leading Pedestrian Interval (LPI)	60%	$8,000	per intersection
128	Install tapered bulb-outs/curb extensions (chicanes)	32%	$20,000	per location
4124	Install High-Visibility Crosswalk	19%	$25,000	per location
-	Install lane assignment signage for freeways	*5%	$2,000	per intersection
-	Remove centerline	*5%	$8,000	per mile
-	Evaluate consolidation of driveways	*5%	$50,000	per segment

*These countermeasures do not have documented CRF's and a conservative 5% CRF was assigned to allow them to show some benefit.

Non-Engineering Safety Strategy Countermeasures:

The identified non-engineering countermeasures below were derived from the collision analysis and build on the actions identified in Section 9.2. These relate to the additional Es of Traffic Safety outside of Engineering. This includes Enforcement, Education, Emergency Services and Emerging Technologies.

Citywide Countermeasure Toolbox (Non-Engineering Opportunities)

PROPOSED COUNTERMEASURE	POTENTIAL PARTNERS	EXAMPLES OF COUNTERMEASURE
ENFORCEMENT		
Establish enforcement and visibility program for aggressive driving	Local law enforcement; CHP	CHP's Regulate Aggressive Driving and Reduce Speed (RADARS) Program
Continued enforcement in school zones	Local law enforcement; CHP; school districts; OCTA; SCAG	Obtain grant funding for additional personnel in school zones
Increased enforcement of safe driving & active transportation behaviors near busy crosswalk locations	Local law enforcement; CHP	Obtain grant funding for additional enforcement near high pedestrian activity locations
EDUCATION		
Campaign to target aggressive driving and DUIs	Local law enforcement; CHP; California Office of Traffic Safety (OTS)	CHP's Regulate Aggressive Driving and Reduce Speed (RADARS) Program
Bicycle and pedestrian safety campaign	Local law enforcement; OCTA; SCAG	SCAG's 'Go Human' Campaign; ' OTS' 'Ride With Traffic' campaign Planned educational events at high activity locations such as future CV Link locations (bicycle, pedestrian, and low-speed (up to 25 mph) electric vehicle pathway)
Explore safe routes to school education grants to expand program	Local school districts; local law enforcement; OCTA; SCAG	Safe Routes to School Program, funded by Caltrans
Coordinate safety education campaigns with SCAG	SCAG; local law enforcement	Roadway safety fairs at schools Education campaign for aging drivers
EMERGENCY SERVICES		
Continue to work on interdepartmental communication between City staff and City police department and fire department	Local law enforcement & fire department	Incorporate law enforcement/fire department as stakeholders on transportation improvement projects
Incorporate public health agencies and fire departments as stakeholders in safety projects	Local public health agencies and fire departments	Adjust safety project development processes to include public health and fire department feedback
EMERGING TECHNOLOGY		

PROPOSED COUNTERMEASURE	POTENTIAL PARTNERS	EXAMPLES OF COUNTERMEASURE
Continue to use best practices for pedestrian crossings at high pedestrian traffic areas	City Public Works; OCTA; Caltrans	Continuously update pedestrian crossing design standards in accordance with latest best practices
Utilize new data sources to monitor traffic conditions and inform County safety plans	City Public Works; OCTA; Caltrans	Utilization of data from OCTA traffic management center

An evaluation and implementation plan were created that identifies actionable items that will help the City achieve the goals and vision set out in this report. This section laid out next steps for the City to continue to capitalize on the analysis and information provided in this report.

Table of Contents

Table of Figures

Table of Tables

1 Introduction

Costa Mesa is a vibrant community in Orange County known for its fine and performing arts scene as well as colorful murals and public art installations. It is also home to South Coast Plaza, one of the largest shopping centers in the nation and who's pre-COVID sales annually were the highest in the nation. Costa Mesa has a population of around 112,000 residents with a median age of 35 years old. With an economy based on retail, commerce, and light manufacturing, this area has numerous traffic safety needs.

This Local Roadway Safety Plan (LRSP) identifies emphasis areas to focus and guide further safety enhancement to the City's transportation network. The LRSP analyzes crash data on an aggregate basis as well as at specific locations to identify high-crash locations, high-risk locations, and citywide trends and patterns. The analysis of crash history throughout the City's transportation network provided the opportunity to: 1) identify factors in the transportation network that inhibit safety for all roadway users, 2) improve safety at specific high-crash locations, and 3) develop safety measures using the five E's of safety: Engineering, Enforcement, Education, Emergency Services, and Emerging Technologies to encourage safer driver behavior and reduced collision severities.

The process and analysis performed for the City's LRSP is described in this document. The plan includes a vision and associated goals for safety, crash history analysis, and specific emphasis areas that represent the most challenge for safety in the City. The plan provides a foundation for decision making and prioritization for safety countermeasures and projects that enhance safety for all modes.

Costa Mesa has been successful at taking steps to enhance safety for all modes throughout the City. This is supported by their California Office of Traffic Safety rankings identifying it amongst the top 60% tier for safety as compared to peer cities in most categories. The City is continuing these safety efforts through this plan by identifying areas of emphasis and opportunities for system improvement that can be implemented to enhance safety. This LRSP analyzes the most recent 5-year period of available crash data (January 1, 2015 – December 31, 2019) and roadway improvements to assess historic trends, patterns, and areas of elevated collision activity. 2020 was also analyzed to identify trends related to the COVID-19 pandemic.

The intent of the LRSP is to:

- Create a greater awareness of road safety and risks
- Reduce the number of fatal and severe-injury crashes
- Develop lasting partnerships
- Support for grant/funding applications, and
- Help prioritize investments in traffic safety.

2 Vision and Goals

The Costa Mesa LRSP evaluates the transportation network as well as non-infrastructure programs and policies within the City. Mitigation measures are evaluated using criteria to analyze the safety of road users (drivers, bicyclists, and pedestrians), the interaction of modes, influences on the roadway network from adjacent municipalities, and the potential benefits of safety countermeasures. This effort is intended to use historical data to identify trends and develop a toolbox of countermeasures applicable to conditions in the City that can be used for proactive identification and implementation of opportunities, without relying solely on a reaction and response to crashes as they occur.

LRSPs have been effective across the country as part of the effort to reduce fatal and severe-injury crashes because they provide a locally developed and customized roadmap to directly address the most common safety challenges in the given jurisdiction. Consistent with these findings, the following Vision, Goals, and Objectives have been established for this project.

VISION:	To enhance the transportation network to achieve zero traffic fatalities and serious injury related crashes.

Goal #1: Identify areas with a high risk for collision.

Objectives:

- Identify intersections and segments that would most benefit from mitigation.
- Identify areas of interest with respect to safety concerns for vulnerable users (pedestrians and bicyclists).

Goal #2: Illustrate the value of a comprehensive safety program and the systemic process.

Objectives:

- Demonstrate the systemic process' ability to identify locations with higher risk for collisions based on present characteristics closely associated with severe collisions.
- Demonstrate, through the systemic process, the gaps and data collection activities that can be improved upon.

Goal #3: Plan future safety improvements for near-, mid- and long-term.

Objectives:

- Identify safety countermeasures for specific locations (case studies).
- Identify safety countermeasures that can be applied citywide.

Goal #4: Define safety projects for future HSIP and other program funding consideration.

Objectives:

- Create the outline for a prioritization process that can be used in this and forth-coming cycles to apply for funding.
- Use the systemic process to create Project Case Studies.
- Use Case Studies to apply for HSIP funding consideration.
- Demonstrate the correlation between the proposed safety countermeasures with the Vision Zero Initiative and the California State Highway Safety Plan.

3 Process

Providing safe, sustainable, and efficient mobility choices for residents and visitors is a primary goal for the City and its safety partners. The City will continue its collaboration with safety partners to identify and discuss safety issues within the community through the development of the LRSP and its implementation.

Guidance on the LRSP process is provided at both the national (FHWA) and state (Caltrans) level.

FHWA encourages:

- The establishment of a working group (Stakeholders) to participate in developing an LRSP.
- Review crash, traffic, and roadway data to identify areas of concern.
- Establish goals, priorities, and countermeasures to identify opportunities for improvements at spot locations, systemically, and comprehensively.

Caltrans guidance includes:

- Establish leadership
- Analyze the safety data
- Determine emphasis areas
- Identify strategies
- Prioritize and incorporate strategies
- Evaluate and update the LRSP

This LRSP documents the results of data and information obtained, including the preliminary vision and goals for the LRSP, existing safety efforts, initial crash analysis, and resulting emphasis areas. The identification of opportunities to enhance safety presented in this LRSP are connected to the five E's of traffic safety defined by the California Strategic Highway Safety Plan (SHSP): Engineering, Enforcement, Education, Emergency Response, and Emerging Technologies throughout its process.

3.1 Guiding Manuals

The following section describes the analysis process undertaken to evaluate safety within Costa Mesa at a systemic level. Using a network screening process, locations within the City that will most likely benefit from safety enhancements will be identified. Using historic crash data, crash risk factors for the entire network were documented. The outcomes will inform the identification and prioritization of engineering and non-infrastructure safety measures that address certain roadway characteristics and related behaviors that contribute to motor vehicle crashes with active transportation users.

This process uses the latest National and State best practices for statistical roadway analysis described as follows.

3.1.1 Local Roads Safety Manual

The *Local Roadway Safety Manual: A Manual for California's Local Road Owners* (Version 1.5, April 2020) purpose is to encourage local agencies to pursue a proactive approach to identifying

and analyzing safety issues, while preparing to compete for project funding opportunities. A proactive approach is defined as analyzing the safety of the entire roadway network through either a one-time, network wide analysis, or by routine analyses of the roadway network.[1]

According to the *Local Roadway Safety Manual* (LRSM), "The California Department of Transportation (Caltrans) – Division of Local Assistance is responsible for administering California's federal safety funding intended for local safety improvements."

To provide the most benefit and to be competitive for funding, the analysis leading to countermeasure selection should focus on both intersections and roadway segments and be considerate of roadway characteristics and traffic volumes. The result should be a list of locations that are most likely to benefit from cost-effective countermeasures, preferably prioritized by benefit/cost ratio. The manual suggests using a mixture of quantitative and qualitative measures to identify and rank locations that considers both crash frequency and crash rates. These findings should then be screened for patterns such as crash types and severity to aid in the determination of issues causing higher numbers of crashes and the potential countermeasures that could be most effective. Qualitative analysis should include field visits and a review of existing roadway characteristics and devices. The specific roadway context can then be used to assess what conditions may increase safety risk at the site and systematic level.

Countermeasure selection should be supported using Crash Modification Factors (CMFs). These factors are the peer reviewed product of before and after research that quantifies the expected rate of crash reduction that can be expected from a given countermeasure. If more than one countermeasure is under consideration, the LRSM provides guidance on how to apply CMFs appropriately.

3.1.2 Highway Safety Manual

"The AASHTO *Highway Safety Manual* (HSM), published in 2010, presents a variety of methods for quantitatively estimating crash frequency or severity at a variety of locations."[2] This four-part manual is divided into Parts: A) Introduction, Human Factors, and Fundamentals, B) Roadway Safety Management Process, C) Predictive Method, D) Crash Modification Factors.

Chapter 4 of Part B of the HSM discusses the Network Screening process. The Network Screening Process is a tool for an agency to analyze their entire network and identify/rank locations that (based on the implementation of a countermeasure) are most likely to realize a reduction in the frequency of crashes.

The HSM identifies five steps in this process:[3]

1. **Establish Focus:** Identify the purpose or intended outcome of the network screening analysis. This decision will influence data needs, the selection of performance measures and the screening method that can be applied.

[1] Local Roadway Safety Manual (Version 1.5) 2020. Page 5.
[2] AASHTO, Highway Safety Manual, 2010, Washington D.C., http://www.highwaysafetymanual.org/Pages/About.aspx
[3] AASHTO. *Highway Safety Manual.* 2010. Washington, DC. Page 4-2.

2. **Identify Network and Establish Reference Populations:** Specify the types of sites or facilities being screened (i.e., segments, intersections, geometrics) and identify groupings of similar sites or facilities.
3. **Select Performance Measures:** There are a variety of performance measures available to evaluate the potential to reduce crash frequency at a site. In this step, the performance measure is selected as a function of the screening focus and the data and analytical tools available.
4. **Select Screening Method:** There are three principle screening methods described in this chapter (i.e., ranking, sliding window, peak searching). Each method has advantages and disadvantages; the most appropriate method for a given situation should be selected.
5. **Screen and Evaluate Results:** The final step in the process is to conduct the screening and analysis and evaluate the results.

The HSM provides several statistical methods for screening roadway networks to identify high risk locations based on overall crash histories. In addition to identifying the total number of crashes, this study uses a method referred to as Critical Crash Rate to analyze the data.

3.2 Analysis Techniques

3.2.1 Crash and Network Screening Analysis

Intersections and roadways were analyzed using four crash metrics:

- Number of Crashes
- Critical Crash Rate (HSM Ch. 4)
- Probability of Specific Crash Types Exceeding Threshold Proportion (HSM Ch. 4)
- Equivalent Property Damage Only (HSM Ch. 4)

The initial steps of the crash analysis established sub-populations of roadway segments and intersections that have similar characteristics. For this study, intersections were grouped by their control type (Signalized, Unsignalized, Roundabout) and segments by their roadway category (Arterial, Collector, Minor Collector, Local). Individual crash rates were calculated for each sub-population. The population level crash rates were then used to assess whether a specific location has more or fewer crashes than expected. These sub-populations were also used to determine typical crash patterns to help identify locations where unusual numbers of specific crash types are seen.

The network screening process ranks intersections and roadway segments by the number of crashes that occurred at each one over the analysis period, and then identifies areas that had more of a given type of crash than would be expected for that type of location. These crash type factors were 1) crash injury (fatal, serious injury, other visible injury, complaint of pain, property damage only), 2) crash type (broadside, rear-end, sideswipe, head-on, hit object, overturned, bicycle, pedestrian, other), 3) environmental factors (lighting, wet roads), and 4) driver behavior (impaired, aggressive, distracted driving). With these additional factors, the locations were further analyzed.

From the results of the network screening analyses, a short-list of locations was chosen based on crash activity, crash severity, crash patterns, location type, and area of the City of Costa

mesa to provide the greatest variety of locations covering the widest range of safety opportunities for toolbox development. The intent is to populate the safety toolbox with mitigation measures that will be applicable to most of the crash activity in the City. Ten locations will ultimately be selected for mitigation analysis.

3.2.2 Critical Crash Rate (CCR) Analysis

Reviewing the number of collisions at a location is a good way to understand the cost to society incurred at the local level but does not give a complete indication of the level of risk for those who use that intersection or roadway segment on a daily basis. The Highway Safety Manual describes the Critical Crash Rate method, which provides a statistical review of locations to determine where risk is higher than that experienced by other similar locations. It is also the first step in analyzing for patterns that may suggest systemic issues that can be addressed at that location, and proactively at others to prevent new safety challenges from emerging.

The Critical Crash Rate compares the observed crash rate to the expected crash rate at a particular location based on facility type and volume using a locally calculated average crash rate for the specific type of intersection or roadway segment being analyzed. Based on traffic volumes and a weighted citywide crash rate for each facility type, a critical crash rate threshold is established at the 95% confidence level to determine locations with higher crash rates that are unlikely to be random. The threshold is calculated for each location individually based on its traffic volume and the crash profile of similar facilities. A negative CCR differential value indicates that there are less collisions than expected for a location while a positive CCR differential value means there are more collisions than expected.

Figure 3-1: Critical Crash Rate Formula

$$R_{c,i} = R_a + \left[P \times \sqrt{\frac{R_a}{MEV_i}} \right] + \left[\frac{1}{(2 \times (MEV_i))} \right]$$

Where,

$R_{c,i}$ = Critical crash rate for intersection i

R_a = Weighted average crash rate for reference population

P = P-value for corresponding confidence level

MEV_i = Million entering vehicles for intersection i

Source: Highway Safety Manual

Data Needs

CCR can be calculated using:

- Daily entering volume for intersections, or vehicle miles traveled (VMT) for roadway segments,
- Intersection control types to separate them into like populations,
- Roadway functional classification to separate them into like populations,
- Collision records in GIS or tabular form including coordinates or linear measures.

Strengths

- Reduces low volume exaggeration
- Considers variance
- Establishes comparison threshold

3.2.3 CCR Methodology

The Process of analyzing the CCR and comparing locations (separately by intersections and segments) is a multi-step process. The following is a high-level description of the process undertaken to develop the initial ranking of locations.

The first step in the process was to establish a citywide crash rate for each facility population. These populations are broken into two categories with sub-categories:

- Intersection:
  - Signalized
  - Unsignalized
- Roadway Classification:
  - Major Arterial
  - Primary Arterial
  - Secondary Arterial
  - Collector Arterial
  - Local

The individual crash rate for each location was then calculated based on the associated traffic volume. This volume was either collected through data count resources or calculated based on the roadway classification. The next step was to establish a Significance Threshold. This Threshold was used to determine what level of exceedance (how much the crash rate exceeded the critical crash rate) a location must have based on traffic volume to provide a high level of confidence that the collision occurring at the location is not random. For this study, a confidence level of 95% was used. The local crash rates were then compared to Significance Threshold to see if each location exceeded the expected CCR and if so, by how much. After this analysis was completed, the locations were ranked by their categories according to that level of exceedance.

3.2.4 Probability of Specific Crash Types Exceeding Threshold Proportion

The Highway Safety Manual describes the methodology for determining the probability that crash type is greater than an identified threshold proportion. This helps to identify locations where a crash type is more likely to occur.

Data Needs

The probability of a specific crash type can be determined using collisions records with location data, and classifications of the locations (intersections or segments) studied.

Strengths

- Can be used as a diagnostic tool
- Considers variance in data

- Not affected by selection bias

The HSM methodology first determines the frequency of a specific collision type at an individual location, then determines the observed proportion of that collision type relative to all collision types at that location. A threshold proportion is then determined for the specific collision type; HSM suggests utilizing the proportion of the collision type observed in the entire reference population (e.g. throughout the entire City of Costa Mesa).

These proportions are then utilized to determine the probability that the proportion of a specific crash type is greater than the long-term expected proportion of that crash type.

Figure 3-2 – Probability of Specific Crash Types Exceeding Threshold Proportion

$$P\left(p_i > \overline{p^*_i} \,/\, N_{observedj}, N_{observedj(TOTAL)}\right) = 1 - betadist\left(\overline{p^*_i}, a + N_{observedj}, \beta + N_{observedj(TOTAL)} - N_{observedj}\right)$$

Where:

$\overline{p^*_i}$ = Threshold proportion

p_i = Observed proportion

$N_{observed,i}$ = Observed target crashes for a site i

$N_{observed,i(TOTAL)}$ = Total number of crashes for a site i

Source: Highway Safety Manual

3.2.5 Equivalent Property Damage Only (EPDO)

The equivalent property damage only (EPDO) method is described in the Highway Safety Manual. This method assigns weighting factors to crashes based on injury level (severe, injury, property damage only) to develop a property damage only score. In this analysis, the injury crash costs were calculated for each location (based on the latest Caltrans injury costs). This figure is then divided by the injury cost for a property damage only crash. The resulting number is the equivalent number of property damage only crashes at each site. This figure allows all locations to be compared based on injury crash costs. (Highway Safety Manual, Chapter 4).

4 Safety Partners

As part of the LRSP, local stakeholders were included in the process to ensure that a diverse set of local perspectives were consistently involved in this planning effort. In addition to the Project Team which included City Staff from the Public Works Department, a stakeholder group was organized. This group consisted of members from City of Costa Mesa Police Department, the Newport-Mesa Unified School District, the City's Bikeway and Walkability Committee, the Costa Mesa Alliance for Better Streets, and other community members.

These leaders in the City and community were called together to offer insight on the safety issues present in the City's transportation network. After the initial network screening and safety analysis, the stakeholder group met to discuss potential countermeasures and challenge areas. The summary of the stakeholder meetings are outlined below.

4.1 Stakeholder Meeting #1

The first stakeholder meeting was conducted virtually using the Zoom platform on August 18, 2021. At the meeting, stakeholders were introduced to the project and provided an overview of the data used, the required outputs, and the potential outcomes of the study.

In addition to the overview, Stakeholders were asked to provide local insight and knowledge at 12 "case study" locations that were identified after the initial network screening and crash analysis process.

Stakeholder feedback regarding the plan and opportunities were reviewed and incorporated into the study process for the development of the LRSP.

4.2 Field Tour Stakeholder Workshop

On September 16, 2021, the stakeholder group visited each of the 12 "case study" locations to identify potential issues that are contributing to the collision patterns. Potential countermeasures were identified and discussed. Additionally, potential emphasis/challenge areas were proposed during the meeting to include vulnerable users (pedestrians and bicyclists), signalized intersection, speeding, and aging drivers.

4.3 Stakeholder Meeting #2

The Second Stakeholder meeting was conducted virtually as well on November 2, 2021 using the Zoom platform. During the meeting, stakeholders were provided with a recap of the project and the previous meeting. A presentation of the draft identified opportunities and case study sheets from the LRSP were discussed and additional feedback regarding countermeasures, funding, and general opportunities took place. This information was processed and incorporated into the LRSP.

4.4 Public Meeting

The City held a virtual public meeting on November 17th, 2021, using the Zoom platform. During the meeting, members of the public were provided project background and objectives and a presentation of the collision trends, emphasis areas, best practices, and identified opportunities and case study sheets. Additional feedback regarding countermeasures, funding, and general

opportunities were provided by participants. This information was processed and incorporated into the LRSP.

5 Existing Efforts

Existing plans, policies, and projects that were recently completed, planned, or are on-going within the City of Costa Mesa were compiled at the start of the LRSP process to gain perspective on the existing efforts for transportation-related improvements within the City. High-level key points regarding transportation improvements and safety-related topics were identified to inform decision making in this LRSP. Information reviewed included the following:

- **Costa Mesa General Plan (2015 – Costa Mesa)**: A long-range plan that incorporates elements such as a future circulation plan, community design, housing and growth management
- **Active Transportation Plan (2018 – Costa Mesa):** A strategic plan that outlines the visions, strategies, and actions to be implemented to improve active transportation in Costa Mesa, which includes the City's Bicycle Master Plan
- **Pedestrian Master Plan (Draft Plan – Costa Mesa):** A proposed plan with pedestrian improvements to infrastructure for connecting communities to schools, parks, businesses, and other destinations in Costa Mesa
- **Neighborhood Traffic Improvement (on-going projects – Costa Mesa):** Neighborhood traffic calming measures which include signage, speed humps, crosswalk enhancements, and landscape improvements
- **Traffic Signal Synchronization Projects, TSSP (ongoing – Costa Mesa):** Proposed plans for improvements for signal timing and communication equipment upgrades.

6 Data Summary

As a data driven process, utilizing the most recent and accurate data is crucial. The following section describes the data inputs used for the analysis process of this LRSP.

6.1 Roadway Network

The Caltrans California Road System (CRS) GIS database was used to build the base roadway network used for this analysis. Functional Classifications were then imported from the City's General Plan. Traffic volumes and signal locations were provided by the City and were included in the analysis network. Intersections and roadway segments were divided into control and classification categories so that each set could have its own crash rates and be evaluated against similar facilities. **Figure 3** illustrates Costa Mesa's roadway network and intersections as classified for this stud

6.2 Intersections

The collision analysis requires each intersection be classified by type: Signalized or Unsignalized. The safety analysis compares intersection safety performance to locations with similar control types. This information is also displayed in **Figure 3**.

6.3 Count Data

Vehicular count data is used as part of the analysis process to evaluate the impact of traffic and understand the natural hierarchy of the roadway network. Count data utilized for this project was pulled from the Master Plan of Arterial Highways volume model data from OCTA. For locations without volume or count data, a reasonable assumption was made based upon available roadways with similar classifications. The traffic volume information allowed the team to assess locations for risk to a given roadway user as well as reviewing locations with the highest number of collisions

6.4 Collision Data

Collision data was collected from Crossroads Software for the period from January 1, 2015 through December 31, 2019. Year 2020 data was also collected for context but is not included in the trend analysis due to unusual traffic patterns resulting from the COVID-19 pandemic. Five years of data are utilized instead of the standard three years to provide more history to evaluate trends or patterns. Analysis of the raw collision data is the first step in understanding the specific and systemic challenges faced throughout the City. Analyzing the five years of data provided insight on the following collision trends and patterns. The locations of fatal and severe injury collisions are displayed in **Figure 4**, and the number of collisions per intersections and roadway segments are shown in **Figure 6-3.**

Figure 6-1: Functional Classification and Intersection Type

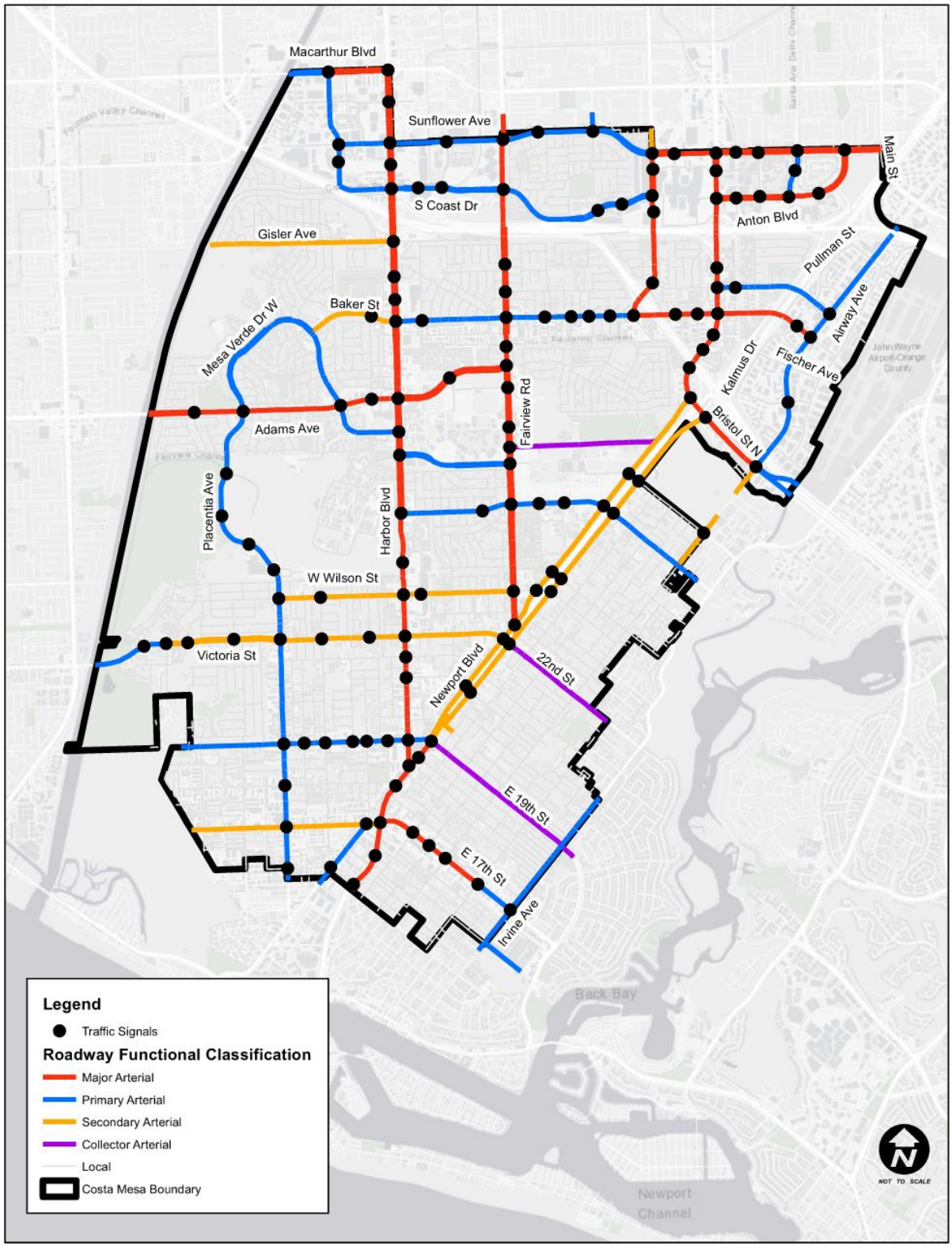


Figure 6-2: Fatal and Severe Injury Collisions (2015-2019)

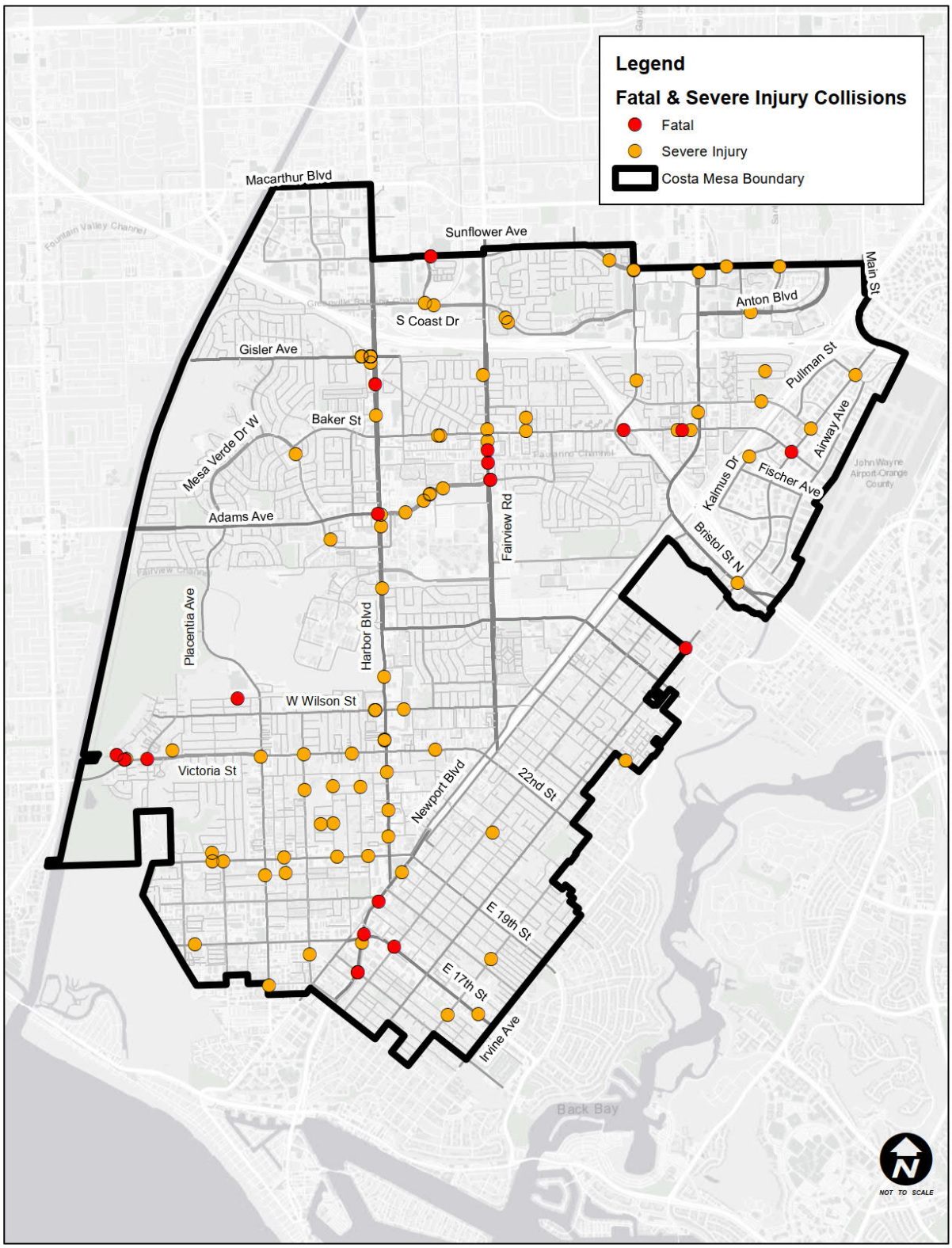
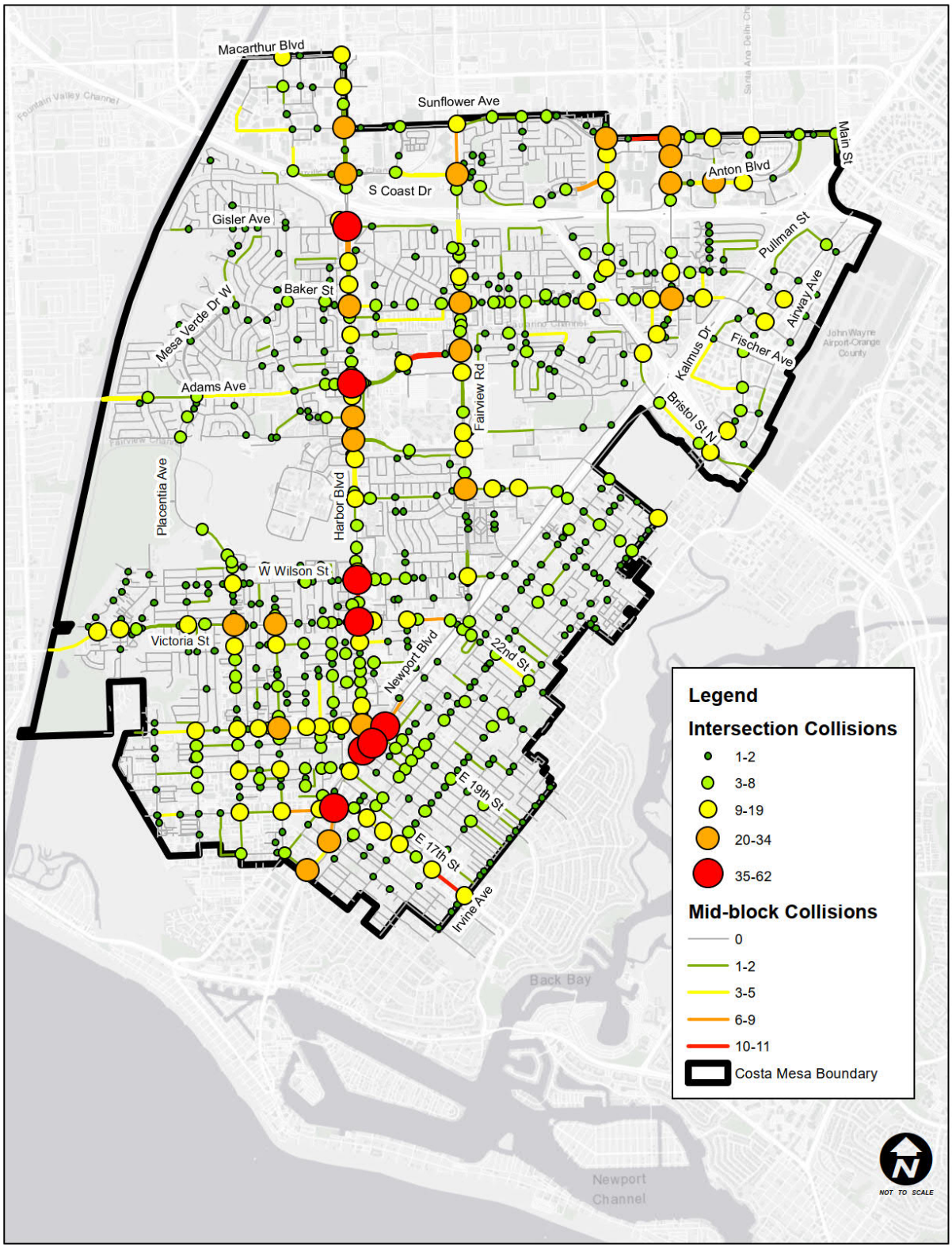


Figure 6-3: Density of all Crashes at Intersections and Segments (2015-2019)



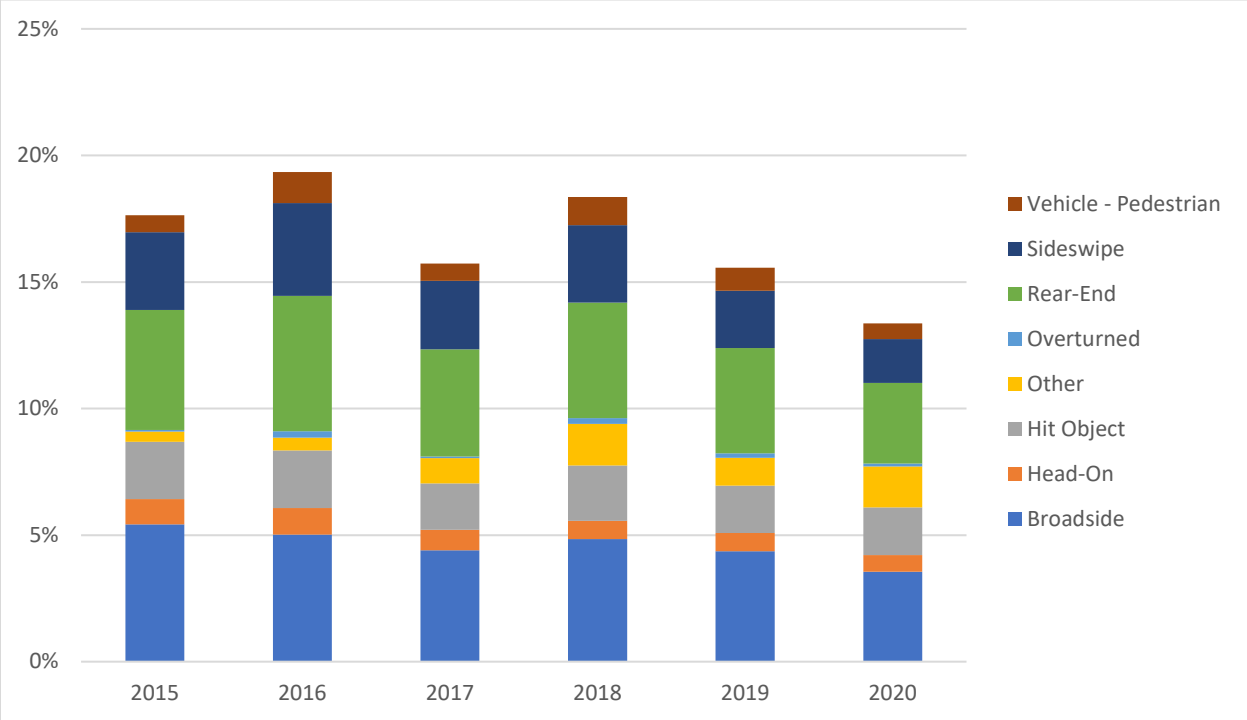
7 Crash Safety Trends

The following section breaks down the collision data by a variety of factors and user types. This information will be used to highlight areas of concern for the City.

7.1 All Crashes

This report utilized collision data for a five-year period to provide a better understanding of trends and to reflect the patterns in crashes that have occurred on City streets. New data is added to the system on an ongoing basis which means that each time the City updates the analysis, a full 5-year draw from the database, rather than just adding records from the last query should be standard practice. Data used for this report were extracted from Crossroads Software analytics on July 7, 2021 and was current as of that date. Collision data from January 1, 2015 through December 31, 2020 as reported to Crossroads from the local enforcement indicated that during this time there were **6,188 collisions** recorded within Costa Mesa.

During this time, the most common occurring collision types were Broadsides (28%) and Rear-ends (26%). The total number of collisions stayed consistent, with a drop in 2020 during the pandemic. Figure 7-1: Collision Type by Year (2015-2019)



7.2 Fatalities

During the study period, 22 fatal collisions occurred, as seen in **Figure 6-2**. Of the 8 pedestrian fatalities, 6 of them took place at night in an area with streetlights. Additionally, of the 10 fatalities with another motor vehicle, 5 of them occurred at night in an area with streetlights. **Table 1** outlines the fatal collisions categorized by modes involved.

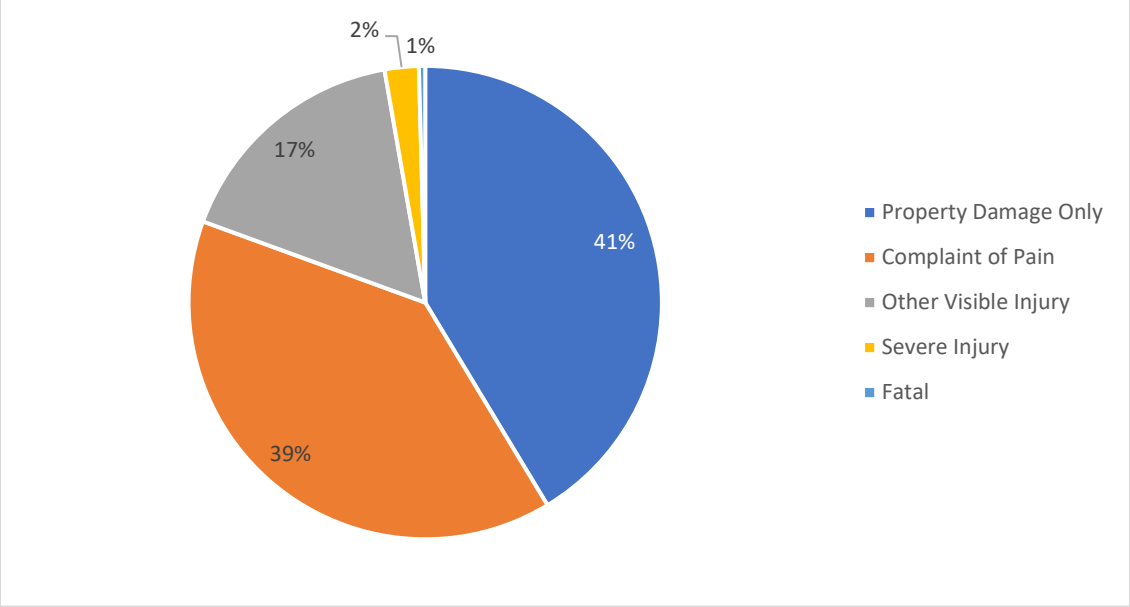
Table 1: Fatal Crashes Categorized by Modes Involved (2015-2019)

Involved With	# of Fatal Collisions	# of Fatal Collision Occurring at Night
Bicycle	0	0
Fixed Object	2	2
Non-Collision	1	1
Other Motor Vehicle	10	5
Parked Motor Vehicle	1	0
Pedestrian	8	6

7.3 Injury Levels

41% of the collisions reported during the time-period resulted in property damage only. Fatalities and severe injuries totaled 3% of all collisions.

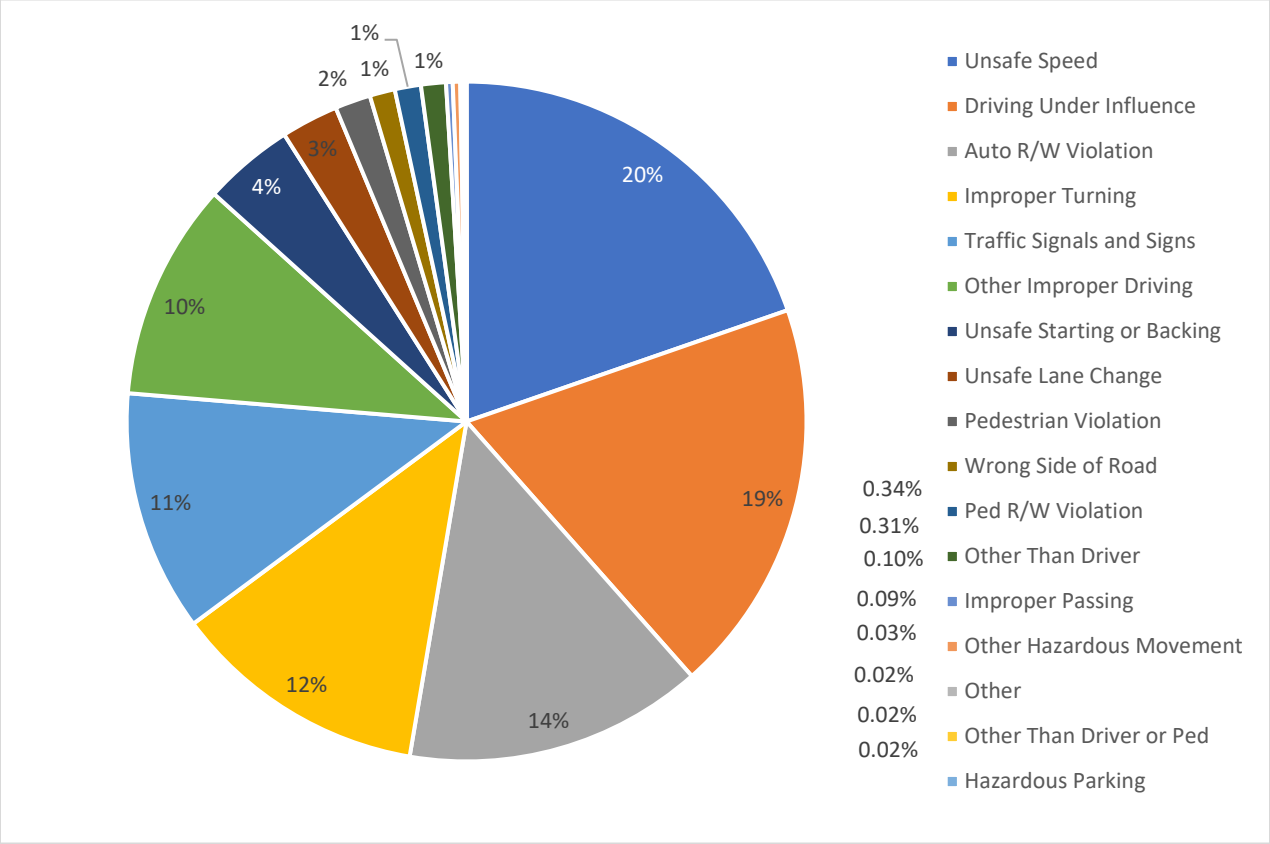
Figure 7-2: Crashes by Injury Levels (2015-2019)



7.4 Cause of Crash

The highest recorded cause of collisions in Costa Mesa during this time period is Unsafe Speed at 20%, followed by Driving Under Influence at 19% and Auto Right-of-Way Violation at 14%. Issues with Improper Turning also had a substantial impact on the City, comprising 12% of the collisions.

Figure 7-3: Cause of Crashes (2015-2019)



7.5 Vulnerable Users

7.5.1 Pedestrians

287 pedestrian involved collisions occurred during the study period, resulting in 8 fatal collisions, 38 severe injury, and 241 collisions with some form of reported injury or pain. 38% of the collisions occurred at night. **Figure 7-4** shows the locations of pedestrian collisions during the study period.

7.5.2 Bicycle

During the study period, 306 collisions involving bicycles were reported. Of these, 0 were fatal, and 17 resulted in severe injuries. The collision history shows 79% of the collisions occurred during daylight. 35% of these collisions were attributed to automobile right-of-way violations, and 12% of collisions were attributed to improper turning movements **Figure 7-5** shows the location of bicycle collisions during the study period.

Figure 7-4: Pedestrian Crashes (2015-2019)

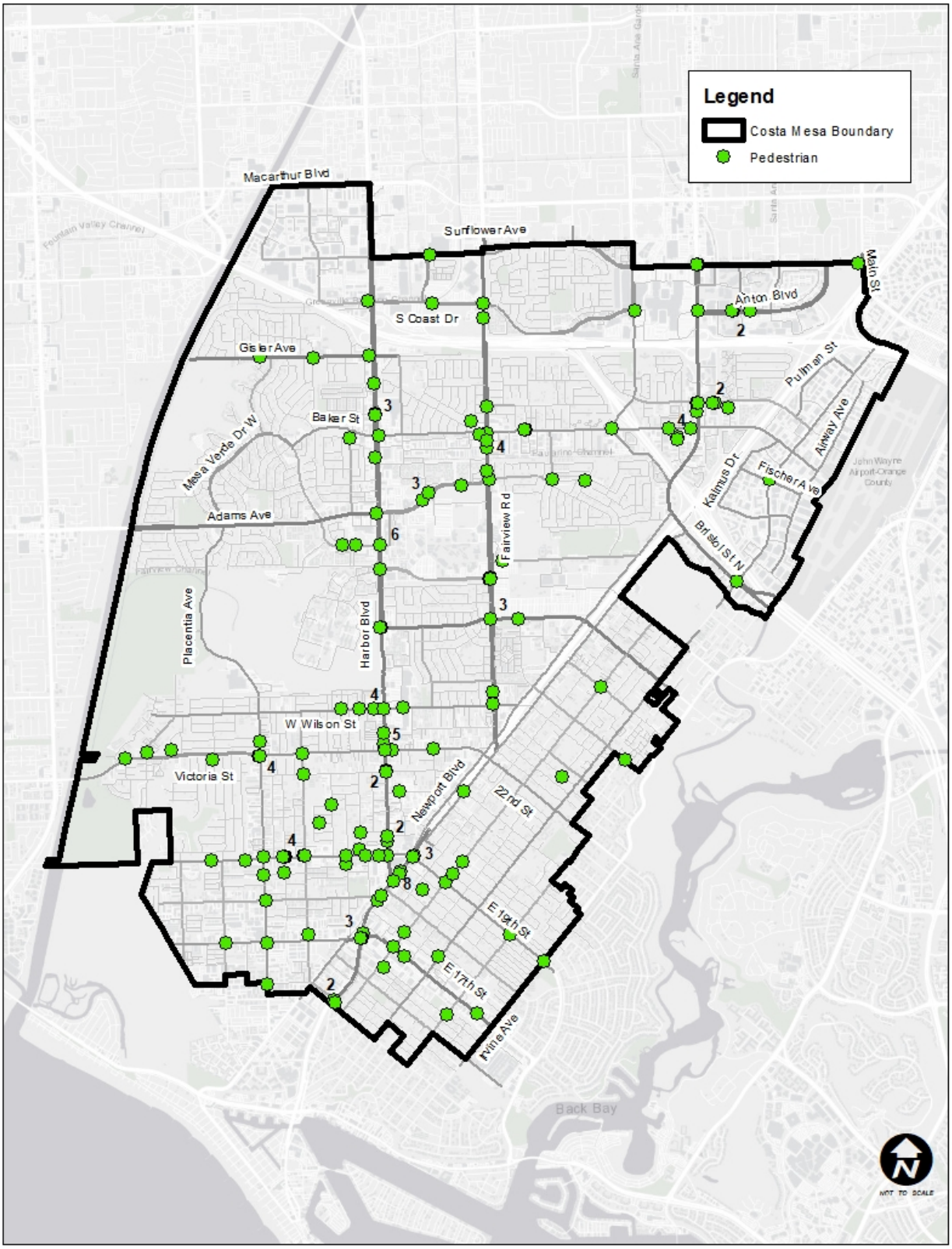
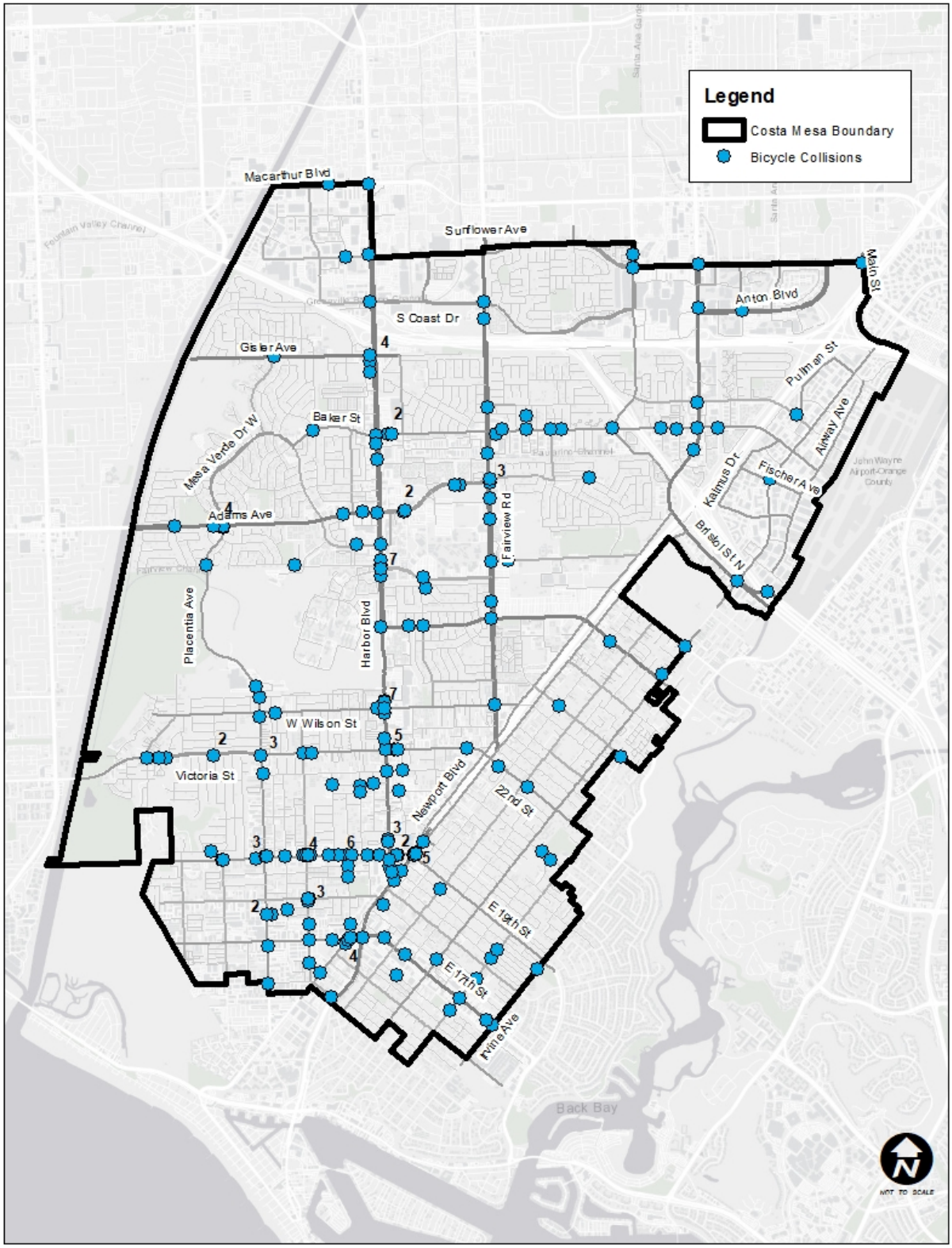


Figure 7-5: Bicycle Crashes (2015-2019)



7.6 Significant Trends for Passenger Vehicles

- Only 5 percent of collisions (255) occurred either at night or during dusk/dawn. Many of these collisions still occurred at or near intersections.
- 28 percent of the total collisions (1486) were broadsides. Although significant in number, there are no discernable patterns to these collisions.
- Drivers aged 65 or older were found to be at fault in 9 percent of collisions. Drivers aged 55 and older were found to be at fault in 21 percent of collisions.
- Drivers aged between 16 and 25 years old were found to be at fault in 26 percent of collisions.

7.7 Initial Findings

Through the initial crash and network screening analysis, an initial ranking of locations of interest was developed. The intersections and roadway segments by sub-population are identified in **Table 2** and **Table 3**. Locations were only considered if they had three or more crashes to be statistically relevant.

A complete table of crash analysis for intersections and segments can be found in **Appendix C.**

Table 2: Analysis Rankings – Intersections

Intersection	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Impaired	Dark	Wet
Signalized Intersections																					
Newport Blvd & 19th St	**62**	0.4	276	0	0	10	23	29	6	11	33	1	5	1	2	3	5	26	12	0	0
Harbor Blvd & Gisler Ave	**50**	0.1	1391	0	7	7	25	11	23	6	13	3	2	0	1	2	2	25	10	0	0
Harbor Blvd & Newport Blvd	**47**	1.2	192	0	0	6	17	24	3	10	26	1	3	1	1	2	2	22	9	0	0
Harbor Blvd & Victoria St	**46**	0.1	196	0	0	5	20	21	7	8	24	1	2	0	0	4	1	13	13	0	0
Harbor Blvd & W Wilson St	**46**	0.3	197	0	0	4	22	20	11	8	20	0	3	0	1	3	5	14	12	0	0
Harbor Blvd & Adams Ave	**43**	0.0	535	1	1	7	19	15	8	10	18	2	4	0	0	1	2	13	14	0	1
Newport Blvd & Broadway	**41**	0.0	379	0	1	8	19	13	6	0	23	1	4	0	1	6	2	18	9	0	0
Newport Blvd & E 17th St	**40**	-0.1	493	1	1	3	19	16	4	4	25	2	2	0	0	3	1	16	9	0	0
Pomona Ave & Victoria St	**34**	0.2	352	0	1	7	17	9	11	3	9	6	2	0	1	3	1	12	8	0	0
Bristol St & Anton Blvd	**32**	0.2	166	0	0	6	15	11	10	3	12	2	3	0	0	2	1	15	3	0	0
Unsignalized Intersections																					
Harbor Blvd & Village Way	**19**	0.2	114	0	0	3	13	3	9	2	4	1	1	1	0	1	1	3	0	0	0
Harbor Blvd & Mesa Verde Center	**15**	0.2	268	0	1	5	8	1	3	1	6	0	3	1	1	0	0	6	0	0	0
Thurin Ave & Victoria St	**13**	0.1	241	0	1	3	7	2	5	1	3	2	1	0	0	1	0	2	1	0	0
Placentia Ave & Hamilton St	**12**	0.1	67	0	0	1	9	2	5	1	2	2	2	0	0	0	1	1	5	0	0
Pomona Ave & Hamilton St	**12**	0.5	51	0	0	3	2	7	4	1	2	1	2	1	0	1	0	4	3	1	0
Harbor Blvd & Shopping Ctr Entrance n/o of Wilson St	**12**	0.2	47	0	0	1	5	6	1	5	4	0	1	1	0	0	2	1	5	1	0
Monrovia Ave & W 19th St	**11**	0.2	228	0	1	5	1	4	4	4	2	0	1	0	0	0	2	2	7	0	0

Intersection	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Impaired	Dark	Wet
Harbor Blvd & Bernard St	**11**	0.1	219	0	1	2	5	3	4	2	1	1	1	0	1	1	0	1	2	0	0
Red Hill Ave & Clinton St	**10**	0.2	65	0	0	2	7	1	8	0	0	1	1	0	0	0	0	0	1	0	0
Enterprise St & Baker St	**10**	0.0	70	0	0	2	8	0	8	1	1	0	0	0	0	0	0	0	0	0	0

Table 3: **Analysis Rankings - Segments**

Facility	Limits	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Impaired	Dark	Wet
Major Arterial																						
Adams Ave	Pinecreek Dr - Fairview Rd	**11**	0.8	209	0	1	2	3	5	0	3	3	1	2	0	1	1	2	3	2	0	0
Harbor Blvd	Wilson St - Victoria St	**11**	0.8	46	0	0	1	5	5	4	1	5	0	0	0	1	0	0	3	3	1	0
Sunflower Ave	S Plaza Dr - S Bristol St	**10**	0.6	55	0	0	2	5	3	5	2	2	0	0	1	0	0	0	6	1	0	0
Fairview Rd	Sunflower - South Coast Dr	**8**	0.1	53	0	0	1	7	0	0	1	6	0	0	1	0	0	0	7	0	0	0
Newport Blvd	17th St - 16th St	**8**	0.2	57	0	0	3	4	1	0	2	5	0	1	0	0	0	0	4	0	0	0
Harbor Blvd	Gisler Ave - Date Pl	**6**	0.0	195	1	0	0	5	0	0	2	3	0	0	0	0	1	0	3	0	0	0
Anton Blvd	Park Center Dr - Avenue of the Arts	**5**	0.2	25	0	0	1	2	2	1	2	0	0	0	0	0	2	0	0	0	0	0
Harbor Blvd	Merrimac Way - Fair Dr	**5**	0.1	35	0	0	1	4	0	0	0	4	0	0	1	0	0	0	4	0	0	0

Facility	Limits	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Impaired	Dark	Wet
Newport Blvd	16th St - Industrial Way	**5**	0.0	20	0	0	0	3	2	1	2	2	0	0	0	0	0	0	1	0	0	0
Adams Ave	Mesa Verde Dr E - Mesa Verde Dr W	**4**	-0.1	24	0	0	1	2	1	0	1	3	0	0	0	0	0	0	3	0	0	0
Primary Arterial																						
W 19th St	Harbor Bl to Pomona Ave	**84**	0.2	899	0	3	14	37	30	29	4	23	6	6	2	3	10	9	3	2	0	0
E 17th St	Tustin Ave - Irvine Ave	**10**	0.4	219	0	1	1	7	1	3	1	3	1	1	0	0	1	0	3	0	0	0
Baker St	College Ave - Harbor Blvd	**4**	0.2	9	0	0	0	1	3	1	0	1	0	1	0	1	0	2	0	1	0	0
Hyland Ave	S Coast Dr - Sunland Ln	**3**	0.8	23	0	0	1	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0
S Coast Dr	Susan St - Fairview Rd	**3**	-0.1	172	0	1	0	1	1	1	0	0	0	1	0	0	1	0	1	0	0	0
Victoria St	Valley Rd - City Limits	**3**	-0.1	18	0	0	1	1	1	0	1	1	0	1	0	0	0	0	2	0	0	0
W 19th St	Meyer Pl - Pomona Ave	**3**	0.3	18	0	0	1	1	1	0	0	1	0	1	1	0	0	0	1	0	0	0
W 19th St	Monrovia Ave - Whittier Ave	**3**	0.4	176	0	1	1	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0
Secondary Arterial																						
W 17th St	Superior Ave - Ponoma Ave	**8**	0.8	58	0	0	2	6	0	4	1	2	0	0	0	1	0	1	2	0	1	0
Newport Blvd	Ford Rd - 19th St	**8**	1.7	38	0	0	2	2	4	1	3	2	0	2	0	0	0	1	1	0	0	0
W Wilson St	Miner St - Harbor Blvd	**5**	1.0	342	0	2	0	2	1	0	1	3	0	0	0	0	1	1	2	0	0	0
W 17th St	Monrovia Ave - Whittier Ave	**3**	2.3	172	0	1	0	1	1	1	2	0	0	0	0	0	0	0	1	0	0	0
Collector Arterial																						
22nd St	Orange Ave - Santa Ana Ave	**5**	0.7	35	0	0	2	2	1	2	1	1	0	1	0	0	0	0	1	0	0	0
Local																						
Hamilton St	Thurin Ave - Harbor Blvd	**5**	13.20	30	0	0	1	3	1	1	0	1	1	1	0	1	0	1	1	0	0	0
Sunflower Ave	Hyland Ave - Toronto Way	**4**	0.11	14	0	0	1	0	3	0	0	0	0	4	0	0	0	0	1	3	0	0

Facility	Limits	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Impaired	Dark	Wet
Randolph Ave	Saint Clair St - Baker St	**4**	8.95	14	0	0	0	2	2	1	0	0	0	0	1	0	2	0	0	1	0	0
Mission Dr	la Salle Ave - Mendoza Dr	**4**	5.33	4	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	1	0	0
Kalmus Dr	Fischer Ave - Red Hill Ave	**4**	0.04	19	0	0	0	3	1	0	0	0	0	4	0	0	0	0	2	1	1	0
Enterprise St	Baker St - Paularine Ave	**3**	7.38	13	0	0	0	2	1	2	0	0	0	0	0	0	1	0	0	0	0	0
Logan Ave	College Ave - Baker St	**3**	2.17	3	0	0	0	0	3	0	2	1	0	0	0	0	0	0	1	1	0	0
Anaheim Ave	W 19th St - Yorkshire St	**3**	3.47	18	0	0	1	1	1	2	0	0	0	0	0	1	0	0	0	0	0	0

7.8 Statewide Comparison

A comparison of fatal & severe injury collision data to the State averages were conducted for data from 2015-2018 (the most recent statewide data available). These numbers may vary slightly from those mentioned previously, due to the differences in the years of the study period. The following are areas where Costa Mesa's collision rates are higher or lower than those of the State. These numbers specifically compare the proportion of fatal and serious injury crashes that have the characteristics listed in **Table 4**Error! Reference source not found..

Table 4: Comparison of Statewide and Costa Mesa Fatal & Severe Injury Crashes (2015-2018)

Challenge Area	Statewide %	Costa Mesa %	Percentage Difference
Costa Mesa has a Higher Percentage of F&SI Crashes			
Aggressive Driving	33.2%	36.9%	3.7%
Young Drivers (15-20)	13.6%	17.1%	3.5%
Impaired Driving	25.8%	28.2%	2.4%
Motorcyclists	20.8%	23.1%	2.3%
Distracted Driving	5.2%	6.0%	0.8%
Costa Mesa has a Lower Percentage of F&SI Crashes			
Aging Drivers (65+)	11.9%	10.2%	-1.7%
Work Zones	1.5%	0.9%	-0.6%
Commercial Vehicles	6.4%	5.1%	-1.3%
Occupant Protection	14.8%	12.6%	-2.2%
Bicyclists	8.4%	5.7%	-2.7%
Intersections	23.6%	20.4%	-3.2%
Pedestrians	19.3%	15.8%	--3.5%
Lane Departure	43.7%	26.4%	-17.3%

8 Emphasis Areas

Emphasis Areas are behavioral, road user, or road condition characteristics that the City of Costa Mesa can strategically focus efforts on to have a large impact on transportation safety. Emphasis areas were developed by revisiting the Vision and Goals developed at the onset of this planning process and comparing them with the trends and patterns identified in the crash analysis. Where these areas aligned, or major challenges were observed, Emphasis Areas and strategies were developed.

Emphasis Area #1: Speeding

Description: Unsafe speed was the highest cause of collisions within the study period, accounting for about 20% of all collisions. 1.7% of these collisions resulted in a fatality or severe injuries, and 68% resulted in some other form of injury. Just 30% of these collisions resulted in Property Damage Only.

Goal for Emphasis Area #1:

- Reduce the number of crashes due to speeding in the City
- Identify hot spots and priority corridors to address and reduce speeding
- Apply for funding and implement countermeasures to address speeding drivers

Strategies for Emphasis Area #1

- Engineering improvements such as reducing lane widths, changes to roadway geometry, signal timing adjustments, speed feedback signage, traffic calming pilot projects, and implementation
- Educational campaign to target speeding drivers
- Increased law enforcement presence near speeding hotspots
- Increased coordination with law enforcement and other community organizations

Emphasis Area #2: Pedestrians & Bicyclists (Vulnerable Road Users)

Description: Pedestrians and bicyclists are classified by Caltrans as vulnerable road users, meaning they have the highest potential for severe harm during a crash. Pedestrian and bicycle activity is high in Costa Mesa. 9.5 percent of all collisions in the study period involved pedestrians or bicyclists. 2.7% of these collisions resulted in fatalities and 9.3% resulted in severe injuries.

Goals for Emphasis Area #2:

- Reduce the number of collisions involving vulnerable road users
- Identify hot spots and priority corridors for addressing vulnerable road user collisions
- Apply for funding and implement countermeasures to address pedestrian & bicyclist collisions

Strategies for Emphasis Area #2:

- Implement pedestrian and bicycle countermeasures/improvements at key locations
- Install active transportation counters to identify high volume locations and implement infrastructure improvements at these locations
- Establish education and training programs to improve vulnerable road user safety citywide

These strategies can be implemented by the City, while partnering with Caltrans, OCTA, NHTSA, CHP and other community partners. Funding sources for these strategies may include HSIP, ATP, STIP, SRTS, GGRF and SB1 grand funding programs.

Emphasis Area #3: Signal Improvements

Description:

28% of all collisions within the study period occurred within 250 ft of a signalized intersection. 0.7% of these collisions resulted in fatalities and 8% resulted in severe injuries. 65% resulted in some other form of injury.

Goal for Emphasis Area #3:

- Reduce the number of collisions at signalized intersections
- Identify hot spots for signalized intersection collisions
- Apply for funding and implement countermeasures at City signals

Strategies for Emphasis Area #3:

- Address intersection collisions by implementing proven countermeasures
- Identify priority corridors for intersections collisions and implement countermeasures on these corridors
- Analyze signal timing and determine if adjustments are needd

Emphasis Area #4: Aging Drivers (65+)

Description: Collisions involving aging drivers, as defined by the Caltrans SHSP, includes instances where the driver of the motor vehicles is 65 years or older. During the study period, 9% of collisions were attributed to drivers 65+.

Goal for Emphasis Area #4

- Reduce the number of crashes involving aging drivers
- Identify hot spots and priority corridors for aging drivers
- Apply for funding and implement countermeasures to address collisions involving aging drivers

Strategies for Emphasis Area #4:

- Educational campaign to target aging drivers with messaging about traffic safety
- Increased coordination with law enforcement and other community organizations

Emphasis Area #5: Impaired Driving

Description: Impaired driving crashes are a high priority challenge area within the Caltrans SHSP. Caltrans defines these as crashes where any evidence of drug or alcohol use by the driver is present, even if the driver was not over the legal limit. 18% were reported as the driver being under the influence of alcohol or drugs. 22% of all fatalities and 17% of all severe injuries were attributable to impaired driving.

Goal for Emphasis Area #5

- Reduce the number of crashes attributed to impaired driving
- Identify hot spots and priority corridors for countermeasures to reduce impaired driving
- Apply for funding to implement countermeasures to reduce impaired driving crashes

Strategies for Emphasis Area #5:

- Authorize, publicize, and conduct sobriety checkpoints programs
- Implement an impaired driving education campaign
- Develop educational programs targeting specific audiences based on age group

- Additional enforcement presence
- Create effective media campaigns in both visual and print media

9 Opportunities

The following provides more information on general identified issues, crash modification factors, improvements, and countermeasures identified for the City of Costa Mesa, as well as for specific project locations identified as part of this analysis.

9.1 Infrastructure Improvements

9.1.1 Countermeasure Selection Process

Part D of the HSM provides information on Crash Modification Factors (CMF) for roadway segments, intersections, interchanges, special facilities, and road networks. CMFs are used to estimate the safety effects of highway improvements and apply CMFs to compare and select highway safety improvements. A CMF less than 1.0 indicates that a treatment has the potential to reduce collisions. A CMF greater than 1.0 indicates that a treatment has the potential to increase collisions. The application of an appropriate CMF can influence the decision to implement a particular project, and the misapplication of CMFs can lead to misinformed decisions. Key factors to consider when applying CMFs include:

1. Selection of an appropriate CMF,
2. Estimation of collisions without treatment,
3. Application of CMFs by type and severity, and
4. Estimation of the combined effect for multiple treatments

Examples of Safety Countermeasures can be found through several sources. This Report utilizes the countermeasures found in the California LRSM (https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/2020/lrsm2020.pdf) and the CMF Clearinghouse (CMF CH) website (http://www.cmfclearinghouse.org/).

Countermeasures for each of the Safety Project Case Studies are based on the data analysis and site visits. Additional countermeasures were identified for the high-level issues on a citywide level and are discussed in Section 0 of this Report.

9.1.2 Safety Project Case Studies

From the citywide analysis, ten project case study locations were selected for further analysis and opportunity identification. For each of these locations, Safety Project Case Studies were developed to provide a case study to organize projects when applying for funding. These locations were identified through the analysis process based on their collision histories, the observed crash patterns, and their differing characteristics to provide the most insight into potential systemic safety countermeasures that the City can employ to achieve the most cost-effective safety benefits.

A Safety Project Case Study was developed for these locations:

1. Segment: 17th Street (Tustin Ave to Irvine Ave)
2. Signalized Intersection: Newport Bl & Broadway + Newport Bl & 19th St
3. Segment: Hamilton Street (Thurin Ave to Harbor Bl)

4. Signalized Intersection: Pomona Ave & Victoria St
5. Segment: Wilson Street (Columbia Dr to Fairview Rd)
6. Unsignalized Intersection: Harbor Bl & Village Way
7. Segment: Harbor Boulevard (Gisler Ave to Date Pl)
8. Segment: Baker Street (Bear St to Century Pl)
9. Segment: Arlington Drive (Fairview Rd to Newport Bl)

Appendix A contains the Case Study pages which summarize conditions at each location, and potentially beneficial countermeasures. Countermeasures were subjected to a benefit/cost assessment and scored according to their potential return on investment. These case studies can be used to select the most appropriate countermeasure, and to potentially phase improvements over the longer-term. The potential benefit of these countermeasures at locations with similar design characteristics can then be extrapolated regardless of crash history. These case study sheets can also be used to position the City for future grant funding opportunities.

9.2 Non-Infrastructure Improvements

Non-Infrastructure improvements have also been proven to impact safety conditions of the transportation network. These education and enforcement measure opportunities are developed to target specific behavior types and populations. Based on a review of the existing plans, policies, and programs within the City, the following topics have been reviewed to identify areas where the City can implement or enhance safety efforts.

Table 5: Summary of Programs, Policies, and Practices for the City of Costa Mesa

Topic	Current Status	Implement or Enhance
Complete Streets Policy	Included in the General Plan as Goal C-1	Identify roadways that are good candidates for complete street implementation consistent with guidance provided in these plans
ADA/Accessibility	City has developed an ADA Self Evaluation and Transition Plan that identifies issues and conditions for the City to improve access to people with disabilities City has a Sidewalk Accessibility Curb Ramp Program to identify locations to install curb ramps throughout the City	Continue to identify areas citywide for ADA improvements, such as audible crossing signals and other enhancements, with special attention paid to areas with aging populations
Traffic Impact Fees	Updated and approved by City Council annually	Continue to assess traffic impact fees
Safe Routes to School Funding	The City has applied but do not have current grants/funds	Identify potential grant projects and apply for grant funding

Topic	Current Status	Implement or Enhance
Traffic Safety Education	CMPD offers bicycle trainings in schools and traffic safety education campaigns with OTS funds	Continue program and identify areas for expansion.
Program for Reviewing Crash Activity	No formal program. Reviewed a few times a year with Police and Transportation staff	Set up formal program for reviewing crash activity; update database for future LRSP analysis & updates
Crossroads/RMS Database Updates	CMPD has a civilian who inputs crash data on weekends. Daily auto update coming soon	Implement automatic daily updates of collision data into database
City Enforcement on Bicycle Rules	Ordinances for bicycles on sidewalks when bike lane present, not enforced. PD enforces bicycle helmet and jaywalking based on CVC	Continue enforcement of current laws, including existing rules regarding electric bicycle usage
Electric Bicycle Policies	City PD enforces existing California Vehicle Code rules and regulations regarding electric bicycles	Incorporate electric bicycles in bicycle safety educational programming Update electric bicycle policies as NACTO, MUTCD, and CVC guidelines are updated in response to developing technologies
Sobriety / Seatbelt Checks	Yes	Continue sobriety & seat belt checks; increase enforcement in hot spots
City Law Enforcement Coordinate with Adjacent Jurisdictions	Yes	Continue to coordinate with adjacent jurisdictions
Speed Surveys	Yes, regularly	Continue to update as required by California Vehicle Code; review new guidance from Assembly Bill 43
Speed Limits	Current	Continue to update as required by California Vehicle Code; review new guidance from Assembly Bill 43

Topic	Current Status	Implement or Enhance
Traffic Calming Policies	Policy C-1.9, and policies C-1.13, C-1.15, and C-1.17 of General Plan	Continue to enact traffic calming implementations throughout the City
Transit Vehicles Accommodation of Bicycles	Yes	Continue to accommodate bicycles on transit to promote multi-modal trips
Coordination of Transit Providers and City Staff	Yes, to ensure safe and equitable access to transit stops	Continue coordination; work to identify areas for improvements
Bicycle and Pedestrian Master Plans	Yes	Continue to update master plans on a regular basis, with special attention paid to electric bicycle policies as technology and laws evolve
General Plan Addresses Multimodal Traffic Safety	Yes. Goal C-8 of General Plan	Continue to implement recommendations under Goal C-8; regularly assess progress and areas for improvement
Inventory of Bicycle, Pedestrian, Parking, and other facilities	No	Start inventory program of facilities; digitize inventory through GIS database
Traffic Safety Audit Program	No	Implement a traffic safety audit program to regularly identify traffic safety issues citywide
Emergency Response and City Transportation Planning	Yes, emergency response is engaged in planning	Continue engaging emergency response in transportation planning processes
Local Health Agencies and City Transportation Planning	They are sometimes involved in coordination	Implement formal coordination processes with local health agencies; involve in collision analysis and planning process
Resident Feedback	Bikeway and Walkability Committee meetings, Q-Alert Costa Mesa app, contacting staff	Continue to seek out resident feedback and incorporate into policies and implementations

Topic	Current Status	Implement or Enhance
Maintenance of Roadway Surfaces	Yes	Continue regular maintenance of roadway surfaces; determine how safety implementations can be incorporated
Transportation Demand Management Policies/Programs	Included in General Plan	Continue to advance Transportation Demand Management programs and support per General Plan policies
Use of overlays, specific plans, redevelopment areas to encourage infill development to reduce VMT	Yes	Continue this process; identify area where infill development will require safety improvements
Regular Collection of Traffic / Bicycle / Pedestrian Volumes	Yes	Continue traffic & active transportation volume collection; utilize this data in collision analysis
Program for Installing Wayfinding Signage	Included in FY 21-22 funding	Continue to identify funding for wayfinding signage; implement in high pedestrian/bicycle locations
Warrants for Traffic Control Devices	Uses CA MUTCD	Continue to use CA MUTCD warrants; identify areas where additional warrants can be used (such as flashing stop signs)

General Citywide Countermeasure Toolbox

This evaluation considered citywide trends to identify countermeasures that would likely provide the most benefit with widespread implementation. Countermeasures for each of the 5Es of Safety (Engineering, Enforcement, Education, Emergency Services, and Emerging Technologies) were identified. These include both infrastructure opportunities, non-infrastructure opportunities. Error! Reference source not found. outlines the citywide safety project opportunities, which is also referred to as the "Countermeasure Toolbox". Within the toolbox, the description of the countermeasure along with its LRSM ID number is listed. The next column, Crash Reduction Factor (CRF) also known as Crash Modification Factor (CMF), are "multiplicative factors used to estimate the expected number of crashes after implementing a given countermeasure at a specific site (the lower the CMF, the greater the expected reduction in crashes)[4]."

For each of these countermeasures, a planning level benefit/cost analysis was completed. Applying the benefit/cost at the citywide level was estimated assuming some randomness in crash distribution. The location characteristics, such as whether there is a traffic signal, and the type of crashes, were used at the citywide level to calculate an average cost of crashes that the countermeasure might reduce. The benefit per location was then factored out to a 20-year life-cycle savings, with an Opinion of Project Probable Cost (OPCC) for the initial installation costs and a per-year maintenance cost estimate. The cost shown in **Table 4** should be considered initial planning costs using 2021 dollars and not assumed final.

Table 6 describes additional opportunities for the remaining categories of traffic safety which includes Enforcement, Education, Emergency Services, and Emerging Technology.

[4] LRSM Version 1.5 (2020), Page 27

Table 6: Citywide Safety Project Opportunities (Countermeasure Toolbox)

LRSM/CMF ID	Potential Countermeasures	Crash Reduction Factor	Per Unit Cost	Unit
NS02	Convert to all-way stop control (from 2-way or Yield Control)	50%	$10,000	per location
NS05	Convert intersection to roundabout (from 2-way stop or yield control)	35%	$80,000	per intersection
NS06	Install/upgrade larger or additional stop signs/other intersections warning/regulatory signs (stop signs with LED borders)	15%	$1,500	per sign
NS15	Create direction median openings to allow/restrict left-turns and U-turns (right-in/right-out)	50%	$15,000	per structure
NS17	Install right-turn lane (N.S.I)	20%	$15,000	per location
NS21PB	Install/upgrade pedestrian crossing at uncontrolled locations	35%	$20,000	per location
R02	Remove or relocate fixed objects outside of Clear Recovery Zone	35%	$10,000	per location
R03	Install barrier in median	25%	$20,000	per location
R08	Install median	25%	$75,000	per mile
R22	Install retroreflective stripes on stop signs	15%	$5,000	per location
R26	Install dynamic/variable speed warning systems	30%	$16,000	per sign
R28	Install edge-lines and centerlines	25%	$8,000	per mile
R32PB	Install green paint in bicycle lanes	35%	$15,000	per location
S02	Install retroreflective backplates	15%	$12,000	per intersection
S03	Improve signal timing (coordination, phasing, red, yellow, operation)	15%	$8,000	per intersection
S04	Install advanced dilemma zone detection	40%	$34,000	per intersection
S07	Provide protected left-turn phase	30%	$40,000	per intersection
S09	Install enhanced freeway lane marking	10%	$5,000	per intersection

LRSM/CMF ID	Potential Countermeasures	Crash Reduction Factor	Per Unit Cost	Unit
S18PB	Install improved pedestrian crossing	25%	$50,000	per intersection
S20PB	Install advance stop bar (bicycle box) before crosswalk	15%	$10,000	per location
S21PB	Modify signal phasing to implement a Leading Pedestrian Interval (LPI)	60%	$8,000	per intersection
128	Install tapered bump-outs (chicanes)	32%	$20,000	per location
4124	Install High-Visibility Crosswalk	19%	$25,000	per location
-	Install lane assignment signage for freeways	*5%	$2,000	per intersection
-	Remove centerline	*5%	$8,000	per mile
-	Evaluate consolidation of driveways	*5%	$50,000	per segment

*These countermeasures do not have documented CRF's and a conservative 5% CRF was assigned to allow them to show some benefit.

Non-Engineering Safety Strategy Countermeasures:

These potential countermeasures were derived from the collision analysis and build on the actions identified in Section 9.2. These relate to the additional Es of Traffic Safety outside of Engineering. This includes Enforcement, Education, Emergency Services and Emerging Technologies.

Table 7: Non-Engineering Safety Strategy Countermeasures

PROPOSED COUNTERMEASURE	POTENTIAL PARTNERS	EXAMPLES OF COUNTERMEASURE
ENFORCEMENT		
Establish enforcement and visibility program for aggressive driving	Local law enforcement; CHP	CHP's Regulate Aggressive Driving and Reduce Speed (RADARS) Program
Continued enforcement in school zones	Local law enforcement; CHP; school districts; OCTA; SCAG	Obtain grant funding for additional personnel in school zones
Increased enforcement of safe driving & active transportation behaviors near busy crosswalk locations	Local law enforcement; CHP	Obtain grant funding for additional enforcement near high pedestrian activity locations
EDUCATION		
Campaign to target aggressive driving and DUIs	Local law enforcement; CHP; California Office of Traffic Safety (OTS)	CHP's Regulate Aggressive Driving and Reduce Speed (RADARS) Program
Bicycle and pedestrian safety campaign	Local law enforcement; OCTA; SCAG	SCAG's 'Go Human' Campaign; ' OTS' 'Ride With Traffic' campaign Planned educational events at high active transportation activity locations
Explore safe routes to school education grants to expand program	Local school districts; local law enforcement; OCTA; SCAG	Safe Routes to School Program, funded by Caltrans
Coordinate safety education campaigns with SCAG	SCAG; local law enforcement	Roadway safety fairs at schools Education campaign for aging drivers
EMERGENCY SERVICES		
Continue to work on interdepartmental communication between City staff and City police department and fire department	Local law enforcement & fire department	Incorporate law enforcement/fire department as stakeholders on transportation improvement projects

PROPOSED COUNTERMEASURE	POTENTIAL PARTNERS	EXAMPLES OF COUNTERMEASURE
Incorporate public health agencies and fire departments as stakeholders in safety projects	Local public health agencies and fire departments	Adjust safety project development processes to include public health and fire department feedback
EMERGING TECHNOLOGY		
Continue to use best practices for pedestrian crossings at high pedestrian traffic areas	City Public Works; OCTA; Caltrans	Continuously update pedestrian crossing design standards in accordance with latest best practices
Utilize new data sources to monitor traffic conditions and inform County safety plans	City Public Works; OCTA; Caltrans	Utilization of data from OCTA traffic management center

10 Evaluation & Implementation

10.1 Evaluation

The success of the LRSP will be evaluated using the preliminary process outlined below. This process will be useful to ensure proper implementation of goals and to determine when updates are needed.

- Quarterly progress meetings will be conducted to track the implementation of the plan. In addition, the success of the plan will be evaluated on an annual basis.
- An update to the plan should be considered within five years.
- Continued monitoring and recording of traffic incidents on local roadways by law enforcement.
- Maintain a list of focus areas where there are transportation safety concerns.

10.2 Implementation

Implementation of the LRSP can be accomplished through several avenues including development of projects, the establishment of new policies and programs, and development/strengthening of relationships with stakeholders.

With regard to projects, the following identifies potential focus areas for the City in the near-to-mid-term.

Near- & Mid-Term Focus Areas

The opportunities identified in this report provide more of the systemic countermeasures that can be applied within the City. Over the next three to five years, the City has the opportunity to concentrate its efforts on the emphasis areas:

1. Speeding
2. Vulnerable Road Users
3. Signal Improvements
4. Aging Drivers (65+)
5. Impaired Driving

Analysis conducted at the citywide level indicated that these factors were some of the most frequent influences contributing to collisions within the City. The countermeasure opportunities previously discussed in this report for both systemic and project-specific improvements can be used as a basis for developing projects at locations where addressing these focus areas would be of the most benefit. Projects that address these focused areas can be developed with a high benefit-to-cost ratio (by applying Citywide collision rates), allowing projects to be developed even at sites with little to no direct collision history, but with conditions that might contribute to future collisions.

10.3 Funding

Competitive funding resources are available to assist in the development and implementation of safety projects in Costa Mesa. The City should continue to seek available funding and grant opportunities from local, state, and federal resources to accelerate their ability to implement safety improvements throughout Costa Mesa. The following is a high-level introduction into some of the main funding programs and grants for which the City can apply. The City should also work with regional agencies such as OCTA and SCAG to identify and apply for safety improvement funding.

10.3.1 Highway Safety Improvement Program

The Highway Safety Improvement Program (HSIP) is a Federal program housed under Fixing America's Surface Transportation (FAST) Act. This program apportions funding as a lump sum for each state, which is then divided among apportioned programs. These flexible funds can be used for projects to preserve or improve safety conditions and performance on any Federal-aid highway, bridge projects on any public road, facilities for non-motorized transportation, and other project types. Example safety improvement projects eligible for this funding include:

- New or upgraded traffic signals
- Upgraded guard rails
- Pedestrian warning flashing beacons
- Marked crosswalks

California's local HSIP focuses on infrastructure projects with national recognized crash reduction factors. Normally HSIP call-for-projects is made at an interval of one to two years. The applicant must be a city, a county, or a tribal government federally recognized within the State of California.

Additional information regarding this program at the Federal level can be found online at: https://safety.fhwa.dot.gov/hsip/. California specific HSIP information – including dates for upcoming call for projects - can be found at: http://www.dot.ca.gov/hq/LocalPrograms/hsip.html.

10.3.2 Caltrans Active Transportation Program

Caltrans Active Transportation Program (ATP) is a statewide funding program, created in 2013, consolidating several federal and state programs. The ATP funds projects that encourage increased mode share for walking and bicycling, improve mobility and safety for non-motorized users, enhance public health, and decrease greenhouse gas emissions. Projects eligible for this funding include:

- Bicycle and pedestrian infrastructure projects
- Bicycle and pedestrian planning projects (e.g. safe routes to school)
- Non-infrastructure programs (education and enforcement)

This program funding is provided annually. The ATP call for projects typically comes out in the spring. Information on this program and cycles can be found online at: http://www.dot.ca.gov/hq/LocalPrograms/atp/

10.3.3 State Transportation Improvement Program

The State Transportation Improvement Program (STIP) provides state and federal gas tax money for improvements both on and off the state highway system. STIP programming occurs every two years. The programming cycle begins with the release of a proposed fund estimate, followed by California Transportation Commission (CTC) adoption of the fund estimate. The fund estimate serves to identify the amount of new funds available for the programming of transportation projects. Once the fund estimate is adopted, Caltrans and the regional planning agencies prepare transportation improvement plans for submittal. Caltrans prepares the Interregional Transportation Improvement Program (ITIP) using Interregional Improvement Program (IIP) funds, and regional agencies prepare Regional Transportation Improvement Programs (RTIPs) using Regional Improvement Program (RIP) funds. The STIP is then adopted by the CTC.

10.3.4 California Senate Bill 1 (SB 1)

SB 1 is a landmark transportation investment to rebuild California by fixing neighborhood streets, freeways and bridges in communities across California and targeting funds toward transit and congested trade and commute corridor improvements.

California's state-maintained transportation infrastructure will receive roughly half of SB 1 revenue: $26 billion. The other half will go to local roads, transit agencies and an expansion of the state's growing network of pedestrian and cycle routes. Each year, this new funding will be used to tackle deferred maintenance needs both on the state highway system and the local road system, including:

- Bike and Pedestrian Projects: $100 million
    - This will go to cities, counties and regional transportation agencies to build or convert more bike paths, crosswalks and sidewalks. It is a significant increase in funding for these projects through the Active Transportation Program (ATP).
- Local Planning Grants: $25 million

10.3.5 California Office of Traffic Safety (OTS) Grants

This program has funding for projects related to traffic safety, including transportation safety education and encouragement activities. Grants applications must be supported by local crash data (such as the data analyzed in this report) and must relate to the following priority program areas:

- Alcohol Impaired Driving
- Distracted Driving
- Drug-Impaired Emergency Medical Services
- Motorcycle Safety
- Occupant Protection
- Pedestrian and Bicycle Safety
- Police Traffic Services
- Public Relations, Advertising, and Marketing Program
- Roadway Safety and Traffic Records

10.3.6 SCAG Sustainable Communities Program (SCP)

This program is an innovative vehicle for promoting local jurisdictional efforts to test local planning tools. The SCP provides direct technical assistance to SCAG member jurisdictions to complete planning and policy efforts to implement the regional Sustainable Communities Strategies (SCS). Grants are available in the following three categories:

- Integrated Land Use
  - Sustainable Land Use Planning
  - Transit Oriented Development (TOD)
  - Land Use & Transportation Integration
- Active Transportation
  - Bicycle Planning
  - Pedestrian Planning
  - Safe Routes to School Plans
- Green Region
  - Natural Resource Plans
  - Climate Action Plans (CAPs)
  - Green House Gas (GHG) Reduction programs

10.4 Next Steps

The City of Costa Mesa has completed this LRSP to guide the process of future transportation safety improvements for years to come. The data-driven analysis process identified collision types, related primary collision factors, and locations of many collisions. Based on this process, Emphasis Areas were developed. These Emphasis Areas will guide corridor improvements, education programs, and capital improvements for the City.

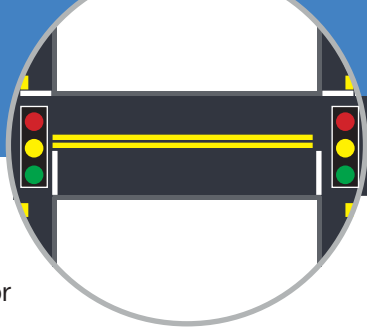
Using the analyzed data and outputs from this LRSP, the City has the opportunity to complete the following tasks:

- Actively seek other funding opportunities to improve safety for all modal users
- Collaborate with established safety partners & neighboring municipalities as improvements are made to create a cohesive transportation network
- Iteratively evaluate existing and proposed transportation safety programs and capital improvements to design a safer transportation network in Costa Mesa
- Continually review collision data and update the analysis performed in this report
- Monitor collision activity at locations where improvements were made to determine their impacts

Based on current Caltrans guidelines, the LRSP is valid for 5 years from date of completion for eligibility for HSIP grant funding.

Appendix A: Case Study Sheets

Project Template: Location #1

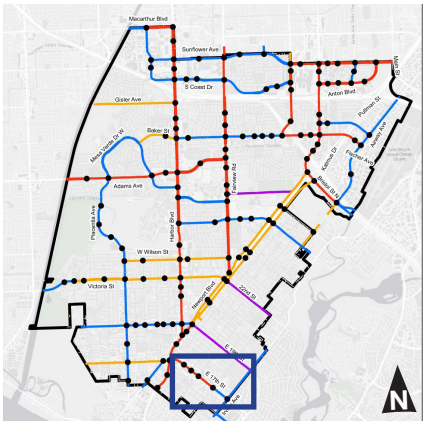


Project Name: Costa Mesa LRSP
Agency Name: Costa Mesa
Contact Name: Jennifer Rosales, P.E., PTOE
Email: JENNIFER.ROSALES@costamesaca.gov

Prepared by: Kimley-Horn
Checked by: Jason Melchor
Date: February 2022

Project Location Description & Maps:

Segment: 17th St: Tustin Ave to Irvine Ave
Similar Segments: W 19th St: Placentia Ave to Pomona Ave; 19th St: Orange Ave to Santa Ana Ave



Traffic and Geometric Data:

Collision Data	
Total Collisions	10
Fatal and Injury Collisions	Fatal Injury - 0 Severe Injury - 1 Visible Injury - 1
Top 3 Collision Types (percentage)	Broadside (30%) Rear-End (30%) Hit-Object (10%)
Total Night Time Collisions	3
Wet Surface Collisions	0
Drug and Alcohol Related Collisions	0

Traffic Data	
Average Daily Traffic (ADT)	30,000
Lighting	Yes
Highest Posted Speed Limit	35 MPH

Collision Breakdown		
Veh vs. Veh	**Veh vs. Ped**	**Veh vs. Bike**
9	1	0

Additional Notes:

- Many driveways and pedestrian/bicycle conflicts
- Mid-block crossing in area is challenging
- Medians were installed recently
- E-bike use is common at this location
- Bicyclists queueing with motorists observed at Irvine and Tustin Avenues
- Higher traffic volume, connection to Newport Beach
- OCTA capacity requirements in effect
- Classified as “Primary Arterial” on the MPAH

Kimley»Horn

Countermeasure Evaluation

Primary Issues	Potential Countermeasures	Crash Modification Factor (LRSM/CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
All	Consolidate driveways	0.95	$582,380	$50,000	11.65
Ped & Bike	Install bicycle box on Irvine Ave at 17th St intersection	0.85 (S20PB)	$1,314,000	$10,000	131.40
Ped & Bike	Improve signal timing	0.85 (S03)	$1,747,140	$8,000	218.39
All	Implement Leading Pedestrian Interval (LPI) at Tustin Ave & Irvine Ave intersections	0.40 (S21PB)	$5,256,000	$8,000	657.0
All	Lane width reductions	0.70 (R14)	$2,628,000	$3,125	840.96

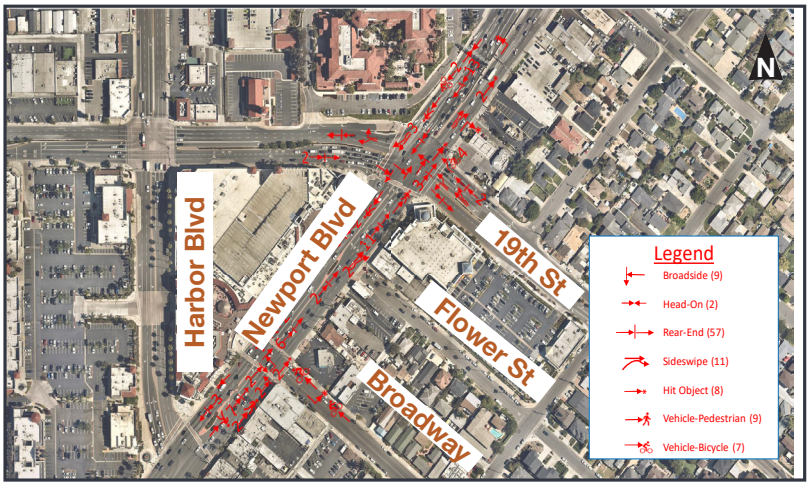
Case Study Sheet: Location #2

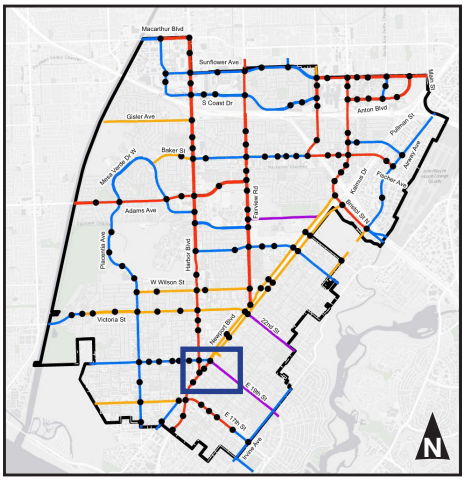
Project Name: Costa Mesa LRSP
Agency Name: Costa Mesa
Contact Name: Jennifer Rosales, P.E., PTOE
Email: JENNIFER.ROSALES@costamesaca.gov

Prepared by: Kimley-Horn
Checked by: Jason Melchor
Date: February 2022

Project Location Description & Maps:

Intersection: Newport Bl & Broadway + Newport Bl & 19th St
Examples of Similar Intersections: Newport Bl & Rochester St/18th S; Newport Bl & 17th St





Traffic and Geometric Data:

Collision Data	
Total Collisions	103
Fatal and Injury Collisions	Fatal Injury - 0 Severe Injury - 1 Visible Injury - 18
Top 3 Collision Types	Rear-End (55%) Broadside (12%) Sideswipe (11%)
Total Nighttime Collisions	51
Wet Surface Collisions	2
Drug and Alcohol Related Collisions	0

Traffic Data	
Number of Approaches	Newport Bl & Broadway (3) Newport Bl & 19th St (4)
Total Entering Vehicles	56,000 (Newport Bl & 19th St)
Crosswalk Condition	Crossing with pedestrian timing
Control Type	Signalized
Lighting	Yes
Highest Posted Speed Limit	40 MPH
Median	Yes

Collision Breakdown		
Veh vs. Veh	**Veh vs. Ped**	**Veh vs. Bike**
87	9	7

Additional Notes:

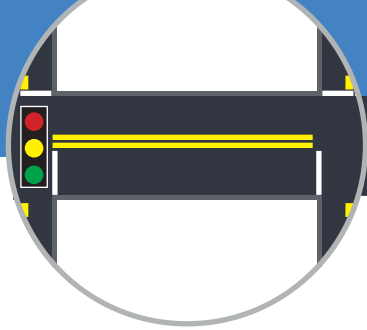
- These intersections are Caltrans owned and maintained
- 19th St intersection has 3 crosswalk legs
- Speed is main issue
- Several bicycle collisions at 19th St intersection; conflicts with WBR movements

Kimley»Horn

Countermeasure Evaluation

Primary Issues	Potential Countermeasures	Crash Modification Factor (LRSM/ CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
Ped & Bike	Install bicycle box along 19th St at Newport Bl intersection; include sharrows directing to WB bike box	0.85 (S20PB)	$328,080	$10,000	32.81
All	Install advanced dilemma zone at each signal	0.60 (S04)	$13,932,480	$34,000	409.78
All	Retroflective backplates at each signal	0.85 (S02)	$5,224,680	$12,000	435.39
All	Review traffic signal operation and determine if crosswalk leg can be installed at Newport Bl & 19th St	0.75 (S18PB)	$546,800	$50,000	10.94
All	Install speed feedback sign	0.70 (R26)	$10,449,360	$6,000	1741.56
All	Targeted Speed Enforcement	-	*Varies*		
All	Adjust signal timing at each signal	0.85 (S03)	$5,224,680	$16,000	326.54
Ped & Bike	Ped refuge islands at both intersections	0.55 (NS19PB)	$15,674,040	$50,000	313.48
Ped & Bike	Add visibility crosswalk on the western leg of the Broadway and 19th intersection	0.81 (4124)	$415,568	$25,000	16.62
All	Add advanced stop bars	0.60 (S04)	$13,932,480	$68,000	204.89
All	Install/ upgrade larger or additional stop signs or other intersection warning/ regulatory signs	0.85 (NS06)	$5,224,680	$9,000	580.52
Ped & Bike	Add curb extension to NW corner	0.75 (S18PB)	$546,800	$125,000	4.37
All	Modify EB right turn slip lane to conventional right turn lane	0.95	$1,741,560	$125,000	13.93

Project Template: Location #3



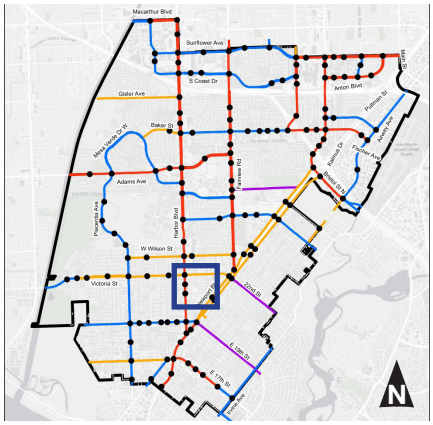
SEGMENT

Project Name: Costa Mesa LRSP
Agency Name: Costa Mesa
Contact Name: Jennifer Rosales, P.E., PTOE
Email: JENNIFER.ROSALES@costamesaca.gov

Prepared by: Kimley-Horn
Checked by: Jason Melchor
Date: February 2022

Project Location Description & Maps:

Segment: Hamilton St: Thurin St to Harbor Bl
Examples of Similar Segments: Bristol St: Randolph Ave to Bear St; Harbor Bl: Sunflower Ave to Coast Dr



Traffic and Geometric Data:

Collision Data	
Total Collisions	6
Fatal and Injury Collisions	Fatal Injury - 0 Severe Injury - 0 Visible Injury - 1
Top 3 Collision Types (percentage)	Broadside (33.3%) Head-On (66.7%) Rear-End (16.7%)
Total Nighttime Collisions	0
Wet Surface Collisions	0
Drug and Alcohol Related Collisions	0

Traffic Data	
Average Daily Traffic (ADT)	2,100
Lighting	Yes
Highest Posted Speed Limit	25 MPH

Collision Breakdown		
Veh vs. Veh	**Veh vs. Ped**	**Veh vs. Bike**
5	0	1

Additional Notes:

- Several driveway related crashes

Kimley»Horn

Countermeasure Evaluation

Primary Issues	Potential Countermeasures	Crash Modification Factor (LRSM/CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
All	Install edgeline paint	0.75 (R28)	$479,200	$4,000	119.80
All	Install traffic circle at Hamilton St & Thurin Ave	0.65 (NS05)	$670,880	$80,000	8.39
All	Remove centerline (after reviewing traffic volumes)	0.95	$95,840	$4,000	23.96

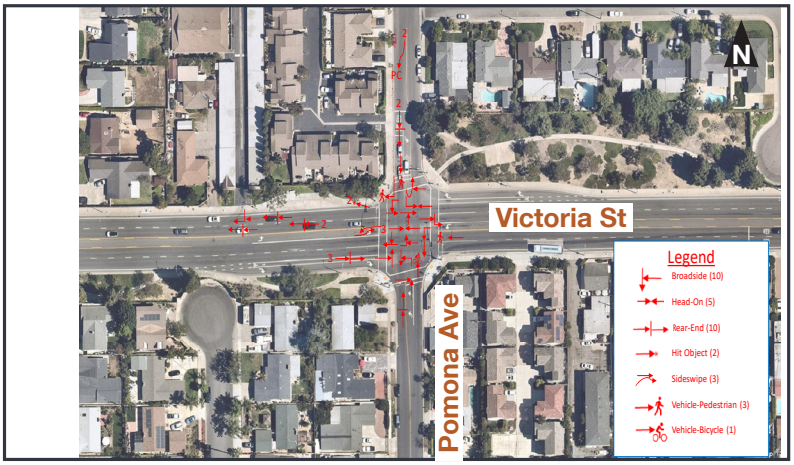
Case Study Sheet: Location #4

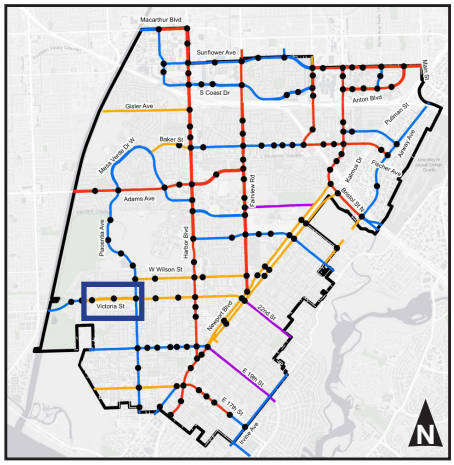
Project Name: Costa Mesa LRSP
Agency Name: Costa Mesa
Contact Name: Jennifer Rosales, P.E., PTOE
Email: JENNIFER.ROSALES@costamesaca.gov

Prepared by: Kimley-Horn
Checked by: Jason Melchor
Date: February 2022

Project Location Description & Maps:

Intersection: Pomona Ave & Victoria St
Examples of Similar Intersections: Pomona Ave & 19th St





Traffic and Geometric Data:

Collision Data	
Total Collisions	34
Fatal and Injury Collisions	Fatal Injury - 0 Severe Injury - 1 Visible Injury - 7
Top 3 Collision Types	Broadside (33%) Rear-End (27%) Head-On (18%)
Total Nighttime Collisions	21
Wet Surface Collisions	1
Drug and Alcohol Related Collisions	0

Traffic Data	
Number of Approaches	2 and 1
Total Entering Vehicles	36,500
Crosswalk Condition	All Legs with Pedestrian Timing
Control Type	Signalized
Lighting	yes
Highest Posted Speed Limit	40 MPH
Median	No

Collision Breakdown		
Veh vs. Veh	**Veh vs. Ped**	**Veh vs. Bike**
30	3	1

Additional Notes:

- High concentration of broadsides
- Permissive left-turns on N/S Pomona Ave; protected LTs on Victoria St (was previously permissive, installed in 2018)
- Victoria St is a large cut-through to beaches in Huntington Beach
- Rear-ends west of Pomona Ave on Victoria St; gated apartment entrance may be contributing to this
- Bicycle issues on Pomona Ave (Class III bike route), bicyclists constrained on this roadway
- Victoria St high cut through location for beach access
- Signal timing on Victoria St will be updated in TSSP
- Victoria St is on the OCTA MPAH

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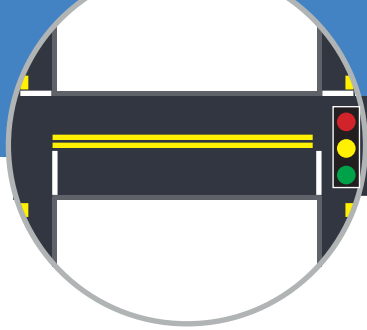
Countermeasure Evaluation

Primary Issues	Potential Counter-measures	Crash Modification Factor (LRSM/CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
All	Install protected left-turn on Pomona Ave N/S movements (3 collisions affected)	0.70 (S07)	$357,480	$40,000	3.57
Bike & Pedestrian	Install high-visibility crosswalks (possibly Triple-4 style)	0.75 (S18PB)	$2,555,500	$50,000	51.11
Bike & Pedestrian	Install Leading Pedestrian Interval timing	0.40 (S21PB)	$6,133,200	$8,000	766.65
All	Install edge line striping on Pomona Ave	0.75 (R28)	$4,216,300	$4,000	1054.08
Bike & Pedestrian	Install Class III bike routes along Pomona Ave (sharrows)	0.65 (R32PB)	$3,577,700	$15,000	238.51
All	Install advanced dilemma zone detection	0.60 (S04)	$6,746,080	$34,000	198.41
All	Install retroflective border backplates	0.85 (S02)	$2,529,780	$12,000	210.82
All	Install dynamic/ variable speed warning systems	0.70 (R26)	$10,449,360	$32,000	326.54
All	Change lane configurations	0.70 (R14)	$10,449,360	$6,250	1671.90
All	Targeted/ increased enforcement for DUIs/ speeding	-	*Varies*		

Project Template: Location #5

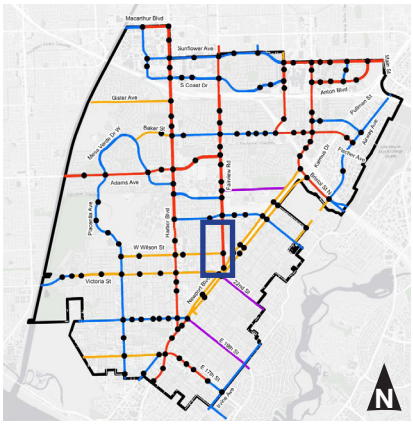
Project Name: Costa Mesa LRSP
Agency Name: Costa Mesa
Contact Name: Jennifer Rosales, P.E., PTOE
Email: JENNIFER.ROSALES@costamesaca.gov

Prepared by: Kimley-Horn
Checked by: Jason Melchor
Date: February 2022



Project Location Description & Maps:

Segment: Wilson St: Columbia Dr to Fairview Road
Examples of Similar Segments: Wilson St: Pomona Ave to Harbor



Traffic and Geometric Data:

Collision Data	
Total Collisions	5
Fatal and Injury Collisions	Fatal Injury - 0 Severe Injury - 0 Visible Injury - 1
Top 3 Collision Types (percentage)	Broadside (40%) Hit-Object (40%) Rear-End (20%)
Total Nighttime Collisions	1
Wet Surface Collisions	0
Drug and Alcohol Related Collisions	0

Traffic Data	
Average Daily Traffic (ADT)	17,000
Lighting	Yes
Highest Posted Speed Limit	35 MPH

Collision Breakdown		
Vehicular	**Veh vs. Ped**	**Veh vs. Bike**
5	0	0

Additional Notes:

- Two collisions involving hit objects
- Much crosstown traffic along Wilson St
- High traffic volumes & bus route; is on MPAH
- Bulb-outs and pedestrian refuge island planned near Wilson Park

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Countermeasure Evaluation

Primary Issues	Potential Countermeasures	Crash Modification Factor (LRSM/CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
All	Install signal ahead signage	0.85 (NS06)	$198,420	$3,000	66.14
All	Install advanced dilemma zone detection	0.60 (S04)	$529,120	$34,000	15.56
All	Install retroreflective backplates	0.85 (S02)	$198,420	$12,000	16.54
All	Remove or relocate utility pole outside of Clear Recovery Zone	0.65 (R02)	$462,980	$10,000	46.30
All	Install edgeline striping	0.75 (R28)	$330,700	$800	413.38

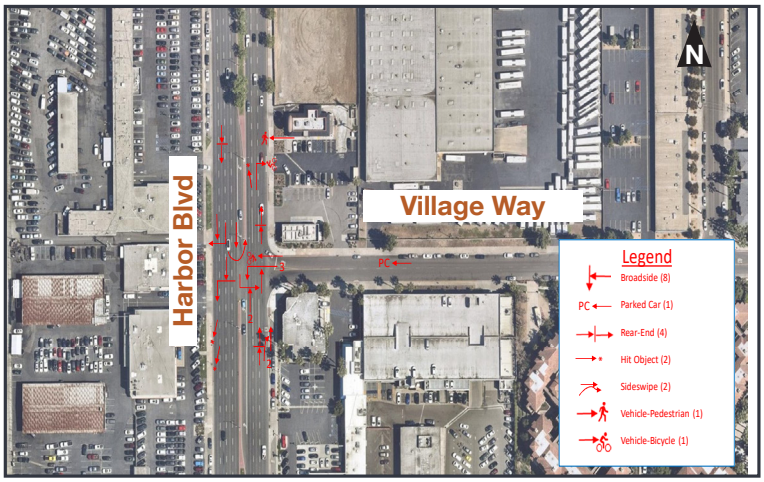
Case Study Sheet: Location #6

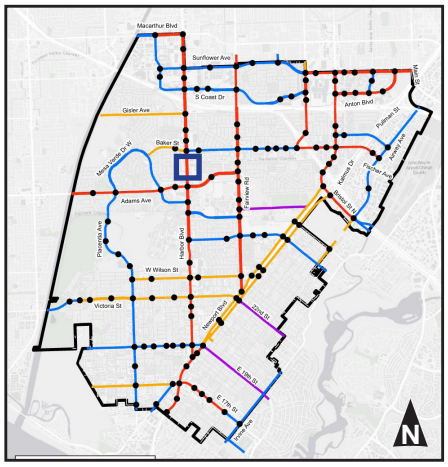
Project Name: Costa Mesa LRSP
Agency Name: Costa Mesa
Contact Name: Jennifer Rosales, P.E., PTOE
Email: JENNIFER.ROSALES@costamesaca.gov

Prepared by: Kimley-Horn
Checked by: Jason Melchor
Date: February 2022

Project Location Description & Maps:

Intersection: Harbor Bl & Village Way
Examples of Similar Intersections: Harbor Bl & Ponderosa St; Fairview Rd & Princeton Dr





Traffic and Geometric Data:

Collision Data	
Total Collisions	19
Fatal and Injury Collisions	Fatal Injury - 0 Severe Injury - 0 Visible Injury - 3
Top 3 Collision Types	Broadside (48%) Rear-End (21%) Sideswipe (11%)
Total Nighttime Collisions	1
Wet Surface Collisions	1
Drug and Alcohol Related Collisions	0

Traffic Data	
Number of Approaches	3
Total Entering Vehicles	54,696
Crosswalk Condition	None present
Control Type	Unsignalized
Lighting	Yes
Highest Posted Speed Limit	40 MPH
Median	On NB/SB approaches

Collision Breakdown		
Veh vs. Veh	**Veh vs. Ped**	**Veh vs. Bike**
17	1	2

Additional Notes:

- Left-turns from Village Way not allowed, but several turns observed
- Two bicycle and one pedestrian crashes

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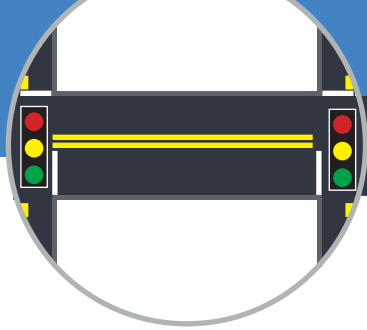
Countermeasure Evaluation

Primary Issues	Potential Countermeasures	Crash Modification Factor (LRSM/CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
All	Install barrier to prevent left-turns from Village Way onto Harbor Bl	0.50 (NS15)	$3,037,000	$15,000	202.47

Project Template: Location #7

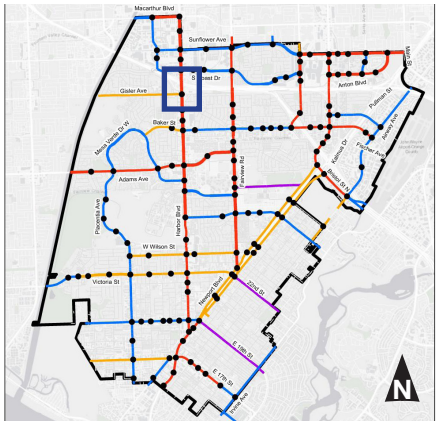


Project Name: Costa Mesa LRSP
Agency Name: Costa Mesa
Contact Name: Jennifer Rosales, P.E., PTOE
Email: JENNIFER.ROSALES@costamesaca.gov

Prepared by: Kimley-Horn
Checked by: Jason Melchor
Date: February 2022

Project Location Description & Maps:

Segment: Harbor Blvd: Gisler Ave to Date Pl
Examples of Similar Segments: Bristol St: Randolph Ave to Bear St; Harbor Bl: Sunflower Ave to Coast Dr



Traffic and Geometric Data:

Collision Data	
Total Collisions	56
Fatal and Injury Collisions	Fatal Injury - 0 Severe Injury - 6 Visible Injury - 7
Top 3 Collision Types (percentage)	Broadside (40%) Rear-End (36%) Sideswipe (9%)
Total Nighttime Collisions	12
Wet Surface Collisions	1
Drug and Alcohol Related Collisions	0

Traffic Data	
Average Daily Traffic (ADT)	62,000
Lighting	yes
Highest Posted Speed Limit	40 MPH

Collision Breakdown		
Veh vs. Veh	**Veh vs. Ped**	**Veh vs. Bike**
51	2	3

Additional Notes:

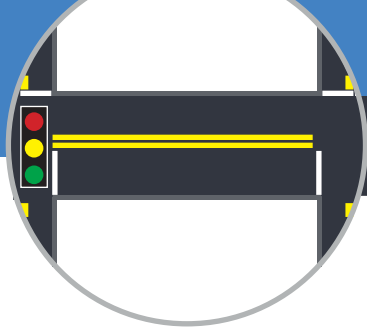
- Broadsides was the main issue, along with rear-ends near intersection
- Many collisions near median opening south of Gisler Ave

Kimley»Horn

Countermeasure Evaluation

Primary Issues	Potential Countermeasures	Crash Modification Factor (LRSM/CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
All	Install advanced dilemma zone detection	0.60 (S04)	$26,389,280	$89,200	776.16
All	Install retroflective backplates	0.85 (S04)	$9,895,980	$12,000	824.67
All	Review and update signal timing (including all-red times)	0.85 (S03)	$9,895,980	$8,000	1237.00
All	Stripe pull-in lane on Harbor Bl as right-turn only lane	0.80 (NS17)	$13,194,640	$3,000	879.64
All	Install restrictive median to prevent left turn conflicts	0.75 (R03)	$32,986,600	$15,000	2199.11
All	Install lane guidance markings for freeway lanes	0.95 (S09)	$6,597,320	$15,000	439.82
All	Install guidance signage for freeway lanes	0.95	$3,298,660	$6,000	549.78

Project Template: Location #8

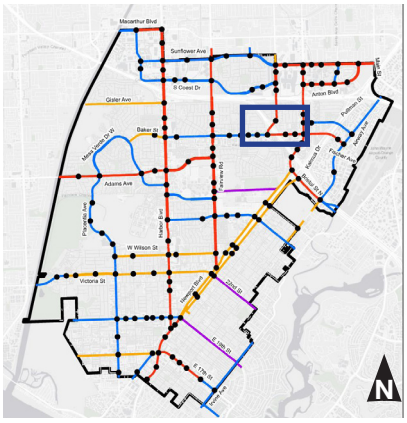


Project Name: Costa Mesa LRSP
Agency Name: Costa Mesa
Contact Name: Jennifer Rosales, P.E., PTOE
Email: JENNIFER.ROSALES@costamesaca.gov

Prepared by: Kimley-Horn
Checked by: Jason Melchor
Date: February 2022

Project Location Description & Maps:

Segment: Baker St: Bear St to Century St
Examples of Similar Intersections: Baker St: Bristol St to Newport Bl; Bristol St: Bear St to Newport Bl



Traffic and Geometric Data:

Collision Data	
Total Collisions	3
Fatal and Injury Collisions	Fatal Injury - 1 Severe Injury - 0 Visible Injury - 0
Top Collision Types (percentage)	Rear-End (67%) Broadside (33%)
Total Nighttime Collisions	2
Wet Surface Collisions	0
Drug and Alcohol Related Collisions	0

Traffic Data	
Average Daily Traffic (ADT)	24,200
Lighting	Yes
Highest Posted Speed Limit	40 MPH

Collision Breakdown		
Veh vs. Veh	**Veh vs. Ped**	**Veh vs. Bike**
3	0	0

Additional Notes:

- Rear-end collisions near Bear St
- Fatal broadside collision involving turning movement across Baker St

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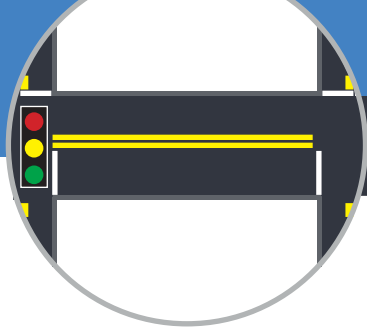
Countermeasure Evaluation

Primary Issues	Potential Countermeasures	Crash Modification Factor (LRSM/CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
All	Extend median along Baker St to reduce left-turn conflicts	0.75 (R03)	$2,365,100	$25,000	94.60
All	Install speed feedback signage	0.70 (R26)	$2,838,120	$16,000	177.38
All	Lane reductions	0.70 (R14)	$2,838,120	$7,500	378.41

Project Template: Location #9

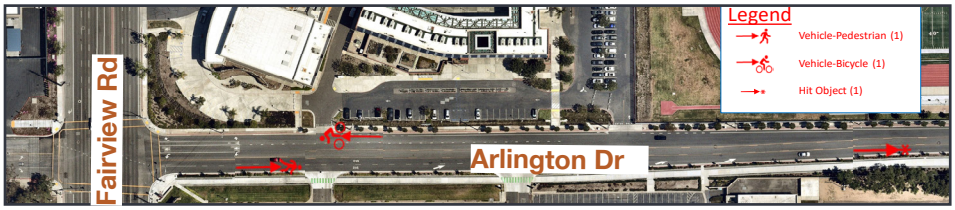


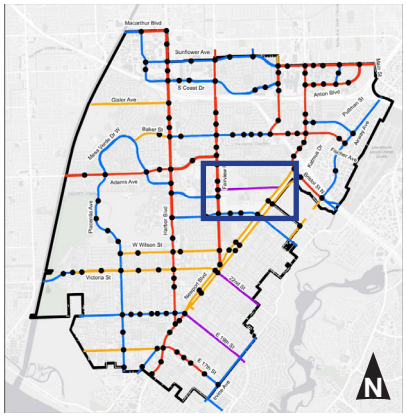
Project Name: Costa Mesa LRSP
Agency Name: Costa Mesa
Contact Name: Jennifer Rosales, P.E., PTOE
Email: JENNIFER.ROSALES@costamesaca.gov

Prepared by: Kimley-Horn
Checked by: Jason Melchor
Date: February 2022

Project Location Description & Maps:

Segment: Arlington Dr: Fairview Rd to Newport Bl
Examples of Similar Segments: Mesa Dr: Newport Bl to Santa Ana Ave; Junipero Dr: Arlington Dr to Presidio





Traffic and Geometric Data:

Collision Data	
Total Collisions	4
Fatal and Injury Collisions	Fatal Injury - 0 Severe Injury - 0 Visible Injury - 1
Top 3 Collision Types (percentage)	Broadside (25%) Head-on (25%) Hit Object (25%)
Total Nighttime Collisions	0
Wet Surface Collisions	0
Drug and Alcohol Related Collisions	0

Traffic Data	
Average Daily Traffic (ADT)	5,000
Lighting	Yes
Highest Posted Speed Limit	35 MPH

Collision Breakdown		
Veh vs. Veh	**Veh vs. Ped**	**Veh vs. Bike**
2	1	1

Additional Notes:

- Park and school are nearby
- Crosswalk at Junipero St
- HAWK signal at Davis Magnet School
- Rolling stops observed
- Bicycle and pedestrian collisions near Fairview Rd
- Arlington Dr is on OCTA MPAH
- There was a fatality on Arlington Dr at Junipero Dr in 2020. It is outside the LRSP study period, but is noted for reference.

Kimley»Horn

Countermeasure Evaluation

Primary Issues	Potential Countermeasures	Crash Modification Factor (LRSM/CMF ID)	20 Year Safety Benefit	Total 20-Year Costs	Safety Related B/C
All	Install tapered bumpouts/chicanes along Arlington Dr	0.68 (CM128)	$319,744	$20,000	15.99
All	Install flashing stop sign (use stop sign warrant similar to implementation in Lancaster, CA)	0.85 (NS06)	$149,880	$5,000	29.98
Ped & Bike	Install additional crosswalk at Arlington Dr/Junipero Dr intersection to connect with bike path	0.65 (NS21PB)	$131,880	$20,000	6.59
All	Install retroreflective tape on stop sign posts at Junipero Dr	0.85 (R22)	$149,880	$2,500	59.95
All	Install median in two-way left-turn lane east of Junipero Dr	0.75 (R08)	$249,800	$56,250	4.44

Appendix B: Analysis Rankings Table – Segments and Intersections

Facility	Limits	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Impaired	Dark	Wet
Major Arterial																						
Adams Ave	Pinecreek Dr - Fairview Rd	**11**	0.8	209	0	1	2	3	5	0	3	3	1	2	0	1	1	2	3	2	0	0
Harbor Blvd	Wilson St - Victoria St	**11**	0.8	46	0	0	1	5	5	4	1	5	0	0	0	1	0	0	3	3	1	0
Sunflower Ave	S Plaza Dr - S Bristol St	**10**	0.6	55	0	0	2	5	3	5	2	2	0	0	1	0	0	0	6	1	0	0
Fairview Rd	Sunflower - South Coast Dr	**8**	0.1	53	0	0	1	7	0	0	1	6	0	0	1	0	0	0	7	0	0	0
Newport Blvd	17th St - 16th St	**8**	0.2	57	0	0	3	4	1	0	2	5	0	1	0	0	0	0	4	0	0	0
Harbor Blvd	Gisler Ave - Date Pl	**6**	0.0	195	1	0	0	5	0	0	2	3	0	0	0	0	1	0	3	0	0	0
Anton Blvd	Park Center Dr - Avenue of the Arts	**5**	0.2	25	0	0	1	2	2	1	2	0	0	0	0	0	2	0	0	0	0	0
Harbor Blvd	Merrimac Way - Fair Dr	**5**	0.1	35	0	0	1	4	0	0	0	4	0	0	1	0	0	0	4	0	0	0
Newport Blvd	16th St - Industrial Way	**5**	0.0	20	0	0	0	3	2	1	2	2	0	0	0	0	0	0	1	0	0	0
Adams Ave	Mesa Verde Dr E - Mesa Verde Dr W	**4**	-0.1	24	0	0	1	2	1	0	1	3	0	0	0	0	0	0	3	0	0	0
E 17th St	Orange Ave - Westminster Ave	**4**	0.1	24	0	0	1	2	1	0	1	1	0	1	0	0	1	1	1	0	0	0
Harbor Blvd	E 18th St - Newport Bl	**4**	0.4	14	0	0	0	2	2	0	1	0	1	1	0	1	0	1	0	0	0	0
Bear St	South Coast Plaza (N) - South Coast Dr	**3**	-0.1	18	0	0	0	3	0	1	0	2	0	0	0	0	0	0	2	0	0	0
Bristol St	Anton Bl - Town Center Dr	**3**	-0.1	13	0	0	0	2	1	0	1	2	0	0	0	0	0	0	2	0	0	0
Anton Blvd	Avenue of the Arts - Sakioka Dr	**3**	-0.1	167	0	1	0	0	2	0	1	0	0	1	0	0	1	0	0	1	0	0
Fairview Rd	I-405 EB Offramp - McCormack Ln	**3**	-0.1	13	0	0	0	2	1	0	0	3	0	0	0	0	0	0	3	0	0	0
Baker St	Newport Dr - Enterprise St	**3**	0.0	18	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	1	0	0
Bristol St	Baker St - Randolph Ave	**3**	0.1	22	0	0	2	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0
Baker St	Bristol St - Randolph Ave	**3**	0.1	181	0	1	1	1	0	1	0	1	0	0	0	0	1	0	1	0	0	0

Facility	Limits	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Impaired	Dark	Wet
Baker St	Bear St - Century Pl	**3**	0.1	177	1	0	0	2	0	1	0	2	0	0	0	0	0	0	2	0	0	0
Adams Ave	City Limits - Albatross Dr	**3**	-0.1	18	0	0	1	1	1	1	0	1	0	1	0	0	0	0	2	0	0	0
Bristol St N	Newport Bl - Santa Ana Ave	**3**	-0.1	18	0	0	1	1	1	1	0	2	0	0	0	0	0	0	1	1	0	0
E 17th St	Westminster Ave - Santa Ana Ave	**3**	0.0	18	0	0	0	3	0	2	0	1	0	0	0	0	0	0	1	0	0	0
Primary Arterial																						
W 19th St	Harbor Bl to Pomona Ave	**84**	0.2	899	0	3	14	37	30	29	4	23	6	6	2	3	10	9	3	2	0	0
E 17th St	Tustin Ave - Irvine Ave	**10**	0.4	219	0	1	1	7	1	3	1	3	1	1	0	0	1	0	3	0	0	0
Baker St	College Ave - Harbor Blvd	**4**	0.2	9	0	0	0	1	3	1	0	1	0	1	0	1	0	2	0	1	0	0
Hyland Ave	S Coast Dr - Sunland Ln	**3**	0.8	23	0	0	1	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0
S Coast Dr	Susan St - Fairview Rd	**3**	-0.1	172	0	1	0	1	1	1	0	0	0	1	0	0	1	0	1	0	0	0
Victoria St	Valley Rd - City Limits	**3**	-0.1	18	0	0	1	1	1	0	1	1	0	1	0	0	0	0	2	0	0	0
W 19th St	Meyer Pl - Pomona Ave	**3**	0.3	18	0	0	1	1	1	0	0	1	0	1	1	0	0	0	1	0	0	0
W 19th St	Monrovia Ave - Whittier Ave	**3**	0.4	176	0	1	1	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0
Secondary Arterial																						
W 17th St	Superior Ave - Ponoma Ave	**8**	0.8	58	0	0	2	6	0	4	1	2	0	0	0	1	0	1	2	0	1	0
Newport Blvd	Ford Rd - 19th St	**8**	1.7	38	0	0	2	2	4	1	3	2	0	2	0	0	0	1	1	0	0	0
W Wilson St	Miner St - Harbor Blvd	**5**	1.0	342	0	2	0	2	1	0	1	3	0	0	0	0	1	1	2	0	0	0
W 17th St	Monrovia Ave - Whittier Ave	**3**	2.3	172	0	1	0	1	1	1	2	0	0	0	0	0	0	0	1	0	0	0
Collector Arterial																						
22nd St	Orange Ave - Santa Ana Ave	**5**	0.7	35	0	0	2	2	1	2	1	1	0	1	0	0	0	0	1	0	0	0
Local																						
Hamilton St	Thurin Ave - Harbor Blvd	**5**	13.20	30	0	0	1	3	1	1	0	1	1	1	0	1	0	1	1	0	0	0

Facility	Limits	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Impaired	Dark	Wet
Sunflower Ave	Hyland Ave - Toronto Way	**4**	0.11	14	0	0	1	0	3	0	0	0	0	4	0	0	0	0	1	3	0	0
Randolph Ave	Saint Clair St - Baker St	**4**	8.95	14	0	0	0	2	2	1	0	0	0	0	1	0	2	0	0	1	0	0
Mission Dr	la Salle Ave - Mendoza Dr	**4**	5.33	4	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	1	0	0
Kalmus Dr	Fischer Ave - Red Hill Ave	**4**	0.04	19	0	0	0	3	1	0	0	0	0	4	0	0	0	0	2	1	1	0
Enterprise St	Baker St - Paularine Ave	**3**	7.38	13	0	0	0	2	1	2	0	0	0	0	0	0	1	0	0	0	0	0
Logan Ave	College Ave - Baker St	**3**	2.17	3	0	0	0	0	3	0	2	1	0	0	0	0	0	0	1	1	0	0
Anaheim Ave	W 19th St - Yorkshire St	**3**	3.47	18	0	0	1	1	1	2	0	0	0	0	0	1	0	0	0	0	0	0

1. Local Critical Crash Rate Differential

2. Equivalent Property Damage Only Crashes

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Signalized Intersections																								
Newport Blvd & 19th St	Newport Blvd	19th St	**62**	0.4	276	0	0	10	23	29	6	11	33	1	5	1	2	3	5	26	0	12	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Harbor Blvd & Gisler Ave	Harbor Blvd	Gisler Ave	**50**	0.1	1391	0	7	7	25	11	23	6	13	3	2	0	1	2	2	25	0	10	0	0
Harbor Blvd & Newport Blvd	Harbor Blvd	Newport Blvd	**47**	1.2	192	0	0	6	17	24	3	10	26	1	3	1	1	2	2	22	0	9	0	0
Harbor Blvd & Victoria St	Harbor Blvd	Victoria St	**46**	0.1	196	0	0	5	20	21	7	8	24	1	2	0	0	4	1	13	0	13	0	0
Harbor Blvd & W Wilson St	Harbor Blvd	W Wilson St	**46**	0.3	197	0	0	4	22	20	11	8	20	0	3	0	1	3	5	14	0	12	0	0
Harbor Blvd & Adams Ave	Harbor Blvd	Adams Ave	**43**	0.0	535	1	1	7	19	15	8	10	18	2	4	0	0	1	2	13	0	14	0	1
Newport Blvd & Broadway	Newport Blvd	Broadway	**41**	0.0	379	0	1	8	19	13	6	0	23	1	4	0	1	6	2	18	0	9	0	0
Newport Blvd & E 17th St	Newport Blvd	E 17th St	**40**	-0.1	493	1	1	3	19	16	4	4	25	2	2	0	0	3	1	16	0	9	0	0
Pomona Ave & Victoria St	Pomona Ave	Victoria St	**34**	0.2	352	0	1	7	17	9	11	3	9	6	2	0	1	3	1	12	0	8	0	0
Bristol St & Anton Blvd	Bristol St	Anton Blvd	**32**	0.2	166	0	0	6	15	11	10	3	12	2	3	0	0	2	1	15	0	3	0	0
Harbor Blvd & W 19th St	Harbor Blvd	W 19th St	**31**	0.15	146	0	0	5	13	13	7	1	16	0	5	0	1	1	1	14	0	13	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Fairview Rd & el Camino Dr	Fairview Rd	el Camino Dr	**31**	0.00	459	1	1	3	14	12	5	1	15	2	4	1	2	1	3	18	0	4	0	0
Harbor Blvd & Sunflower Ave	Harbor Blvd	Sunflower Ave	**30**	0.11	151	0	0	3	18	9	13	2	9	1	5	0	0	0	1	18	0	3	0	0
Newport Blvd & Industrial Way	Newport Blvd	Industrial Way	**29**	0.15	155	0	0	3	19	7	6	2	11	2	3	0	3	2	1	9	0	6	0	0
Bristol St & Baker St	Bristol St	Baker St	**29**	-0.03	139	0	0	4	14	11	7	4	12	3	2	0	1	0	1	12	0	4	0	0
Placentia Ave & Victoria St	Placentia Ave	Victoria St	**28**	0.06	311	0	1	6	12	9	8	4	6	2	3	0	1	4	3	11	0	5	0	0
Fairview Rd & Baker St	Fairview Rd	Baker St	**28**	-0.09	316	0	1	5	15	7	11	6	8	0	1	0	0	2	0	11	0	5	0	0
Fairview Rd & S Coast Dr	Fairview Rd	S Coast Dr	**27**	-0.07	142	0	0	4	15	8	11	2	8	1	2	0	2	1	1	14	0	3	0	0
Harbor Blvd & Mesa Verde Dr E	Harbor Blvd	Mesa Verde Dr E	**25**	0.23	158	0	0	9	9	7	5	6	4	0	2	0	1	6	1	8	0	3	0	0
Ave of the Arts & Anton Blvd	Ave of the Arts	Anton Blvd	**24**	0.87	173	0	0	8	14	2	10	3	0	7	3	0	0	1	2	4	0	1	0	0
Bristol St & Sunflower Ave	Bristol St	Sunflower Ave	**24**	0.16	267	0	1	4	8	11	6	4	8	1	4	0	0	2	1	11	0	3	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Deodar Ave & Baker St	Deodar Ave	Baker St	**23**	-0.11	138	0	0	5	13	5	9	2	8	1	2	0	1	1	1	10	0	4	0	0
Harbor Blvd & S Coast Dr	Harbor Blvd	S Coast Dr	**23**	0.14	138	0	0	4	15	4	11	4	5	0	1	0	1	1	1	15	0	1	0	0
Bristol St & Town Center Dr	Bristol St	Town Center Dr	**23**	-0.15	138	0	0	4	15	4	8	5	8	1	1	0	0	0	0	11	0	2	0	0
Pomona Ave & W 19th St	Pomona Ave	W 19th St	**21**	0.22	111	0	0	4	10	7	8	3	5	2	1	0	0	2	4	6	0	4	0	0
Fairview Rd & Fair Dr	Fairview Rd	Fair Dr	**21**	-0.04	124	0	0	8	5	8	6	0	7	1	3	0	1	3	1	12	0	3	0	1
Newport Blvd & E 16th St	Newport Blvd	E 16th St	**20**	-0.13	586	1	2	3	9	5	3	3	13	0	1	0	0	0	0	7	0	8	0	0
Harbor Blvd & Merrimac Way	Harbor Blvd	Merrimac Way	**20**	0.64	110	0	0	4	10	6	6	1	6	0	3	0	1	3	6	5	0	1	0	0
S Bear St & Sunflower Ave	S Bear St	Sunflower Ave	**20**	0.45	422	0	2	3	9	6	10	0	4	2	3	0	1	0	1	12	0	3	0	0
Harbor Blvd & Hamilton St	Harbor Blvd	Hamilton St	**19**	-0.03	292	0	1	6	10	2	11	1	3	0	2	0	0	2	1	10	0	5	0	0
Harbor Blvd & Fair Dr	Harbor Blvd	Fair Dr	**19**	0.12	109	0	0	4	10	5	6	2	6	0	3	0	0	2	3	5	0	3	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Ave of the Arts & Sunflower Ave	Ave of the Arts	Sunflower Ave	**19**	0.13	118	0	0	6	8	5	12	1	4	0	2	0	0	0	0	5	0	1	0	0
Anaheim Ave & W 19th St	Anaheim Ave	W 19th St	**17**	0.01	87	0	0	3	8	6	3	3	6	2	0	1	0	2	2	3	0	6	0	0
Pinecreek Dr & Adams Ave	Pinecreek Dr	Adams Ave	**17**	-0.03	404	0	2	3	6	6	5	1	3	1	5	0	0	2	0	4	0	4	0	0
Newport Blvd & Rochester St	Newport Blvd	Rochester St	**16**	-0.20	215	1	0	1	5	9	1	2	9	0	1	1	0	2	0	7	0	2	0	0
Placentia Ave & W 19th St	Placentia Ave	W 19th St	**16**	-0.08	100	0	0	6	5	5	3	4	5	1	1	0	1	1	2	3	0	3	0	0
Fairview Rd & W Wilson St	Fairview Rd	W Wilson St	**16**	0.81	76	0	0	3	6	7	5	1	4	0	5	0	0	1	1	6	0	4	0	0
Fairview Rd & Marrimac Way	Fairview Rd	Marrimac Way	**16**	-0.03	95	0	0	4	8	4	6	0	2	3	1	0	0	4	0	9	0	1	0	0
Bristol St & Paularino Ave	Bristol St	Paularino Ave	**16**	-0.15	85	0	0	4	6	6	6	1	4	0	3	0	0	2	1	5	0	5	0	0
Bear St & South Coast Dr	Bear St	South Coast Dr	**16**	0.60	71	0	0	1	9	6	6	2	5	1	1	0	0	1	0	8	0	3	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Sakioka Dr & Sunflower Ave	Sakioka Dr	Sunflower Ave	**16**	1.18	250	0	1	1	12	2	12	2	2	0	0	0	0	0	0	10	0	0	0	0
Fairview Rd & Sunflower Ave	Fairview Rd	Sunflower Ave	**16**	-0.16	85	0	0	4	6	6	4	3	8	0	1	0	0	0	0	11	0	1	0	0
MacArthur Blvd & Hyland Ave	MacArthur Blvd	Hyland Ave	**16**	0.16	105	0	0	5	8	3	8	1	2	2	3	0	0	0	0	7	0	2	0	0
S Harbor Blvd & MacArthur Blvd	S Harbor Blvd	MacArthur Blvd	**16**	-0.10	77	0	0	1	10	5	7	3	5	1	0	0	0	0	1	9	0	4	0	0
Superior Ave & 17th St	Superior Ave	17th St	**16**	-0.11	76	0	0	3	6	7	6	2	2	3	2	0	1	0	2	3	0	1	0	0
Placentia Ave & W 17th St	Placentia Ave	W 17th St	**15**	0.00	59	0	0	3	3	9	4	1	1	0	7	0	1	1	1	2	0	4	0	0
Fairview Rd & Arlington Dr	Fairview Rd	Arlington Dr	**14**	-0.08	98	0	0	6	5	3	7	2	2	0	1	1	1	0	3	9	0	0	0	0
Park Ave & W 19th St	Park Ave	W 19th St	**13**	-0.12	231	0	1	3	5	4	7	0	4	1	0	0	0	1	1	7	0	0	0	0
Vanguard Way & Fair Dr	Vanguard Way	Fair Dr	**13**	-0.06	58	0	0	2	5	6	3	1	3	1	4	0	0	1	0	5	0	0	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Red Hill Ave & Bristol St N	Red Hill Ave	Bristol St N	**13**	0.33	226	0	1	3	4	5	2	3	4	0	2	0	0	1	2	2	0	4	0	0
Harbor Blvd & Nutmeg Pl	Harbor Blvd	Nutmeg Pl	**13**	0.05	242	0	1	2	9	1	2	2	5	0	1	0	0	3	0	5	0	1	0	0
Harbor Blvd & W Lake Center Dr	Harbor Blvd	W Lake Center Dr	**13**	-0.05	68	0	0	1	9	3	3	0	9	0	1	0	0	0	0	9	0	2	0	0
Irvine Ave & E 17th St	Irvine Ave	E 17th St	**12**	-0.18	76	0	0	4	5	3	4	0	6	0	1	0	1	0	2	5	0	1	0	0
Tustin Ave & E 17th St	Tustin Ave	E 17th St	**12**	-0.17	72	0	0	3	6	3	4	1	4	1	1	0	1	0	1	4	0	2	0	0
Orange Ave & E 17th St	Orange Ave	E 17th St	**12**	-0.17	221	1	0	0	9	2	3	1	4	0	2	0	1	1	0	6	0	2	0	0
Placentia Ave & W 18th St	Placentia Ave	W 18th St	**12**	-0.08	72	0	0	3	6	3	4	3	3	0	0	0	1	2	0	4	0	2	0	0
Meyer Pl & W 19th St	Meyer Pl	W 19th St	**12**	0.06	211	0	1	1	5	5	4	0	5	1	2	0	0	0	2	5	0	2	0	0
Canyon Dr & Victoria St	Canyon Dr	Victoria St	**12**	-0.08	240	1	0	4	5	2	7	0	2	0	1	1	1	0	2	1	0	3	0	0
Santa Ana Ave & Mesa Dr	Santa Ana Ave	Mesa Dr	**12**	0.01	221	1	0	1	7	3	8	0	0	3	1	0	0	0	1	5	0	3	0	0
Fairview Rd & Monitor Way	Fairview Rd	Monitor Way	**12**	0.05	61	0	0	3	4	5	3	1	4	1	3	0	0	0	1	4	0	3	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Bristol St & Randolph Ave	Bristol St	Randolph Ave	**12**	-0.09	71	0	0	4	4	4	7	1	2	1	0	1	0	0	0	5	0	3	0	0
Bear St & Baker St	Bear St	Baker St	**12**	-0.19	86	0	0	5	5	2	2	2	6	0	1	0	0	1	1	3	0	2	0	0
Bear St & Yukon Ave	Bear St	Yukon Ave	**12**	-0.14	76	0	0	5	3	4	4	2	2	1	3	0	0	0	0	7	0	0	0	0
Sakioka Dr & Anton Blvd	Sakioka Dr	Anton Blvd	**12**	0.00	77	0	0	3	7	2	7	1	1	2	1	0	0	0	0	0	0	1	0	0
Wallace Ave & W 19th St	Wallace Ave	W 19th St	**11**	0.08	215	0	1	1	6	3	2	0	3	0	0	0	2	4	1	3	0	0	0	0
Valley Rd & Victoria Pl	Valley Rd	Victoria Pl	**11**	-0.15	551	1	2	3	4	1	1	1	4	2	2	0	0	2	0	5	0	1	0	0
National Ave & Governor St	National Ave	Governor St	**11**	-0.01	85	0	0	5	5	1	3	0	5	0	1	0	1	1	2	6	0	1	0	0
Fairview Rd & Paularino Ave	Fairview Rd	Paularino Ave	**11**	-0.09	71	0	0	2	8	1	5	0	4	0	1	0	0	1	1	6	0	2	0	0
Date Pl & Harbor Blvd	Date Pl	Harbor Blvd	**11**	-0.16	66	0	0	2	7	2	2	0	7	0	1	1	0	0	0	6	0	2	0	0
Bear St & Town Center Dr	Bear St	Town Center Dr	**11**	0.09	65	0	0	4	3	4	8	1	0	1	1	0	0	0	0	9	0	1	0	0
Santa Ana Ave & E 17th St	Santa Ana Ave	E 17th St	**10**	-0.23	44	0	0	3	1	6	6	0	2	0	1	0	1	0	0	3	0	2	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Placentia Ave & W Wilson St	Placentia Ave	W Wilson St	**10**	-0.15	40	0	0	0	6	4	2	0	5	2	1	0	0	0	0	5	0	1	0	0
Bear St & Bristol St	Bear St	Bristol St	**10**	-0.18	49	0	0	3	2	5	1	2	4	1	1	1	0	0	0	3	0	3	0	0
Red Hill Ave & Paularino Ave	Red Hill Ave	Paularino Ave	**10**	-0.14	224	0	1	2	6	1	9	0	1	0	0	0	0	0	0	8	0	1	0	0
Westminster Ave & E 17th St	Westminster Ave	E 17th St	**9**	-0.20	44	0	0	1	5	3	1	3	3	0	1	0	0	1	1	3	0	1	0	0
Red Hill Ave & Baker St E	Red Hill Ave	Baker St E	**9**	-0.17	222	1	0	4	2	2	5	0	2	1	1	0	0	0	0	5	0	3	0	0
City Hall & Fair Dr	City Hall	Fair Dr	**9**	-0.15	58	0	0	3	4	2	0	3	5	0	1	0	0	0	0	5	0	1	0	0
Randolph Ave & Baker St	Randolph Ave	Baker St	**9**	-0.16	376	1	1	3	2	2	6	1	1	0	1	0	0	0	1	0	0	4	0	0
South Coast Dr & Susan St	South Coast Dr	Susan St	**8**	-0.13	216	0	1	2	5	0	5	0	0	1	2	0	0	0	0	4	0	1	0	0
Harbor Blvd & Harbor Center	Harbor Blvd	Harbor Center	**8**	-0.23	197	0	1	1	3	3	4	0	1	1	1	1	0	0	0	6	0	2	0	0
Mesa Verde Dr W & Adams Ave	Mesa Verde Dr W	Adams Ave	**7**	-0.24	42	0	0	1	5	1	3	0	3	0	1	0	0	0	3	3	0	0	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Red Hill Ave & Kalmus Dr	Red Hill Ave	Kalmus Dr	**7**	-0.20	51	0	0	3	3	1	5	0	1	0	0	0	1	0	0	3	0	1	0	0
Bear St & Metro Pointe E	Bear St	Metro Pointe E	**7**	-0.21	46	0	0	3	2	2	4	2	1	0	0	0	0	0	0	4	0	1	0	0
Jian Way & Paularino Ave	Jian Way	Paularino Ave	**7**	-0.16	51	0	0	3	3	1	5	0	0	0	0	0	0	2	0	4	0	0	0	0
Fairview Rd & Costa Mesa High School	Fairview Rd	Costa Mesa High School	**6**	-0.18	26	0	0	1	2	3	1	0	1	0	4	0	0	0	0	3	0	1	0	0
Shantar Dr & Adams Ave	Shantar Dr	Adams Ave	**6**	-0.21	40	0	0	3	1	2	1	0	1	0	3	0	1	0	1	3	0	0	0	0
Royal Palm Dr & Adams Ave	Royal Palm Dr	Adams Ave	**6**	-0.25	41	0	0	2	3	1	3	1	2	0	0	0	0	0	0	3	0	0	0	0
Sunflower Ave & Anton Blvd	Sunflow er Ave	Anton Blvd	**6**	-0.22	36	0	0	1	4	1	3	0	2	0	1	0	0	0	0	1	0	1	0	0
Susan St & Sunflower Ave	Susan St	Sunflower Ave	**6**	0.03	200	1	0	1	4	0	5	0	0	0	0	0	0	1	0	0	0	0	0	0
Coolidge Ave & Baker St	Coolidge Ave	Baker St	**6**	-0.24	195	0	1	1	3	1	1	1	2	0	0	0	0	2	1	4	0	0	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Placentia Ave & 16th St	Placentia Ave	16th St	**5**	-0.22	203	0	1	3	1	0	3	0	0	0	0	0	1	1	1	1	0	0	0	0
Superior Ave & W 16th St	Superior Ave	W 16th St	**5**	-0.26	30	0	0	1	3	1	2	2	1	0	0	0	0	0	0	1	0	0	0	0
Newport Blvd & Fair Dr	Newport Blvd	Fair Dr	**5**	-0.26	25	0	0	1	2	2	3	0	2	0	0	0	0	0	0	1	0	2	0	0
Mendoza Dr & Baker St	Mendoza Dr	Baker St	**5**	-0.22	40	0	0	2	3	0	2	0	2	0	0	0	1	0	1	2	0	1	0	0
Lombard Ct & Baker St	Lombard Ct	Baker St	**5**	-0.26	15	0	0	0	2	3	3	0	0	1	1	0	0	0	0	0	0	1	0	0
Bristol St & Hotel Way	Bristol St	Hotel Way	**5**	-0.27	35	0	0	2	2	1	2	2	1	0	0	0	0	0	0	3	0	0	0	0
S Raitt St & Sunflower Ave	S Raitt St	Sunflower Ave	**5**	-0.24	30	0	0	1	3	1	3	1	0	1	0	0	0	0	0	3	0	0	0	0
Fairview Rd & Village Way	Fairview Rd	Village Way	**5**	-0.26	179	1	0	0	2	2	3	1	1	0	0	0	0	0	0	1	0	2	0	0
Harbor Blvd & W Bay St	Harbor Blvd	W Bay St	**4**	-0.28	14	0	0	0	2	2	1	0	3	0	0	0	0	0	0	1	0	3	0	0
22nd St & Newport Blvd	22nd St	Newport Blvd	**4**	-0.27	24	0	0	1	2	1	1	1	2	0	0	0	0	0	0	2	0	1	0	0
Placentia Ave & Joann St	Placentia Ave	Joann St	**4**	-0.24	23	0	0	2	0	2	1	0	1	0	1	0	1	0	1	3	0	1	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Newport Blvd & Del Mar Ave	Newport Blvd	Del Mar Ave	**4**	-0.28	14	0	0	0	2	2	2	0	1	0	1	0	0	0	0	2	0	0	0	0
College Ave & Baker St	College Ave	Baker St	**4**	-0.28	29	0	0	1	3	0	1	1	2	0	0	0	0	0	0	3	0	0	0	0
Fairview Rd & McCormack Ln	Fairview Rd	McCormack Ln	**4**	-0.27	19	0	0	0	3	1	2	0	1	0	0	1	0	0	0	4	0	0	0	0
W Stevens Ave & Sunflower Ave	W Stevens Ave	Sunflower Ave	**4**	-0.27	34	0	0	2	2	0	1	0	2	1	0	0	0	0	0	2	0	1	0	0
Center Way & Wilson St	Center Way	Wilson St	**4**	-0.23	183	0	1	0	3	0	2	0	1	0	0	0	0	1	0	1	0	0	0	0
Newport Blvd & SE Bristol St	Newport Blvd	SE Bristol St	**4**	-0.27	19	0	0	1	1	2	1	0	1	0	2	0	0	0	0	0	0	3	0	0
Maple St & Victoria St	Maple St	Victoria St	**3**	-0.29	172	0	1	0	1	1	1	0	1	0	0	0	1	0	0	1	0	1	0	0
Royal Palm Dr & Corsica Pl	Royal Palm Dr	Corsica Pl	**3**	-0.29	13	0	0	0	2	1	0	1	1	1	0	0	0	0	0	1	0	1	0	0
S Greenville St & Sunflower Ave	S Greenville St	Sunflower Ave	**3**	1.68	3	0	0	0	0	3	1	0	1	1	0	0	0	0	0	2	0	1	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Orange County Model Engineers & Placentia Ave	Orange County Model Engineers	Placentia Ave	**3**	-0.28	8	0	0	0	1	2	0	0	0	0	3	0	0	0	0	1	0	1	0	0
Unsignalized Intersections																								
Harbor Blvd & Village Way	Harbor Blvd	Village Way	**19**	0.2	114	0	0	3	13	3	9	2	4	1	1	1	0	1	1	3	0	0	0	0
Harbor Blvd & Mesa Verde Center	Harbor Blvd	Mesa Verde Center	**15**	0.2	268	0	1	5	8	1	3	1	6	0	3	1	1	0	0	6	0	0	0	0
Thurin Ave & Victoria St	Thurin Ave	Victoria St	**13**	0.1	241	0	1	3	7	2	5	1	3	2	1	0	0	1	0	2	0	1	0	0
Placentia Ave & Hamilton St	Placentia Ave	Hamilton St	**12**	0.1	67	0	0	1	9	2	5	1	2	2	2	0	0	0	1	1	0	5	0	0
Pomona Ave & Hamilton St	Pomona Ave	Hamilton St	**12**	0.5	51	0	0	3	2	7	4	1	2	1	2	1	0	1	0	4	0	3	1	0
Harbor Blvd & Shopping Ctr Entrance n/o of Wilson St	Harbor Blvd	Shopping Ctr Entrance n/o of Wilson St	**12**	0.2	47	0	0	1	5	6	1	5	4	0	1	1	0	0	2	1	0	5	1	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Monrovia Ave & W 19th St	Monrovia Ave	W 19th St	**11**	0.2	228	0	1	5	1	4	4	4	2	0	1	0	0	0	2	2	0	7	0	0
Harbor Blvd & Bernard St	Harbor Blvd	Bernard St	**11**	0.1	219	0	1	2	5	3	4	2	1	1	1	0	1	1	0	1	0	2	0	0
Red Hill Ave & Clinton St	Red Hill Ave	Clinton St	**10**	0.2	65	0	0	2	7	1	8	0	0	1	1	0	0	0	0	0	0	1	0	0
Enterprise St & Baker St	Enterprise St	Baker St	**10**	0.0	70	0	0	2	8	0	8	1	1	0	0	0	0	0	0	0	0	0	0	0
Pomona Ave & W 17th St	Pomona Ave	W 17th St	**9**	0.09	64	0	0	3	5	1	4	0	3	1	0	0	0	1	2	4	0	2	0	0
Pomona Ave & W 18th St	Pomona Ave	W 18th St	**9**	0.15	54	0	0	2	5	2	5	3	0	0	0	0	1	0	3	4	0	1	0	0
Parsons St & Victoria St	Parsons St	Victoria St	**9**	0.04	58	0	0	4	2	3	4	1	2	0	0	0	2	0	2	0	0	3	0	0
Harbor Blvd & Princeton Dr	Harbor Blvd	Princeton Dr	**9**	0.71	222	0	1	3	4	1	1	0	6	0	2	0	0	0	0	5	0	1	0	0
Round Table Pizza & Baker St	Round Table Pizza	Baker St	**8**	0.01	53	0	0	2	5	1	6	1	1	0	0	0	0	0	2	2	0	0	0	0
Harbor Blvd & Fairfax Dr	Harbor Blvd	Fairfax Dr	**7**	0.00	42	0	0	2	3	2	1	0	2	1	1	0	1	1	2	1	0	0	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Placentia Ave & W 20th St	Placentia Ave	W 20th St	**7**	0.01	32	0	0	0	5	2	3	0	3	0	1	0	0	0	0	3	0	0	0	0
Victoria St & Westward Ln	Victoria St	Westward Ln	**7**	0.09	46	0	0	3	2	2	2	0	0	0	4	0	1	0	2	2	0	3	0	0
Victoria St & Alley east of Myran Dr	Victoria St	Alley east of Myran Dr	**7**	-0.01	56	0	0	3	4	0	1	0	6	0	0	0	0	0	0	6	0	0	0	0
College Ave & W Wilson St	College Ave	W Wilson St	**7**	0.05	42	0	0	2	3	2	3	0	4	0	0	0	0	0	0	2	0	2	0	0
Red Hill Ave & Fischer Ave	Red Hill Ave	Fischer Ave	**7**	0.02	61	0	0	4	3	0	4	0	0	0	2	1	0	1	2	0	0	0	0	0
Grace Ln & Baker St	Grace Ln	Baker St	**7**	0.00	32	0	0	0	5	2	3	1	2	0	1	0	0	0	0	2	0	1	0	0
Fairview Rd & Belfast Ave	Fairview Rd	Belfast Ave	**7**	0.03	47	0	0	2	4	1	3	1	2	0	0	0	1	0	0	2	0	1	0	0
Fairview Rd & Drivewway s/o Coast Dr	Fairview Rd	Drivewway s/o Coast Dr	**7**	-0.04	37	0	0	1	4	2	0	1	5	0	0	0	0	1	1	5	0	0	0	0
Smalley Rd & Sunflower Ave	Smalley Rd	Sunflower Ave	**7**	0.08	42	0	0	2	3	2	2	2	0	1	2	0	0	0	0	1	0	2	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Santa Ana Ave & E 19th St	Santa Ana Ave	E 19th St	**6**	0.08	40	0	0	3	1	2	4	1	0	0	1	0	0	0	0	3	0	2	0	0
Anaheim Ave & Center St	Anaheim Ave	Center St	**6**	1.69	30	0	0	2	1	3	2	2	1	0	1	0	0	0	1	3	0	1	0	0
Harbor Blvd & Mall Entrance n/o Ford Rd	Harbor Blvd	Mall Entrance n/o Ford Rd	**6**	-0.02	180	0	1	0	2	3	2	0	1	0	3	0	0	0	0	0	0	3	1	0
Orange Ave & 22nd St	Orange Ave	22nd St	**6**	0.03	26	0	0	1	2	3	1	1	2	1	0	0	1	0	1	3	0	1	0	0
Placentia Ave & Joann St	Placentia Ave	Joann St	**6**	0.09	26	0	0	1	2	3	2	0	1	1	2	0	0	0	1	3	0	0	0	0
Mall Entrance s/o of Harbor Center & Harbor Blvd	Mall Entrance s/o of Harbor Center	Harbor Blvd	**6**	0.01	26	0	0	0	4	2	2	2	0	1	1	0	0	0	0	1	0	1	0	0
Santa Ana Ave & del Mar Ave	Santa Ana Ave	del Mar Ave	**6**	0.10	41	0	0	1	5	0	3	0	3	0	0	0	0	0	1	2	0	1	0	0
Merrimac Way & Mall Entrance n/o Merrimac Way	Merrimac Way	Mall Entrance n/o Merrimac Way	**6**	0.35	36	0	0	2	2	2	1	2	0	0	2	0	1	0	1	0	0	1	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Fairview Rd & Mall Rd s/o Baker St	Fairview Rd	Mall Rd s/o Baker St	**6**	-0.05	185	1	0	0	3	2	4	1	0	0	0	0	0	1	0	0	0	0	0	0
Mall Entrance w/o Harbor Blvd & Gisler Ave	Mall Entrance w/o Harbor Blvd	Gisler Ave	**6**	0.53	343	0	2	0	2	2	2	1	1	0	2	0	0	0	0	1	0	1	0	0
Santa Ana Ave & Cabrillo St	Santa Ana Ave	Cabrillo St	**5**	-0.05	35	0	0	2	2	1	0	1	0	1	1	1	0	1	1	1	0	1	0	0
Anaheim Ave & Terminal Way	Anaheim Ave	Terminal Way	**5**	1.32	30	0	0	1	3	1	2	0	2	1	0	0	0	0	2	0	0	2	0	0
Monrovia Ave & W 18th St	Monrovia Ave	W 18th St	**5**	0.01	24	0	0	2	0	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0
Orange Ave & E 19th St	Orange Ave	E 19th St	**5**	0.00	20	0	0	1	1	3	2	0	0	0	2	0	0	1	0	2	0	1	0	0
Placentia Ave & Center St	Placentia Ave	Center St	**5**	0.14	189	0	1	1	2	1	2	0	0	1	1	0	0	1	0	0	0	0	0	0
Fullerton Ave & E 19th St	Fullerton Ave	E 19th St	**5**	0.05	10	0	0	0	1	4	1	3	1	0	0	0	0	0	0	2	0	2	0	0
Sterling Ave & W 19th St	Sterling Ave	W 19th St	**5**	0.06	10	0	0	0	1	4	1	0	1	0	2	0	1	0	0	1	0	2	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Maple Ave & W 19th St	Maple Ave	W 19th St	**5**	-0.05	15	0	0	0	2	3	3	0	0	1	0	0	0	1	0	0	0	1	0	1
Harbor Blvd & Ford Rd	Harbor Blvd	Ford Rd	**5**	-0.04	29	0	0	2	1	2	2	3	0	0	0	0	0	0	0	1	0	0	0	0
Pomona Ave & W 20th St	Pomona Ave	W 20th St	**5**	0.12	29	0	0	2	1	2	0	2	3	0	0	0	0	0	0	0	0	3	1	0
Santa Ana Ave & 22nd St	Santa Ana Ave	22nd St	**5**	0.03	25	0	0	1	2	2	2	0	2	1	0	0	0	0	0	1	0	1	0	0
Parsons St & W Bay St	Parsons St	W Bay St	**5**	1.32	25	0	0	1	2	2	2	0	1	0	0	0	1	1	1	0	0	1	0	0
Victoria St & Unnamed Rd e/o of Placentia Ave	Victoria St	Unnamed Rd e/o of Placentia Ave	**5**	-0.04	25	0	0	0	4	1	0	0	3	0	1	0	1	0	0	2	0	1	0	0
Continental Ave & Victoria St	Continental Ave	Victoria St	**5**	0.01	30	0	0	1	3	1	0	1	4	0	0	0	0	0	0	4	0	0	0	0
Doctors Cir & Victoria St	Doctors Cir	Victoria St	**5**	-0.04	30	0	0	1	3	1	2	0	2	0	1	0	0	0	0	2	0	0	0	0
Harbor Blvd & Entrance Rd s/o of Fair Dr	Harbor Blvd	Entrance Rd s/o of Fair Dr	**5**	-0.02	25	0	0	0	4	1	2	1	2	0	0	0	0	0	0	2	0	0	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Harbor Blvd & Access Rd e/o Fair Dr	Harbor Blvd	Access Rd e/o Fair Dr	**5**	0.28	20	0	0	0	3	2	0	1	3	0	1	0	0	0	0	3	0	1	0	0
Placentia Ave & Swan Cir	Placentia Ave	Swan Cir	**5**	0.04	35	0	0	2	2	1	1	0	0	0	3	1	0	0	1	2	0	2	0	0
Red Hill Ave & Lear Ave	Red Hill Ave	Lear Ave	**5**	0.01	30	0	0	0	5	0	3	0	0	1	1	0	0	0	0	1	0	1	0	0
Access road east of Royal Palm Drive & Adams Ave	Access road east of Royal Palm Drive	Adams Ave	**5**	-0.05	25	0	0	0	4	1	2	0	2	0	0	0	1	0	1	2	0	0	0	0
Harbor Blvd & Ponderosa St	Harbor Blvd	Ponderosa St	**5**	-0.04	29	0	0	2	1	2	2	1	2	0	0	0	0	0	0	2	0	0	0	0
Fairview Rd & Access Rd	Fairview Rd	Access Rd	**5**	-0.02	15	0	0	1	0	4	2	3	0	0	0	0	0	0	1	0	0	1	0	0
Harbor Blvd & Dale Way	Harbor Blvd	Dale Way	**5**	-0.06	20	0	0	1	1	3	2	1	2	0	0	0	0	0	1	2	0	0	0	0
McClintock Way & Baker St	McClintock Way	Baker St	**5**	0.05	25	0	0	1	2	2	4	0	0	1	0	0	0	0	0	0	0	1	0	0
Fairview Rd & Dorset Ln	Fairview Rd	Dorset Ln	**5**	-0.02	25	0	0	1	2	2	2	1	2	0	0	0	0	0	0	2	0	0	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
S Main St & Sunflower Ave	S Main St	Sunflower Ave	**5**	-0.05	30	0	0	1	3	1	2	0	2	0	0	0	0	1	1	2	0	0	0	0
Harbor Blvd & Access Rd n/o of Sunflower Ave	Harbor Blvd	Access Rd n/o of Sunflower Ave	**5**	-0.02	35	0	0	2	2	1	2	0	2	0	1	0	0	0	0	2	0	0	0	0
Orange Ave & Cabrillo St	Orange Ave	Cabrillo St	**4**	0.04	29	0	0	1	3	0	3	0	0	0	0	0	0	1	0	1	0	1	0	0
Monrovia Ave & Sunset Dr	Monrovia Ave	Sunset Dr	**4**	0.05	19	0	0	0	3	1	3	0	1	0	0	0	0	0	0	0	0	1	0	0
Orange Ave & Broadway	Orange Ave	Broadway	**4**	0.04	9	0	0	0	1	3	2	0	1	1	0	0	0	0	0	2	0	0	1	0
Anaheim Ave & W 18th St	Anaheim Ave	W 18th St	**4**	0.04	19	0	0	0	3	1	3	1	0	0	0	0	0	0	0	2	0	0	1	0
Orange Ave & Flower St	Orange Ave	Flower St	**4**	0.04	29	0	0	1	3	0	3	1	0	0	0	0	0	0	1	0	0	2	0	0
Monrovia Ave & Center St	Monrovia Ave	Center St	**4**	0.05	34	0	0	2	2	0	2	1	0	0	0	1	0	0	0	1	0	1	0	0
Pomona Ave & Plumer St	Pomona Ave	Plumer St	**4**	0.05	24	0	0	1	2	1	2	0	1	0	1	0	0	0	0	2	0	0	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Anaheim Ave & Plumer St	Anaheim Ave	Plumer St	**4**	0.96	24	0	0	1	2	1	2	1	0	0	0	0	0	1	1	0	0	0	0	0
Maple Ave & Bernard St	Maple Ave	Bernard St	**4**	3.32	14	0	0	1	0	3	1	1	0	0	1	0	0	1	0	0	0	1	0	0
Charle St & Access road n/o Bernard St	Charle St	Access road n/o Bernard St	**4**	0.96	24	0	0	1	2	1	2	1	0	1	0	0	0	0	0	0	0	1	0	0
Maple Ave & Yorkshire St	Maple Ave	Yorkshire St	**4**	0.96	23	0	0	2	0	2	2	0	0	1	0	0	1	0	0	0	0	3	0	0
Harbor Blvd & Access road s/o of W Bay St	Harbor Blvd	Access road s/o of W Bay St	**4**	-0.06	19	0	0	0	3	1	0	0	3	1	0	0	0	0	0	3	0	0	0	0
Maple Ave & Hamilton St	Maple Ave	Hamilton St	**4**	0.96	24	0	0	1	2	1	2	1	1	0	0	0	0	0	0	1	0	1	0	0
Palmilla Ct & Victoria St	Palmilla Ct	Victoria St	**4**	-0.06	24	0	0	1	2	1	0	1	2	0	1	0	0	0	1	1	0	1	0	0
Newport Blvd & Victoria St	Newport Blvd	Victoria St	**4**	-0.06	9	0	0	0	1	3	0	2	1	0	1	0	0	0	0	1	0	0	0	0
Orange Ave & Santa Isabel Ave	Orange Ave	Santa Isabel Ave	**4**	-0.03	19	0	0	1	1	2	1	1	2	0	0	0	0	0	0	1	0	0	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Fountain Way W & W Wilson St	Fountain Way W	W Wilson St	**4**	-0.03	24	0	0	1	2	1	1	0	2	0	0	1	0	0	0	2	0	1	0	0
Westminster Pl & del Mar Ave	Westminster Pl	del Mar Ave	**4**	0.12	19	0	0	1	1	2	2	1	0	0	1	0	0	0	0	1	0	2	0	0
Carnegie Ave & Fair Dr	Carnegie Ave	Fair Dr	**4**	-0.01	34	0	0	2	2	0	2	0	0	0	2	0	0	0	0	1	0	1	0	0
Harla Ave & Mesa Verde Dr E	Harla Ave	Mesa Verde Dr E	**4**	0.02	28	0	0	2	1	1	2	1	0	0	0	0	0	1	1	0	0	0	0	0
Peterson Pl & Adams Ave	Peterson Pl	Adams Ave	**4**	-0.01	38	0	0	3	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0
Donnybrook Ln & Baker St	Donnybrook Ln	Baker St	**4**	-0.05	331	0	2	0	0	2	0	0	0	1	2	0	1	0	0	0	0	1	0	0
Coolidge Ave & Baker St	Coolidge Ave	Baker St	**4**	-0.06	19	0	0	0	3	1	1	0	1	2	0	0	0	0	0	1	0	0	0	0
Labrador Dr & Baker St	Labrador Dr	Baker St	**4**	0.03	9	0	0	0	1	3	2	0	1	0	1	0	0	0	1	1	0	2	0	0
Century Pl & Baker St	Century Pl	Baker St	**4**	-0.05	34	0	0	2	2	0	1	0	0	2	0	0	0	1	1	0	0	0	0	0
Bray Ln & McCormack Ln	Bray Ln	McCormack Ln	**4**	0.96	178	0	1	0	2	1	0	2	1	0	0	1	0	0	0	1	0	1	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Greenbrook Dr & S Coast Dr	Greenbrook Dr	S Coast Dr	**4**	-0.03	33	0	0	3	0	1	2	0	0	0	2	0	0	0	0	0	0	1	0	0
Hyland Ave & S Coast Dr	Hyland Ave	S Coast Dr	**4**	0.04	34	0	0	2	2	0	1	1	1	0	1	0	0	0	0	1	0	1	0	0
Raymond Ave & E 17th St	Raymond Ave	E 17th St	**3**	-0.08	18	0	0	1	1	1	0	2	0	0	0	1	0	0	0	1	0	0	0	0
Orange Ave & Ogle St	Orange Ave	Ogle St	**3**	-0.01	13	0	0	1	0	2	0	1	1	0	0	0	0	1	0	0	0	1	0	0
Tustin Ave & Broadway	Tustin Ave	Broadway	**3**	-0.02	13	0	0	1	0	2	2	0	0	0	0	0	1	0	1	1	0	0	0	0
Santa Ana Ave & E 18th St	Santa Ana Ave	E 18th St	**3**	-0.08	13	0	0	0	2	1	1	1	1	0	0	0	0	0	0	2	0	0	0	0
Fullerton Ave & E 17th St	Fullerton Ave	E 17th St	**3**	-0.07	13	0	0	0	2	1	1	0	1	0	1	0	0	0	0	1	0	0	0	0
Superior Ave & W 17th St	Superior Ave	W 17th St	**3**	-0.02	18	0	0	1	1	1	1	0	0	0	1	0	0	0	1	0	0	0	0	0
Tustin Ave & E 19th St	Tustin Ave	E 19th St	**3**	-0.05	22	0	0	2	0	1	0	0	0	0	1	1	0	1	0	0	0	0	0	0
Orange Ave & Rochester St	Orange Ave	Rochester St	**3**	-0.02	8	0	0	0	1	2	1	0	2	0	0	0	0	0	0	0	0	1	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Kenwood Pl & Shalimar Dr	Kenwood Pl	Shalimar Dr	**3**	0.59	3	0	0	0	0	3	0	2	1	0	0	0	0	0	0	1	0	1	0	0
Wallace Ave & James St	Wallace Ave	James St	**3**	0.59	13	0	0	1	0	2	2	1	0	0	0	0	0	0	1	0	0	1	0	0
Orange Ave & Magnolia St	Orange Ave	Magnolia St	**3**	-0.02	22	0	0	2	0	1	1	0	2	0	0	0	0	0	0	0	0	2	0	0
Crestmont Pl & W 18th St	Crestmont Pl	W 18th St	**3**	-0.01	3	0	0	0	0	3	0	1	2	0	0	0	0	0	0	1	0	0	0	0
Park Pl & W 18th St	Park Pl	W 18th St	**3**	-0.01	13	0	0	0	2	1	1	0	1	0	1	0	0	0	0	1	0	1	0	0
Monrovia Ave & Towne St	Monrovia Ave	Towne St	**3**	-0.01	8	0	0	0	1	2	0	2	0	0	1	0	0	0	0	0	0	1	0	0
Fullerton Ave & Flower St	Fullerton Ave	Flower St	**3**	0.40	18	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	2	0	0
Orange Ave & Costa Mesa St	Orange Ave	Costa Mesa St	**3**	-0.02	13	0	0	1	0	2	1	0	1	0	0	0	0	1	0	0	0	1	1	0
Santa Ana Ave & Robin Hood Ln	Santa Ana Ave	Robin Hood Ln	**3**	0.59	13	0	0	1	0	2	0	1	2	0	0	0	0	0	0	0	0	2	0	0
Orange Ave & E 20th St	Orange Ave	E 20th St	**3**	-0.02	18	0	0	1	1	1	1	1	0	1	0	0	0	0	0	1	0	2	1	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Pomona Ave & Access Rd n/o W 19th St	Pomona Ave	Access Rd n/o W 19th St	**3**	-0.02	27	0	0	2	1	0	0	1	2	0	0	0	0	0	0	2	0	0	0	0
Santa Ana Ave & E 21st St	Santa Ana Ave	E 21st St	**3**	-0.01	13	0	0	1	0	2	0	1	0	1	1	0	0	0	0	1	0	1	0	0
la Costa Ct & Access Rd	la Costa Ct	Access Rd	**3**	0.59	176	0	1	1	0	1	0	1	0	1	1	0	0	0	0	0	0	1	0	0
Placentia Ave & W Place Dr	Placenti a Ave	W Place Dr	**3**	-0.07	13	0	0	0	2	1	0	0	2	0	1	0	0	0	0	2	0	1	0	0
Placentia Ave & Access Road n/o of W Place Dr	Placenti a Ave	Access Road n/o of W Place Dr	**3**	-0.07	23	0	0	1	2	0	0	1	2	0	0	0	0	0	0	2	0	0	0	0
Maple Ave & Knowell Pl	Maple Ave	Knowell Pl	**3**	0.59	167	0	1	0	0	2	0	0	1	0	2	0	0	0	1	1	0	0	0	0
Charle St & Hamilton Community Garden Entrance	Charle St	Hamilton Communit y Garden Entrance	**3**	0.59	8	0	0	0	1	2	1	0	0	0	0	0	2	0	1	1	0	0	0	0
Meyer Pl & Hamilton St	Meyer Pl	Hamilton St	**3**	0.59	8	0	0	0	1	2	0	1	2	0	0	0	0	0	0	2	0	0	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Rural Ln & 22nd St	Rural Ln	22nd St	**3**	-0.05	27	0	0	2	1	0	1	0	1	0	1	0	0	0	1	2	0	1	0	0
Newport Blvd & Virginia Pl	Newport Blvd	Virginia Pl	**3**	-0.05	23	0	0	1	2	0	1	0	2	0	0	0	0	0	0	2	0	0	0	0
Pomona Ave & Governor St	Pomona Ave	Governor St	**3**	-0.01	8	0	0	0	1	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0
Orange Ave & E Wilson St	Orange Ave	E Wilson St	**3**	-0.02	13	0	0	1	0	2	0	0	2	0	1	0	0	0	0	2	0	1	0	0
Harbor Blvd & Access Rd n/o of Victoria St	Harbor Blvd	Access Rd n/o of Victoria St	**3**	-0.08	13	0	0	0	2	1	0	1	1	0	0	0	0	1	0	1	0	0	0	0
Harbor Blvd & Tradewinds Mobile Home Park	Harbor Blvd	Tradewinds Mobile Home Park	**3**	0.59	340	0	2	1	0	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0
Fordham Dr & W Wilson St	Fordham Dr	W Wilson St	**3**	-0.07	18	0	0	0	3	0	1	1	1	0	0	0	0	0	0	1	0	1	0	0
Access Rd n/o of Joann St & Joann St	Access Rd n/o of Joann St	Joann St	**3**	-0.04	8	0	0	0	1	2	1	0	0	0	2	0	0	0	0	0	0	2	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Elden Ave & Alleyway n/o of Monte Verde Ave	Elden Ave	Alleyway n/o of Monte Verde Ave	**3**	0.59	8	0	0	0	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Orange Ave & del Mar Ave	Orange Ave	del Mar Ave	**3**	-0.06	13	0	0	0	2	1	1	0	1	1	0	0	0	0	0	2	0	1	0	0
Elden Ave & Mesa Dr	Elden Ave	Mesa Dr	**3**	-0.01	8	0	0	0	1	2	0	0	2	0	1	0	0	0	0	0	0	1	0	0
Fairview Rd & Princeton Dr	Fairview Rd	Princeton Dr	**3**	-0.04	18	0	0	0	3	0	2	0	1	0	0	0	0	0	1	1	0	0	0	0
Merrimac Way & Mall Entrance w/o Fairview Rd	Merrimac Way	Mall Entrance w/o Fairview Rd	**3**	-0.02	18	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Bristol St N & Access Rd w/o of Red Hill Ave	Bristol St N	Access Rd w/o of Red Hill Ave	**3**	-0.07	23	0	0	1	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Tern Cir & Oriole Dr	Tern Cir	Oriole Dr	**3**	-0.05	8	0	0	0	1	2	0	0	0	0	3	0	0	0	0	2	0	0	0	0
Elm Ave & Adams Ave	Elm Ave	Adams Ave	**3**	-0.08	23	0	0	1	2	0	0	0	2	0	1	0	0	0	0	2	0	0	0	0
Mendoza Dr & el Camino Dr	Mendoza Dr	el Camino Dr	**3**	-0.02	13	0	0	0	2	1	2	0	0	0	0	0	0	1	0	1	0	1	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Miguel Ln & Mission Dr	Miguel Ln	Mission Dr	**3**	0.59	3	0	0	0	0	3	0	1	1	0	1	0	0	0	0	1	0	1	0	0
Jeffrey Dr & Baker St	Jeffrey Dr	Baker St	**3**	-0.07	13	0	0	0	2	1	1	1	1	0	0	0	0	0	0	1	0	0	0	0
Babb St & Van Ness Ct	Babb St	Van Ness Ct	**3**	0.59	3	0	0	0	0	3	0	2	1	0	0	0	0	0	0	1	0	1	0	0
Bear St & SR-73 Ramp	Bear St	SR-73 Ramp	**3**	-0.08	23	0	0	1	2	0	2	0	0	0	1	0	0	0	0	1	0	0	0	0
Yukon Ave & Liard Pl	Yukon Ave	Liard Pl	**3**	0.59	3	0	0	0	0	3	0	2	0	0	1	0	0	0	0	0	0	2	0	0
Bear St & Liard Pl	Bear St	Liard Pl	**3**	-0.05	181	0	1	1	1	0	2	0	1	0	0	0	0	0	0	1	0	0	0	0
Red Hill Ave & Pullman St	Red Hill Ave	Pullman St	**3**	-0.08	176	0	1	1	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0
South Coast Dr & Back Access Road e/o San Leandro Ln	South Coast Dr	Back Access Road e/o San Leandro Ln	**3**	-0.06	13	0	0	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Bristol St & I-405 off ramp	Bristol St	I-405 off ramp	**3**	-0.08	23	0	0	1	2	0	1	0	2	0	0	0	0	0	0	2	0	1	0	0
Harbor Blvd & I-405 off ramp	Harbor Blvd	I-405 off ramp	**3**	-0.07	13	0	0	0	2	1	2	1	0	0	0	0	0	0	0	2	0	0	0	0

Intersection	Cross Street 1	Cross Street 2	Crashes	Local CCR Differential[1]	EPDO[2]	*Fatal*	*Serious Injury*	*Other Visible Injury*	*Complaint of Pain*	*PDO*	Broadside	Sideswipe	Rear End	Head On	Hit Object	Overturned	Other	Pedestrian	Bicycle	Aggressive	Distracted	Impaired	Dark	Wet
Carmel Dr & S Coast Dr	Carmel Dr	S Coast Dr	**3**	-0.06	330	0	2	0	0	1	1	0	2	0	0	0	0	0	0	1	0	1	0	0
Hyland Ave & Scenic Ave	Hyland Ave	Scenic Ave	**3**	-0.03	23	0	0	1	2	0	2	0	1	0	0	0	0	0	0	2	0	0	0	0

1. Local Critical Crash Rate Differential

2. Equivalent Property Damage Only Crashes