ATTACHMENT A

Pacifica Local Roadway Safety Plan

ADOPTED: XX

PREPARED FOR THE CITY OF PACIFICA

CITY OF PACIFICA

FEHR PEERS

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1 Introduction

The City of Pacifica ("City") is bounded to the West by the Pacifica Ocean. Moving east, the City quickly becomes hilly terrain due to the Montara Mountain and associated open space. Pacifica attracts a lot of visitors for access to the ocean as well as the open space in Montara Mountains. Pacifica's primary North-South route is Highway 1, and due to the terrain of the City, many north-south and east-west routes are interrupted or made discontinuous. As a result, all road users tend to get funneled onto a small number of continuous routes. The City includes residential, supporting commercial, and other community services (e.g., schools or community centers). Many residents commute to either San Francisco or other cities on the San Francisco Peninsula for employment. There are no major employers within the City.

ABOUT PACIFICA

POPULATION (2020 US Census)
38,640 people

DEMOGRAPHICS
58.8% White
21.3% Asian
18.6% Latino or Hispanic
2.6% Black
10.2% Two or More Races

Approximately **5.3%** of Pacifica residents are in poverty, with a town-wide median income of **$138,548**.

Pacifica's Local Roadway Safety Plan (LRSP) documents roadway safety performance in Pacifica and strategies for reducing the risk of collisions. The analysis used to inform the LRSP considered reported collision data, confirmed with community voiced concerns about road safety and stakeholder input on ways to improve road safety. The following provides an overview of what an LRSP is, explains the Safe System approach, an idea which underlies this LRSP, and summarizes contextual information about Pacifica. The LRSP identifies a set of emphasis areas that are based on roadway or land-use characteristics, includes concept designs for priority locations, and a toolbox of additional countermeasures that can be implemented across the City.

WHAT IS AN LRSP?

As part of the Highway Safety Improvement Program (HSIP), every state in the U.S., is required to have a Strategic Highway Safety Plan (SHSP) that establishes goals, objectives, and emphasis (or challenge) areas to reduce traffic accident fatalities and serious injuries on all public roads using a data-driven approach. Within California, every local agency is required to have an LRSP to be eligible for state administrated (HSIP) grant funding. An LRSP provides a framework for agencies to proactively and systemically identify and address unique safety issues prevalent in their jurisdiction. LRSPs require using a data driven process to identify trends and priorities as well as a multidisciplinary input to facilitate partnerships with key stakeholders in the community.

The LRSP process offers an opportunity to learn from many perspectives – from collision data to feedback on perceived safety issues to contextual patterns in collision data that may be similar systemically – to develop and prioritize a list of meaningful and grant-competitive safety projects for Pacifica. This priority list of projects must be informed by a collision data analysis. This study also sets up a process for multi-disciplinary collaboration, transparency, and accountability to support implementation actions that follow after the LRSP's adoption.

SAFE SYSTEM APPROACH

Each day, people are killed and seriously injured on California roads. Crashes can irreversibly change the course of human lives, touching victims, their families and loved ones, and society as a whole. Through collective action on the part of all roadway system stakeholders—from system operators, vehicle manufacturers, to law enforcement and everyday users—the City of Pacifica can move to a Safe System approach that anticipates human mistakes, with the goal of eliminating fatalities and serious injuries for all road users.

A Safe System acknowledges the vulnerability of the human body – in terms of the amount of kinetic energy transfer a body can withstand – when designing and operating a transportation network to minimize serious consequences of crashes.

According to the World Health Organization, the goal of a Safe System is to ensure that if crashes occur, they "do not result in serious human injury. "A Safe System approach addresses the five elements of a safe transportation system – safe road users, safe vehicles, safe speeds, safe roads, and post-crash care – in an integrated manner, through a wide range of interventions.

The Safe System approach to road safety started internationally as part of the Vision Zero proclamation that, from an ethical standpoint, no one should be killed or seriously injured on the road system. It is founded on the principle that people make mistakes, and that the road system should be adapted to anticipate and accommodate human mistakes and the physiological and psychological limitations of humans. Countries that have adopted the Safe System approach have had significant success reducing highway fatalities, with reductions in fatalities between 50% and 70%.

The Institute of Transportation Engineers (ITE) and the Road to Zero Coalition's Safe System Explanation and Framework articulate that to anticipate human mistakes, a Safe System seeks to:

- Separate users in a physical space (e.g., sidewalks, dedicated bicycle facilities)
- Separate users in time (e.g., pedestrian scramble, dedicated turn phases)
- Alert users to potential hazards
- Accommodate human injury tolerance through interventions that reduce speed or impact force

Creating a Safe System means shifting a major share of the responsibility from road users to those who design the road transport system. "Individual road users have the responsibility to abide by laws and regulations" and do so by exhibiting due care and proper behavior on the transportation system. While road users are responsible for their own behavior, this is a shared responsibility with those who design, operate, and maintain the transportation network: including the automotive industry, law enforcement, elected officials, and government bodies. In a Safe System, roadway system designers and operators take on the highest level of ethical responsibility. This report is organized by the Safe System key principles to encompass the full range of safety stakeholders and facilitate cross-disciplinary collaboration and accountability. This is consistent with the methods outlined in the United States Department of Transportation (USDOT) National Roadway Safety Strategy and the Caltrans commitment to a Safe System approach to achieving Vision Zero [traffic fatalities and severe injuries] goals.

BACKGROUND

This is the first LRSP for the City of Pacifica, but builds upon numerous related transportation planning and engineering efforts. This LRSP provides the City and its stakeholders a findings and actions to advance to improve road safety and accessibility. This LRSP will also assist the City when it applies for safety infrastructure funding sources such as future HSIP grant funding opportunities from Caltrans as well as regional One Bay Area Grant (OBAG) Cycle 3 funding.

2 Safety Partners

The City has engaged stakeholders to address the unique traffic safety concerns in Pacifica. The assembled team of Safety Partners for the LRSP included representatives from the City of Pacifica along with the following local and regional partners:

SAFE ROUTES PACIFICA

Safe Routes Pacifica is Pacifica's Safe Routes to School (SR2S) Program, a nonprofit organization that provides education and encouragement efforts to six schools in the City of Pacifica. SR2S strives to build a collaborative community to support students using alternative transportation (walking, biking, skating and scooting) to and from school with the goal to encourage lifelong healthy habits and create a more livable

PACIFICA POLICE DEPARTMENT

Police officers provide valuable insight into behaviors they observe on the roads, and are important partners in safety conversations so that jurisdictions can focus enforcement time on behaviors most closely associated with injuries and fatalities. The Pacifica Police Department also leads and participates in traffic safety education programs.

NORTH COUNTY FIRE AUTHORITY

The North County Fire Authority is an interjurisdictional fire department for Pacifica, Daly City, and Brisbane. The Fire Department is the first point of contact for emergency medical services and are responsible for directing post-crash care for victims of collisions.

PACIFICA PLANNING COMMISSION

The Planning Commission advises the City Council in the preparation, adoption, and amendment of the City's General Plan, Coastal Plan, Zoning Law, and other specific and area development plans which provide for and control the future physical development and conservation of the City.

PACIFICA EMERGENCY PREPAREDNESS AND SAFETY COMMISSION

The Emergency Preparedness and Safety Commission recommends and advises the City Council on City programs, activities, plans and other related actions that assist the City in preparing for possible future disasters and safety, including roadway safety.

3 Vision

At the start of the LRSP preparation, the project team and Stakeholder Group developed the following Pacifica road safety vision statement and set of corresponding goals.

VISION STATEMENT

Residents of and visitors to Pacifica are able to safely travel by car, foot, bicycle, transit, and other modes of transportation to access daily needs and recreational opportunities.

GOALS:

1. Balance roadway safety improvements and other travel needs across different modes of transportation.

2. Modernize and maintain infrastructure through cost efficient means.

3. Advance risk-based, data-driven, and systemic approach to improving safety on local roadways.

4. Decrease the severity of collisions through roadway infrastructure improvements.

5. Coordinate with law enforcement and emergency responders to maintain adequate emergency response times.

6. Invest in safety improvements for students walking and rolling to school.

7. Encourage people to drive at lower speeds with cost efficient roadway design, signage, and educational campaigns.

8. Discourage motorists from driving under the influence of alcohol or drugs through educational and enforcement programs.

4 Supporting Efforts

In recent years, the City's efforts to improve safety have been most visible throughthrough a range of plans and programs. This section describes plans and recent efforts supporting road safety within the City of Pacifica.

PLANS

▶ Pacifica General Plan (July 2022 Draft)

The Pacifica General Plan lays out a community vision and policy framework for the long-range development of the City of Pacifica, including land use, transportation, open space and community facilities, and safety. Of the seven purposes outlined in the General Plan, the following purpose most closely encompasses road safety: "allow City departments, other public agencies, and private developers to design projects that enhance the character of the community, promote public health, preserve environmental resources, and minimize hazards."

The Circulation Element of the General Plan creates a vision for transportation in Pacifica that strengthens the transportation network by providing more choice of travel modes, identifies needed improvements to support all modes of travel, and works in tandem with land use changes. Through roadway classifications, land use characteristics, and relationship to the circulation system, the plan identifies pedestrian priority areas and Complete Street corridors, which are intended to balance different modal needs and improve the road safety for all users.

▶Pacifica Bicycle and Pedestrian Plan (2020)

The Pacifica Bicycle and Pedestrian Master Plan sets forth a blueprint for improving walking and bicycle infrastructure through policies, programs, and project recommendations. It is guided by the vision statement "Pacifica is a city where walking and bicycling is encouraged as safe and practical means of transportation that provide access to schools, parks, shopping, trails, beaches, bluffs, and other community destinations together on both sides of Highway 1."

Four goals are outlined in the plan, including improving safety through infrastructure and education and prioritizing safe routes to school. This plan identifies current challenges and opportunities in the modal culture and infrastructure of Pacifica. Three of the challenges are that Highway 1 crossings are currently uncomfortable for pedestrians and bicyclists and therefore are a barrier for people to do so, that bikeways are uncomfortable along major arterials, and that missing sidewalks present discontinuities for pedestrians.

▶ SafeTREC Complete Streets Safety Assessment (2020)

The Complete Streets Safety Assessment was created by the Safe Transportation Research and Education Center (SafeTREC) at U.C., Berkeley in November 2020. The report includes a bicycle and pedestrian collision analysis for the five-year period between 2015 and 2019. Based on a request from the City, eight locations were chosen as focal areas. SafeTREC additionally identifies strengths, opportunities, and recommendations for City

programs, policies, and practices. These recommendations were considered alongside the safety analysis results and stakeholder input as part of the LRSP development.

ENGAGEMENT AND SAFETY PARTNERS

A key step in addressing safety issues is hearing from local officials, key stakeholders, and the general public. Working through a collaborative process, the City can create effective solutions by considering and coordinating with the general public, engineering, enforcement, education, and emergency service strategies. The project team deployed the following tools that are most appropriate for the City-wide planning effort:

- Solicited community feedback via Nextdoor and other community forums.
- Updates to the City Council, open to the public.
- Solicited input from a group of Safety Partners.

Stakeholder Meetings

Pacifica held three safety partners meetings to discuss the safety vision, priorities, existing conditions, and draft collision risk profiles in Pacifica. During the first stakeholder meeting, safety partners were presented initial findings from the collision data analysis and provided input on major safety topics, including barriers and opportunities related to implementation. During the second meeting, stakeholders were presented to about the emphasis areas and proposed engineering and non-engineering countermeasures that are recommended in this Plan. During the final meeting, stakeholders were involved in a discussion related to the proposed strategies and actions in the Plan and helped identify how to overcome potential barriers for implementation.[1]

Soliciting Community Feedback

The road safety concerns of Pacifica residents is valuable insight to understand priority locations that may be overlooked through data analysis. The City of Pacifica invited the community to provide feedback on the current state of roadway safety to identify concerns that were incorporated into the development of countermeasures and emphasis areas.

Community feedback was solicited through posts on online neighborhood forums. 114 residents submitted responses to the open-ended prompt, describing both general roadway safety concerns and identifying specific intersection and corridors that warrant consideration during the development of the LRSP. In the responses, 71 percent mentioned unsafe speeds, 32 percent mentioned poor sightlines at intersection approaches, 21 percent mentioned gaps in pedestrian network connectivity, and 26 percent mentioned pedestrian safety as a concern. Other significant concerns included reckless driving, degraded pavement conditions, congestion, and inappropriate intersection controls as contributors to road safety issues in the city.

Infrastructure Improvements

In the period between 2016 and 2020, the City focused on integrating low cost safety-related improvements into projects related to maintenance such as pavement markings and signs. In recent years, the City has invested more in bicycle and pedestrian safety-related improvements. The following are a list of funded and planned projects from the 2022-2027 Capital Improvement Program related to roadway safety:

- The Pavement Resurfacing Program: Resurfaces the pavement along roads designated in the five-year paving plan with appropriate treatment types, including base repair and installation of thermoplastic traffic striping and pavement markings. These programs include upgrading ADA ramps for many roadways as well as installation of new bike lanes/boulevards and crosswalk striping.
- Manor Drive Overpass Improvements (Planning Phases): Alleviate weekday peak hour traffic and provide safe pedestrian and bicycle facilities by installing new traffic signals, widening the overcrossing, improving crosswalks and ramps, and implementing other infrastructure upgrades.
- Esplanade and Palmetto Bicycle & Pedestrian Improvement Project: Install class II bike facilities along Palmetto and Esplanade and improve pedestrian safety at two highly utilized intersections.
- School Crosswalk Beacon Replacement Project: Replace outdated school crossing warning system and minor striping and signage improvements

Additional routine maintenance infrastructure improvements occurred under the Annual Pavement Striping and Marking Refresh Project; the Annual Concrete & ADA Improvement Project, and the Sidewalk

[1] Additional supporting information is available upon request.

Repair Program. The Sharp Park Priority Development Area (PDA) Pedestrian Improvement Project received a One Bay Area Grant (OBAG) award, which aims to promote active transportation through proposed sidewalk improvements, bike-friendly streets, and multi-use paths.

The following are recent safety projects completed by the City since 2017:

- Palmetto Avenue Streetscape Project (2017): The project focused investment into the pedestrian-oriented mixed-use district along Palmetto Avenue to increase the comfort, atmosphere, and navigability of the corridor. Improvements included installing bulb outs, curb ramps, ADA driveways, Class II bike lanes, and improved crosswalks in downtown area
- Linda Mar Boulevard Bikeway Project: Class II bike lanes were installed along Linda Mar Boulevard between Oddstad Boulevard and Seville Drive.
- Monterey Road between Waterford Street and Fremont Avenue: school mid block crossing improvements installed RRFBs, high visibility crosswalk, and bulb outs.
- Palmetto Aveneue Sidewalk Project: sidewalk installation from Westline Dr. to Dollar Radio
- Terra Nova Boulevard & Oddstad Boulevard – Class II bicycle lane installation.
- Cabrillo School Crosswalk and Stop Improvements: installed stormwater retention bulb outs, flashing stop signs, improved signage, and improved striping near Cabrillo School.
- FY 20-21 and FY 21-22 Concrete and Curb Ramp Project: Various curb ramps and sidewalk improvements.
- North Pacifica Pedestrian Improvement Project: Curb ramps.

5 Safety Analysis

Chapter 2 of Caltrans' Local Roadway Safety Manual (LRSM) instructs safety practitioners to "consider a wide range of data sources to get an overall picture of the safety needs." Crash data and contextual data were collected and analyzed as part of this LRSP.

This analysis considers injury collisions from 2016 through 2020 available through the Transportation Injury Mapping System (TIMS). TIMS reports injury collisions from the Statewide Integrated Traffic Records System (SWITRS). This analysis excludes property damage only (PDO) collisions to enable the City to focus on reducing risk of injury on public roadways. The analysis considered all at-grade public roadways within the City limits. This includes

state-owned, at-grade roadways (i.e., excludes freeway sections of Highway 1 and Highway 35). Where applicable throughout this document, trends are analyzed for City owned roadways and Caltrans at-grade facilities separately.

DATA LIMITATIONS

Collision databases have been found to have certain reporting biases, including:

- Collision involving people walking, on bicycles, or on motorcycles are less likely to be reported than collisions with people driving;
- Property damage collisions are less likely to be reported compared to more severe collisions;
- Younger victims are less likely to report collisions;
- Alcohol-involved collisions may be under-reported.

Race, income, immigration status, and English proficiency may also impact reporting, but there is limited research on these factors.

COLLISION ANALYSIS SUMMARY

The collision analysis identified several collision trends and risk factors in Pacifica, including:

KEY TERMS

INJURY COLLISIONS REFERS TO COLLISIONS WHERE ONE OR MORE INDIVIDUALS WERE INJURED OR KILLED.

KILLED OR SEVERELY INJURED (KSI COLLISIONS) REFERS TO COLLISIONS WHERE ONE OR MORE INDIVIDUALS WERE SEVERELY INJURED OR KILLED IN COLLISION. THIS INCLUDES SEVERE INJURY COLLISIONS AND FATAL COLLISIONS.

- People walking and biking are more likely to be fatally or severely injured in a collision.
- Unsafe speed is the most frequent factor listed for fatal and severe collisions.
- Drugs or alcohol increase the likelihood that a collision will be more severe.
- 45% of injuries to people walking occur when people are crossing in marked crosswalks.
- Another 44% of injuries to people walking occur when people are walking in the road or crossing not in a crosswalk.
- A majority (65%) of collisions where someone was killed or severely injured (KSI collisions) occurred between 6 PM and 6 AM.

COLLISIONS BY YEAR AND MODE

From 2016 to 2020, there were 414 total injury collisions, and 32 collisions where victims were killed or severely injured (KSI) within the City, shown in **Table 1**. 18 of the 32 KSI collisions (56%) occurred on locally owned roadways, while 14 occurred on Caltrans at-grade facilities, and 261 of the 414 injury collisions (63%) occurred on locally owned roadways, while the remaining 37% occurred on state-owned roadways.

On average, six people were killed or seriously injured each year in Pacifica due to traffic collisions. When compared against the City's population, there are 0.16 fatal or severe collisions per 1,000 residents, roughly half of the rate of San Mateo County. **Figure 1** shows the geographic distribution of collisions across the City.

FIGURE 1 GEOGRAHPIC DISTRIBUTION OF COLLISIONS

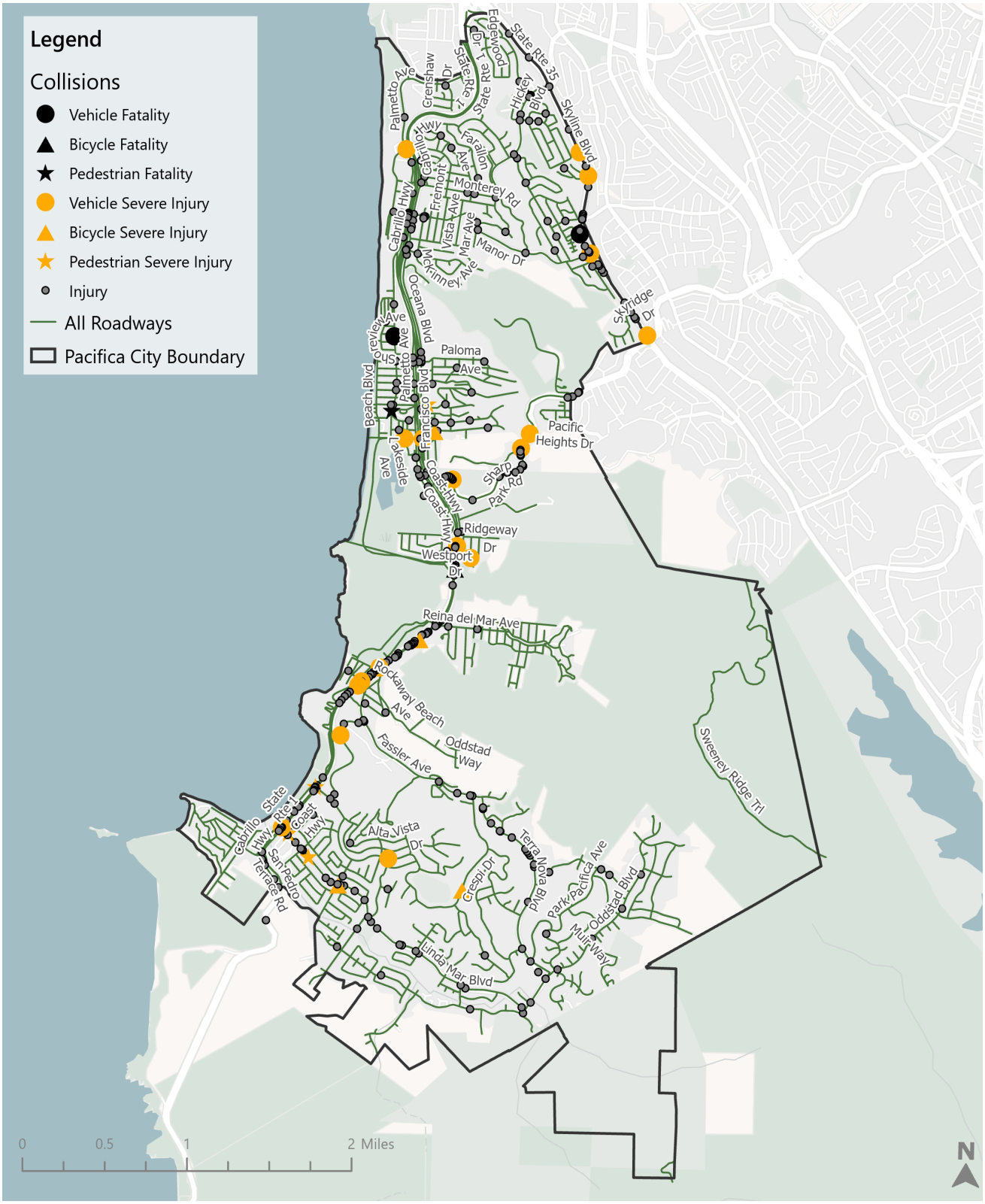
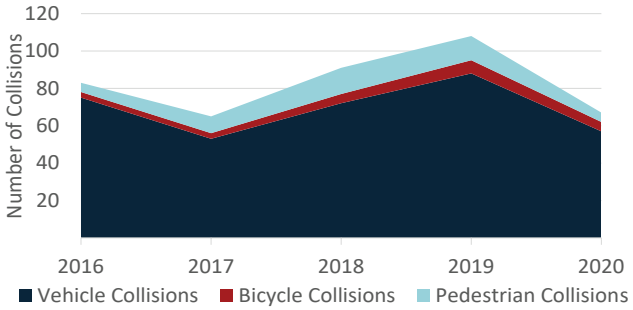


TABLE 1 COLLISION SUMMARY STATISTICS

	INJURY COLLISIONS IN PACIFICA, 2016-2020			
	VEHICLE ONLY	BICYCLE-INVOLVED	PEDESTRIAN-INVOLVED	TOTAL
Citywide Total	345	23	46	414
Citywide KSI	22	5	5	32
Caltrans At Grade Facility Total	136	5	12	153
Caltrans At Grade Facility KSI	11	2	1	14
City Owned Roads Total	209	17	35	261
City Owned Roads KSI	11	3	4	18

People walking and biking are over-represented in KSI collisions: bicyclists are involved in 6 percent of injury collisions but 16 percent of KSI collisions, and pedestrians are involved in 11 percent of injury collisions but 16 percent of KSI collisions. This is consistent with state-wide and national trends. The number of injury collisions for each year by mode is shown in **Figure 2.** The number of injury collisions per year is on an overall upward trend through 2019 and decreases in 2020. This varies from national trends of continuing increases in traffic injuries and fatalities through 2020.

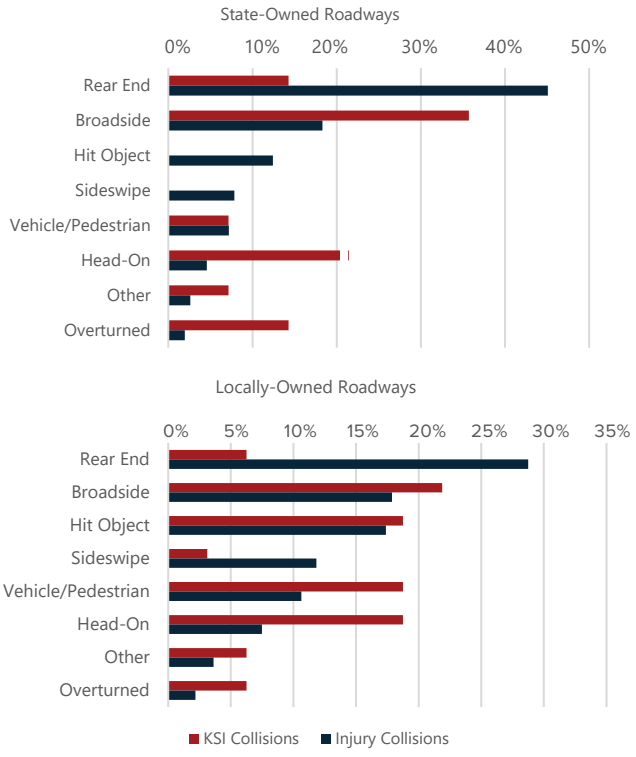
FIGURE 1 INJURY COLLISIONS BY YEAR & MODE



COLLISIONS TYPE

The three most common injury collision types on state-owned roadways are Rear End (45%) and Broadsides (18%), and on locally-owned roads are Broadsides (20%), Rear Ends (19%), Hit Object (19%), as shown in **Figure 3**. For KSI collisions on state-owned facilities, Broadside collisions are most common (36%), followed by Vehicle/Pedestrian collisions (21%). On locally-owned facilities, the most common KSI collision types are Hit Objects (33%) and Vehicle/Pedestrian (28%). This further illustrates the disproportionate share pedestrians make of KSI collisions in the City. It also shows that Broadside collisions are more likely, compared to other collision types, to result in a fatality or severe injury.

FIGURE 3 INJURY COLLISIONS BY TYPE

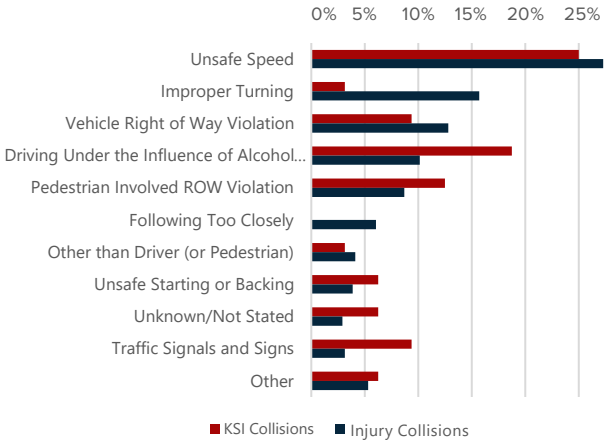


PRIMARY COLLISION FACTOR (PCF)

In Pacifica, the most common primary collision factors (PCFs) in injury collisions are Unsafe Speed (27%), Improper Turning (16%), Vehicle Right-of-Way Violations (13%), and Driving or Bicycling Under the Influence of Alcohol or Drugs (10%). For KSI collisions, the most common PCFs are Unsafe Speed collisions (25%), Driving or Bicycling Under the Influence collisions (19%), and Vehicle Right-of-Way Violations and Traffic Signals and Signs (9% each). **Figure 4** compares the cited primary collision factors for injury collisions versus KSI collisions. These trends are mostly consistent across state- and locally-owned facilities. KSI collisions citing "Traffic Signals and Signs" and "Pedestrian ROW Violation" disproportionately affect locally-owned roads.

The Pedestrian Involved Violation PCF includes both instances where a pedestrian violated a rule of the road and where a vehicle violated the pedestrian's right of way. The two are combined in the figure below because the severity outcome of such collisions is such that the pedestrian involved in the collision is often not able to provide their own account of the collision.

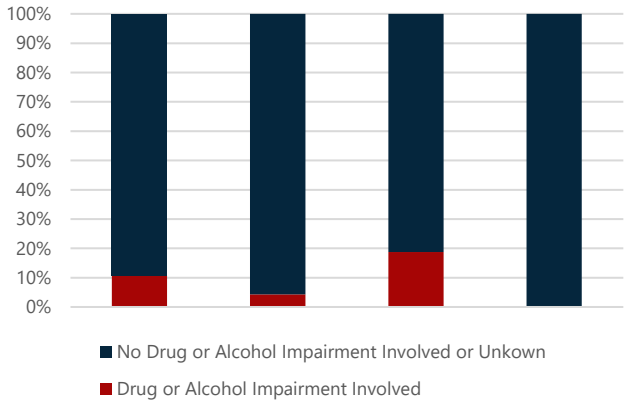
FIGURE 4 INJURY COLLISIONS BY PCF



DRIVING UNDER THE INFLUENCE

Drugs or alcohol increase the likelihood that a collision will be more severe in Pacifica. While 11 percent of injury collisions involve drugs or alcohol (45 collisions), 19 percent of KSI collisions involve drugs or alcohol (six collisions), as shown in **Figure 5**. These percentages reflect the portion of collisions involving one or more parties determined to be under the influence of drugs or alcohol. Driving under the influence may not always be listed as the primary collision factor even if a driver is found to be under the influence. 24 of the 45 injury collisions (53%) occurred on locally-owned roadways, compared with 2 of the 6 KSI collisions (33%).

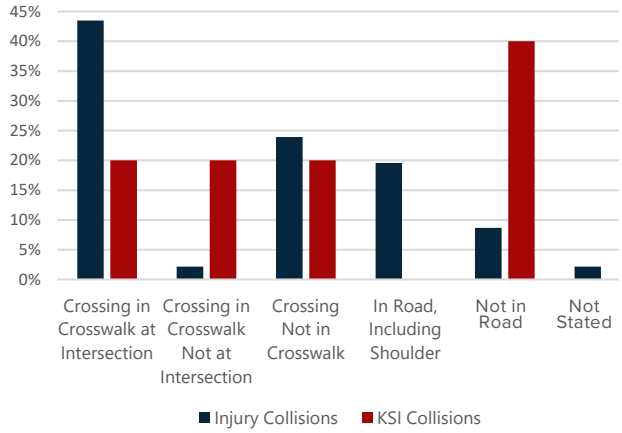
FIGURE 5 COLLISIONS INVOLVING DRUG OR ALCOHOL IMPAIRMENT



PEDESTRIAN LOCATION

As shown in **Figure 6**, collisions with people walking frequently involved pedestrians crossing in a crosswalk in the intersection (43%) or crossing not in a crosswalk (24%). For KSI collisions, collisions frequently occurred with pedestrians not in the road (40%), followed by crossing in crosswalk in the intersection, crossing in crosswalks not at the intersection, and not crossing in the crosswalk (20% each).

FIGURE 6 PEDESTRIAN ACTIONS PRECEDING INJURY COLLISIONS



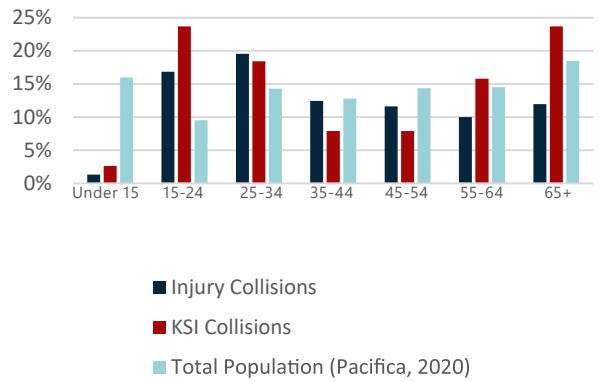
Collisions with pedestrians occurring not in the road is uncommon and something that can be

further explored in conversation with local police department. People crossing the street outside of crosswalks and walking in the road may indicate that there are unmet pedestrian desire lines, and could be evaluated to identify potential locations for new crosswalks and sidewalks. 75% of the pedestrian-involved injury collisions and 100% of the KSI collisions on state-owned roadways involved a pedestrian crossing in a crosswalk.

VICTIM PROFILE

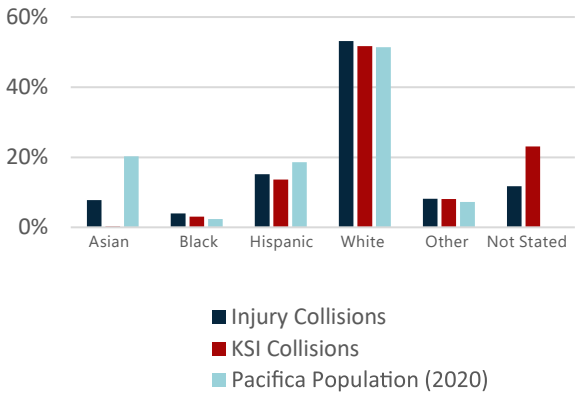
When compared with the population of Pacifica, fatal and severe collisions are disproportionately affecting young adults (ages 15-34). People between the ages of 15 and 34 are 24 percent of the City's population but represent 37 percent of injury crashes and 42 percent of KSI crashes. Additionally, people 65 years and older are disproportionately affected by KSI crashes. People 65 years and older are 18 percent of the City's population and 12 percent of injury crashes but are 24 percent of KSI crashes. The age distribution of collision victims is shown on **Figure 7.** Given the recreational opportunities in Pacifica, as well as people using Highway 1 to drive through Pacifica, collisions are likely affecting both residents and visitors who live outside of the City. People under the age of 15 have not experienced a disproportionate share of crashes in Pacifica. The youngest age group is 16 percent of the City's population and represent less than 3 percent of injury and KSI injury crashes. This distribution is consistent across collisions on both locally- and state-owned roadways.

FIGURE 7 COLLISION VICTIM AGE DISTRIBUTION



As shown in **Figure 8,** the distribution of reported race of the victim involved in the collision is somewhat similar to the population of Pacifica. It is important to note that race is determined at the discretion of the reporting officer and is only reported at the party level. If people of multiple races are present in a vehicle, only the driver's race will be reported. As noted at the beginning of this chapter, race, income, immigration status, and English proficiency may impact collision reporting. This distribution is consistent across collisions on both locally- and state-owned roadways.

FIGURE 8 COLLISION VICTIM RACE DISTRIBUTION



ROAD SAFETY PRIORITIES

The high injury network was identified based on reported injury and fatal collisions from 2016 through 2020.

HIGH INJURY NETWORK

The High Injury Network (HIN) represents the corridors with the highest concentrations of fatal and serious injury collisions. The High Injury Network is shown in **Figure 9** and includes the following roadways:

- Linda Mar Boulevard
- Terra Nova Boulevard
- Manor Drive
- Sharp Park Road
- Oceana Boulevard
- Palmetto Avenue
- Clarendon Road
- Skyline Boulevard (Highway 35)
- At-Grade Highway 1 (Westport Drive to Southern Limits

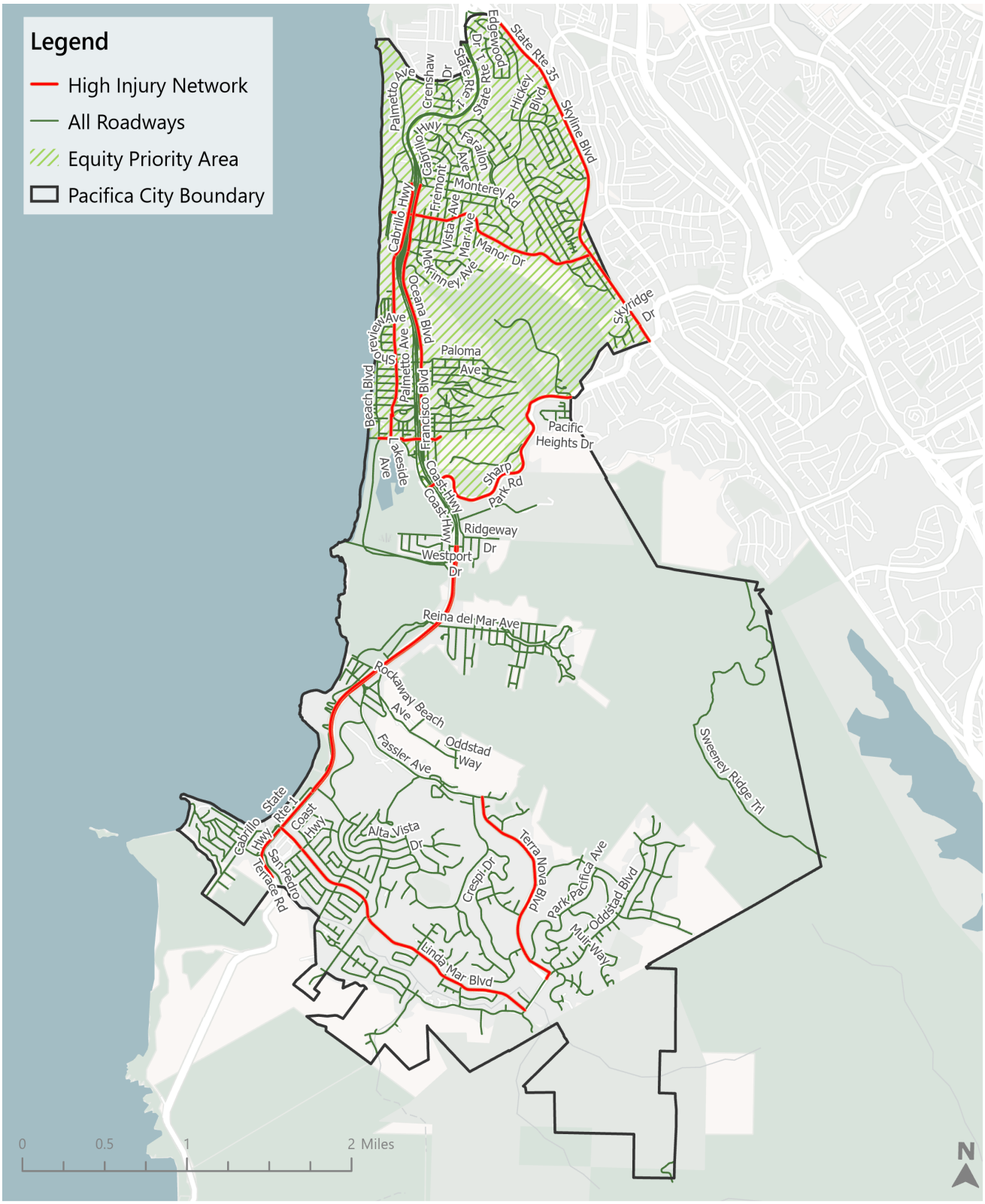
[3] Additional supporting information is available upon request.

The total distance of the High Injury Network makes up approximately 24% of the cumulative distance of at-grade, public roadways in Pacifica, but accounts for 69% of injury collisions and 77% of fatal and serious injury collisions. The collision data analysis considered the Equity Priority Area, an area in the Northern portion of the City that was identified using four socio-economic indicators that are commonly used to determine historically underinvested communities, including race, income, English ability, and vehicle access.[3] The City does not have any Census Tracts in its jurisdiction that the Metropolitan Transportation Commission, Safe Streets and Roads for All, or California Office of Environmental Health Hazard Assessment respective definitions for underserved or disadvantaged.

SYSTEMIC ANALYSIS

Systemic analysis is a proactive safety approach that focuses on evaluating an entire roadway network using a defined set of criteria. It looks at collision history on an aggregate basis to identify high-risk roadway characteristics in addition to looking at high collision locations. By merging adjacent road and intersection features with collision data, relationships can be uncovered between contextual factors and the risk of frequent and severe collisions. This systemic process relied on a two-fold approach to identify key safety issues and locations to prioritize hot spot analysis and development of collision types. The result of the systemic analysis was the identification of City-wide emphasis areas shown in the subsequent chapter.

FIGURE 9 HIGH INJURY NETWORK



6 Emphasis Areas & Countermeasure Toolbox

This chapter presents Emphasis Areas identified through the hotspot and systemic analyses as well as key safety countermeasures applicable to different roadway contexts across Pacifica.

EMPHASIS AREA PROFILES

Emphasis area profiles were identified based on collision history and contextual factors. These profiles describe roadway or land use characteristics and/or driver behaviors that are found to be leading to collisions and can therefore be used in a systemic methodology to proactively identify locations which have similar contexts but may have experienced fewer collisions in the past. A similar set of low-cost countermeasures can then be used to improve road safety at locations that have experienced severe crashes in the past as well as similar locations that have yet to experience such incidents. Systemic improvements enable greater systemwide gains in road safety.

The systemic analysis combined collision history with contextual data on roadway characteristics as well as input from local stakeholders to produce a set of five emphasis areas to highlight the most common and severe collision patterns in Pacifica, shown in **Table 2**. Eighty-two percent (82%) of injury collisions are represented in at least one of the five city-wide emphasis areas.

SAFETY COUNTERMEASURES TOOLBOX

This chapter presents key safety countermeasures applicable in different roadway contexts acrossPacifica. The countermeasures associated with the emphasis areas are described further, including engineering countermeasures and non-engineering countermeasures.

TABLE 2 EMPHASIS AREA PROFILES

EMPHASIS AREA	DESCRIPTION	FACTORS	NUMBER OF COLLISIONS	POTENTIAL COUNTERMEASURES
At-Grade Caltrans Facilities (e.g., Highway 1 South of Westport Dr; Skyline Blvd)	Caltrans operated roadways that intersect with the local raodway network.	Higher speeds and more severe collisions; unclear right of way.	153 Injury (37%) 14 KSI (44%)	• Upgrade pavement markings • Reduce speed limit; • Convert stop control to signal control; • Install raised median; • Install a Pedestrian Hybrid Beacon; • Install retroreflective backing for signal heads; • Install pedestrian refuge island.
Frontage Roads (e.g., Palmetto Ave)	Roadways adjacent to Highway 1 where Highway 1 is grade separated.	Higher speeds, lack of clear pavement markings.	35 Injury (8%) 3 KSI (9%)	• Upgrade or add pavement markings, including centerlines, edge lines, and high-visibility crosswalks; • Install centerline rumble strips; • Add or upgrade lighting; • Install transverse rumble strips on approach to stop signs; • Reduce speed limit.
Mixed-Use Areas (e.g., Linda Mar Blvd and Highway 1)	Roadways adjacent to mixed use land-use or commercial centers.	Increased pedestrian and vehicular activity.	160 Injury (39%) 10 KSI (31%)	• Upgrade pavement markings; • Add or improve lighting; • Convert stop control to signal control; • Convert two-way stop control to all-way stop control; • Install a raised crosswalk; • Improve access management.
Winding Roads in the Hills (e.g., Sharp Park Rd)	Winding roads with curves that are graded	Higher speeds in the downhill direction with limited sightlines	75 Injury (18%) 6 KSI (19%)	• Upgrade or add pavement markings; • Install centerline rumble strip; • Implement road diet; • Install curve warning signs; • Improve approach sightlines/daylighting.
Community Centers, Schools, and Senior Housing Facilities (e.g., Crespi Dr)	Roads adjacent to community centers, schools, and senior housing facilities	Higher frequency of travel by children and people over the age of 65	114 Injury (28%) 5 KSI (16%)	• Upgrade pavement markings; • Add or improve lighting; • Reduce speed limit; • Install raised crosswalk; • Install Rectangular Rapid Flashing Beacon; • Install pedestrian refuge island.

Note: Because an individual collision may be categorized under multiple profiles, the values in the table do not sum to 100%. Cells without a percentage KSI represent profiles where zero KSI collisions occurred for a given mode.

Many of the countermeasures are Caltrans-approved, with an associated Crash Reduction Factor (CRF) and crash type (i.e., all modes, bicycle and pedestrian crashes only, etc.) as outlined in the 2020 California Local Roadway Safety Manual (LRSM). The higher the CRF (100% being the highest), the greater the expected reduction in crashes. Countermeasures not in the LRSM are scored on a "low-medium-high" AVAILABILITY OF RESEARCH scale based on proven safety studies; otherwise, denoted as "N/A" when limited safety studies are available. The higher the AVAILABILITY OF RESEARCH rating, the greater the expected reduction in crashes.

ENGINEERING COUNTERMEASURES

A complete Safety Countermeasure Toolbox containing relevant engineering countermeasures can be found in **Appendix 1.**

NON-ENGINEERING COUNTERMEASURES

Education

Transportation safety education plays an important role in shaping and shifting behavior. Many cities, such as Seattle, Oakland, and Los Angeles, are including community engagement and education to make streets safer for all. For example, the Los Angeles Vision Zero Dignity-Infused Community Engagement (DICE) approach includes partnerships with local nonprofits, paid outreach work for those experiencing barriers to employment, and both large- and small-scale community engagement events.

Various organizations and agencies release both general and seasonal educational materials and marketing campaigns around traffic safety. The California Office of Traffic Safety (CA OTS) has a series of campaigns for public use shared on their website,[4] as does the National Highway Traffic Safety Administration (NHTSA).[5]

Community engagement is not a one-size-fits-all model as different communities have different needs. By developing culturally relevant engagement strategies, all participants are invited into conversations about safety. For example, including cultural markers of a local community can be a creative and welcoming way of engaging residents. Also, meeting people "where they are" to gather input on safety issues at local parks can more effectively engage parents and children, rather than expecting families to attend a meeting at a government building. Pop-up engagement conducted by the City and Safe Routes to School staff at the Pacifica Farmers' Market as part of the LRSP is an example of such education efforts.

Enforcement

Traffic enforcement can be one part of a multipronged approach to communicating expected behaviors for safe road users, combined with other strategies such as road user education and safe road design. The following sections discuss effective strategies and noteworthy considerations for implementing enforcement-based strategies.

Emergency Services

Victims involved in collision have a higher chance of survival if they can quickly receive medical care. In many cases, law enforcement officers and fire department staff are the first responders to arrive at a collision location. In addition to equipping all first responders with the appropriate training, improving response times for Emergency Medical Services (EMS) will help improve collision victims' chances of survival. Additionally, collisions on their own can also put first responders' and other road users' lives at risk due to increased congestion during the collision response, which may lead to secondary collisions.

Pacifica could work with EMS to provide effective response times while maintaining a safe environment while traveling to the scene of collisions and attending to patients at the scene. Strategies include designing emergency vehicles to be highly visible (e.g., retroreflective striping and chevrons, high-visibility paint, and built-in passive light) and implementing emergency vehicle signal preemption, which allows emergency vehicles to break a normal signal cycle and proceed through an intersection.

Emerging Technology

Recent advancements in transportation technology have not only introduced new transportation modes and travel patterns but have also presented opportunities to better understand travel behavior and encourage safe behavior.

[4] California Office of Traffic Safety, Campaigns, 2023, https://www.ots.ca.gov/media-and-research/campaigns/.

[5] United States Department of Transportation, Traffic Safety Marketing, 2023, https://www.trafficsafetymarketing.gov/.

7 Priority Locations

Through the collision and roadway and land-use characteristics analysis, five priority locations and associated infrastructure recommendations were identified with the intent that the City will strive to advance projects for these locations over the next five years (i.e., between this LRSP's adoption and the next update to it). The priority locations were selected based on the systemic collision data analysis and conversations with City Staff. **Appendix 2** contains the cut sheets for each priority location illustrating improvements the City could work to advance towards implementation.

In addition to the quantitative and geographic data analyzed as part of this project, a combination of in-person and virtual (remote using satellite, aerial, and virtual photograph imagery from sources such as Google and Bing) investigations were conducted to better understand existing conditions, constraints, opportunities, and needs at each project location. The combination of data analysis and site investigations were utilized to identify issues and candidate treatments.

Initial List of Priority Locations

An initial list of ten intersection and segment priority locations was identified using a combination of the number of collisions, the number of KSI collisions, and the systemic analysis results (see section above "Emphasis Area Profiles"). These locations reflect a variety of contexts, location types, and emphasis area profiles. The initial ten locations are reflected in Table 3.

TABLE 3 INITIAL LIST OF PRIORITY LOCATIONS

LOCATION	TYPE	COLLISIONS	EMPHASIS AREA PROFILES
Highway 1 and Fassler Ave	Intersection	24 Collisions (2 KSI)	High Injury Network; Caltrans At-Grade; Mixed-Use Area
Highway 1 and Westport Dr	Intersection	9 Collisions (1 KSI)	High Injury Network; Caltrans At-Grade
Skyline Blvd and Manor Dr	Intersection	4 Collisions (1 KSI)	High Injury Network; Caltrans At-Grade; Mixed-Use Area; Equity Priority Area
Skyline Blvd and Cypress St	Intersection	4 Collisions (1 KSI)	High Injury Network; Caltrans At-Grade; Equity Priority Area
Sharp Park Rd: Lundy Way to College	Segment	34 Collisions (4 KSI)	High Injury Network; Caltrans At-Grade; Mixed-Use Area
Clarendon Rd: Lakeside Ave to Francisco Blvd	Segment	4 Collisions (2 KSI)	High Injury Network; Frontage Roads; Mixed-Use Area; Equity Priority Area
Crespi Dr: Highway 1 to Roberts Rd	Segment	5 Collisions (1 KSI)	Caltrans At-Grade; Mixed-Use Area; Community Centers
Linda Mar Blvd: De Solo Dr to Adobe Dr	Segment	10 Collisions (2 KSI)	High Injury Network; Mixed-Use Area
Fassler Ave: not inclusive of Highway 1	Segment	8 Collisions (0 KSI)	Mixed Use Area; Caltrans At-Grade; Winding Roads
Manor Dr	Segment	11 Collisions (1 KSI)	High Injury Network; Winding Roads; Mixed-Use Area; Equity Priority Area

Final Priority Locations

In collaboration with City staff, five final priority locations were selected from the initial ten locations. The selection of these areas took into account recent or planned implementation of safety improvements at some of the locations, and prioritized locations that appear most likely to be competitive for Highway Safety Improvement Program grant funds.

The final five priority locations reflect a variety of contexts, including two intersections with Highway 1, three locations on residential neighborhood streets, including one with various community centers and one near commercial centers, and a winding, graded, high-speed roadway. This allows the potential countermeasures identified for the five priority locations to provide a representative framework for evaluating safety countermeasures at locations throughout the City as part of future efforts. The five priority locations are:

1. Linda Mar Blvd between De Solo Dr and Adobe Dr
2. Sharp Park Rd
3. Crespi Dr and Highway 1
4. Fassler Ave and Highway 1
5. Clarendon Rd between Lakeview Ave and Franicsco Blvd

Field Visit

A field visit to the priority locations was conducted on February 10, 2023 with City staff to review potential countermeasures as well as benefits and challenges related to implementation. The group visited each of the five priority locations. After the field visit, adjustments to preliminarily identified countermeasures at each location were made. Adjustments included edits in consideration of elements such as:

- Impact of traffic signal and utility poles on the placement of curb ramps and consideration for pedestrian scale lighting
- Realignment of crosswalks and tightening of curb radii
- Ensuring consistency with prior studies and past recommendations.

Reported Collisions, Primary Collision Factors and Potential Countermeasures for Priority Locations

Below is the table of the final Priority Locations with the total collisions, KSI collisions, and top injury factors identified. The potential countermeasures at these locations may be suited to a wide variety of approaches for funding and implementation, with opportunities to implement systemic, low-cost, quick-build improvements potentially best suited to funding through the Highway Safety Improvement Program (HSIP). The priority location cutsheets can be found in Appendix 2, which shows the collisions, top injury factors, and proposed countermeasures at each location. Table 4 shows the final priority locations, while Table 5 shows the countermeasures for each location.

TABLE 4 FINAL PRIORITY LOCATIONS

	LOCATION	Total Injury Collisions	KSI Collisions
1	Segment Linda Mar Boulevard: De Solo Drive to Adobe Drive	10	2
2	Segment Crespi Drive: Highway 1 to Roberts Road	5	1
3	Segment Clarendon Road: Lakeside Avenue to Francisco Boulevard	4	2
4	Segment Sharp Park Road: Lundy Way to College Road	34	4
5	Intersection Fassler Avenue and Highway 1	24	2

TABLE 5: PRIORITY LOCATION COUNTERMEASURES

LOCATION	Signal Timing and Phasing	Signs and Markings	Intersection and Roadway Design	Bikeway Design	Pedstrian Crossings
Linda Mar Blvd: De Solo Dr to Adobe Dr	Retroreflective backplates.	Road diet.		Class II Bike Lanes.	Upgrade to high visibiility crosswalks with advance stop bars.
Crespi Dr: Highway 1 to Roberts Rd	Install retroreflective backplates on northbound signal heads; add Leading Pedestrian Intervals for all phases; Include pedestrian cyclist actuated phase phase to restrict turns from Crespi Drive onto Highway 1; Install bicycle signal head for east/westbound bikes.	Upgrade striping and install high visibility cross-walks with ad-vance stop bars. Consider road diet on Crespi Drive. Install two-way cycle track.	Install two-way cycle track conflict markings. Widen median island and landing (shift sig-nal poles as needed); install centerline rum-ble strips south of in-tersection.	Two-way Cycle Track.	Advance stop bars and high visibility crossings.
Clarendon Road: Lakeside Avenue to Francisco Blvd		Upgraded striping with high visibility crosswalks and advance stop bars. Yield here to pe-destrian signs.	Tighten intersection so that Lakeside Avenue “T’s” into Clarendon Road. Improved pedes-trian scale lighting.		Upgraded high visibility crosswalks.
Sharp Park Road: Lundy Way to Col-lege Road		Advance curve warning signs and chevrons.	Road diet to accom-modate a separated bike lane.	Class IV Bike Lanes.	
Fassler Avenue and Highway 1	Consider a pedestrian-actuated No Right Turn illu-minated sign on Westbound Fassler turning Northbound on Highway 1. Ensure pedes-trian push buttons are ap-propriately placed.	Ensure “No Pedes-trian Crossing” signs are clear on each intersection leg where there is no marked cross-walk. Upgrade pavement mark-ings.	Tightened corner radii; Removal of eastbound right turn slip lane; Installation of sidewalk to connect intersection with bus stop.		Upgrade crosswalks to high visibility ladder crosswalks with advance limit lines. Install island thumbnails. Straighten crosswalks.

8 Funding, Implementation, & Evaluation Strategies

This chapter identifies funding and implementation considerations that will be important to City staff as they seek to program and construct safety projects.

FUNDING OPPORTUNITIES

Although HSIP is a common avenue for funding safety improvements, a variety of additional funding sources can be used to finance safety projects. **Table 6** outlines regional, state, and federal programs related to transportation, air quality, sustainability, and housing that can be utilized to fund associated safety improvements depending on context.

TABLE 6 FUNDING SOURCES

FUNDING SOURCE	PROGRAM PURPOSE	APPROXIMATE TIMING
Congestion Mitigation and Air Quality (CMAQ) Improvement Program	The FAST Act continued the CMAQ program to provide a flexible funding source to State and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter (nonattainment areas) and for former nonattainment areas that are now in compliance (maintenance areas).	Forthcoming.
Rebuilding American Infrastructure with Sustainability and Equity (RAISE)	This program supports projects that for surface transportation infrastructure projects that will improve: safety; environmental sustainability; quality of life; mobility and community connectivity; economic competitiveness and opportunity including tourism; state of good repair; partnership and collaboration; and innovation.	Annual Call for Projects, Opens in Spring
Highway Safety Improvement Program (HSIP)	California's Local HSIP focuses on infrastructure projects with nationally recognized crash reduction factors (CRFs). Local HSIP projects must be identified on the basis of collision experience, collision potential, collision rate, or other data-supported means.	18-month Cycle

FUNDING SOURCE	PROGRAM PURPOSE	APPROXIMATE TIMING
Active Transportation Program (ATP)	ATP is a statewide competitive grant application process with the goal of encouraging increased use of active modes of transportation. The ATP consolidates existing federal and state transportation programs, including the Transportation Alternatives Program (TAP), Bicycle Transportation Account (BTA), and State Safe Routes to School (SR2S), into a single program with a focus to make California a national leader in active transportation. The ATP administered by the Division of Local Assistance, Offi ce of State Programs.	18-month Cycle
SB-1 Transportation Funding	The State Transportation Improvement Program (STIP) is the biennial five-year plan for future allocations of certain state transportation funds for state highway improvements, intercity rail, and regional highway and transit improvements.	Forthcoming.
City/County Association of Governments (C/CAG) of San Mateo County's Transportation Development Act (TDA) Article 3	The goal of the TDA Article 3 Pedestrian and Bicycle Program is to fund projects that encourage and improve bicycling and walking conditions in San Mateo County. Bicycling and walking are sustainable forms of transportation and contribute to the overall goals of the TDA Article 3 to reduce commute corridor congestion, make regional connections, enhance safety, and meet local mobility needs. The program is funded every two to three years.	Forthcoming.
City/County Association of Governments (C/CAG) of San Mateo County's Transportation Fund for Clean Air (TFCA)	The TFCA provides funding for arterial traffic management utilizing advanced technology and traffic calming projects, including quick build bicycle and/or pedestrian improvement projects.	Forthcoming.
San Mateo County Transportation Authority's Measure A Program	The goal of the Measure A Pedestrian and Bicycle Program is to fund projects that improve bicycling and walking accessibility and safety in San Mateo County, helping to encourage more residents to participate in active transportation. Historically, the call for projects has occurred biennially.	Forthcoming.
Metropolitan Transportation Commission (MTC) One Bay Area Grant (OBAG) Program	The TFCA provides funding for arterial traffic management utilizing advanced technology and traffic calming projects, including quick build bicycle and/or pedestrian improvement projects.	Forthcoming.
Caltrans Sustainable Transportation Planning Grant Program	The goal of the Measure A Pedestrian and Bicycle Program is to fund projects that improve bicycling and walking accessibility and safety in San Mateo County, helping to encourage more residents to participate in active transportation. Historically, the call for projects has occurred biennially.	Forthcoming.

IMPLEMENTATION STRATEGIES

Implementation of the LRSP is a vital step in the process where identified strategies and projects are executed. To successfully implement programs and projects, partnerships, trust, funding and coordination need to be proactively managed. Successful implementation requires sustained and coordinated support from key stakeholders, elected officials and City staff. Some strategies are outlined below:

OVERSIGHT & ACCOUNTABILITY

Establishing a committee or Task Force with key officials and stakeholders (in and outside of the City) that meets bi-annually or quarterly is recommended to facilitate effective delivery of safety projects and programs. Having appointed leadership will be a crucial part of maintaining buy-in and support for the LRSP from not only officials, but the community as well. Leadership could additionally include members from identified LRSP partners. Holding the City's community development, engineering, and public safety departments accountable is crucial for effective implementation, along with holding County departments accountable as well. Some duties could include conducting briefings and presentations at board and agency meetings, collecting and sharing information on a regular basis and updating a public-facing database (or scorecard) on LRSP goal progress.

COORDINATION & PARTNERSHIP

Throughout the lifetime of the LRSP, coordination and partnership amongst diverse stakeholders will be essential for effective delivery of the LRSP. Some strategies include regularly informing leaders and stakeholders on progress and key milestones, consulting partner agencies early on in the implementation process to gather suggestions and feedback, and finding opportunities for partnership via project bundling (e.g. integrating LRSP projects with pavement resurfacing and maintenance).

FUNDING

One major hurdle to plan implementation is often funding. As part of an implementation strategy it is recommended that the City stay up to date on potential grant opportunities and place the most competitive projects forward as grant sources evolve. Additionally, reviewing an updated list of current capital projects to find where LRSP projects could overlap for possible project bundling. See previous section on funding for more details.

COMMUNICATION

Having continued communication and transparency with stakeholders and community members can allow for greater trust and support of the LRSP's goals. Some strategies include communication across diverse channels (e.g. updated webpage, news, and social media), actively addressing community concerns, publishing updating factsheets on plan progress, and regular public meetings using effective community engagement techniques. An oversight committee or Task Force (as proposed above) could aid with leading efforts on communication and trust-building.

IMPLEMENTATION ACTIONS, PHASING & SEQUENCING

Implementing countermeasures, projects, and programs identified in the LRSP typically requires an ongoing, long-term commitment from the City. To facilitate the evaluation and prioritization of funding, it can be desirable to consider the implementation of safety projects through different time horizons.

Near-term implementation efforts may focus on low-cost improvements which can be constructed within five years. These may include systemic improvements such as upgraded traffic signal heads, signal phasing and timing modifications, high-visibility crosswalk markings, and pedestrian visibility enhancements which can be pursued as discrete projects or as system improvements at multiple locations.

Medium-term implementation goals may target the pursuit of progressive safety elements such as those identified in the Countermeasure Toolbox in all capital projects and infrastructure planning efforts already underway.

Long-term goals may focus on further emphasizing safety in future planning and design efforts, including updates to the Bicycle and Pedestrian Master

Plan and all capital improvement projects. Future efforts for the City to consider may also include a commitment to Vision Zero strategies and values. An ongoing commitment to the inclusion of off-site safety improvements in conjunction with development projects will allow the City to capitalize on additional funding opportunities.

EVALUATION STRATEGIES

Evaluation allows the City to understand its performance in achieving its safety goals and inform future decision-making accordingly. It provides the basis for determining selection of emphasis or priority areas, countermeasures, and locations to reduce collisions and collision severity.

UPDATE THE PLAN REGULARLY

For example, scheduling an update every five years could assist with organizing and directing evaluation efforts. As conditions within the City and region could change, it will be necessary to update the LRSP in the future.

IDENTIFY TARGET METRICS AND MEASURE GOAL PERFORMANCE IN PRIORITY AREAS

In order to understand progress and safety conditions, several metrics could be used in LRSP evaluation. Examples of measuring goal performance include monitoring the number of total collisions, specific types of collisions, and/or safety infrastructure improvements installed.

Additional regular measurement of goal progress in priority areas can be performed every year. One example is a safety scorecard. Safety scorecards that are released annually can be a powerful tool for measuring effectiveness, highlighting areas that need further attention and resources, and identifying tasks and deadlines for responsible stakeholder parties.

CONTINUE ENGAGEMENT OF STAKEHOLDERS

Efforts around evaluation could include expanding partnership from diverse sources (e.g. officials, agencies, community advocacy groups). Input from identified stakeholders and future partners, along with collected target metrics, could be used to adapt the plan based on community feedback and expert insight as projects and programs are rolled out.

Conduct pre- and post- surveys with community members to measure how their actions and views have shifted after engagement around traffic safety. Local partners can be tasked with disseminating the pre- and post-surveys to residents. Surveys could evaluate whether respondents express a shift in behavior after having participated in traffic safety programming. The metrics for evaluation can also be developed in partnership with local partners to facilitate broader accessibility for the public.

Pacifica Local Roadway Safety Plan: Appendices

Appendix 1: Safety Countermeasure Toolbox

Appendix 2: Priority Concept Design Cutsheets