Oxnard LOCAL ROAD SAFETY PLAN

FEHR & PEERS

Adopted January 17, 2023

CITY OF OXNARD CALIFORNIA

Statement of Protection of Data from Discovery and Admissions

SECTION 148 OF TITLE 23, UNITED STATES CODE

REPORTS DISCOVERY AND ADMISSION INTO EVIDENCE OF CERTAIN REPORTS, SURVEYS, AND INFORMATION – Notwithstanding any other provisions of law, reports, surveys, schedules, lists, or data compiled or collected for any purpose relating to this section, shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at the location identified or addressed in the reports, surveys, schedules, lists, or other data.

This study applies a systemic safety approach that identifies certain features on particular roadways that are correlated with specific collision types and frequencies. This broad approach is necessitated by the inherent nature of covering an entire agency's facilities in one study and the limited scope/budget available to prepare LRSPs. Limited time is available to perform field observations throughout the study area to contextualize the data, and therefore, it is beyond the scope of work to perform in-depth "hot spot" evaluations at all locations.

Local Roadway Safety Plans are a Caltrans requirement for jurisdictions to be eligible for Highway Safety Improvement Program (HSIP) grant funding. The recommended countermeasures included in this LRSP were developed based on outcomes from a collision history analysis and present a "menu" of options for consideration. Each "Hot Spot" location may consider one, two, or a combination of improvements, all of which will require further analysis for consideration. The proposed countermeasures do not commit the City to employ them, but provide a number of options to further analyze for implementation.

Acknowledgments

The City of Oxnard Local Roadway Safety Plan was funded through a Local Roadway Safety Plan (LRSP) grant provided by the California Department of Transportation (Caltrans). Input was sought from a stakeholder group consisting of staff from the City of Oxnard and partner public agencies. Fehr & Peers assisted the City of Oxnard in preparing the plan.

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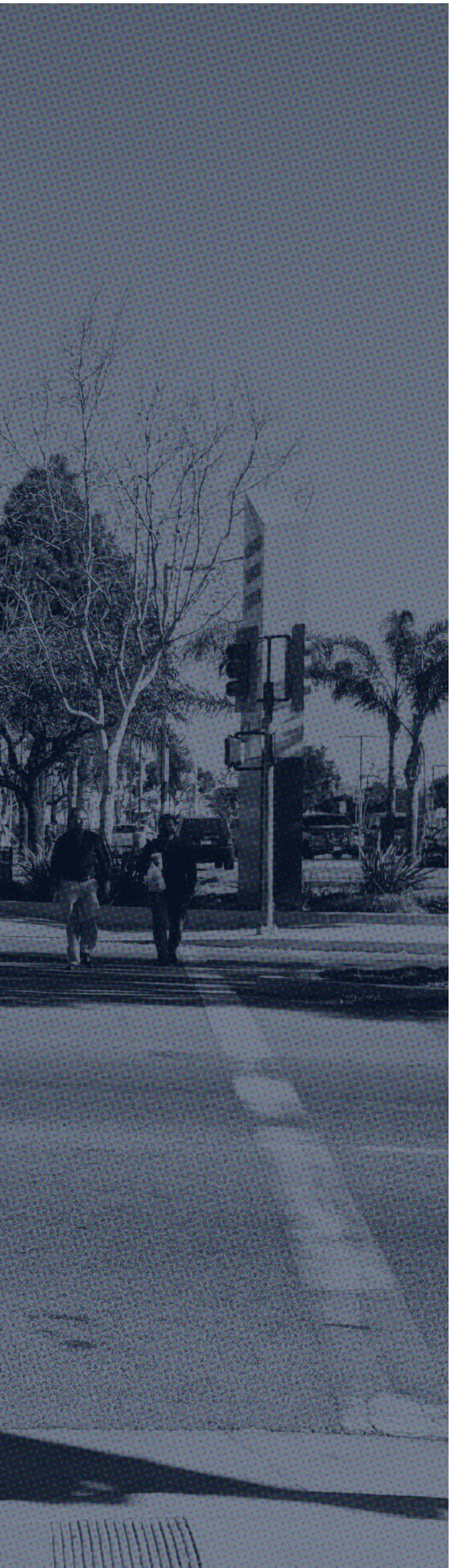
FACE COVER REQ.



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APPENDICES

01 Introduction

The City of Oxnard is committed to prioritizing transportation safety and decreasing the number of traffic related deaths and serious injuries on City streets. This Local Road Safety Plan (LRSP) builds on existing and ongoing City safety efforts by proactively identifying and evaluating hot spots and systemic risk factors throughout the City. The LRSP identifies proven countermeasures that can be implemented through roadway design changes, as well as key partnerships with safety stakeholders. This plan applies the Safe System Approach, an international best practice framework, as the foundation for this LRSP.

Introduction

Caltrans Local Road Safety Plan Background

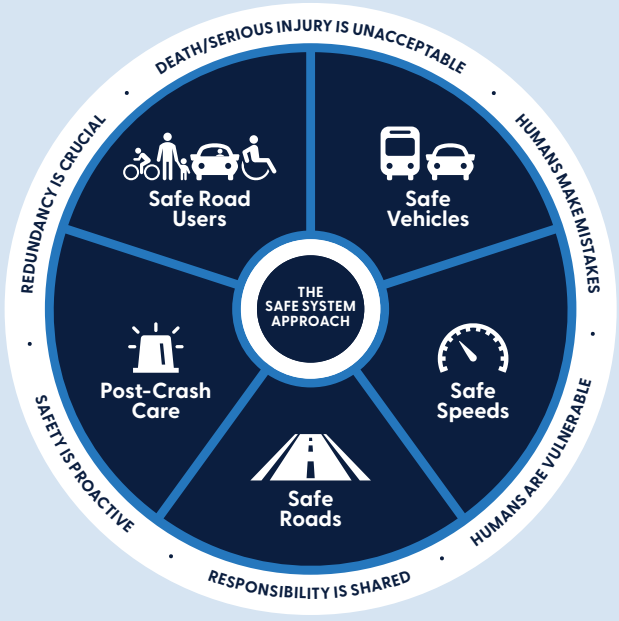
A Local Road Safety Plan (LRSP) is a means for providing Oxnard with an opportunity to address unique roadway safety needs while contributing to the success of the California Strategic Highway Safety Plan and statewide safety goals. The process of preparing an LRSP is based on a framework to systemically identify and analyze safety challenges and recommend safety improvements in coordination and collaboration with local agency partners. The LRSP offers a proactive approach to addressing safety needs and demonstrates Oxnard's responsiveness to safety challenges.

This LRSP will be the first comprehensive safety plan for the City of Oxnard. This LRSP builds on the City's roadway safety projects and programmatic efforts and provides the City and its major stakeholders with a blueprint for a safe and more accessible community. Cycle 11 of the Highway Safety Improvement Program (HSIP) in 2022 requires an LRSP for an agency to be eligible to apply for funds. HSIP is a key funding source for local safety project implementation in California.

The Safe System Approach

The 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.

Source: Fehr & Peers for FHWA



The Safe System Approach

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 and vehicle manufacturers to law enforcement and everyday users—we can move to a Safe System Approach that anticipates human mistakes, with the goal of eliminating fatal 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."[1]

The Safe System Approach to road safety started internationally as part of the Vision Zero proclamation that no one should be killed or seriously injured on the road system.[2,3] The Approach 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.[4] Countries that have adopted the Safe System approach have

had significant success reducing highway fatalities, with reductions in fatalities between 50% and 70%.[5] The Safe System approach is the foundation for the National Safety Strategy released by USDOT in 2022. Caltrans has also adopted both a Safe System approach and a Vision Zero goal in roadway safety planning across California.

The Institute of Transportation Engineers (ITE) and the Road to Zero Coalition's Safe Systems 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"[6] 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.[7] In a Safe System, roadway system designers and operators take on the highest level of ethical responsibility.

About Oxnard

The City of Oxnard, located in Ventura County, is home to approximately 207,700 people.[8] The majority of the population is Hispanic (75%), followed by Non-Hispanic White (14%), Asian (7%), and Black (2%).[9] Approximately 34 percent of Oxnard residents are foreign-born,[10] and 18 percent are not U.S. citizens.[11]

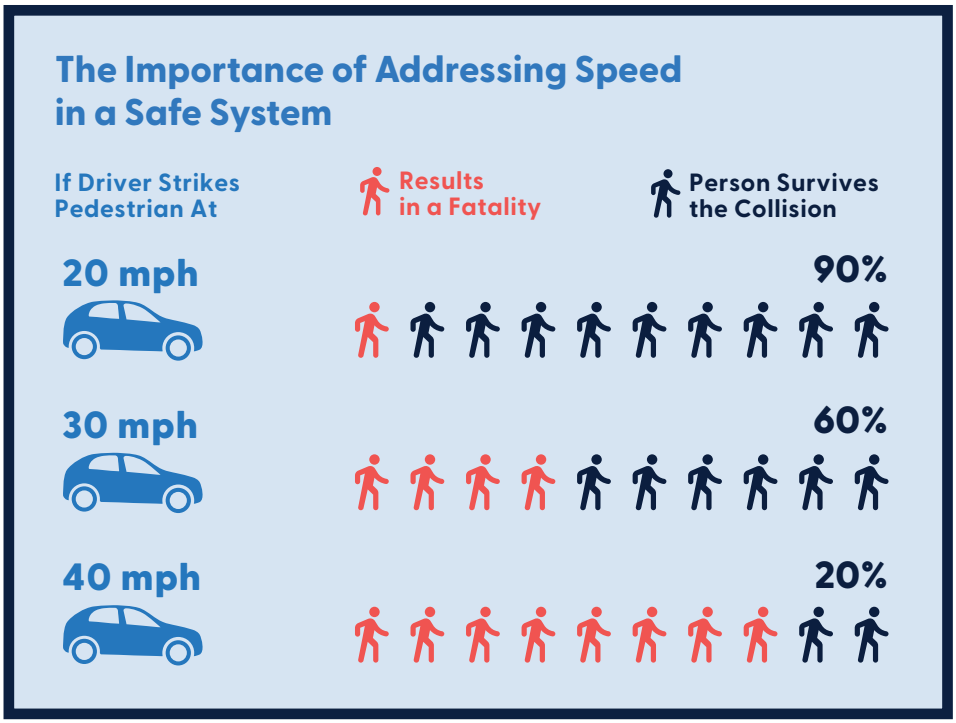
Many residents live in disadvantaged or low-income communities that often experience disproportionate burden in roadway safety outcomes.[12] Most of the City's census tracts also rank in the bottom half of the state for healthy community conditions according to the California Healthy Places Index, including four tracts below the 10th percentile.[13] Collision data from across California and the United States show that pedestrians who are Black and Indigenous, as well as residents living in low-income communities, are more likely to be killed or seriously injured in traffic collisions when compared to the population as a whole. A prominent factor contributing to this trend is historic disinvestment in roadway safety infrastructure, and thus when developing an LRSP, specific attention should be directed to safety concerns facing these communities.

The median household income is $77,050 whereas the Oxnard-Thousand Oaks-Ventura metro area median household income is $89,295.[14] Approximately 12 percent of Oxnard residents live below the federal poverty line,[15] and approximately 10 percent live with a disability.[16] 78 percent of workers in Oxnard commute to work by driving alone in a car and 15 percent of workers in Oxnard commute to work by carpooling.[17]

ITE Safe System Framework: Focus on Safe Speeds

The ITE Safe System framework provides important context for the focus on safe speeds within a Safe System approach. For vulnerable users, such as people who walk or bike, speed is a determining factor in survivability; a human's chance of surviving being struck by a vehicle increases from 20% at 40 miles per hour to 60% at 30 miles per hour to 90% at 20 miles per hour. Reducing speed in the presence of vulnerable users is a key Safe System strategy. Approaches include:

- Physical roadway designs (width, horizontal alignment) to limit speeds
- Traffic calming treatments that induce slower speeds
- Traffic signal timing that minimizes high speed flow
- Traditional or automated enforcement that discourages speeding



Endnotes:

[1]World Health Organization (2011). Decade of Action for Road Safety 2011-2020. Retrieved from https://www.who.int/ roadsafety/decade_of_action/plan/plan_en.pdf, p. 9.

[2]Johansson, R. (2009). Vision Zero - Implementing a policy for traffic safety. Safety Science, 47, 826-831.

[3]Tingvall, C., & Haworth, N. (1999). An Ethical Approach to Safety and Mobility. Paper presented at the 6th ITE International Conference Road Safety and Traffic Enforcement. 6-7 September 1999, Melbourne, Australia.

[4]Belin, M.-Å., Tillgren, P., & Vedung, E. (2012). Vision Zero - a road safety policy innovation. International Journal of Injury Control and Safety Promotion, 19, 171-179.

[5]World Resources Institute (2018). Sustainable and Safe: A Vision and Guidance for Zero Road Deaths. Retrieved from https://www.wri.org/publication/sustainable-and-safe-vision-and-guidance-zero-road-deaths

[6]World Health Organization (2011). Decade of Action for Road Safety 2011-2020. Retrieved from https://www.who.int/ roadsafety/decade_of_action/plan/plan_en.pdf, p. 9.

[7]World Health Organization (2011). Decade of Action for Road Safety 2011-2020. Retrieved from https://www.who.int/ roadsafety/decade_of_action/plan/plan_en.pdf

[8]U.S. Census Bureau. (2020). 2016 – 2020 American Community Survey 5-Year Estimates Table B01003.

[9]U.S. Census Bureau. (2020). 2016 – 2020 American Community Survey 5-Year Estimates Table B03002.

[10]U.S. Census Bureau. (2020). 2016 - 2020 American Community Survey 5-Year Estimates Table B05006.

[11]U.S. Census Bureau. (2019). 2019 American Community Survey 1-Year Estimates Table C05001.

[12]Disadvantaged or Low-Income Community designation is based on SB 535 or AB 1550.

[13]California Healthy Places Index, HPI Score (3.0), https://map.healthyplacesindex.org.

[14]U.S. Census Bureau. (2020). 2016 – 2020 American Community Survey 5-Year Estimates Table B19001.

[15]U.S. Census Bureau. (2020). 2016 – 2020 American Community Survey 5-Year Estimates Table S1701.

[16]U.S. Census Bureau. (2020). 2016 – 2020 American Community Survey 5-Year Estimates Table S1810.

[17]U.S. Census Bureau. (2020). 2016 – 2020 American Community Survey 5-Year Estimates Table B08006.

02
Vision & Goals

Oxnard will have an equitable, sustainable, and multimodal transportation system where people of all ages, abilities, and backgrounds can travel safely throughout the city.

Vision & Goals

The City of Oxnard's safety vision statement and goals were collaboratively developed by the City at the first stakeholder meeting, which was attended by representatives from City of Oxnard departments, school districts, and regional agencies. A summary of the stakeholder meetings and additional stakeholder engagement is in the following chapter.

Oxnard's Safety Vision Statement

> ***Oxnard will have an equitable, sustainable, and multimodal transportation system where people of all ages, abilities, and backgrounds can travel safely throughout the city.***

Goals

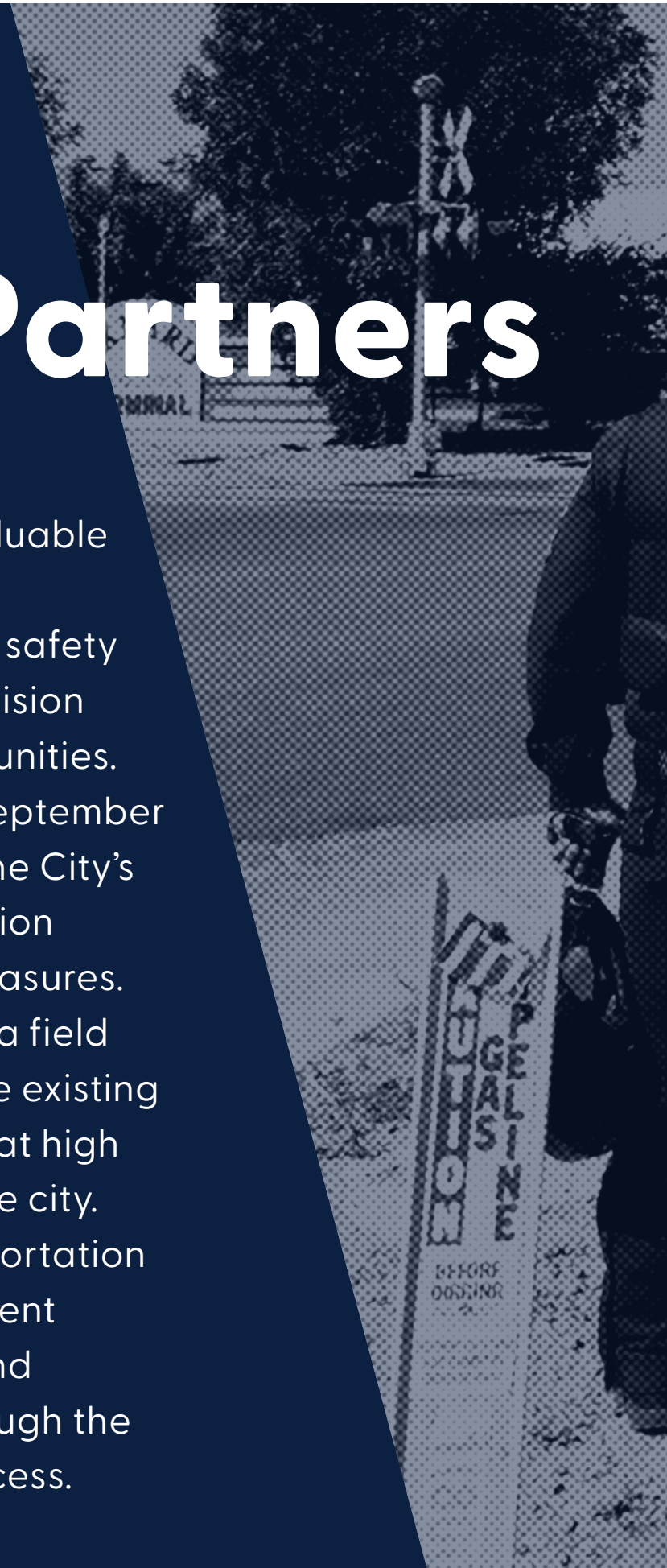
1. **Prioritize traffic safety programs and infrastructure investments for locations with high collision rates or severity.**

2. **Foster a citywide culture of safety where all road users have shared responsibility and a feeling of belonging on streets and sidewalks.**

3. **Ensure equitable access to safety education and resources by removing barriers, such as language or technology.**


Gary Dr
Rose Ave

03
Safety Partners



The City of Oxnard received valuable input from a multidisciplinary stakeholder group on roadway safety concerns, priority locations, collision trends, and partnership opportunities. The stakeholder group met in September 2021 and April 2022 to discuss the City's vision for roadway safety, collision analysis results, and countermeasures. The LRSP team also conducted a field visit in February 2022 to observe existing conditions and traffic patterns at high priority locations throughout the city. The Oxnard Sustainable Transportation Plan (STP) was under development at the same time as the LRSP, and community input gathered through the STP also informed the LRSP process.

Safety Partners

Stakeholder Group Members

- Gold Coast Transit District
- Oxnard College
- Oxnard Fire Department
- Oxnard Police Department
- Oxnard Public Works Department
- Oxnard School District
- Oxnard Union School District
- Rio School District
- Ventura County Transportation Commission

Stakeholder Meeting #1: September 2021

The LRSP team provided an overview of Local Road Safety Plans, the Safe System Approach, and the Oxnard LRSP's connection to the ongoing Oxnard Sustainable Transportation Plan (STP). Although the STP has a broader focus than the LRSP, the STP includes a goal to improve safety, connectivity, and mobility for all Oxnard travelers. Stakeholders shared the following safety concerns they have experienced or observed in Oxnard:

- People driving under the influence of drugs and/or alcohol, too fast, and/or not stopped at stop signs.
- Lack of Class IV bicycle infrastructure to separate people walking, bicycling, and driving.
- Uneven sidewalks due to tree roots.
- Lack of awareness around people traveling in wheelchairs.
- Poor driving habits, including around schools for pick up and drop off.

Stakeholders also participated in an interactive mapping activity by drawing points and lines to identify intersections and corridors with safety concerns. Some of the locations included:

- Gonzales Road: people driving at high speeds, including near schools
- Oxnard Boulevard: wide street with many lanes and limited pedestrian crossings
- Saviers Road & Clara Street: existing bus stop that would benefit from a crosswalk at the intersection to serve people riding transit.
- Wooley Road & C Street: many students crossing intersection to/from school.

Field Visit: February 2022

On February 25, 2022, Fehr & Peers engineering and planning staff spent a day observing existing conditions and travel patterns along five hot spot corridors with officers from the Oxnard Police Department and staff from the Oxnard Public Works Department. The Oxnard Police Officers and Public Works staff provided additional context at key locations along the hot spot corridors that supplemented the collision and contextual factors analyzed in the collision analysis. The field visit helped the LRSP team better understand the safety challenges along the hot spot corridors and assess which safety strategies would and would not be applicable at various locations.

Stakeholder Meeting #2: April 2022

Stakeholders shared trends and observations they had noted since the last stakeholder meeting, such as more people are walking, skateboarding, and biking around Oxnard and fewer students have been riding the bus due to COVID-19 and are getting dropped off, biking, or walking to school. The LRSP team shared the hot spot locations and collision profiles and associated countermeasures that had been identified through the collision analysis. Stakeholders provided feedback on the findings and draft safety strategies, such as:

- Support for the City to explore adding pedestrian crossing locations, such as along Gonzales Road, that reflect pedestrian desire lines, or informal places where pedestrians are observed frequently crossing a street outside of a crosswalk
- Support from Oxnard Police Department (PD) for

retroreflective backplates on traffic signal heads.

» Support from Gold Coast Transit District (GCTD) for curb extensions that could double as bus bulb outs, such as along C Street and Bard Road, which are two of GCTD's busiest routes.

The stakeholder meeting also served as a venue to identify partnership opportunities:

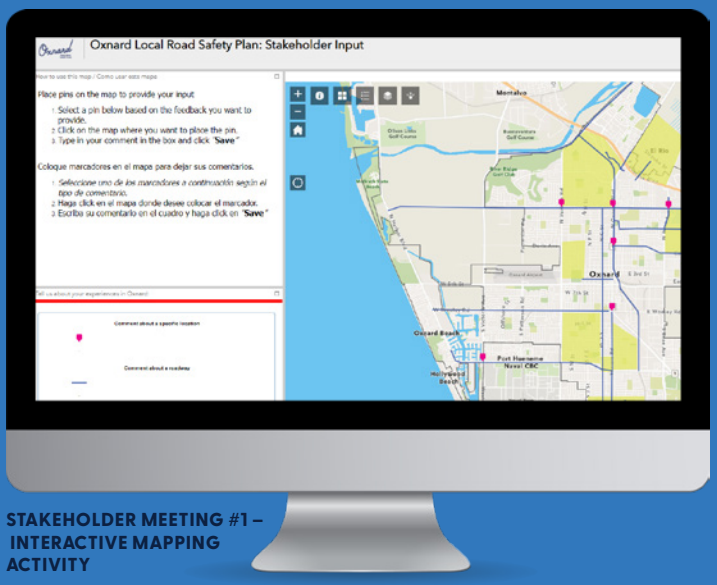
» GCTD sent Oxnard PD a flyer about the GCTD late night safe rides pilot program so that Oxnard PD could distribute the flyer at sobriety checkpoints to educate drivers about a transportation alternative to driving under the influence.

» School representatives identified an opportunity to partner with Oxnard PD to enforce school zone speed limits and stopping for school buses.

» Oxnard PD identified an opportunity to partner with the Public Works Department and school districts on the City's upcoming Safe Routes to School program as they have received grants from the Office of Traffic Safety to focus on bicycle and pedestrian safety and education and enforcement programs.

A full summary of stakeholder comments can be found in Appendix A.

FIELD VISIT



STAKEHOLDER MEETING #1 – INTERACTIVE MAPPING ACTIVITY

FIELD VISIT

04
Existing Efforts

Over the past several years, the City has made investments in roadway safety through project implementation, grant applications, maintenance activities, and adoption of planning documents that identify priorities and future projects.

Existing Efforts

Planning documents that have specific safety-related goals, policies, projects, and recommendations were reviewed to set the foundation for the LRSP. The planning documents include:

- Bicycle and Pedestrian Facilities Master Plan (BPMP)
- Capital Improvement Plan 2021 – 2026 (CIP)
- Complete Streets Safety Assessment (CSSA)
- Downtown Oxnard Vision Plan Charrette Report
- Downtown Strategic Plan
- Green Alleys Plan
- Oxnard Corridor Community Transportation Improvement Plan (OCCTIP)
- Oxnard General Plan Circulation Element
- Oxnard Sidewalk Survey Report
- Oxnard Transportation Demand Management (TDM) Plan

Intersections and corridors that were identified in several of these planning efforts were flagged as Opportunity Areas and are described later in this chapter.

City maintenance programs that are relevant to traffic safety were also reviewed to document safety considerations in routine City functions. The programs include the Streets Division of Public Works, the Pavement Management System (PMS) Update, the City's Intelligent Transportation System (ITS) Master Plan, and the City's 311 Reporting System.

This summary organizes Oxnard's existing roadway safety efforts into the five categories of a Safe System, as defined by FHWA: safe roads, safe speeds, safe road users, safe vehicles and post-crash care.

Existing Efforts Within Safe System Approach

Safe Roads

The Safe Roads Element of the Safe System Approach includes the physical design of roadways, including the separation of users in time and space, and whether designs are accommodating to human mistakes and injury tolerance levels. Roadway design projects with a focus on safety enhancements are summarized here.

Capital Improvement Program (CIP)

The following projects are found in the City of Oxnard's 2021 CIP, *Our Assets, Our Safety, Our Future: 2021-2026 City of Oxnard Five Year Capital Improvement Program* (the City of Oxnard's 2022 CIP, Restoring Oxnard: 2022 - 2027 Capital Improvement Program, was adopted near the completion of this LRSP). Several projects are supplemented with funding from VCTC grant programs, such as Congestion Mitigation and Air Quality (CMAQ) and Transportation Development Act (TDA) funds.

COMPLETED OR UNDER CONSTRUCTION (AS OF MAY 2022)

- **C Street Bicycle Facilities:** Completed in Winter 2021, new Class II and Class III bicycle facilities were installed on C Street from W. Gonzales Road to Hueneme Rd with CMAQ funding.
- **La Colonia bicycle boulevards and green alleys:** Completed in 2022, several alleys in the La Colonia neighborhood were converted into pedestrian and cycling zones with green infrastructure elements, such as permeables surfaces and bioswales, as a first step in implementing the Oxnard Green Alleys Plan.
- **Northeast Community and Cloyne Street Bike Lanes:** New Class II and Class III bicycle lanes, bicycle detection, and pedestrian improvements will be implemented on several streets in Northeast Oxnard and along Cloyne Street with CMAQ and TDA funding. Expected completion is Spring 2023.
- **Oxnard Boulevard Bicycle Lanes:** Bicycle lanes will be implemented on Oxnard Boulevard from US-101 to Gonzales Road with CMAQ funding. Expected completion is December 2023.
- **Oxnard Boulevard/Saviers Road Signal Improvements:** Funded and planned signal upgrade projects in the CIP consist of new signal heads, protected left turn phasing, bicycle detection, Accessible Pedestrian Signals, and LED lights at five intersections along Oxnard Boulevard and Saviers Road. Expected completion Summer 2023.
- **Pedestrian Beacon Installation:** Completed in April 2020, new pedestrian crossing flashing beacons and signage along with ADA improvements and crosswalks were implemented

in various locations throughout the City with TDA funding.

» **Rose Avenue & Gary Drive New Traffic Signal:** Completed in May 2020, the City installed a new traffic signal and pedestrian ADA improvements and crosswalks at the intersection of Rose Avenue & Gary Drive by Oxnard College.

» **Sidewalks:** New sidewalks are planned for Ventura Blvd between Rose Ave and Balboa St. Expected completion is June 2023.

» **Signal Improvements on Oxnard Blvd, Channel Islands Blvd, and Ventura Rd:** The City was awarded HSIP Cycle 8 funding to implement improvements, including signal hardware upgrades, adding protected left turn phasing, Accessible Pedestrian Signals, and adding intersection lighting at seven signals. Expected completion, December 2022.

PROJECTS IN DESIGN

» 4th Street Mobility Improvements: widen sidewalks, upgrade streetlights, install bike facilities, and improve bus stop.

» Adaptive traffic signals on Rose Avenue and Gonzales Road for 35 intersections. Expected completion is Winter 2023.

» Etting Road bike lane and sidewalks with TDA funding.

» Guardrail for Vineyard Avenue/ Patterson Road curve.

» The City plans to construct grade separation bridge over UPRR tracks, two new signals, bike lanes and sidewalks at Rice Avenue & Fifth Street. Expected completion Summer 2025.

» Traffic signal modernization at City's 170 signals.

Adopted Plans

The City's Circulation Element, BPMP, OCCTIP, Downtown Vision Plan, Green Alleys Plan, TDM Plan, CSSA, and Oxnard Vision Plan feature infrastructure recommendations that prioritize safer roadway design.

Circulation Element: The Circulation Element establishes a goal for safe bicycle and pedestrian circulation throughout the city. For example, the Circulation Element recommends closing gaps in bicycle and sidewalk connectivity and improving ADA compliance at curb ramps and crosswalks.

Complete Streets Safety Assessment: The Oxnard Complete Streets Safety Assessment includes a review of existing conditions, a walk audit, and recommendations to improve safety and accessibility for people walking and biking in Oxnard. The CSSA benchmarks key strengths, enhancement areas, and opportunity areas for the City's existing bicycle and pedestrian programs, policies, and practices. Recommendations include curb extension, high visibility crosswalks, sidewalk widening, increasing pedestrian crossing time, and conflict striping at intersections for bike lanes.

Bicycle and Pedestrian Facilities Master Plan: The BPMP provides recommendations for Class I, II, and III bicycle facilities throughout Oxnard, as well as ADA improvements, countdown timer pedestrian signal heads, and pedestrian refuge islands. The plan also defines priority bicycle and pedestrian projects for the City to implement as funding becomes available.

Oxnard Corridor Community Transportation Improvement Plan: The OCCTIP recommends infrastructure upgrades, such as shared bike lanes, sidewalks,

new signals, roundabouts, and ADA improvements, along Oxnard Boulevard along with funding recommendations.

Downtown Vision Plan and Downtown Strategic Plan: The Downtown Vision Plan and Downtown Strategic Plan are important documents in Oxnard's Safe Roads efforts as they feature extensive community engagement and input. These plans identify and recommend opportunities for safer roadway infrastructure specifically in Downtown Oxnard, including complete streets concepts and safe bicycle connectivity in the Downtown core.

Green Alleys Plan: The Green Alleys Plan integrates Safe Roads concepts into Oxnard's network of alleyways. This Plan incorporates a shared street approach to alleys by re-imagining them as places with pedestrian, bicycle, and community-serving opportunities. Safety improvements outlined in the Green Alleys Plan include signage, bicycle facilities, and pedestrian crossing enhancements, and priority locations include La Colonia and South Winds neighborhoods, as well as Downtown.

Oxnard Vision Plan: As a part of the Southern California Association of Governments High Quality Transit Areas pilot, the Oxnard Vision Plan includes Safe Roads goals of promoting safety, reducing collisions, and supporting multi-modal travel in Downtown Oxnard. Specific infrastructure recommendations in the Oxnard Vision Plan include bicycle facilities, curb extensions, pedestrian scramble crosswalks, and lighting improvements.

Accessible Sidewalk and Ramp Upgrades: The Sidewalk Survey included an inventory of existing sidewalks, curb ramps, and traffic calming devices. The Sidewalk Survey also provides recommendations for high priority areas.

Grant Funding

The City of Oxnard has received Active Transportation Program (ATP) and Highway Safety Improvement Program (HSIP) for roadway design projects.

ATP Grant Funding: Oxnard previously received funding through ATP Cycles 1-4 for infrastructure improvements. In 2021, Oxnard received funding for a Safe Routes to Schools program and mobility improvements for the 4th Street corridor through the most recent ATP Cycle 5. The Safe Routes to Schools improvements include physical curb extensions, accessible curb ramps, high-visibility crosswalks, roadside signs, traffic pavement markings and striping, and rectangular rapid flashing beacons (RRFBs) at six elementary schools. The Safe Routes to Schools program also includes walkability assessment at 26 schools to identify infrastructure improvements. The mobility improvements for the 4th Street corridor include pedestrian crossing enhancements, bicycle facilities, street lighting, and modified traffic signals.

HSIP Grant Funding: In 2021, Oxnard received HSIP funding as part of the most recent HSIP Cycle 10 for signal improvements, streetlights, and accessible crossing facilities, as well as pedestrian crossing upgrades near Ramona Elementary School.

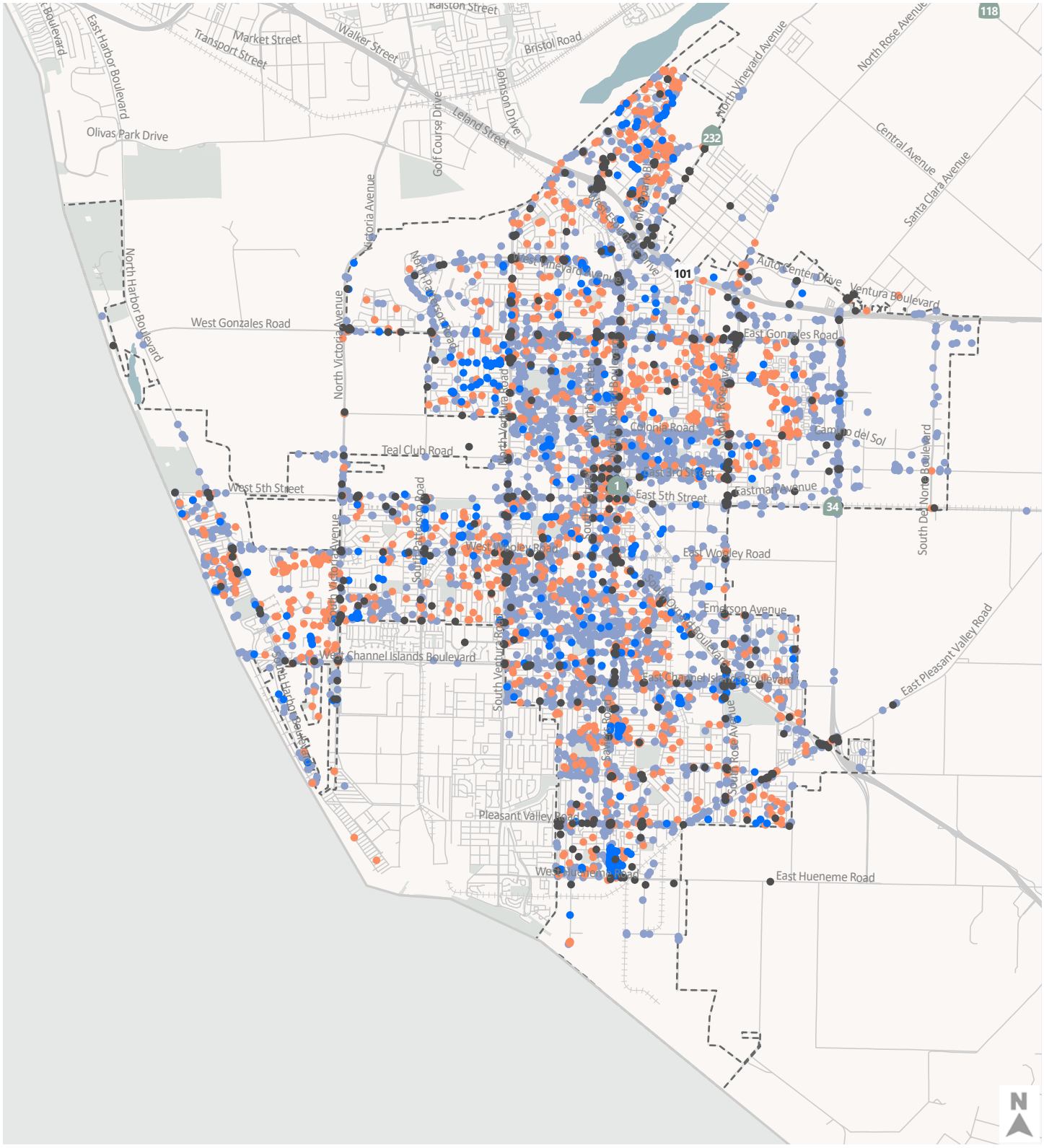
Maintenance Programs

Streets Division of Public Works: The Streets Division of Public Works currently employs a reactive approach to repairs, under the philosophy that quickly addressing street maintenance issues avoids negative safety implications that may stem from disrepair. The division focuses on repairing inadequate structures back to their original, intended state. Although much of the Streets Division work is inherently related to safety, the division does not currently prioritize maintenance based on collision or other safety data, nor does it have in place a process for bundling safety improvement projects with maintenance projects for priority safety locations.

Pavement Management System (PMS): The PMS evaluates pavement conditions throughout the city and presents budget scenarios for maintaining or improving overall pavement condition. Recommendations range from light maintenance to full reconstruction, the latter of which presents opportunities for bundling maintenance with safety improvements, such as pedestrian crossing enhancements or bicycle lanes. However, this is currently not a feature of the PMS program.

311 Reporting System: The City began accepting non-emergency requests and reports through a 311 Reporting System in May 2016. Requests and reports cover a wide range of topics, such as potholes, overgrown landscape, faded street markings, and water waste and leaks, and are routed to the relevant department. Transportation safety-

Oxnard 311 Transportation Safety-Related Requests between May 2016 and December 2020



311 Request Type (May 2016 - December 2020)

- Enforcement Requests
- Roadway Infrastructure (potholes, signs, and markings)
- Streetlight Out
- Signal Issues

Existing Efforts (Continued)

related requests made between May 2016 and December 2020 were reviewed to provide additional context for the collision data. The majority of transportation safety-related requests are concentrated in the central part of the City between Ventura Road and Oxnard Boulevard with the majority of requests related to potholes, signs, and roadway markings.

Safe Speeds

The Safe Speeds element of the Safe System Approach focuses on infrastructure and policy changes that specifically target speed as a major factor in collisions and collision severity.

Speed is a major concern for active transportation safety in Oxnard, with the BPMP noting that 64% of bicycle collisions occur on the City's high-speed, high-volume arterial roadways. The City collects speed data and performs a speed limit review every five years, as identified in the CSSA, and as of August 2022, is wrapping up a speed survey.

Oxnard's adopted plans contain infrastructure and program recommendations that support Safe Speeds efforts. These include speed radar trailers (BPMP), lane narrowing on Oxnard Boulevard and A Street to encourage slower speeds (Downtown Vision Plan), speed enforcement in school zones (Sidewalk Survey), and a neighborhood pace car program where residents pledge to drive courteously and obey the speed limit to discourage speeding on residential roadways while children walk to school (Sidewalk Survey).

Safe Road Users

The Safe Road Users element of the Safe System Approach addresses safety from a behavioral perspective by focusing on education, engagement, and enforcement.

Education

The CSSA notes several ongoing Safe Road Users educational efforts, such as traffic safety education programs led by the Oxnard Police Department and coordination between City departments and school districts to identify safety needs. The BPMP and Sidewalk Survey include Safe Road User recommendations. The BPMP recommends "Share the Road" campaigns that include the distribution of educational flyers and the creation of a multi-modal access guide. The Sidewalk Survey recommends staff and agency training on street safety topics such as pedestrian design treatments, and open street events where educational materials about Safe Road Users concepts may be distributed.

Enforcement

Enforcement measures, both traditional and innovative, to equitably serve the goal of Safe Road Users have been highlighted in Oxnard's BPMP and Sidewalk Survey. Innovative policies include targeted enforcement in high collision areas or areas with high active transportation volumes, as well as concentrated enforcement during the start of the school year. Coordination between City staff, the public, and the Police Department are also noted as innovative enforcement opportunities to serve the Safe Road Users element. On the more traditional side, the Sidewalk Survey includes recommendations for increased driver fines, speed enforcement in school zones, and speed radar trailers, which establish a nexus between the Safe Road Users and Safe Speeds elements.

Engagement

The upcoming Safe Routes to Schools program, described under Safe Roads, also includes bicycle and pedestrian safety educational workshops, bicycle and pedestrian rodeos, and coordination with Oxnard Police Department to develop action plans for 26 schools, including the six schools receiving infrastructure improvements. The Oxnard Police Department also received Office of Traffic Safety (OTS) grant funding for educational outreach on bicycle and pedestrian safety and enforcement, safety items for distribution, and enforcement of bicycle and pedestrian safety violations. The grant funding also allocates funds to the Police Department to target DUIs with sobriety checkpoints and educational campaigns (e.g. "Know Your Limit"), distracted driving, motorcycle safety, and traffic violations.

Safe Vehicles

Some existing and emerging on-board vehicle technologies require investments in public infrastructure in order to function properly. For example, lane departure warning technology, common on newer vehicles, requires regular maintenance of roadway striping and the use of highly retroreflective materials to maximize effectiveness. The City's pavement management system and resurfacing program would support the effectiveness of this technology. Emerging Vehicle-to-Infrastructure (V2I) technologies will likely require integration with existing infrastructure, and the City's ITS Master Plan includes emergency vehicle preemption and transit signal priority investments for each phase of the plan.

In addition to technological and infrastructure investments, the City of Oxnard has made safety interventions that recognize the role particular vehicles play in safer roadways. In 2019, the City re-routed trucks away from Oxnard Boulevard in Downtown Oxnard based on concerns of narrow streets and tight turns.

Post-Crash Care

While much of the Safe System Approach centers on collision prevention, Post-Crash Care is an important element in reducing fatalities or life-changing complications when collisions do occur. Within road design, Post-Crash Care involves the balance of prioritizing access for active transportation modes while considering emergency vehicle access needs.

The CSSA notes that City staff review collision reports semi-annually, as well as whenever requests are made for infrastructure improvements, which aligns with the Sidewalk Survey's recommendation to use collision data to monitor collision trends. The Sidewalk Survey recommends the City use their collision monitoring to collaborate with the Police Department, first responders, and health professionals to develop more efficient reporting and robust datasets to drive post-crash analysis. The City's ITS Master Plan includes a goal to improve public safety and incident response times by including investments, such as expanding on the City's existing emergency vehicle preemption program by adding new preemption as part of signal and infrastructure upgrades. The City implemented emergency vehicle preemption at 70 signals and is expanding the system to 30 additional signals.

Opportunity Areas

Based on the planning documents reviewed, fifteen opportunity areas were selected to form a baseline for priority safety improvements in the City. While all safety-related planning documents were reviewed, not all plans are represented in the final list of opportunity areas. Corridors and intersections that meet at least one of the following selection criteria were selected as opportunity areas:

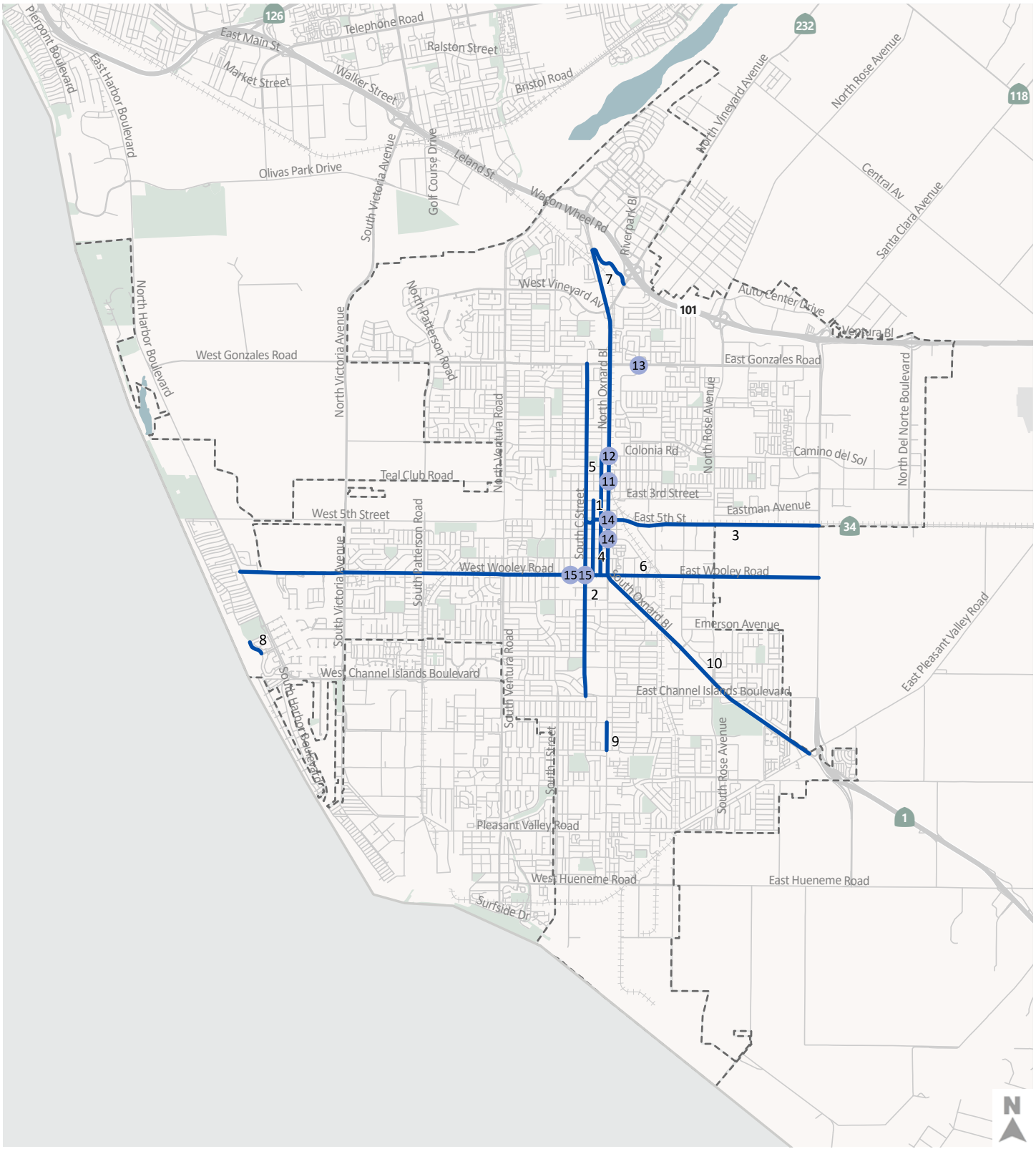
- Mentioned in three or more plans
- Existing conditions were verified through field visits
- Majority of proposed improvements are related to safety
- Located outside of the Downtown Oxnard area to provide citywide geographic coverage as most other plans were focused on the central area of the City and Oxnard Boulevard.

The opportunity areas were identified in their respective plans through data analysis, field visits, and community engagement. Most locations contain several distinct safety recommendations, and some components of those recommendations may have confirmed funding though the CIP.

The fifteen locations are listed below, and mapped on the following page. The detailed Opportunity Areas Matrix is in Appendix B.

1. Oxnard Boulevard from Esplanade Drive to Wooley Road
2. C Street from Gonzales Road to Channel Islands Boulevard
3. 5th Street from C Street to Rice Avenue
4. B Street from 3rd Street to Wooley Road
5. A Street from Colonia Road to Wooley Road
6. Wooley Road from Harbor Boulevard to Rice Avenue
7. Esplanade Drive from Vineyard Avenue to Oxnard Boulevard
8. Mandalay Beach Road from Falkirk Avenue to Costa de Oro
9. Saviers Road from Thomas Avenue to Yucca Street
10. Oxnard Boulevard from Wooley Road to Pleasant Valley Road
11. Oxnard Boulevard & 1st Street
12. Oxnard Boulevard & Colonia Road
13. Pacifica High School & Gonzales Road
14. Oxnard Boulevard & 5th Street/7th Street
15. Wooley Road & E Street/C Street

City of Oxnard Planning Documents Review: Opportunity Areas



Opportunity Area Corridors

Opportunity Area Intersections

05
Safety Analysis

This chapter summarizes the results of a comprehensive collision analysis for the City of Oxnard, which informed the identification of emphasis areas and safety strategies for the City.

Safety Analysis

This analysis reflects injury collisions that occurred on City of Oxnard roadways between 2016 and 2020 according to the Transportation Injury Mapping System (TIMS) and the City of Oxnard Record Management System (RMS) database as of August 2021 (excluding grade-separated facilities, such as US-101 and portions of SR-1). Collisions resulting only in property damage are not included in this analysis.

To better understand systemic collision patterns in Oxnard, contextual factors were analyzed in conjunction with collision characteristics. Contextual factors include:

- Roadway attributes, such as number of lanes, posted speed limit and classification
- Roadway facilities, such as traffic signals, streetlights, and on-street bicycle facilities
- Nearby land uses, such as communities with a disadvantaged or low-income community designation, schools, parks, and transit.
- Driver behavior, such as hard braking or acceleration activity

Additional details of the contextual factors and systemic analysis are documented in a Collision History and Data Collection/Assessment memorandum, found in Appendix C. During the development of the LRSP, the City was also updating their collision reporting and data management process by implementing the Crossroads Software Collision Report Writer. Details about this effort are in the Crossroads Data Management Plan, found in Appendix C.

Key Takeaways

People walking and biking are more likely to be killed or severely injured in a collision. More than half of fatal collisions involved someone walking or biking.

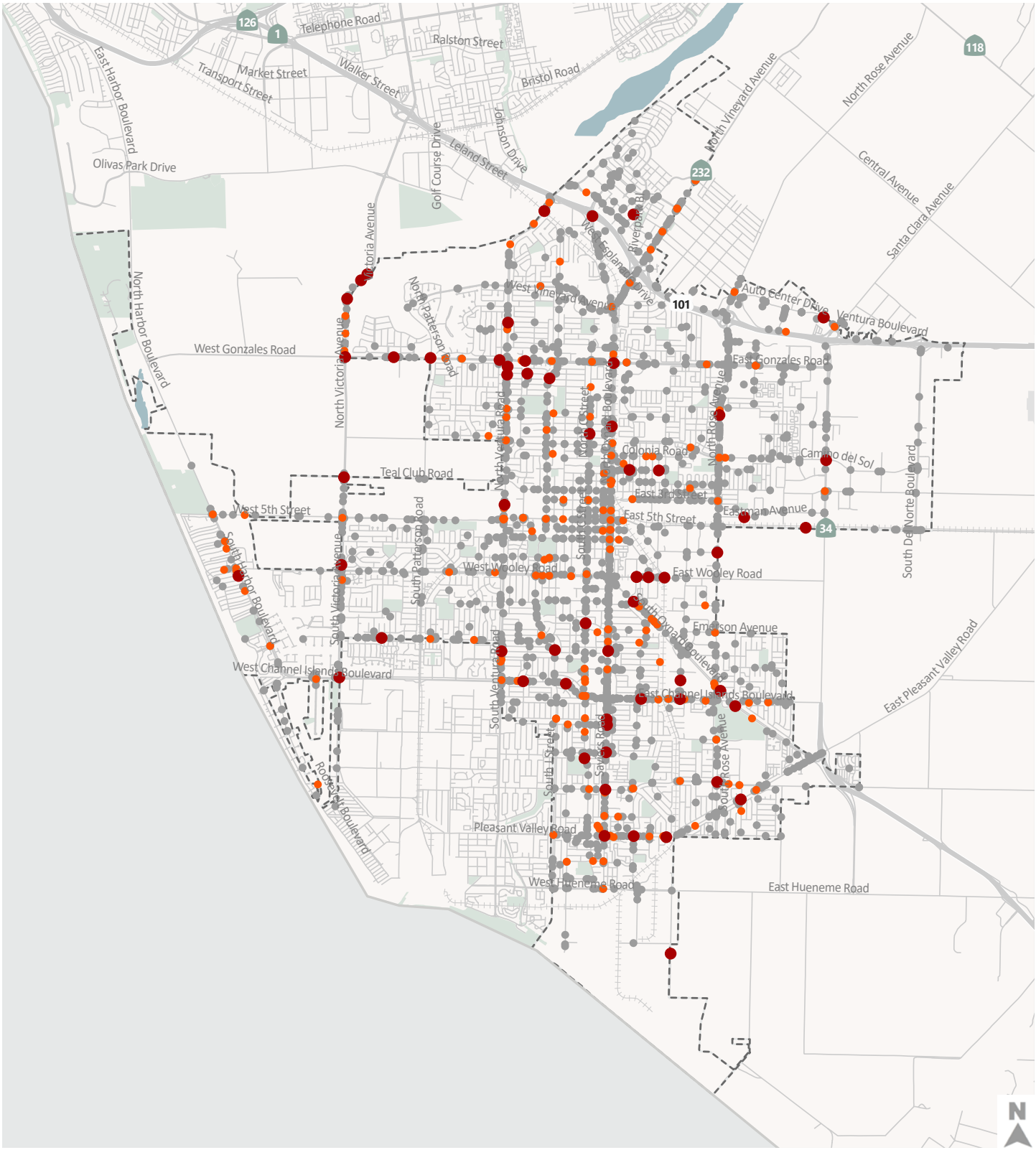
Unsafe speed violations accounted for nearly a quarter of all injury collisions.

Bicycle and pedestrian collisions primarily occurred during the PM peak period and late at night, when visibility is limited and people may be traveling at higher speeds.[18]

Pedestrians crossing outside of a marked crossing accounted for over half of severe and fatal pedestrian-involved collisions.

Nearly 90 percent of collisions occurred within an intersection sphere of influence.[19]

Injury Collisions (2016 - 2020)



Crash Severity

- Fatal
- Injury (Severe)
- Other Injury

Collision Overview

Killed or Severely Injured in a Collision

Severe injuries resulting from a traffic collision can result in a number of catastrophic impacts, including permanent disability, lost productivity and wages, and ongoing healthcare costs. These injuries can include:

- Broken or fractured bones
- Dislocated or distorted limbs
- Severe lacerations
- Severe burns
- Skull, spinal, chest or abdominal injuries
- Unconsciousness at or when taken from the collision scene

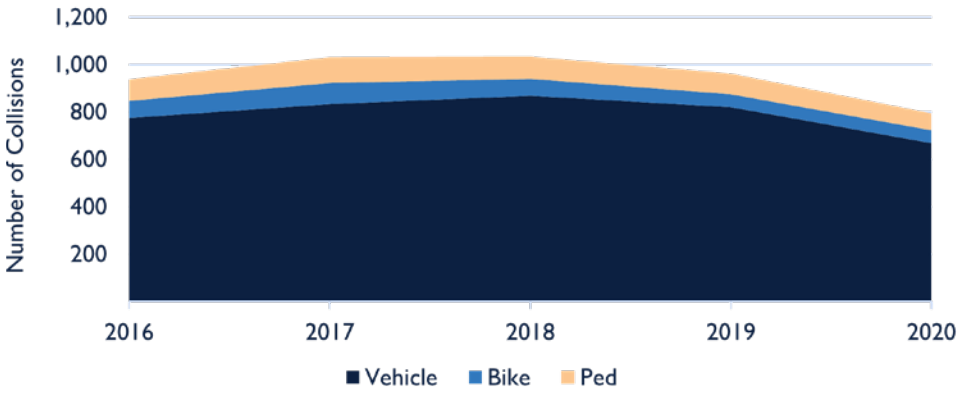
Throughout this plan, the acronym KSI is used to denote collisions where someone was killed or severely injured.

INJURY COLLISIONS BY YEAR AND MODE, 2016 - 2020

From 2016 to 2020, there were 4,751 injury collisions. Someone was killed or severely injured (KSI) in 259 of these collisions (5% of the total). On average, 12 people were killed each year in Oxnard in a traffic collision.

The number of injury collisions increased from 2016 to 2017 and 2018, then generally trended downwards in 2020. Travel patterns in 2020 shifted due to the COVID-19 pandemic as people were working and attending school remotely, and are likely not representative of longer-term typical conditions.

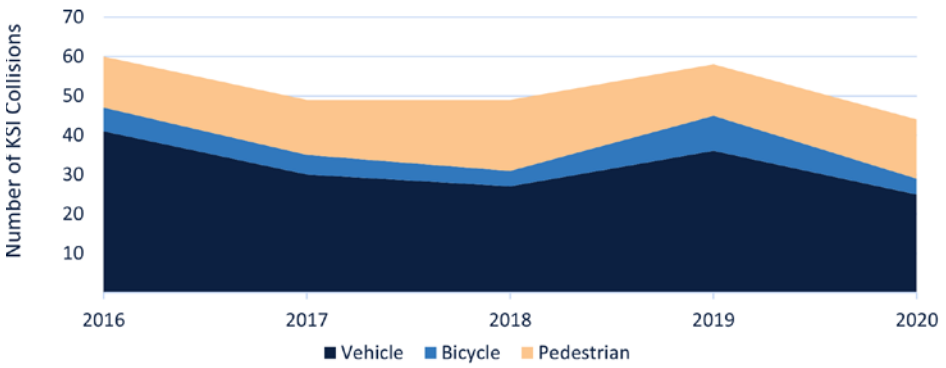
ALL INJURY COLLISIONS BY YEAR AND MODE (2016-2020)



KSI COLLISIONS BY YEAR AND MODE, 2016 - 2020

From 2016 to 2020, the number of KSI collisions trended inversely to the number of injury collisions, where KSI collisions decreased in 2017 and 2018 but increased in 2019. KSI collisions followed the same pattern as total injury collisions with a decrease in 2020.

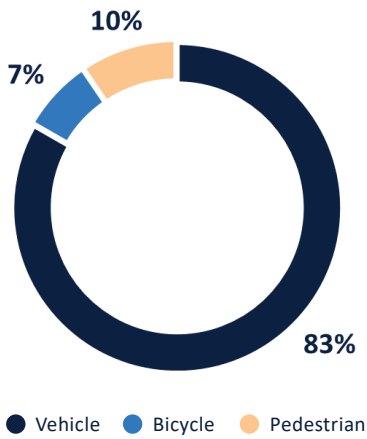
KSI COLLISIONS BY YEAR AND MODE (2016-2020)



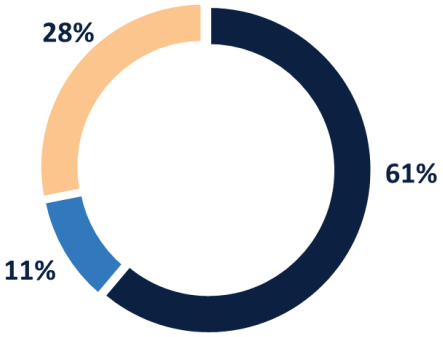
COLLISIONS BY MODE

People walking and biking were involved in 17 percent of total collisions, but 39 percent of KSI collisions. People walking were particularly over-represented in KSI collisions, as they were involved in ten percent of all collisions but 28 percent of KSI collisions. Additionally, 52 percent of the City's fatal collisions involved either a bicyclist or a pedestrian.

ALL INJURY COLLISIONS BY MODE



KSI COLLISIONS BY MODE



INJURY COLLISIONS BY TYPE

The most common injury collision types in Oxnard were:

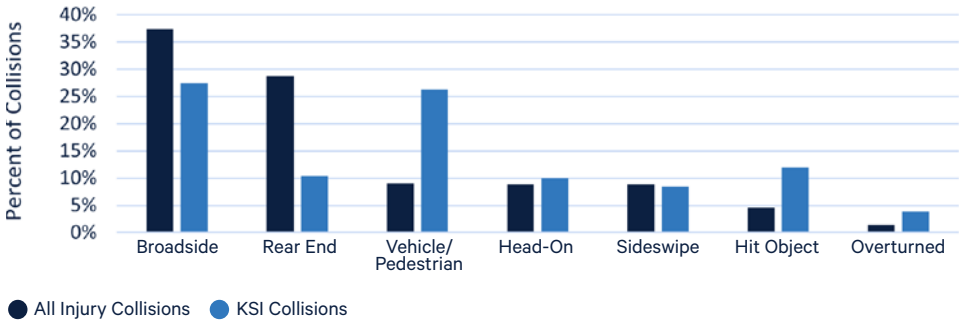
- **Broadside (37%)**
- **Rear End (29%)**
- **Head-On (9%)**
- **Sideswipe (9%)**
- **Vehicle/Pedestrian (9%)**

For KSI collisions, the most common collision types in Oxnard were:

- **Broadside (27%)**
- **Vehicle/Pedestrian (26%)**
- **Hit Object, such as trees, utility poles, or traffic barriers (12%)**

This trend further illustrates the disproportionate share of KSI collisions involving pedestrians in Oxnard. Hit Object collisions were also more likely to result in a fatality or severe injury, compared to other common collision types.

INJURY COLLISIONS BY COLLISION TYPE (2016-2020)



PRIMARY COLLISION FACTOR

Collision reports note a Primary Collision Factor (PCF), which is the reporting officer's determination of the violation that was the primary cause of the collision. In Oxnard, the most **common violations** were **:**

- **Unsafe Speed (23%)**
- **Vehicle Right of Way Violation (23%)**
- **Traffic Signals and Signs (11%)**

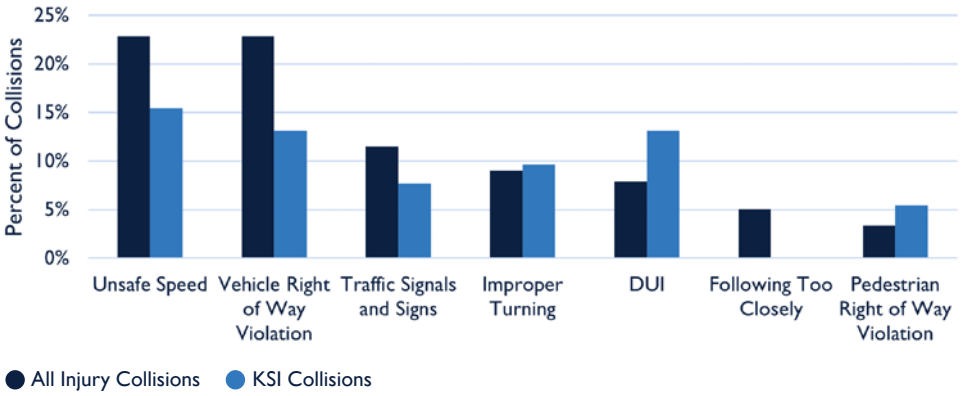
The majority of Vehicle Right of Way violations included drivers not yielding during left turns or U-turns, drivers not adhering to right of way rules at stop signs, and drivers not yielding to oncoming traffic when entering or crossing the road from property or alley. The majority of Traffic Signals and Signs violations were drivers running red lights and stop signs.

For **KSI collisions**, the most common violations were **:**

- **Unsafe Speed (15%)**
- **Pedestrian Violation (14%)**
- **Driving/Bicycling Under the Influence (13%)**
- **Vehicle Right of Way Violation (13%)**

The Pedestrian Violation PCF indicates that the pedestrian violated a rule of the road, such as crossing on a red signal, as opposed to the Pedestrian Right of Way Violation PCF (4%), where the driver violates the pedestrian's right of way.

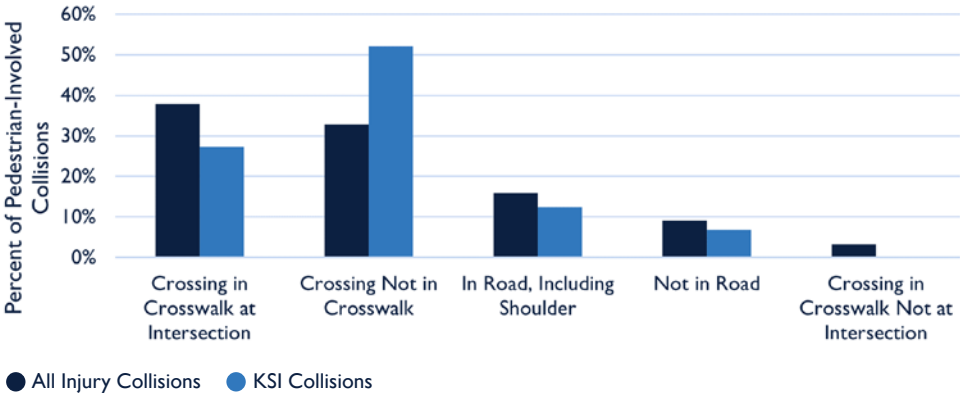
PRIMARY COLLISION FACTOR (2016-2020)



PEDESTRIAN ACTION/LOCATION

A large share of injuries to people walking occurred when people were crossing in the crosswalk at an intersection (38%) or crossing not in a crosswalk (33%). For **KSI collisions, pedestrians crossing not in a crosswalk** made up the largest share (52%). Collisions where people were crossing the street outside of crosswalks and walking in the road may indicate that there are unmet pedestrian desire lines and these locations were evaluated to identify potential locations for new crosswalks and sidewalks.

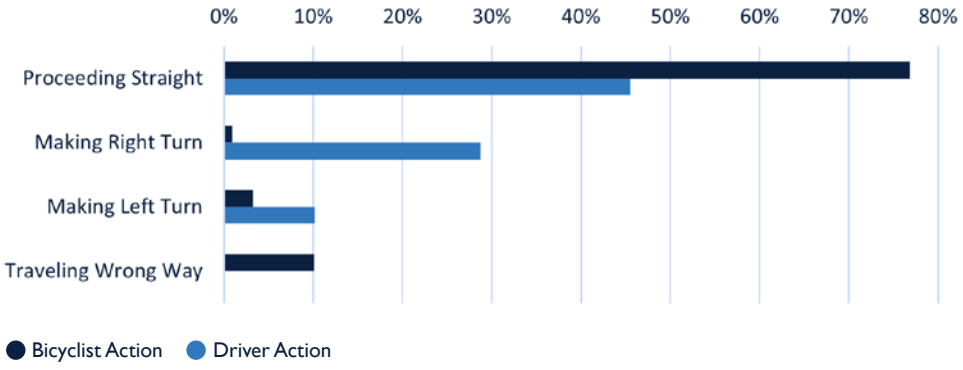
PEDESTRIAN ACTION PRECEDING INJURY COLLISION (2016-2020)



BICYCLIST/DRIVER MOVEMENT

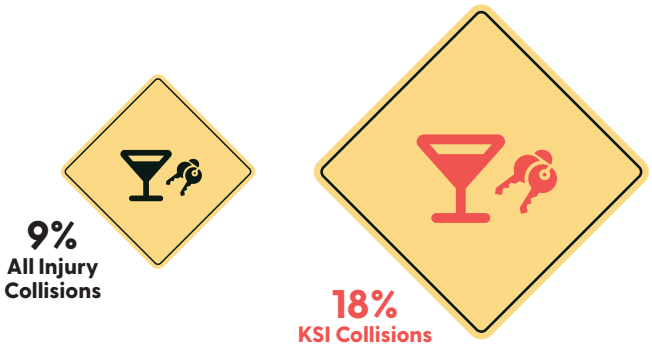
In bicyclist collisions, the majority of people biking were either proceeding straight (77%) or traveling the wrong way on the road (i.e. traveling against the flow of vehicular traffic; 10%) before the collision occurred. The majority of people driving were also proceeding straight (46%) followed by making either a right turn (29%) or left turn (10%). Collisions involving a vehicle turning movement may indicate a need to increase drivers' awareness of bicyclists by increasing the visibility of bicyclists with signage and striping.

MOVEMENT PRECEDING COLLISION FOR BICYCLE-INVOLVED INJURY COLLISIONS (2016-2020)



DRIVING UNDER THE influence

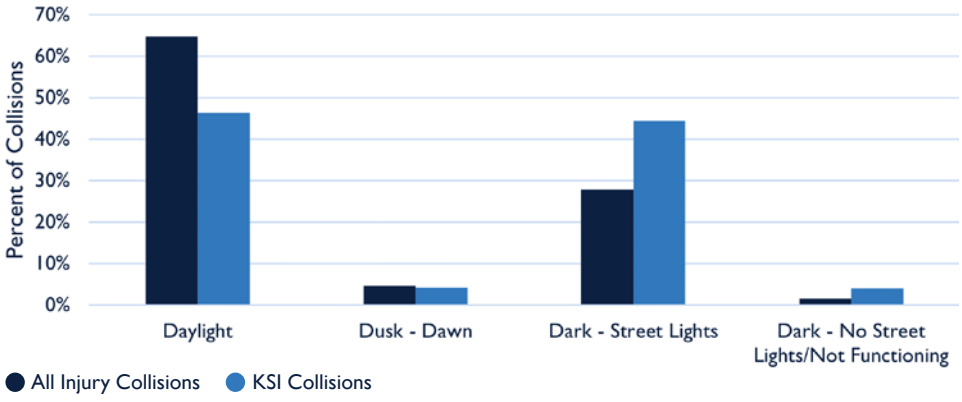
A driver under the influence of alcohol and/or drugs increases the likelihood of a collision resulting in a severe injury or a fatality. From 2016 to 2020, nine percent of all collisions involved drugs or alcohol. The percentage increases to **18 percent for KSI collisions.**



LIGHTING CONDITIONS

Roadway lighting conditions can influence the visibility of roadway users, especially pedestrians and bicyclists, and road infrastructure. **While 30 percent of all collisions occurred during nighttime, nighttime collisions accounted for 48 percent of KSI collisions.**

INJURY COLLISIONS BY LIGHTING CONDITIONS (2016-2020)

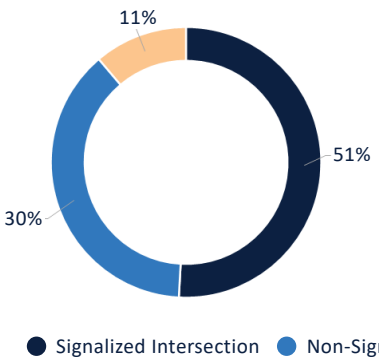


LOCATION TYPE

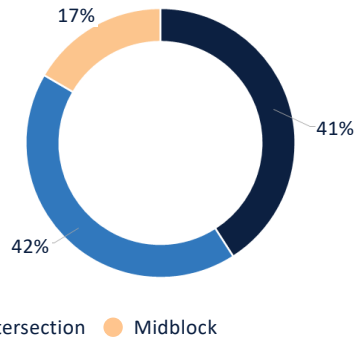
Most injury collisions took place at intersections (89%), with the largest share at signalized intersections (51%). Injury collisions are more likely to occur at intersections than midblock because people walking, biking, and driving are interacting with other road users, changing directions, and making decisions. **Midblock collisions make up a larger share of KSI collisions (17%) compared to all injury collisions (11%).**

INJURY COLLISIONS BY LOCATION

ALL INJURY COLLISIONS



KSI COLLISIONS

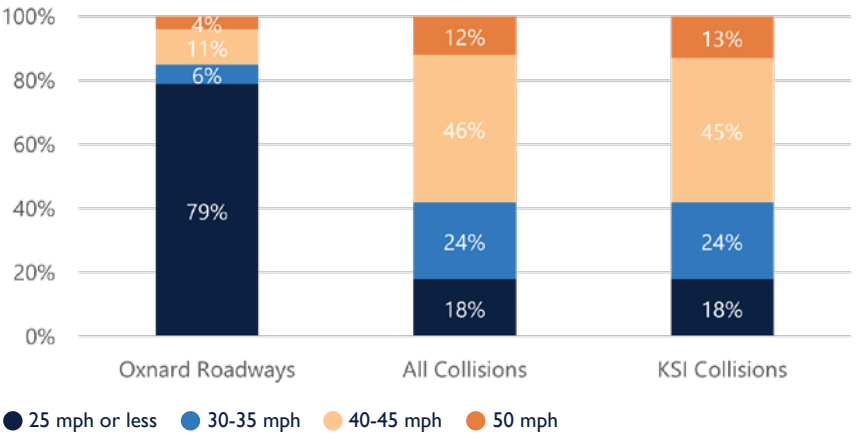


Signalized Intersection · Non-Signalized Intersection · Midblock

POSTED SPEED

Speed is the primary factor in determining the severity of a collision. While roadways with 40 - 45 mph posted speed limit make up 11 percent of all centerline miles in Oxnard, these roadways accounted for nearly half of all injury collisions (46%) and KSI collisions (45%). **Roadways with posted speed limit of 25 mph or less account for nearly 80 percent of Oxnard's centerline miles but represent only 18 percent of all injury collisions and KSI collisions.**

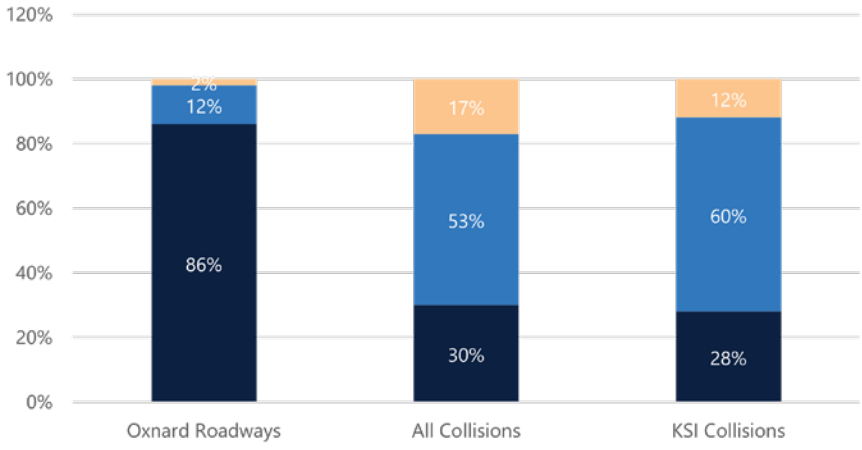
INJURY COLLISIONS AND SHARE OF ROADWAY NETWORK BY POSTED SPEED



NUMBER OF LANES

The number of lanes on a roadway can influence the frequency and severity of collisions with a larger number of lanes often accompanied by higher speed limits/speeds. A larger number of lanes also increases the number of conflict points with vehicles changing lanes in addition to conflict points between people driving, bicycling, and walking. **While roadways with 4 – 5 lanes make up 12 percent of all centerline miles in Oxnard, roadways with 4 – 5 lanes accounted for the majority of all collisions (53%) and KSI collisions (60%). Roadways with 3 lanes or less, which are often accompanied by lower speeds, make up the majority of centerline miles in Oxnard (86%) but accounted for a much smaller share of all collisions (30%) and KSI collisions (28%).**

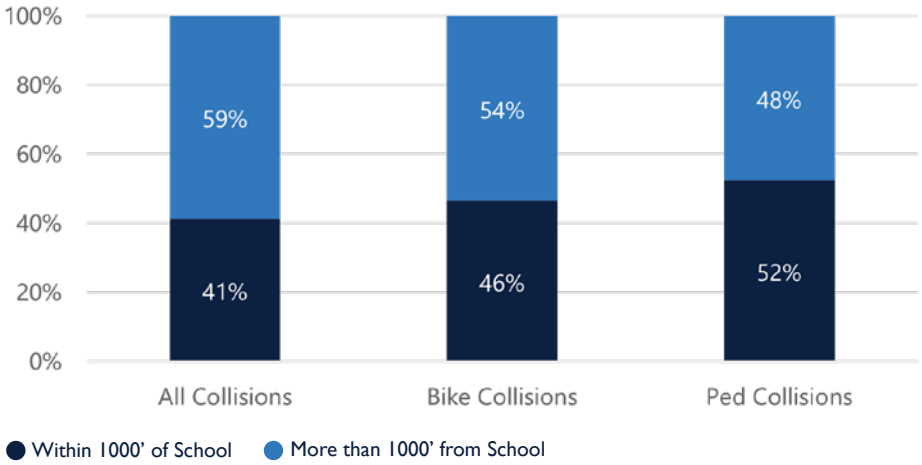
INJURY COLLISIONS AND SHARE OF ROADWAY NETWORK BY NUMBER OF LANES



PROXIMITY TO SCHOOLS

Schools are areas of concentrated walking and bicycling activity, especially during arrival and dismissal times. **While 41 percent of all injury collision occurred near a school (within 1000' feet), a larger share of injury collisions involving a bicycle (46%) or a pedestrian (52%) occurred near a school.**

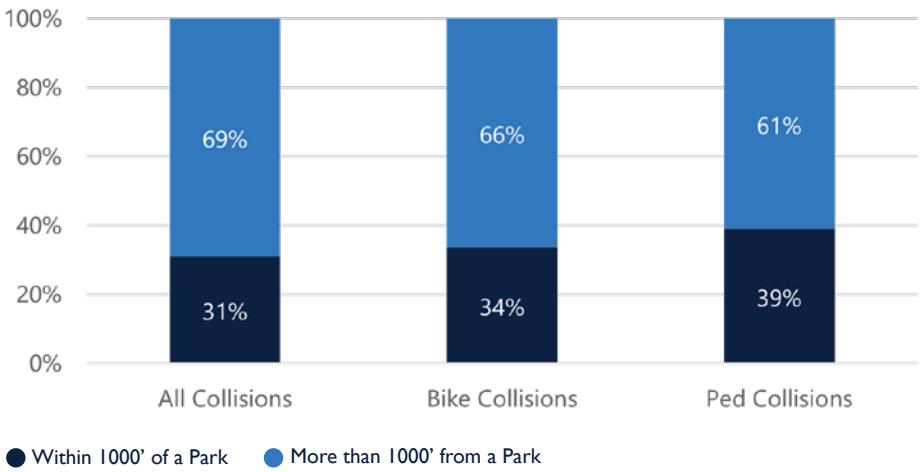
INJURY COLLISIONS IN PROXIMITY TO A SCHOOL



PROXIMITY TO PARKS

Parks are often areas of concentrated walking and bicycling activity, with people walking and bicycling to, from, and around a park. **While 31 percent of all injury collision occurred near a park (within 1000' feet), a larger share of injury collisions involving a bicycle (34%) or a pedestrian (39%) occurred near a park.**

INJURY COLLISIONS IN PROXIMITY TO A PARK




Channel Islands Bl
BIKE LANE

Hot Spot Analysis

In safety analyses, locations with a higher number of crashes are often referred to as "hot spots."[20] The term "hot spot" is used to differentiate the conventional, reactive approach that looks at observed crash patterns from the proactive and systemic analysis approach. The top ten intersections were identified for all injury collisions, weighted score (i.e. higher severity collisions were weighted more heavily), and collision rate based on vehicle volume (i.e. per million entering vehicles). Similarly, the top ten roadway segments were identified for all injury collisions, weighted score, and collisions per million vehicle miles traveled. Intersections and roadway segments with fewer than three collisions were omitted for this analysis.

The top ten intersections and roadway segments for weighted score are listed below and the top ten intersections and roadway segments based on the additional metrics are in Appendix C.

Intersections

To associate collisions to intersections, a set of non-overlapping areas of influence were generated based on a 50-foot radius around minor intersections and a 250-foot radius around major intersections.[21] Major intersections are defined as intersections where a primary road meets a primary, secondary, or minor road and where a secondary road meets a secondary or minor road.

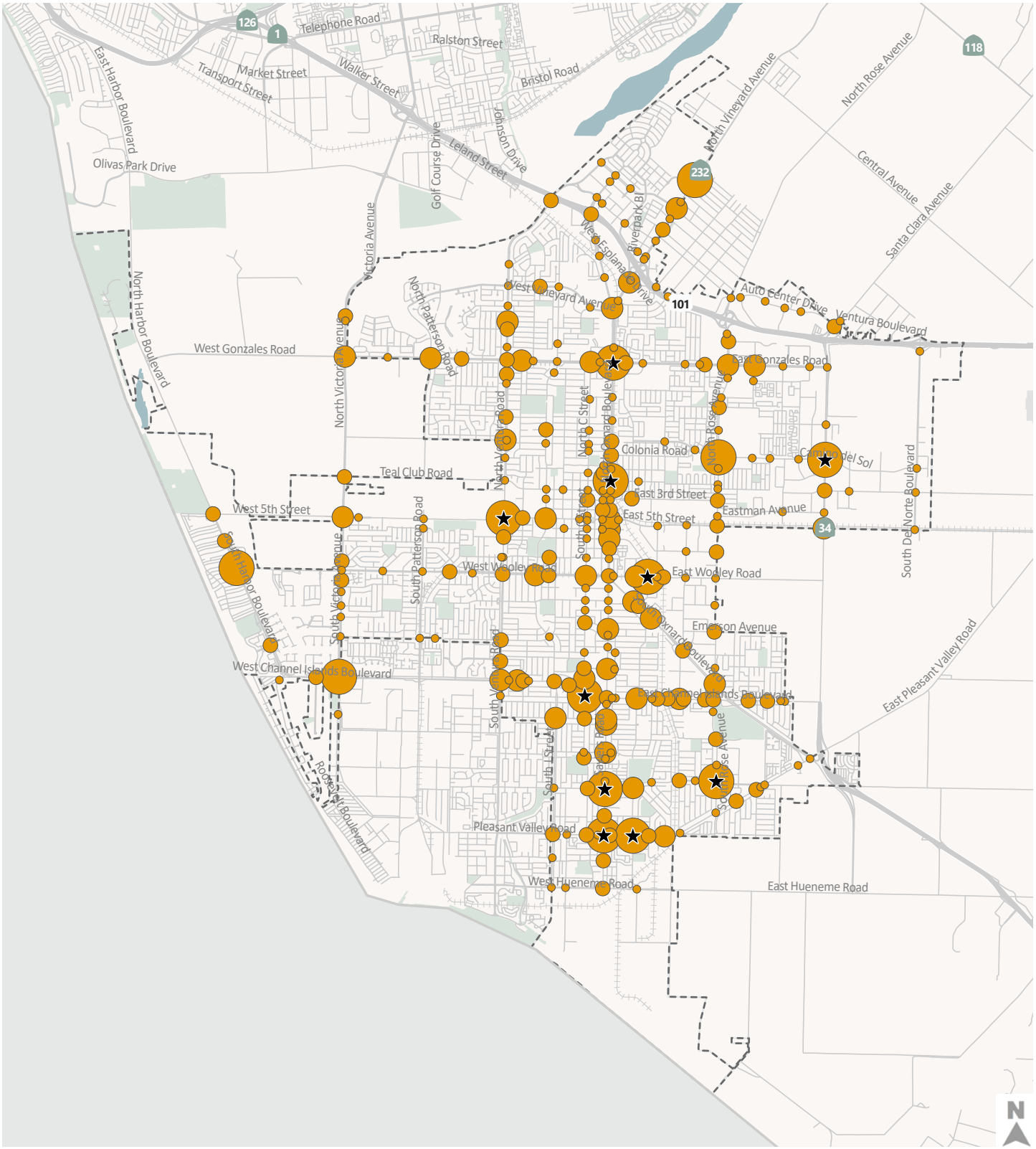
To calculate weighted scores, collisions were weighted by severity: collisions where the highest degree of injury was a fatality or severe injury received a weight of 27. The weight of 27 for KSI collisions was calculated by comparing the average cost of a fatality or severe injury ($2.1 million) to the average cost of other visible injury, complaint of pain, and property damage only ($78.8 thousand) for a ratio of 27:1. The collision costs are found in the Caltrans Local Road Safety Manual Benefit/Cost Ratio Calculations.[22]

The ten intersections with the highest weighted score are at major intersections, which have relatively high traffic volumes and increased exposure.

TOP TEN INTERSECTIONS BY TOTAL WEIGHTED SCORE (2016-2020)

Intersection Name	Intersection Classification	Weighted Score	Total Injury Collisions	KSI Collisions
W Pleasant Valley Rd & Saviers Rd	Primary-Primary	149	19	5
S Ventura Rd & W Fifth St	Primary-Primary	137	33	4
S Rose Ave & E Bard Rd	Secondary-Secondary	135	31	4
E Wooley Rd & Commercial Ave	Secondary-Minor	123	19	4
W Channel Islands Blvd & S C St	Primary-Secondary	110	32	3
N Rice Ave & Camino Del Sol	Primary-Secondary	104	26	3
W Bard Rd & Saviers Rd	Primary-Secondary	97	45	2
N Oxnard Blvd & 1st St	Primary-Minor	97	19	3
E Pleasant Valley Rd & Cypress Rd	Primary-Minor	95	17	3
N Vineyard Ave & Thames River Dr	Primary-Minor	93	15	3

Intersections by Total Weighted Score (2016-2020)



Weighted Score

- 4 - 20
- 21 - 48
- 49 - 83
- 84 - 149

★ Top Ten Intersections for Weighted Score

*Note: The total weighted score for each intersection reflects collisions involving a fatality or severe injury receiving a weight of 27 and other injury collisions receiving a weight of one.

Roadway Segments

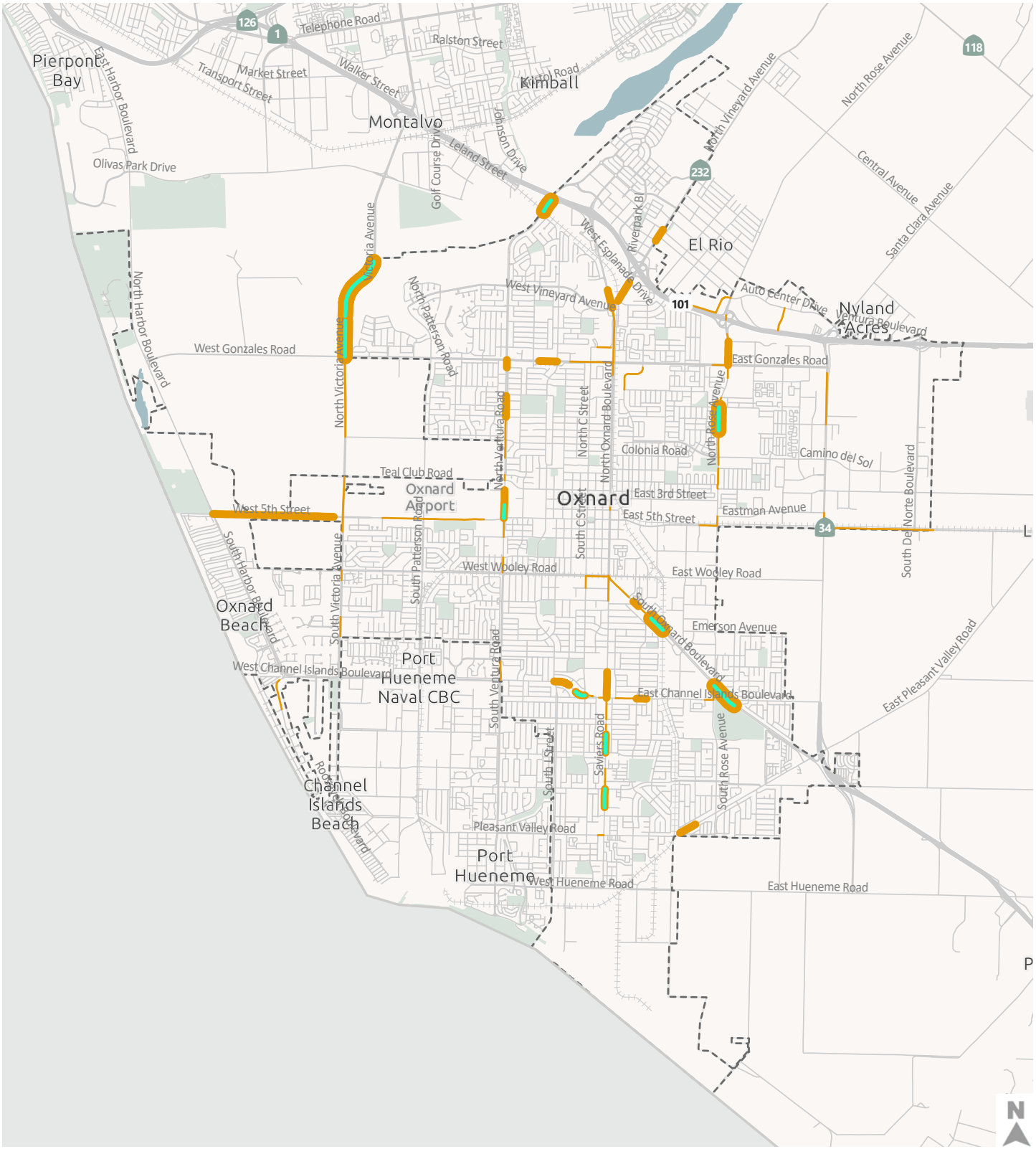
In identifying roadway segment hot spots, collisions that were more than 50 feet away from an intersection were matched to the nearest roadway segment. Because of the sphere of influence for large intersections, some collisions were assigned both to an intersection and a roadway segment.

Consistent with the intersection analysis, collisions were weighted by severity for the roadway segment analysis with KSI collisions receiving a weight of 27 and other injury collisions receiving a weight of one. Similar to the intersection analysis, the ten segments with the highest weighted score are major (primary and secondary) roadways, which have relatively high traffic volumes and increased exposure.

TOP TEN ROADWAY SEGMENTS BY TOTAL WEIGHTED SCORE (2016-2020)

Road Name	From	To	Class	Weighted Score	Total Collisions	KSI Collisions
N Victoria Ave	Gum Tree St	City Boundary	Primary	88	10	3
N Victoria Ave	Flax Pl	W Gonzales Rd	Primary	68	16	2
S Oxnard Blvd	E Date St	Midblock (Near Sunkist Cir)	Primary	62	10	2
N Rose Ave	N Rose Ave & Camino De La Luna	Cesar Chavez Dr & N Rose Ave	Secondary	61	9	2
N Ventura Rd	Wagon Wheel Rd	Railroad Crossing	Secondary	56	4	2
S Oxnard Blvd	Rose Ave	Channel Island Blvd	Primary	56	4	2
Saviers Rd	E Yucca St	Plaza Driveway	Primary	36	10	1
Saviers Rd	W Bard Rd	Fashion Park Pl	Primary	35	9	1
S Ventura Rd	W Fifth St	Plaza Dwy	Primary	33	7	1
W Channel Islands Blvd	S C St	The Palms Apts Dwy	Primary	33	7	1

Roadway Segments by Total Weighted Score (2016-2020)



Weighted Score — Top Ten Weighted Score

- 4 - 12
- 13 - 36
- 37 - 88

*Note: The total weighted score for each roadway segment reflects collisions involving a fatality or severe injury receiving a weight of 27 and other injury collisions receiving a weight of one.

Systemic Analysis

Systemic analysis is a proactive safety approach that evaluates an entire roadway network using a defined set of criteria. Systemic analysis merges adjacent road, intersection, and land use features with collision data to uncover relationships between contextual factors and the risk of frequent and severe collisions.

Contextual Data Overview

To better understand systemic collision patterns in Oxnard, contextual factors were analyzed in conjunction with collision characteristics. Contextual factors include:

- Roadway attributes
- Roadway facilities
- Nearby land uses
- Driver behavior

The area of influence for each contextual factor varied based on the level of anticipated activity each contextual factor would generate (e.g. a school has a much larger area of influence than a transit stop). Major intersections are defined as intersections that include a major road (i.e. Primary or Secondary road, as defined by the City's Circulation Element) road. A subset of contextual factors and their respective areas of influence are summarized in the following table; the full set of contextual factors is in **Appendix C**.

CONTEXTUAL FACTORS AND THEIR AREAS OF INFLUENCE

Roadway Characteristics	Distance
Number of Lanes	50'
Posted Speed Limit	50'
Roadway Classification (from Oxnard General Plan): » Primary » Secondary » Minor	50'
Traffic Signal » Fully Protected Left Turn Phases	50' Minor Roadway 250' Major Roadway
Location Type » Major Intersection* » Minor Intersection* » Midblock	50' Minor Intersection 250' Major Intersection 250'+ Midblock
Average Annual Daily Traffic (AADT)	50'
Roadway Facilities	**Distance**
Streetlights	75'
On-Street Bicycle Facility	100'
Land Use Characteristics	**Distance**
Disadvantaged or Low-Income Community based on SB 535 or AB 1550 designation	Inside or within 100' of boundary
Schools	1,000'
Bus stop	500'
Parks	1,000'

* Major intersections are defined as where a primary road meets a primary, secondary, or minor road and where a secondary road meets a secondary or minor road. Minor intersections are defined as where a minor road meets a minor road.

Source: The data in this table were provided by City of Oxnard and the California Air Resources Board.

Systemic Trends

Collision data were paired with contextual data in a series of systemic matrices. Outputs from the collision analysis were used to populate a set of matrices that have collision attributes (e.g. violation, collision type, time of day) in rows and contextual data in columns. The matrices help identify combinations of factors that contributed to a high number of total collisions, KSI collisions, bike collisions, and pedestrian collisions. The identified combinations informed the development of collision profiles (described in Chapter 7) that were paired with applicable countermeasures to be applied at locations that match the collision profile throughout the City. The full set of systemic matrices are in Appendix C, and a subset of key findings are summarized here.

4-Lane Roads:

In Oxnard, **roadways with 4 lanes account for 12 percent of centerline miles, but 53 percent of injury collisions occurred on these roadways.**

Downtown Oxnard:

Injury collisions were concentrated in the central area of Oxnard, which has several major north-south travel corridors (defined by the City's Circulation Element), such as Oxnard Boulevard and Saviers Road, and a relatively dense roadway network compared to other areas of the City.

Primary Arterials:

Primary arterial roadways are defined by the City's Circulation Element as roadways designed to carry through traffic on continuous routes and join major traffic origins and destinations, freeways and other arterials. **As a result, primary arterial roadways carry a relatively higher number of vehicles compared to more local-serving roads. This is illustrated by the trend that primary arterial roadways make up seven percent of centerline miles but accounted for 56 percent of collisions.**

Signals:

Signals with fully protected left turn phases reduce the amount of decision-making and potential conflict points at an intersection. **Signalized intersections with fully protected left-turn phases had fewer injury collisions when compared to signalized intersections without fully protected left-turn phases.** The difference is especially pronounced for broadside collisions where 26 percent of broadside collisions occurred at signalized intersections with fully protected left-turn phases and 74 percent of broadside collisions occurred at signalized intersections without fully protected left-turn phases.

Pedestrian Collisions on Smaller Roads:

The highest share of all injury collisions (33%) and bicycle-involved collisions (33%) occurred on roadways with four lanes and 40 - 45 mph posted speed limits. However, **the highest share of pedestrian-involved collisions (35%) occurred on roadways with three lanes or less and 15 - 25 mph posted speed limits.**

Endnotes:

[18]National Highway Traffic Safety Administration National Center for Statistics and Analysis (2007) Passenger Vehicle Occupant Fatalities by Day and Night – A Contrast. Traffic Safety Facts Research Note.

[19]The intersection area of influence was defined as a 50-foot radius around minor intersections and a 250-foot radius around major intersections.

[20]U.S. Department of Transportation Federal Highway Administration. (2018). Guidebook on Identification of High Pedestrian Crash Locations.

[21]The radius for minor intersections was determined by the length of centerline striping at stop-signs, and the radius for major intersections was determined by the length of the striping for left-turn turn pockets.

[22]Caltrans. (2020). Local Roadway Safety: A Manual for California's Local Road Owners. https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/2020/lrsm2020.pdf

06
Countermeasure Toolbox

This toolbox presents safety countermeasures covering safe road users, safe vehicles, safe speeds, safe roads, and post-crash care that address the collision trends identified through the comprehensive collision analysis.

Countermeasure Toolbox

This plan's focus on the elements of the Safe System approach and an emphasis on equity not only helps to provide alignment with current LRSP guidelines but also sets the City of Oxnard up for success in recognition of emerging safety best practices.

This toolbox furthers the work that the City of Oxnard has done over the past several years to prioritize safer roadway design through efforts such as project implementation, grant applications, maintenance activities, and adoption of planning documents that identify priorities and future projects.

SAFE SYSTEM ELEMENTS

Making a commitment to zero deaths means addressing every aspect of crash risks through the five elements of a Safe System, shown below. These layers of protection and shared responsibility promote a holistic approach to safety across the entire transportation system. The key focus of the Safe System approach is to reduce death and serious injuries through design that accommodates human mistakes and injury tolerances.

Safe Road Users

The Safe System approach addresses the safety of all road users, including those who walk, bike, drive, ride transit, and travel by other modes.

Safe Vehicles

Vehicles are designed and regulated to minimize the occurrence and severity of collisions using safety measures that incorporate the latest technology.

Safe Speeds

Humans are unlikely to survive high-speed crashes. Reducing speeds can accommodate human injury tolerances in three ways: reducing impact forces, providing additional time for drivers to stop, and improving visibility.

Safe Roads

Designing to accommodate human mistakes and injury tolerances can greatly reduce the severity of crashes that do occur. Examples include physically separating people traveling at different speeds, providing dedicated times for different users to move through a space, and alerting users to hazards and other road users.

Post-Crash Care

When a person is injured in a collision, they rely on emergency first responders to quickly locate them, stabilize their injury, and transport them to medical facilities. Post-crash care also includes forensic analysis at the crash site, traffic incident management, and other activities.

SOURCE: FEHR & PEERS FOR FHWA

Summary of Engineering Countermeasures

✓ Local Road Safety Manual (LRSM) Countermeasure

Control

All-Way Stop Control ✓
LED-Enhanced Stop Sign ✓
Mini-Roundabout ✓

Geometric Modifications

Directional Median Openings to Restrict Left Turns ✓
Lane Narrowing
Remove or Relocate Fixed Objects ✓
Repurpose Roadway Space ✓

Lighting

Intersection Lighting ✓
Segment Lighting ✓

Operation/Warning

Delineators, Reflectors, and/or Object Markers ✓
Flashing Beacon as Advance Warning ✓
Improve Sight Distance ✓
Pedestrian and/or Bicyclist Warning Signage
Speed Monitoring and Feedback
Striping Through Intersection ✓
Upgrade Intersection Pavement Markings ✓
Upgrade to Larger Warning Signs ✓
Upgrade Signs with Fluorescent Sheeting ✓

Pedestrian & Bicycle

Add Sidewalk ✓
Advanced Stop Bar ✓
Advanced Yield Markings
Bike Lane ✓
Curb Extensions ✓
Extend Bike Lane to Intersection
Green Conflict Striping
High-Visibility Crosswalk ✓
Install/Upgrade Pedestrian Crossing at Uncontrolled Locations (Signs and Markings Only) ✓
Pedestrian Hybrid Beacon ✓
Raised Median/Pedestrian Refuge Island ✓
Rectangular Rapid Flashing Beacon ✓
Separated Bikeway ✓
Straighten Crosswalk
Traffic Calming/Bicycle Boulevard Elements
Upgrade Curb Ramp
Widen Sidewalk

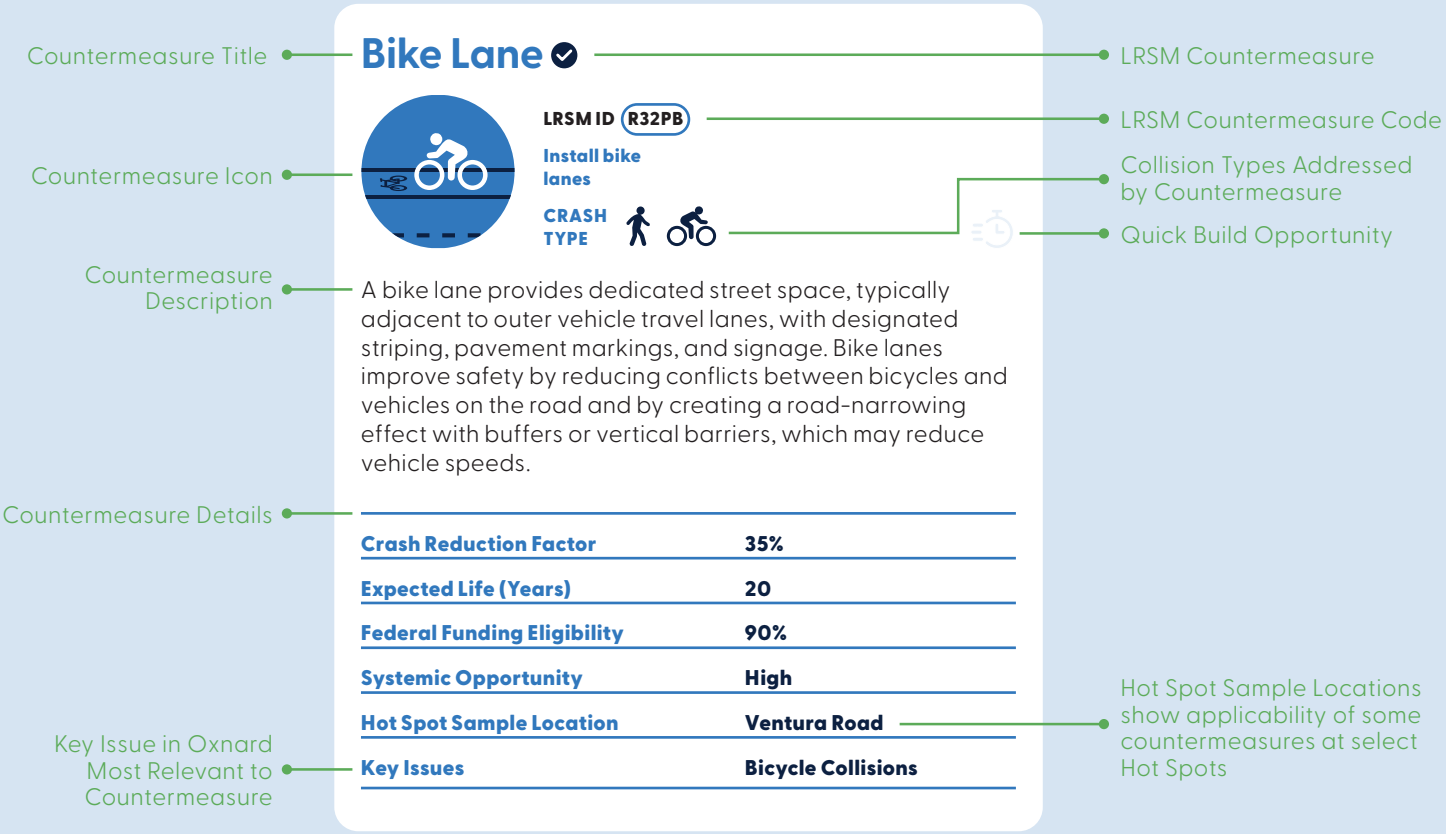
Signal Modifications & Intelligent Transportation Systems (ITS)

Accessible Pedestrian Signal ✓
Emergency Vehicle Preemption ✓
Extend Yellow and All Red Time ✓
Improve Signal Timing ✓
Leading Pedestrian Interval ✓
Pedestrian Countdown ✓
Pedestrian Scramble Phase/All Pedestrian Phase ✓
Prohibit Right-Turn-on-Red
Protected Left Turns ✓
Retroreflective Signal Backplates ✓
Signal Interconnectivity & Coordination / Green Wave ✓
Speed Sensitive Rest in Red Signal ✓
Supplemental Signal Heads ✓
Signal Adaptive Speed Response
Traffic Signal Confirmation Light

WHAT YOU'LL SEE IN THIS ENGINEERING TOOLBOX

Local Roadway Safety Manual

Many of the countermeasures in the toolbox are recommended for the 15 emphasis areas included in this report. Most of the countermeasures are included in the 2022 Caltrans Local Roadway Safety Manual (LRSM) and can be advantageous for use in Caltrans Highway Safety Improvement Program (HSIP) grant funding applications. For countermeasures in the LRSM, the toolbox identifies a Caltrans-approved Crash Reduction Factor (CRF), the expected life of the project, the federal funding eligibility, the systemic opportunity for countermeasure implementation, and applicable collision type (e.g., all modes, bicycle and pedestrian collisions only, etc.) as outlined in the LRSM. The higher the CRF, the greater the expected reduction in collisions. This countermeasure toolbox also includes additional safety improvements beyond those listed in the LRSM.



CONTROL

All-Way Stop Control

LRSM ID NS02

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

CRASH TYPE

An all-way stop-controlled (AWSC) intersection requires all vehicles to stop before crossing the intersection. An AWSC intersection improves safety by removing the need for road users on a side-street stop-controlled intersection to cross free-flowing lanes of traffic, which reduces the risk of collision. An "ALL WAY" sign should be placed under the octagonal stop sign at AWSC intersections as required by the California Manual on Uniform Traffic Control Devices.

Crash Reduction Factor	**50%**
Expected Life (Years)	**10**
Federal Funding Eligibility	**90%**
Systemic Opportunity	**High**
Key Issue	**Broadside**

Mini-Roundabout

LRSM ID NS05mr

Convert intersection to mini-roundabout

CRASH TYPE

A roundabout is a type of circular intersection in which road traffic flows in one direction around a central island, and priority is typically given to traffic already in the intersection. A mini-roundabout is characterized by a small diameter (45-90 feet) and traversable center island. Roundabouts eliminate conflicts from crossing and leftturn movements and force drivers to reduce speeds as they proceed through the intersection. Vehicle/pedestrian conflicts are also reduced. Modular barriers are a quick build option.

Crash Reduction Factor	**30%**
Expected Life (Years)	**20**
Federal Funding Eligibility	**90%**
Systemic Opportunity	**Medium**
Hot Spot Sample Location	**Bard Road**
Key Issue	**Broadside**

LED-Enhanced Sign

LRSM ID NS08

Install Flashing Beacons at Stop-Controlled Intersections

CRASH TYPE

An LED-enhanced sign has LED lights embedded in the sign to outline the sign itself or the words and symbols on the sign. The LEDs may be set to flash or operate in a steady mode. An LED-enhanced sign improves safety by improving the visibility of signs at locations with visibility limitations or with a documented history of drivers failing to see or obey the sign (e.g. at STOP signs). An LED-Enhanced sign may qualify as a flashing beacon under the LRSM (NS08 - Install Flashing Beacons at Stop-Controlled Intersections) but confirmation would be needed from Caltrans.

Crash Reduction Factor	**15%**
Expected Life (Years)	**10**
Federal Funding Eligibility	**90%**
Systemic Opportunity	**High**
Hot Sample Location	**Bard Road**
Key Issue	**Rear End**

GEOMETRIC MODIFICATIONS

Directional Median Openings to Restrict Left Turns

LRSM ID S14

Create directional median openings to allow (and restrict) left-turns and u-turns (S.I.)

CRASH TYPE

A directional median opening restricts specific turning movements, such as allowing a left-turn from a major street but not from a minor street. Limiting turning movements decreases the number of vehicles crossing the centerline and can reduce head-on collisions. Plastic posts and barriers are a quick build option.

Crash Reduction Factor	**50%**
Expected Life (Years)	**20**
Federal Funding Eligibility	**90%**
Systemic Opportunity	**Medium**
Hot Spot Sample Location	**Gonzales Road & Almanor Street, Saviers Road & Hughes Drive**
Key Issue	**Broadside**

Remove or Relocate Fixed Objects

LRSM ID R02

Remove or relocate fixed objects outside of Clear Recovery Zone

CRASH TYPE

Relocating or removing fixed objects, such as utility poles/boxes and signage, from intersections or roadway segments with a history of hit object collisions can reduce or eliminate the potential for hit object collisions.

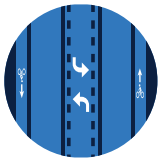
Crash Reduction Factor	**35%**
Expected Life (Years)	**20**
Federal Funding Eligibility	**90%**
Systemic Opportunity	**High**
Hot Spot Sample Location	**Gonzales Road & Merion Way**
Key Issue	**Hit Object**

Lane Narrowing

Lane narrowing reduces lane widths to encourage motorists to travel at slower speeds. Speed reductions brought about by lane narrowing improve safety by lowering the risk of collision among bicyclists, pedestrians, and other motorists.

Hot Spot Sample Location	**Bard Road**
Key Issue	**Unsafe Speed**

Repurpose Roadway Space



LRSM ID R14

Road Diet (Reduce travel lanes and add a two way left-turn and bike lanes)

CRASH TYPE

Repurposing roadway space reallocates space dedicated to vehicle travel to create room for bicycle facilities, wider sidewalks, or center turn lanes. Repurposing roadway space improves safety by reducing vehicle speeds and creating designated space for all road users. For HSIP Cycle 11, this countermeasure is eligible for roadways without existing left turn lanes and is expected to include bike lanes. Raised lane separators, delineator and flexible posts, curb barriers, and painted pavement are quick build options.

Crash Reduction Factor	**35%**
Expected Life (Years)	**20**
Federal Funding Eligibility	**90%**
Systemic Opportunity	**Medium**
Hot Spot Sample Location	**Ventura Road, Saviers Road**
Key Issue	**Unsafe Speed**

LIGHTING

Intersection Lighting

LRSM ID NS01/S01

Add intersection lighting (NS.I./S.I.)

CRASH TYPE

Adding intersection lighting at the intersection, and on its approaches, improves the safety of an intersection during nighttime conditions by (1) making drivers more aware of their surroundings at an intersection (2) enhancing drivers' available sight distances, and (3) improving the visibility of non-motorists. Intersection lighting is also beneficial to non-motorized users by helping them navigate the intersection. Upgrading to LED lighting also has a documented safety benefit.

Crash Reduction Factor	40%
Expected Life (Years)	20
Federal Funding Eligibility	90%
Systemic Opportunity	Medium
Hot Spot Sample Location	All Hot Spot Corridors
Key Issue	Nighttime

Segment Lighting

LRSM ID R01

Add segment lighting

CRASH TYPE

Providing segment lighting improves safety during nighttime conditions by making drivers more aware of their surroundings, enhancing drivers' available sight distances to perceive roadway characteristic in advance of the change, and improving non-motorist's visibility and navigation. Upgrading to LED lighting also has a documented safety benefit.

Crash Reduction Factor	35%
Expected Life (Years)	20
Federal Funding Eligibility	90%
Systemic Opportunity	Medium
Hot Spot Sample Location	Ventura Road
Key Issue	Nighttime

OPERATION/WARNING

Delineators, Reflectors, and/or Object Markers

LRSM ID R27

Install delineators, reflectors and/or object markers

CRASH TYPE

Delineators, reflectors and/or object markers are intended to warn drivers of an approaching curve or fixed object that cannot easily be removed. They are generally less costly than chevron signs as they don't require posts to place along the roadside, avoiding an additional object with which an errant vehicle can crash into.

Crash Reduction Factor	**15%**
Expected Life (Years)	**10**
Federal Funding Eligibility	**90%**
Systemic Opportunity	**Very High**
Key Issue	**Hit Object**

Improve Sight Distance

LRSM ID NS11

Improve sight distance to intersection (clear sight triangles)

CRASH TYPE

Remove objects that may prevent drivers and pedestrians from having a clear sightline. May include installing red curb at intersection approaches to remove parked vehicles (also called "daylighting"), trimming or removing landscaping, or removing or relocating large signs.

Crash Reduction Factor	**20%**
Expected Life (Years)	**10**
Federal Funding Eligibility	**90%**
Systemic Opportunity	**High**
Key Issue	**Pedestrian Crossing, Broadside**

Flashing Beacon as Advance Warning

LRSM ID S10

Install flashing beacons as advance warning (S.I.)

CRASH TYPE

A flashing beacon as advanced warning is a blinking light with signage to notify motorists of an upcoming intersection or crosswalk. A flashing beacon improves safety by providing motorists more time to become aware of and slow down for an intersection or yield to pedestrians crossing at a crosswalk.

Crash Reduction Factor	**30%**
Expected Life (Years)	**10**
Federal Funding Eligibility	**90%**
Systemic Opportunity	**Medium**
Hot Spot Sample Location	**Gonzales Road & Victoria Avenue**
Key Issue	**Rear End**

Pedestrian and/or Bicyclist Warning Signage

Pedestrian and/or bicyclist warning signage is placed at intersections to alert or remind left- or right-turning vehicles to yield to pedestrians crossing the crosswalk and/or bicyclists crossing the intersection. A static sign or electronic blankout sign can convey the warning message.

Key Issue	**Bicycle Collisions**

OPERATION/WARNING

Speed Monitoring and Feedback

Video or radar roadside sensors are used to monitor individual vehicle speeds. With speed monitoring and feedback, signs can notify motorists of excessive speed through a combination of dynamic roadside signage and vehicle-to-infrastructure (V2I) messaging. By notifying motorists of their speed, feedback signs may promote slower speeds and safer driver behavior.

Key Issue	**Unsafe Speed**

Upgrade Intersection Pavement Markings

LRSM ID NS07

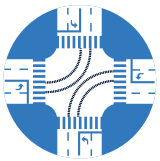
Upgrade intersection pavement markings (NS.I.)

CRASH TYPE

Upgrading intersection pavement marking can include "Stop Ahead" markings and the addition of centerlines and stop bars. These markings can improve safety by increasing the visibility of intersections for drivers.

Crash Reduction Factor	**25%**
Expected Life (Years)	**10**
Federal Funding Eligibility	**90%**
Systemic Opportunity	**Very High**
Key Issue	**Nighttime**

Striping Through Intersection



LRSM ID S09

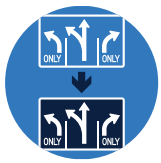
Install raised pavement markers and striping (Through Intersection)

CRASH TYPE

Adding clear pavement markings (i.e. "cat track") can guide motorists through complex intersections. Intersections where the lane designations are not clearly visible to approaching motorists and/or intersections noted as being complex and experiencing crashes that could be attributed to a driver's unsuccessful attempt to navigate the intersection can benefit from this treatment.

Crash Reduction Factor	**10%**
Expected Life (Years)	**10**
Federal Funding Eligibility	**90%**
Systemic Opportunity	**Very High**
Hot Spot Sample Location	**Ventura Road & Wooley Road**
Key Issue	**Signalized Intersection**

Upgrade Signs with Fluorescent Sheeting



LRSM ID R22

Install/Upgrade signs with new fluorescent sheeting (regulatory or warning)

CRASH TYPE

Upgrading signs with fluorescent sheeting such as the high intensity retroreflective film in the City of Oxnard sign specifications, replaces existing signs with new signs that can clearly display warnings by reflecting headlamp light back to vehicles. Upgrading signs with fluorescent sheeting improves safety by increasing visibility of signs to drivers at night.

Crash Reduction Factor	**15%**
Expected Life (Years)	**10**
Federal Funding Eligibility	**90%**
Systemic Opportunity	**Very High**
Key Issue	**Nighttime**

PEDESTRIAN & BICYCLE

Add Sidewalk

LRSM ID R34PB

Install sidewalk/pathway (to avoid walking along roadway)

CRASH TYPE

Adding sidewalks provides a separated and continuous facility for people to walk along the roadway. Adding sidewalks also improves safety by minimizing the risk of vehicle and bicycle collisions with pedestrians.

Crash Reduction Factor	80%
Expected Life (Years)	20
Federal Funding Eligibility	90%
Systemic Opportunity	Medium
Hot Spot Sample Location	Wooley Road
Key Issue	Pedestrian Walking Along Road/Shoulder

Advanced Yield Markings

Yield markings are placed 20 to 50 feet in advance of pedestrian crossings to alert drivers of an upcoming pedestrian crossing. Yield markings indicate where drivers should stop when pedestrians are crossing at the crosswalk.

Key Issue	Pedestrian Crossing in Crosswalk

Advanced Stop Bar

LRSM ID S20PB

Install advance stop bar before crosswalk (Bicycle Box)

CRASH TYPE

An advanced stop bar is a horizontal stripe painted ahead of the crosswalk at stop signs and signals to indicate where drivers should stop. An advanced stop bar improves safety by reducing instances of vehicles encroaching on the crosswalk. Creating a wider stop bar or setting the stop bar further back from the crosswalk may be appropriate for locations with known crosswalk encroachment issues. See CA MUTCD Section 3B.16 for more information. Current detection loops may need to be adjusted to accommodate advanced stop bars.

Crash Reduction Factor	15%
Expected Life (Years)	10
Federal Funding Eligibility	90%
Systemic Opportunity	Very High
Key Issue	Pedestrian Crossing in Crosswalk

Bike Lane

LRSM ID R32PB

Install bike lanes

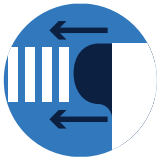
CRASH TYPE

A bike lane provides dedicated street space, typically adjacent to outer vehicle travel lanes, with designated striping, pavement markings, and signage. Bike lanes improve safety by reducing conflicts between bicycles and vehicles on the road and by creating a road-narrowing effect with buffers or vertical barriers, which may reduce vehicle speeds.

Crash Reduction Factor	35%
Expected Life (Years)	20
Federal Funding Eligibility	90%
Systemic Opportunity	High
Hot Spot Sample Location	Ventura Road
Key Issues	Bicycle Collisions

PEDESTRIAN & BICYCLE

Curb Extensions



LRSM ID NS21PB

Install/upgrade pedestrian crossing at uncontrolled locations (with enhanced safety features)

CRASH TYPE

A curb extension widens the sidewalk for a short distance to reduce the crossing distance and to improve pedestrians and drivers' visibility that would otherwise be limited by parked vehicles. Curb extensions also slow vehicles around turns by forcing drivers to make turns at a smaller radius. Paint, surface-mounted flexible guide posts, raised lane separators, delineators posts, and plastic curb barriers are quick build options.

Crash Reduction Factor	35%
Expected Life (Years)	20
Federal Funding Eligibility	90%
Systemic Opportunity	Medium
Key Issue	Pedestrian Crossing in Crosswalk

Green Conflict Striping

Green conflict striping are markings painted in a dashed pattern on bike lanes approaching an intersection or driveway and/or going through an intersection. Green conflict striping highlights potential conflict points.

Extend Bike Lane to Intersection

In locations where a bike lane is dropped due to the addition of a right turn pocket, the intersection approach may be restriped to allow bicyclists to move to the left side of right turning vehicles ahead of reaching the intersection.

Hot Spot Sample Location	Gonzales Road & Bard Road
Key Issue	Bicycle Collisions

High-Visibility Crosswalk

LRSM ID S18PB/NS20PB

Install pedestrian crossing (S.I.)/Install pedestrian crossing at uncontrolled locations (new signs and markings only)

CRASH TYPE

A high-visibility crosswalk has a striped pattern with markings made of high-visibility material, such as thermoplastic tape, instead of paint. A high-visibility crosswalk improves safety with a clearly marked pedestrian crossing so motorists exercise caution and yield to pedestrians. The crash reduction factor noted here only applies to locations currently without a marked crosswalk, but high-visibility crosswalk upgrades can be implemented at existing marked crosswalks. See Section 3B.18 of the CA MUTCD for more detail

Crash Reduction Factor	25%
Expected Life (Years)	20
Federal Funding Eligibility	90%
Systemic Opportunity	High
Key Issue	Pedestrian Crossing in Crosswalk

PEDESTRIAN & BICYCLE

Install Pedestrian Crossing at Uncontrolled Locations

LRSM ID NS20PB

Install pedestrian crossing (signs and markings only)

CRASH TYPE

A pedestrian crossing provides a formalized location for people to cross the street, reducing the risk of people crossing outside crosswalks where drivers are not expecting them. Crosswalk striping and signs alert drivers that there may be a pedestrian crossing.

Crash Reduction Factor	25%
Expected Life (Years)	10
Federal Funding Eligibility	90%
Systemic Opportunity	High
Hot Spot Sample Location	Bard Road & San Simeon Avenue
Key Issue	Pedestrian Crossing Outside Crosswalk

Raised Median/Pedestrian Refuge Island

LRSM ID S12/NS14/R08

Install raised median on approaches/ Install raised median

CRASH TYPE

A raised median is a raised curb in the center of the roadway that can restrict certain turning movements. A pedestrian refuge island provides a place for pedestrians to wait if they are unable to finish crossing a crosswalk. A raised median can improve safety by reducing the number of potential conflict points for turning vehicles. A refuge island improves safety by reducing the roadway exposure time for pedestrians. Paint, delineator posts, and modular barriers are quick build options.

Crash Reduction Factor	25%
Expected Life (Years)	20
Federal Funding Eligibility	90%
Systemic Opportunity	Medium
Key Issue	Pedestrian Crossing

Pedestrian Hybrid Beacon

LRSM ID NS23PB

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

CRASH TYPE

Pedestrian hybrid beacon (PHB), also known as a HAWK, is a flashing light that is activated by a pedestrian pushing a button or some other form of detection. A PHB is used at unsignalized intersections or mid-block crosswalks to notify oncoming motorists to stop with a series of red and yellow lights. Unlike a traffic signal, the PHB rests in dark until a pedestrian activates it via pushbutton or other form of detection. See CA MUTCD Section 4F for more detail.

Crash Reduction Factor	55%
Expected Life (Years)	20
Federal Funding Eligibility	90%
Systemic Opportunity	Low
Key Issue	Pedestrian Crossing Outside Crosswalk, Major Unsignalized Intersection

Rectangular Rapid Flashing Beacon

LRSM ID NS22PB

Install Rectangular Rapid Flashing Beacon (RRFB)

CRASH TYPE

A rectangular rapid flashing beacon (RRFB) is a pedestrian-activated flashing light with additional signage to alert motorists of a pedestrian crossing. An RRFB improves safety by increasing the visibility of marked crosswalks

Crash Reduction Factor	35%
Expected Life (Years)	20
Federal Funding Eligibility	90%
Systemic Opportunity	Medium
Key Issue	Pedestrian Crossing

PEDESTRIAN & BICYCLE

Separated Bikeway

LRSM ID R33PB

Install separated bike lanes

CRASH TYPE

A separated bikeway provides dedicated street space with physical separation from vehicle traffic, designated lane markings, pavement legends, and signage. Physical separation may consist of plastic posts, parked vehicles, or a curb. Separated bikeways improve safety by reducing conflicts between bicycles and vehicles and by creating a road-narrowing effect which may reduce vehicle speeds. Raised lane separators, delineator and flexible guide posts, planters, and curb barriers are quick build options.

Crash Reduction Factor	45%
Expected Life (Years)	20
Federal Funding Eligibility	90%
Systemic Opportunity	High
Hot Spot Sample Location	Ventura Road
Key Issue	Bicycle Collisions

Traffic Calming/Bicycle Boulevard Elements

Bicycle boulevards are streets with low vehicular volumes and speeds that are designed to prioritize non-motorized forms of travel, such as walking and biking. Bicycle boulevards are designed with traffic calming elements, such as signs, pavement markings, and speed and volume management measures to discourage cut-through vehicular traffic and serve as an alternative route to busier arterial streets for people walking and biking. Speed and volume management measures include speed humps, raised crosswalks, curb extensions, mini-roundabouts, lane narrowing, and restricted turning movements. These measures are also included as separate items in the countermeasure toolbox. See each item for quick build options.

Key Issue	Bicycle Collisions

Straighten Crosswalk

Straightening crosswalks improves sight lines, making pedestrians more visible to oncoming drivers, and may shorten the crossing distance, reducing the length of time pedestrians are exposed to vehicle traffic.

Hot Spot Sample Location	Gonzales Road & Rose Avenue
Key Issue	Pedestrian Collisions

Upgrade Curb Ramp

Upgrading a curb ramp primarily involves installing tactile warning devices (e.g. truncated domes) that alert visually impaired pedestrians of a pedestrian crossing. Upgrades can also include ensuring that the design, such as the incline, of the curb ramp is compliant with Americans with Disabilities Act Accessibility Guidelines.

Hot Spot Sample Location	Wooley Road
Key Issue	Pedestrian Collisions

PEDESTRIAN & BICYCLE

Widen Sidewalk

Widening sidewalks provides a more comfortable space for pedestrians, particularly in locations with high volumes of pedestrians, and provides space to accommodate people in wheelchairs. Widening sidewalks improves safety by minimizing collisions with pedestrians walking in the road.

Hot Spot Sample Location	**Wooley Road**
Key Issue	**Pedestrian Collisions**

SIGNAL MODIFICATIONS & ITS

Accessible Pedestrian Signal

LRSM ID S17PB

Install pedestrian countdown signal heads

CRASH TYPE

Accessible pedestrian signals, including audible push buttons, improve access for pedestrians who are blind or have low vision. Curb ramps and push buttons must comply with the Americans with Disability Act (ADA) standards for accessibility. Push buttons should be visible and conveniently located for pedestrians waiting at a crosswalk.

Crash Reduction Factor	25%
Expected Life (Years)	20
Federal Funding Eligibility	90%
Systemic Opportunity	Very High
Hot Spot Sample Location	Gonzales Road
Key Issue	Pedestrian Crossing in Crosswalk

Extend Yellow and All Red Time

LRSM ID S03

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

CRASH TYPE

Extending yellow and all red time increases the time allotted for the yellow and red lights during a signal phase. This improves safety by allowing drivers and bicyclists to safely cross through an intersection before conflicting traffic movements are permitted to enter the intersection. See CA MUTCD Section 4D.26 for more detail.

Crash Reduction Factor	15%
Expected Life (Years)	10
Federal Funding Eligibility	50%
Systemic Opportunity	Very High
Key Issue	Broadside

Emergency Vehicle Preemption

LRSM ID S05

Install emergency vehicle preemption systems

CRASH TYPE

Providing emergency vehicle preemption capability at a signal or along a corridor provides two major safety benefits. First, preemption may decrease the potential for a collision to occur as emergency vehicles try to navigate through intersections. Second, a signal preemption system can decrease emergency vehicle response times, therefore decreasing the time for victims to receive medical attention, which is a critical concept of the Post Crash Care element of the Safe Systems Approach. An agency may consider combining emergency vehicle preemption into a comprehensive signal improvement project.

Crash Reduction Factor	70%
Expected Life (Years)	10
Federal Funding Eligibility	90%
Systemic Opportunity	High
Hot Spot Sample Location	Gonzales Road
Key Issue	Post-Crash Care

Improve Signal Timing

LRSM ID S03

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

CRASH TYPE

Certain timing, phasing, and control strategies can produce multiple safety benefits. Signal timing improvements may include adjusting Flashing Don't Walk time, setting maximum cycle lengths, setting minimum green time, adding phases, lengthening clearance intervals, eliminating or restricting higher-risk movements, and coordinating signals at multiple locations.

Crash Reduction Factor	15%
Expected Life (Years)	10
Federal Funding Eligibility	50%
Systemic Opportunity	Very High
Key Issue	Signalized Intersection Operations

SIGNAL MODIFICATIONS & ITS

Leading Pedestrian Interval

LRSM ID S21PB

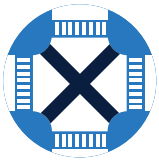
Modify signal phasing to implement a Leading Pedestrian Interval (LPI)

CRASH TYPE

At intersection locations with a high volume of turning vehicles and pedestrian/vehicle crashes, a leading pedestrian interval gives pedestrians the opportunity to establish a presence in the crosswalk 3 - 7 seconds before vehicles are given a green indication. Pedestrian recall timing automatically provides a pedestrian crossing phase, without having to press the pedestrian call button.

Crash Reduction Factor	60%
Expected Life (Years)	10
Federal Funding Eligibility	90%
Systemic Opportunity	Very High
Key Issue	Pedestrian Crossing in Crosswalk

Pedestrian Scramble Phase/ All Pedestrian Phase



LRSM ID S19PB

Pedestrian Scramble

CRASH TYPE

An all pedestrian phase is a form of pedestrian "WALK" phase at a signalized intersection in which all vehicular traffic is required to stop, allowing pedestrians to safely cross through the intersection in any direction. A pedestrian scramble phase allows pedestrians to cross diagonally.

Crash Reduction Factor	40%
Expected Life (Years)	20
Federal Funding Eligibility	90%
Systemic Opportunity	High
Key Issue	Pedestrian Crossing in Crosswalk

Pedestrian Countdown

LRSM ID S17PB

Install pedestrian countdown signal heads

CRASH TYPE

A Pedestrian Countdown signal displays the number of seconds remaining for a pedestrian to cross the intersection. Pedestrian countdowns improve safety by providing pedestrians the information needed to determine if there is enough time to cross the street.

Crash Reduction Factor	25%
Expected Life (Years)	20
Federal Funding Eligibility	90%
Systemic Opportunity	Very High
Key Issue	Pedestrian Crossing in Sidewalk

Prohibit Right-Turn-on-Red

Prohibiting right-turn-on-red movements should be considered at skewed intersections, or where exclusive pedestrian "WALK" phases, leading pedestrian intervals (LPIs), sight distance issues, or high pedestrian volumes are present. Prohibiting right-turn-on-red movements can help prevent collisions between vehicles turning right on red from one street and through vehicles on the cross street, and collisions involving pedestrians.

Hot Spot Sample Location	Gonzales Road & C Street
Key Issue	Pedestrian Crossing in Crosswalk

SIGNAL MODIFICATIONS & ITS

Protected Left Turns

LRSM ID S06/S07

Install left-turn lane and add turn phase (signal has no left-turn lane or phase before)/Provide protected left turn phase (left turn lane already exists)

CRASH TYPE

A protected left turn can be implemented at signalized intersections (with existing left turns pockets) that currently have a permissive left-turn or no left-turn protection and a high frequency of angle crashes involving left turning movements. Left turns are widely recognized as the highest-risk movements at signalized intersections. Providing protected left-turn phases significantly improves the safety for left-turn maneuvers by removing the need for the drivers to navigate through gaps in oncoming through vehicles.

Crash Reduction Factor	55%/30%
Expected Life (Years)	20
Federal Funding Eligibility	90%
Systemic Opportunity	Low/High
Key Issue	Broadside

Signal Interconnectivity and Coordination / Green Wave

LRSM ID S03

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

CRASH TYPE

This countermeasure focuses on retiming signals for slow speed signal coordination to encourage slower, safer travel along the corridor. This countermeasure can also include coordinating signals to allow for bicyclist progression, also known as a 'green wave,' gives bicyclists and pedestrians more time to safely cross through the 'green wave' intersections.

Crash Reduction Factor	15%
Expected Life (Years)	10
Federal Funding Eligibility	50%
Systemic Opportunity	Very High
Hot Spot Sample Location	Gonzales Road
Key Issue	Unsafe Speed

Retroreflective Signal Backplates

LRSM ID S02

Improve signal hardware: lenses, back-plates with retroreflective borders,

CRASH TYPE

Retroreflective borders and backplates enhance the visibility of traffic signals for aging and color-vision-impaired drivers, enabling them to understand which signal indication is illuminated. Retroreflective borders may also alert drivers to signalized intersections during periods of power outages when the signals would otherwise be dark, and non–reflective signal heads and backplates would not be visible. See CA MUTCD Section 4D.19 for more detail.

Crash Reduction Factor	15%
Expected Life (Years)	10
Federal Funding Eligibility	90%
Systemic Opportunity	Very High
Key Issue	Nighttime

Speed Sensitive Rest in Red Signal

LRSM ID R26

Install dynamic/variable speed warning signs

CRASH TYPE

With rest-in-red, signals with no volume detected will remain red instead of green, which requires drivers to slow down or stop when approaching the intersection. This can lower intersection departure speeds and reduce the frequency or severity of speed-related collisions. Rest-in-red is intended to be implemented during low-volume conditions.

Crash Reduction Factor	30%
Expected Life (Years)	10
Federal Funding Eligibility	90%
Systemic Opportunity	High
Key Issue	Unsafe Speed

SIGNAL MODIFICATIONS & ITS

Supplemental Signal Heads

LRSM ID S02

Improve signal hardware: lenses, back-plates with retroreflective borders,

CRASH TYPE

Additional signal heads allow drivers to anticipate signal changes farther away from intersections. Supplemental traffic signals may be placed on the near side of an intersection, far-left, far-right, or very high.

Crash Reduction Factor	**15%**
Expected Life (Years)	**10**
Federal Funding Eligibility	**90%**
Systemic Opportunity	**Very High**
Hot Spot Sample Location	**Ventura Road**
Key Issue	**Rear End**

Traffic Signal Confirmation Light

A traffic signal confirmation light is a small blue light that is placed on the top, rear, or bottom of a signal and turns on when the traffic signal turns red. The confirmation light allows law enforcement officers to observe vehicles that enter the intersection on a red light and enforce red light violations.

Key Issue	**Red Light Running**

Signal Adaptive Speed Response

If speeds are observed to exceed specified thresholds, traffic signal timing is modified to a lower progression speed or a speed-sensitive rest-in-red. By modifying the progression speed, signal adaptive speed response can result in fewer collisions related to unsafe speed and decrease overall collision severity.

Key Issue	**Unsafe Speed**


RIO DEL MAR SCHOOL

Ongoing City Efforts and General Recommendations

There are several ongoing safety efforts by the City of Oxnard:

- **Accessible Pedestrian Signals:** The City will upgrade 12 traffic signals to include APS in 2022 and is planning to upgrade 10 traffic signals to include APS in 2023. As a standard moving forward, the City will install accessible pedestrian signals (APS) as part of signal upgrades and new signals.
- **Leading Pedestrian Interval:** The City is developing a policy to guide the installation of Leading Pedestrian Intervals (LPI) at signalized intersections throughout the City. LPIs have been piloted at Gonzales Road & Entrada Drive. LPIs are recommended to be included at locations with a high potential for pedestrian and vehicle conflicts, such as schools, colleges, and shopping centers.
- **Traffic Signal Confirmation Lights:** The Oxnard Police Department purchased 36 traffic signal confirmation lights with grant funding. The confirmation lights are placed on the traffic signal(s) that require enforcement and allow law enforcement officers to enforce red light violations by turning on when the traffic signal turns red, which indicates if a vehicle enters the intersection after the traffic signal turns red. Traffic Signal Confirmation Lights are recommended for locations with a history of red light violations. A map and list of locations with red light violations are in Appendix C

In addition to the specific countermeasures identified for the Emphasis Areas in Chapter 7, the following safety measures are applicable throughout the City:

- **Advanced Stop Bars and High Visibility Crosswalks:** at stop-controlled approaches and signalized intersections to increase pedestrian visibility and reduce instances of drivers encroaching on the crosswalk.
- **Crosswalks with a Triple 4 Pattern and Raised Pavement Markers:** at locations with high pedestrian activity, such as around schools.
- **Green Conflict Striping:** at intersections and driveways to increase driver awareness of bicyclists.
- **Emergency Vehicle Preemption:** at signalized intersections, particularly along key routes to hospitals. The City is continuing to expand the existing emergency vehicle preemption system.

Advanced Stop Bar and High Visibility Crosswalks

Leading Pedestrian Interval

Summary of Non-Engineering Countermeasures

Safe Road Users

Education & Public Awareness Campaigns Targeted at Speeding, Driving Under the Influence, and Increasing Awareness of Bicycles and Pedestrians

High-Visibility Enforcement for DUI

Street Safety Ambassadors paired with Safe Routes to School

Safe Ride Home

Pair Education with Engineering Countermeasures

Enforcement Priorities Mandate

Pedestrian Safety and Homeless Services

Safe Roads

Placemaking in Traffic Safety Initiatives

Regular Countywide Traffic Safety Coordination Meetings

Safe Speeds

Automated Enforcement

Speed Limit Modification

Safe Speeds Education Campaign

Safe Vehicles

Emerging Technology

Post-Crash Care

Rapid Response Safety Communication Protocol & Multi-Disciplinary Team

CTW Effectiveness Rating

Countermeasures That Work, National Highway Traffic Safety Administration, 2017

Demonstrated to be effective by several high-quality evaluations with consistent results

Demonstrated to be effective in certain situations

Likely to be effective based on balance of evidence from high-quality evaluations or other sources

Effectiveness still undetermined; different methods of implementing this countermeasure produce different results

Limited or no high-quality evaluation evidence

What You'll See in this Non-Engineering Countermeasure Toolbox

The countermeasures are organized by Safe System Element

The emphasis areas that are addressed by the countermeasure

Countermeasure Description

Lead agency recommended to lead effort

Partner agencies to support effort

Potential funding sources for implementation

Locations or specific times when the countermeasure is relevant

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SAFE ROAD USERS

Education & Public Awareness Campaigns Targeted at Speeding, Driving Under the Influence, and Increasing Awareness of Bicycles and Pedestrians

EMPHASIS AREAS

Speeding

Profile 1: Unsafe speed collisions along roadways with 4-5 lanes

Driving Under the Influence

Profile 3: Driving under the influence of drugs or alcohol at primary roadway intersections

Awareness of Bicycles and Pedestrians

Profile 6: Pedestrian or bicycle-involved collisions on roadways with 3 lanes or less with 15 - 25 mph posted speed limit

Profile 7: Pedestrian or bicycle-involved collisions at major unsignalized intersections

Profile 8: Bicycle-involved collisions with vehicles proceeding straight at signals

Profile 9: Pedestrian-involved collisions on roadways with 4 – 5 lanes and 30 – 45 mph speed limit

Profile 10: Pedestrian-involved collisions midblock along primary roadways

TIMELINE

ONGOING

EFFECTIVENESS

CTW Rating

Mass Media Campaigns on DUI

DESCRIPTION

Coordinate with the City's Communications Department to use the City's existing social media accounts to establish an ongoing public education campaign focused on safe and responsible driving, discouraging drinking and driving, and increasing awareness of pedestrians and bicyclists. Campaigns could also involve collaborating with local radio stations to disseminate safety messages in English, Spanish, and Mixteco. Additionally, campaigns could collaborate with community-based organizations and direct service providers to vulnerable populations.

The SCAG Go Human campaign and the OTS Go Safely California campaign both have free resources for local agencies to use in implementing public awareness campaigns.

The Oxnard Police Department has two ongoing programs to address DUIs:

» Know Your Limit: Oxnard police officers partner with bars and restaurants to talk to patrons about drinking and driving and offer a free breathalyzer test.

» Choose Your Ride: Oxnard police officers have a patrol vehicle with half of the vehicle decorated as a police car and the other half decorated as a taxi as part of a campaign to discourage driving under the influence.

LEAD AGENCY

Oxnard Public Works

Oxnard Police Department

PARTNER AGENCIES

Oxnard Communications Department

Community-Based Organizations (e.g. BikeVC and MICOP)

Local Media Outlets (e.g. VC Star, KVTA, Vida)

SCAG Go Human Campaign

OTS Go Safely California Campaign

FUNDING SOURCES

California Office of Traffic Safety (OTS) Grants

SCAG Go Human Grants

CONTEXT

Citywide

RESOURCES

USDOT Traffic Safety Marketing | SCAG Go Human Campaign | OTS Go Safely California Campaign

Pedestrian Crossing Campaign Example:

San Francisco Municipal Transportation Agency's (SFMTA) "Be Nice, Look Twice" Pedestrian Safety Campaign aims to increase driver awareness of pedestrians in crosswalks and encourage proper yielding behavior.

Turning Movement Campaign Example:

"Safety - It's Your Turn", an SFMTA campaign, encourages safe left-turn behavior through social media, billboard, and bus poster messaging, disseminated in multiple languages.

Countermeasure Title

Effectiveness Rating from Countermeasures that Work (see rating scale on previous page)

When the countermeasure is applicable

Examples of best practices and countermeasures in action

SAFE ROAD USERS

Education & Public Awareness Campaigns Targeted at Speeding, Driving Under the Influence, and Increasing Awareness of Bicycles and Pedestrians

EMPHASIS AREAS

Speeding

Profile 1: Unsafe speed collisions along roadways with 4-5 lanes

Driving Under the Influence

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Profile 10: Pedestrian-involved collisions midblock along primary roadways

TIMELINE

ONGOING

EFFECTIVENESS

★★★ **CTW Rating**

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DESCRIPTION

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RESOURCES

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LEAD AGENCY

Oxnard Public Works

Oxnard Police Department

PARTNER AGENCIES

Oxnard Communications Department

Community-Based Organizations (e.g. BikeVC and MICOP)

Local Media Outlets (e.g. VC Star, KVTA, Vida)

SCAG Go Human Campaign

OTS Go Safely California Campaign

FUNDING SOURCES

California Office of Traffic Safety (OTS) Grants

SCAG Go Human Grants

CONTEXT

Citywide

High Visibility Enforcement for DUIs

EMPHASIS AREAS

Driving Under the Influence

Profile 3: Driving under the influence of drugs or alcohol at primary roadway intersections

TIMELINE

PERIODIC, ONGOING

with emphasis around holidays (New Years, Halloween, 4th of July)

EFFECTIVENESS

★★★★★ **CTW Rating**

Publicized Sobriety Checkpoints

★★★★ **CTW Rating**

High-Visibility Saturation Patrols

LEAD AGENCY

Oxnard Police Department

PARTNER AGENCIES

California Office of Traffic Safety (OTS)

FUNDING SOURCES

California Office of Traffic Safety (OTS) Grants

CONTEXT

Focused on top corridors with DUI crashes

DESCRIPTION

Deterrence policies, such as high visibility enforcement, focus on raising the actual and perceived risk of high-risk behaviors. Oxnard PD should continue their use of high visibility enforcement for DUIs to deter and increase awareness of the risks of this behavior. High visibility enforcement for driving under the influence, such as publicized sobriety checkpoints and saturation patrols, has been found to be effective to improve safety outcomes. Since speeding and driving aggressively are moving violations, officers can focus their efforts along corridors with a history of speeding-related collisions and speeding violations since they must observe driving behavior on the road. Oxnard PD has deployed red light confirmation signals to support high-visibility enforcement for aggressive driving. Based on the evaluation evidence gathered by NHTSA in *Countermeasures* that Work, the findings have been inconclusive on the effectiveness of high-visibility enforcement efforts focused on speeding and driving aggressively. Some studies found these efforts produced safety-related benefits while other studies found these efforts produced no benefits or even negative outcomes (e.g. an increase in crashes),

Integrated enforcement would include coordination with Public Awareness Campaigns. For example, widespread dissemination of multi-lingual educational messaging and promotion of safe rides home programs in advance of major DUI enforcement efforts will help to mitigate equity concerns about disproportionate impacts of fines/fees on lower income residents.

RESOURCES

Massachusetts Saving Lives – Enforcement Strategies

This program combines community engagement events, high-visibility enforcement including sobriety checkpoints, and media communication to discourage DUI.

Public Health Partnership on DUI Prevention

EMPHASIS AREAS

Driving Under the Influence

Profile 3: Driving under the influence of drugs or alcohol at primary roadway intersections

TIMELINE

ONGOING

EFFECTIVENESS

★★★★★ **CTW Rating**

Alcohol Screening & Brief Intervention

LEAD AGENCY

Ventura County Public Health Agency

PARTNER AGENCIES

Medical offices/centers (e.g. St. John's Regional Medical Center)

Oxnard Police Department

State Highway Patrol

FUNDING SOURCES

California Office of Traffic Safety (OTS) Grants

CONTEXT

Citywide, focused on top corridors with DUI crashes

DESCRIPTION

Prevention and education policies focus on mobilizing and educating the community and intervening before driving under the influence takes place. According to NHTSA research, alcohol problem assessment and treatment programs, as well as alcohol intervention in settings such as a doctor's office, are highly effective strategies for improving safety outcomes.

The Ventura County Public Health Agency Behavioral Health Department has a DUI Program that provides courses, counseling, and educational resources for first time DUI offenders, multiple DUI offenders, and for DUI prevention. The Behavioral Health Department could partner with the Oxnard Police Department to share information and medical offices, such as St. John's Regional Medical Center, to share information and conduct screenings.

RESOURCES

Behavior Change Campaigns to Improve Traffic Safety Toolkit

Countermeasures that Work, 10th Edition

Street Safety Ambassadors paired with Safe Routes to School

EMPHASIS AREAS

Awareness of Bicycles and Pedestrians

Profile 6: Pedestrian or bicycle-involved collisions on roadways with 3 lanes or less with 15 - 25 mph posted speed limit

Profile 7: Pedestrian or bicycle-involved collisions at major unsignalized intersections

Profile 8: Bicycle-involved collisions with vehicles proceeding straight at signals

Profile 9: Pedestrian-involved collisions on roadways with 4 – 5 lanes and 30 – 45 mph speed limit

Profile 10: Pedestrian-involved collisions midblock along primary roadways

TIMELINE

ONGOING

with a focus on the start of the school year

EFFECTIVENESS

★★★ **CTW Rating**

Safe Routes to School

DESCRIPTION

Expand the City's upcoming Safe Routes to School (SRTS) program in partnership with school districts and Oxnard PD to train and engage street safety ambassadors to support school arrival and dismissal operations. Oxnard PD has directed traffic during arrival and dismissal periods at schools but may not have the capacity to continue this effort on an on-going basis. Safety ambassadors can help facilitate safe pick-up and drop-off throughout the year, with an emphasis on the start of the school year.

RESOURCES

Safe Routes - National Center for Safe Routes to School

LEAD AGENCY

Oxnard Public Works

PARTNER AGENCIES

Oxnard School District

Oxnard Union High School District

Rio School District

Hueneme School District

Oceanview School District

Community-Based Organizations (e.g. BikeVC)

Oxnard Police Department

FUNDING SOURCES

California Active Transportation Program (ATP) Grants

CONTEXT

Schools within Oxnard

Safe Ride Home

EMPHASIS AREAS

Driving Under the Influence

Profile 3: Driving Under the Influence of drugs or alcohol at primary roadway intersections

TIMELINE

ONGOING

with emphasis around holidays or weekend nights (New Years, Halloween, 4th of July)

EFFECTIVENESS

★★★ **CTW Rating**

Alternative Transportation

LEAD AGENCY

Oxnard Public Works

PARTNER AGENCIES

TNC Operators (Lyft, Uber, Taxis, etc.)

Gold Coast Transit District

Oxnard Police Department

Local businesses

FUNDING SOURCES

User Fees (taxi and TNC fee)

CONTEXT

Citywide, weekends, holidays, events

DESCRIPTION

Develop partnerships between the City of Oxnard, the Oxnard Police Department, TNC operators, Gold Coast Transit District (GCTD), and local businesses to offer promotional codes for free or discounted rides home from establishments or events in Oxnard to reduce the potential for DUI, drowsy driving, or distracted driving. This program may be an opportunity to partner with GCTD on the Late Night Safe Rides program, which is a shuttle service from 8 PM – 11 PM, focused on people with late night commutes. This program may be focused on particular holidays or event days or applied more broadly to weekend nights.

RESOURCES

Portland Bureau of Transportation Safe Ride Home Program

PBOT partnered with the Portland Police Bureau, TriMet, Old Town Hospitality Group, and Portland cab companies Radio Cab, Broadway Cab, New Rose City Cab and United Independent Cab, as well as transportation network companies Lyft and Uber to provide promo codes for discounted rides. The program is funded by a 50-cent fee charged for every taxi and TNC ride in Portland.

Pairing Education with Key Engineering Countermeasures

EMPHASIS AREAS

Hot Spots

Hot Spot 3: Wooley Road from Factory Lane to Pacific Avenue

Hot Spot 4: Saviers Road from Laurel Street to Pleasant Valley Road

Hot Spot 5: Bard Road from Saviers Road to Pleasant Valley Road

Awareness of Bicycles and Pedestrians

Profile 6: Pedestrian or bicycle-involved collisions on roadways with 3 lanes or less with 15 - 25 mph posted speed limit

Profile 7: Pedestrian or bicycle-involved collisions at major unsignalized intersections

Profile 9: Pedestrian-involved collisions on roadways with 4 – 5 lanes and 30 – 45 mph speed limit

Profile 10: Pedestrian-involved collisions midblock along primary roadways

LEAD AGENCY

Oxnard Public Works

PARTNER AGENCIES

Community-Based Organizations (e.g. BikeVC and MICOP)

Oxnard Communications Department

FUNDING SOURCES

California Office of Traffic Safety (OTS) Grants

General Funds

CONTEXT

Citywide, focused on prioritized infrastructure project locations

TIMELINE

LONG TERM

before or during the implementation of a new engineering countermeasure

EFFECTIVENESS

N/A

DESCRIPTION

Educational materials can be used to teach people how to use new and unfamiliar safety countermeasures, such as rectangular rapid flashing beacon (RRFB), roundabouts, or protected bikeways. These materials can consist of informational signs or demonstration videos, and should be presented in multiple languages, including English, Spanish, and Mixteco.

RESOURCES

City of Sacramento Bicycling Videos

The City of Sacramento has used demonstration videos to engage residents in bicycling safety procedures. The videos on their website feature a series of safety improvements such as protected bike lanes, bike boxes, and bike signals, and inform residents how to use these new roadway features, both as a bicyclist and a driver.

City of Los Angeles Education through Pop-Up Installations

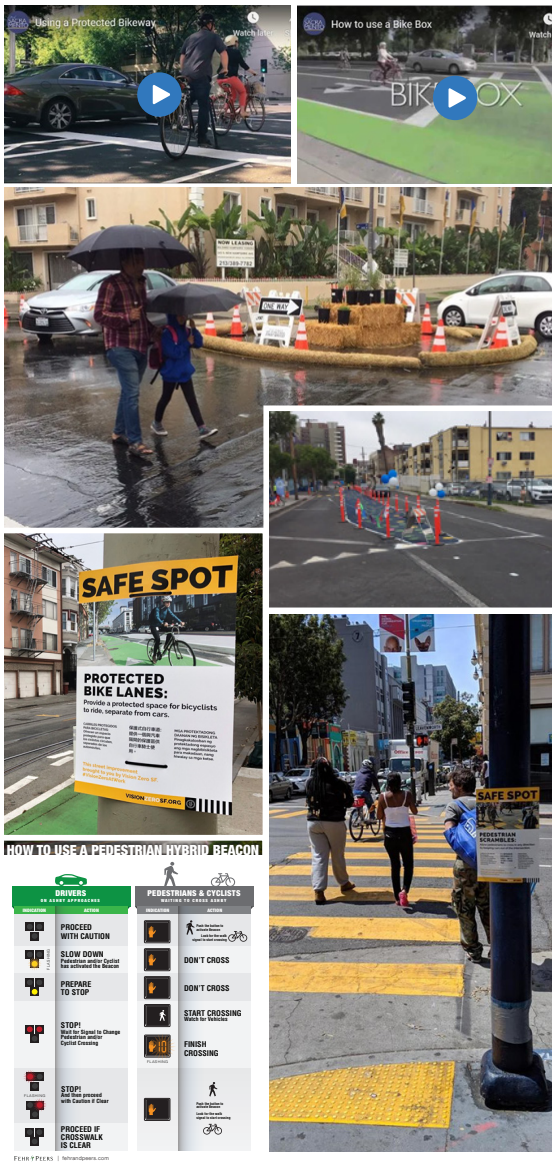
As part of Bike to Work Day in 2019, LADOT used temporary pop-up installations to introduce safety improvements in specific neighborhoods. Hay bales, straw wattles, and plants were used to test the roundabout design and educate drivers on how to use the traffic circle countermeasure. In addition to introducing safety improvements, pop-up installations can bring out emergency vehicles to ensure the vehicles can navigate around roundabouts or curb extensions.

City of San Francisco Informational Signs

The San Francisco Municipal Transportation Agency (SFMTA) posted signs with a brief explanation next to a newly installed protected bike lane in multiple languages as part of their Vision Zero SF initiative. This approach was also applied to educate people about pedestrian scrambles and bus bulb outs.

City of Berkeley "How to Use a Pedestrian Hybrid Beacon" Flyer

This informational flyer was paired with the installation of a new PHB and includes both driver and pedestrian instruction for properly using the new countermeasure.



Enforcement Priorities Mandate

EMPHASIS AREAS

Speeding

Profile 1: Unsafe speed collisions along roadways with 4-5 lanes

Profile 2: Broadside collisions at signals without fully protected left turns

Driving Under the Influence

Profile 3: Driving under the influence of drugs or alcohol at primary roadway intersections

TIMELINE

ONGOING

EFFECTIVENESS

★★★ / ★★★★ **CTW Rating**

Communications and Outreach Supporting Enforcement, High-Visibility Cell Phone and Text Messaging Enforcement

DESCRIPTION

Use crash history and emphasis area corridors as one criterion to direct enforcement efforts, with a focus on the three "Ds" identified by the Oxnard Police Department: Driving Under the Influence, Distracted Driving, and Dangerous Driving. This may require additional police department funding.

LEAD AGENCY

Oxnard Police Department

PARTNER AGENCIES

Oxnard Public Works

FUNDING SOURCES

User Fees (taxi and TNC fee)

CONTEXT

This would focus on the hot spot corridors and locations with DUIs, distracted driving, and dangerous driving.

RESOURCES

Behavior Change Campaigns to Improve Traffic Safety Toolkit

Countermeasures that Work, 10th Edition

Pedestrian Safety and Homeless Services

EMPHASIS AREAS

Awareness of Bicycles and Pedestrians

Profile 6: Pedestrian or bicycle-involved collisions on roadways with 3 lanes or less with 15 - 25 mph posted speed limit

Profile 7: Pedestrian or bicycle-involved collisions at major unsignalized intersections

Profile 8: Bicycle-involved collisions with vehicles proceeding straight at signals

Profile 9: Pedestrian-involved collisions on roadways with 4 – 5 lanes and 30 – 45 mph speed limit

Profile 10: Pedestrian-involved collisions midblock along primary roadways

TIMELINE

ONGOING

EFFECTIVENESS

N/A

DESCRIPTION

In jurisdictions with a large unsheltered population, unsheltered people are often disproportionately represented in pedestrian collisions. Unsheltered people have a relatively high level of traffic exposure as they may stand in medians, cross roadways outside of designated pedestrian crossings, and/or spend time in parking lots. The City of Oxnard has a Five-Year Homeless Plan that primarily focuses on getting people into housing but also includes strategies related to roadway safety, such as providing safe crossings between shelters and social services (e.g. Gabriel's House to County HSA building). The Plan also includes a Downtown Ambassador Program to provide information and assistance to unsheltered people in Downtown Oxnard. In addition to connecting people to social services, ambassadors could provide information about safe walking practices, such as using crosswalks and increasing visibility. The ambassador program could also distribute traffic safety kits to help unsheltered people increase their visibility, such as reflective safety vests and bicycle reflectors.

Oxnard Police Department also has a Homeless Liaison Unit, which has previously engaged with unsheltered people by distributing "overdose rescue kits," which contain three doses of Narcan, a CPR shield, and educational information for countywide drug addiction treatment and recovery resources. Pedestrian safety could be incorporated into the ongoing engagement that Oxnard Police Department has with the unsheltered community. Although roadway safety education and traffic safety kits would not address the underlying cause of unsheltered people disproportionately involved in collisions, these strategies may help mitigate the number of collisions as the City and County work to get people into housing and/or receive social services.

RESOURCES

The City of Austin, TX has a "Housing First" strategy in their Vision Zero Action Plan that prioritizes ending homelessness to address larger societal issues contributing to crashes involving homeless persons crossing the roadway. The Ending Community Homelessness Coalition, a non-profit organization, and Austin-Travis County Integral Care, the county's mental health and intellectual and developmental disability authority, are leading this effort.

The City of Fremont, CA distributed 100 traffic safety kits to its unsheltered community in an effort to make them more visible when walking and biking at night. Each kit consists of a reflective safety vest, flashlight, bicycle reflectors, and a reflective backpack. This Fremont Public Works Department and Human Services Department led this effort.

Portland, Oregon's Bureau of Transportation collaborated with Portland State University to engage in research and outreach to understand best practices for ensuring the safety of unhoused individuals around roadways. 70 percent of pedestrian fatalities within the City of Portland are among people experiencing homelessness. Through outreach with the unhoused community and data analysis, the study recommends implementing a "safe streets" program on streets surrounding encampments, increasing general infrastructure such as roadway lighting and traffic calming, increasing the number of safe parking areas for cars and RVs, and reducing encampment sweeps.

LEAD AGENCY

Oxnard Housing Department – Homeless Service Team

Oxnard Police Department – Homeless Liaison Unit

PARTNER AGENCIES

Oxnard Police Department

Oxnard Public Works Department

Ventura County Human Services Agency

Ventura County Continuum of Care Alliance

Housing Organizations (e.g. The Kingdom Center, Turning Point Foundation, RAIN Project Transitional Living Center, Gabriel's House)

FUNDING SOURCES

General Funds; Public/Private Partnerships

CONTEXT

Citywide

SAFE ROADS

Placemaking in Traffic Safety Initiatives

EMPHASIS AREAS

Hot Spots

Hot Spot 4: Saviers Road from Laurel Street to Pleasant Valley Road

Hot Spot 5: Bard Road from Saviers Road to Pleasant Valley Road

TIMELINE

ONGOING

EFFECTIVENESS

Initial studies indicate art-based placemaking efforts have a strong positive correlation with improve safety benefits but further studies are recommended to cover a wider variety of roadway and land use contexts to inform development of a crash modification factor.

LEAD AGENCY

Oxnard Public Works

PARTNER AGENCIES

Ventura County Public Works (e.g. for unincorporated areas, such as El Rio)

Oxnard Community Development

Community-Based Organizations (e.g. BikeVC, MICOP, and Community Environmental Council)

FUNDING SOURCES

General Funds; Public/Private Partnerships; User Fees; SCAG Go Human

CONTEXT

Would apply to areas throughout the city with high volumes of vulnerable users

DESCRIPTION

Launch a citywide initiative to treat streets as places by incorporating permanent placemaking efforts (public art, green infrastructure and neighborhood amenities) into traffic safety initiatives. Such amenities can activate streetscapes and encourage lower speeds and better awareness of non-vehicle users. Prioritize areas with high numbers of vulnerable users.

RESOURCES

Asphalt Art Safety Study: Historical Crash Analysis and Observational Behavior Assessment at Asphalt Art Sites

A study by Sam Schwartz and Bloomberg Philanthropies on the effectiveness of "asphalt art," which are public art projects coupled with transportation infrastructure improvements, found that asphalt art can have traffic-calming benefits and encourage safer behavior. Asphalt art includes intersection murals, crosswalk art, and painted plazas or sidewalk extensions. The study tracked crash rates (crashes per year) and observed pedestrian and motorist behavior at 17 study sites in urban core, neighborhood residential/commercial, and suburban settings in cities along the East Coast of the U.S. The historical crash analysis found an average:

- 50% decrease in the rate of crashes involving pedestrians or other vulnerable road users
- 37% decrease in the rate of crashes leading to injuries
- 17% decrease in the total crash rate

The observational behavior assessment found a:

- 25% decrease in pedestrian crossing involving a conflict with drivers
- 27% increase in frequency of drivers immediately yielding to pedestrians with the right-of-way
- 38% decrease in pedestrians crossing against the walk signal

The SCAG Go Human program is a community engagement with the goal of reducing traffic collisions in Southern California and encouraging people to walk and bike more. The Go Human program has a Kit of Parts (link: https://scag.ca.gov/borrow-kit-parts) that includes pop-up materials for jurisdictions to temporarily demonstrate potential and planned street design treatments and safety infrastructure. The Kit of Parts includes materials to showcase a parklet, curb extension, median refuge island, artistic crosswalk, and separated bike lane.

Regular Countywide Traffic Safety Coordination Meetings

EMPHASIS AREAS

ALL

TIMELINE

ONGOING

EFFECTIVENESS

N/A

LEAD AGENCY

Oxnard Public Works

PARTNER AGENCIES

Ventura County Public Works
City of Ventura Public Works
Simi Valley Public Works
Thousand Oaks Public Works
Camarillo Public Works

FUNDING SOURCES

General Funds

CONTEXT

Citywide and regionwide

DESCRIPTION

The City of Oxnard is just one jurisdiction within the larger Ventura County region. Given that residents and visitors often pass back and forth between the different jurisdictions with regularity, coordination and updates on roadway safety best practices and observations across the region can create a unified approach to traffic safety. Information sharing could improve efficiencies in traffic safety management, including policies that are working and those that require improvement. The meetings could be held monthly or semi-annually.

RESOURCES

In August 2019, SCAG hosted a series of traffic safety workshops entitled Go Human with representatives from each of the counties and many jurisdictions within the SCAG region. Presenters from the region spoke on a number of projects within their region including multi-lingual pedestrian safety campaigns, open streets projects, safe routes to school, and others. This allowed members from cities within the SCAG region to hear best practices, successes, and hurdles from their counterparts and enhance their understanding of roadway safety.

SAFE SPEEDS

Automated Enforcement

EMPHASIS AREAS

Speeding

Profile 1: Unsafe speed collisions along roadways with 4-5 lanes

Profile 2: Broadside collisions at signals without fully protected left turns

Hot Spots

Locations 1-5

TIMELINE

ONGOING

EFFECTIVENESS

★★★★★ **CTW Rating**

Enforcement - A 2002 study* compared crash data between Oxnard and three control cities for 29 months preceding red light camera enforcement (January 1995 – May 1997) and 29 months with red light camera enforcement (August 1997 – December 1999). Overall, crashes at signalized intersections throughout Oxnard were reduced by 7% and injury crashes were reduced by 29%. Right-angle crashes (e.g. broadside collisions) involving injuries were reduced by 68%.

LEAD AGENCY

Oxnard Police Department

PARTNER AGENCIES

Oxnard Public Works

FUNDING SOURCES

General Funds; Citations

CONTEXT

Would apply to areas throughout the city with frequent instances of red light running

DESCRIPTION

Automated enforcement, such as red-light cameras or speed cameras, target the specific drivers who are behaving dangerously. Although red light cameras have been found to increase rear-end crashes, they reduce broadside collisions, which often result in more serious injuries or fatalities than rear end collisions.

Automated speed detection devices can identify speeding violations and provide citations. California is currently considering legislation to allow this type of enforcement and the City of Oxnard can consider supporting this effort.

A strictly data-driven approach to automated enforcement might place red-light or speed cameras in locations with the highest number of collisions. However, given that many low-income neighborhoods have historically received fewer infrastructure investments, which often results in a higher rate of collisions, a strictly data-driven approach could lead to a disproportionate burden of enforcement. Therefore, automated enforcement should be implemented evenly across a jurisdiction at problem locations. In addition, cities should pair automated enforcement with updated fine structures so that low-income communities don't bear a disproportionate burden of traffic fines.

RESOURCES

The Federal Highway Administration has published a report named *Red Light Camera Systems: Operational Guidelines* which documents the best practices for installing and maintain a red-light camera enforcement system. This includes the most important procedures for planning a red-light camera program and system. The report highlights the necessity of a robust public information and education to accompany the camera system. It recommends focusing on the consequences of fatalities and severe injuries that can accompany red light running within the campaign and distributing information through a variety of media channels including mailings, billboards, PSAs, and others. Education encompassing what red light running is, why it is dangerous, and what actions have been undertaken to reduce the frequency of its occurrence is important as well. Ongoing public information and education, beyond just the immediate period when the system is implemented, is a key aspect to enhance program effectiveness. The report lists key stakeholders that should be present during red light camera program planning, including law enforcement, public works, city attorneys, and representatives from the community.

* Source: Retting, R. A., & Kyrychenko, S. Y. (2002). Reductions in injury crashes associated with red light camera enforcement in Oxnard, California. American journal of public health, 92(11), 1822–1825. https://doi.org/10.2105/ajph.92.11.1822

Speed Limit Modification

EMPHASIS AREAS

Speeding

Profile 1: Unsafe speed collisions along roadways with 4-5 lanes

TIMELINE

ONGOING

EFFECTIVENESS

★★★★★ **CTW Rating**

Speed Limits

LEAD AGENCY

Oxnard Public Works

PARTNER AGENCIES

Oxnard Police Department

FUNDING SOURCES

California Office of Traffic Safety (OTS) Grants

General Funds

CONTEXT

Citywide, focused on hot spot corridors, business activity districts, and school zones

DESCRIPTION

Utilize California Assembly Bill (AB) 43 methodology to lower speed limits on additional corridors.

AB 43 features the following five major components, focused on providing local jurisdictions more flexibility in setting speed limits, especially regarding vulnerable road users:

- Engineering & Traffic Survey (E&TS) - option to extend enforceable time period
- Post E&TS - agency can elect to retain current or immediately prior speed limit
- Speed Limit Reduction - reduction of additional 5 mph based on several factors, including designation of local "Safety Corridors"
- Prima Facie Speed Limits - options for 15 and 25 mph in certain zones
- Business Activity Districts - option for 20 or 25 mph

RESOURCES

California Assembly Bill 43

NACTO City Limits Setting Safe Speed Limits on Urban Streets guide

The City of Palm Springs reduced the speed limits for 36 street segments (nearly 17 street miles) for areas with frequent pedestrian or bicycle traffic. Many of the street segment speed limits were reduced by 5 mph (e.g. 35 mph to 30 mph).

The City of San Francisco reduced speed limits by 5 mph for key business activity districts, which are defined as areas with streets where at least half of the property uses are dining or retail. Most of these streets had a speed limits of 25 mph or 30 mph and were reduced to 20 mph or 25 mph, respectively.

Safe Speeds Education Campaign

EMPHASIS AREAS

Speeding

Profile 1: Unsafe speed collisions along roadways with 4-5 lanes

Hot Spots

Hot Spots 1-5

TIMELINE

PERIODIC, ONGOING

EFFECTIVENESS

★★★ **CTW Rating**

Communications and Outreach on Speeding

LEAD AGENCY

Oxnard Public Works

PARTNER AGENCIES

Oxnard Police Department
Oxnard Communications Department
Community-Based Organizations
Local Media Outlets
Caltrans
SCAG Go Human Campaign
OTS Go Safely California Campaign

FUNDING SOURCES

General Funds
California Office of Traffic Safety (OTS) Grants

CONTEXT

Citywide, focused on top corridors for unsafe speed collisions

DESCRIPTION

Continue existing safety education campaign targeting safe speeds. This could include yard signs, wall boards/posters in prime injury-corridor neighborhoods, ads on bus exteriors, radio ads, etc. To maximize effectiveness, this should be an ongoing program.

The SCAG Go Human campaign and the OTS Go Safely California campaign both have free resources for local agencies to use in implementing public awareness campaigns.

RESOURCES

USDOT Traffic Safety Marketing

"Stop Speeding Before it Stops You" is a media materials campaign provided by USDOT Traffic Safety Marketing, which includes social media-sharable GIFs discouraging speeding.

SCAG Go Human Campaign

OTS Go Safely California Campaign

Minnesota DOT Using Technology for In-Vehicle Alerts Jurisdictions, such as the Minnesota Department of Transportation have also started to partner with technology companies to provide alerts to on-vehicle computer systems and phones when drivers pass through designated corridors that have been targeted for speed enforcement and education programs. These programs use geofencing technology and send push alerts urging drivers to travel at reasonable speeds.

SAFE VEHICLES

Emerging Technology, including Autonomous and Connected Vehicles

EMPHASIS AREAS

ALL

TIMELINE

LONG TERM

EFFECTIVENESS

N/A

LEAD AGENCY

Oxnard Public Works

PARTNER AGENCIES

Oxnard Police Department

Caltrans

FUNDING SOURCES

Caltrans Highway Safety Improvement Program

California Office of Traffic Safety (OTS) Grants

General Funds

CONTEXT

Citywide

DESCRIPTION

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. The following represent a summary of emerging technology trends related to safety.

Intelligent Transportation Systems

The City has an Intelligent Transportation Systems (ITS) Master Plan with strategies to improve mobility and safety in Oxnard. Strategies include improving incident response times, managing congestion with signal timing, and deploying a traffic management center to fully utilize the ITS outlined in the plan. Dynamically managing the City's transportation system contributes to safety by minimizing incidence response times, improving auto travel time reliability, and facilitating efficient transit service to raise the value of transit relative to auto travel.

Safe Vehicle Technology

Some existing and emerging on-board vehicle technologies require investments in public infrastructure in order to function properly. For example, lane departure warning technology common on newer vehicles requires regular maintenance of roadway striping and the use of highly retroreflective materials to maximize effectiveness. Emerging Vehicle-to- Infrastructure (V2I) technologies will likely require integration with existing infrastructure. The City's ITS Master Plan and Capital Improvement Plan can facilitate the effectiveness of safe vehicle technology with traffic signal and detection upgrades and systematic resurfacing projects to ensure roadway striping is easily visible.

Near Miss Data

Near misses have historically been difficult to study in practical safety applications due to an overall lack of reported information. In the absence of sufficient crash data, near miss data is an important indicator for guiding crash prevention. Video data and incidence data from connected vehicles are emerging data sources that can provide key safety insights regarding near misses.

AV Readiness Planning

Having strategies prepared to meet and address the oncoming challenges posed by AV technology will be crucial in advancing road safety in Oxnard. Fully automated vehicles have the potential to transform travel behavior and safety outcomes given that AVs are ultimately designed to operate without any human intervention. Some strategies for preparation include educating the public on current and future safety features and limitations, developing signing and striping standards, and conducting reviews of equity implications. Without appropriate research and guidance, AVs could widen accessibility and safety gaps for vulnerable communities.

RESOURCES

NHTSA Automated Vehicles for Safety

POST-CRASH CARE

Rapid Response Safety Communication Protocol & Multi-Disciplinary Team

EMPHASIS AREAS

ALL

TIMELINE

LONG TERM

EFFECTIVENESS

N/A

LEAD AGENCY

Oxnard Police Department

Oxnard Fire Department

PARTNER AGENCIES

Oxnard Public Works

FUNDING SOURCES

California Office of Traffic Safety (OTS) Grants

General and Road Funds

CONTEXT

Citywide

DESCRIPTION

Employ an internal, multi-departmental communication strategy in response to severe and fatal collisions. The protocol should outline a path forward for Public Works staff to be a part of the immediate on-the ground-response to an investigation of severe and fatal collisions, ensuring a multi-disciplinary response team focused both on the behavioral and engineering elements of a collision. Development of this multi-disciplinary team can also support timely data sharing among City departments

RESOURCES

San Francisco Vision Zero Traffic Fatality Protocol

This protocol is an efficient and standardized procedure for reporting, investigating, and collecting data on traffic fatalities, with coordination across multiple city agencies.

Endnotes:

[23]California Public Radio, California Study Shows Racial, Gender Disparities in Police Stops and Searches. January 4, 2022. Accessed on June 29, 2022. https://www.capradio.org/articles/2022/01/04/california-study-shows-racial-gender-disparities-in-police-stops-and-searches/

[23]California Public Radio, California Study Shows Racial, Gender Disparities in Police Stops and Searches. January 4, 2022. Accessed on June 29, 2022. https://www.capradio.org/articles/2022/01/04/california-study-shows-racial-gender-disparities-in-police-stops-and-searches/

[24]BikeVentura and Community Environmental Council, Clean Mobility Options Voucher Pilot Program – Oxnard Community Transportation Needs Assessment, November 9, 2021.

[25]National Public Radio. Why Philadelphia has Banned Low-Level Traffic Stops. November 8, 2021. Accessed June 29, 2022. https://www.npr.org/2021/11/08/1052957246/why-philadelphia-has-banned-low-level-traffic-stops

07
Emphasis Areas & Strategies

This chapter outlines 15 Emphasis Areas selected for project development. Each Emphasis Area is presented on a cutsheet that includes a location summary, key collision trends, and safety strategies.


STOP

Emphasis Areas & Strategies

The 15 Emphasis Areas are a combination of five hot spot corridors and ten collision profiles.

Hot Spot Corridors:

The five hot spot corridors were identified based on total collisions, weighted score, and collision rates, as described in Chapter 05 (Safety Analysis) and Appendix C (Collision Analysis Memo). The top ten intersections and roadway segments by weighted score generally anchor each of the five hot spot corridors and were grouped with several adjacent locations based on collision patterns and roadway context to facilitate a systemic approach for identifying safety improvements. The hot spot corridor process also considered not duplicating other major ongoing efforts by the City, capturing a variety of roadway and land use contexts in Oxnard, and geographic distribution.

Hot Spot Corridors:

1. **Ventura Road from 5th Street to Wooley Road**
2. **Gonzales Road from Victoria Avenue to Rose Avenue**
3. **Wooley Road from Factory Lane to Pacific Avenue**
4. **Saviers Road from Laurel Street to Pleasant Valley Road**
5. **Bard Road from Saviers Road to Pleasant Valley Road**

Collision Profiles:

The ten collision profiles were identified by pairing collision data with contextual data in a series of systemic matrices, which are described in Chapter 05 (Safety Analysis) and Appendix C (Collision Analysis Memo). The collision profiles reflect the combinations of factors that contributed to a high number of total collisions, KSI collisions, bike collisions, and pedestrian collisions. The collision profile process also considered the countermeasures available to address the safety issue, grant competitiveness, geographic or other equity considerations, and capturing a variety of roadway and land use contexts in Oxnard. The top ten intersections and roadway segments by total collisions, weighted score, and collision rates are generally reflected in the collision profiles.

Collision Profiles:

1. **Unsafe Speed Collisions Along Roadways with 4 – 5 Lanes**
2. **Broadside Collisions at Signals without Fully Protected Left Turns**
3. **Driving Under the Influence of Drugs or Alcohol at Primary Roadway Intersections**
4. **Nighttime Collisions on 4 - 5 Lane Roadways**
5. **Hit Object Collisions at Major Intersections**
6. **Pedestrian or Bicycle-Involved Collisions on Roadways with 2 - 3 Lanes and ≤ 25 mph Posted Speed Limit**
7. **Pedestrian or Bicycle-Involved Collisions at Major Unsignalized Intersections**
8. **Bicycle-Involved Collisions with Vehicles Proceeding Straight at Signals**
9. **Pedestrian-Involved Collisions on Roadways with 4 - 5 Lanes and 30 - 45 mph Speed Limit**
10. **Pedestrian-Involved Collisions Midblock Along Primary Roadways**

What You'll See on the Hot Spot Corridor Overview Cutsheet

Corridor name and extents

Collision summary of total collisions and collisions where someone was killed or severely injured (KSI).

Key collision, land use, and activity trends that were identified through collision analysis, field observation, and stakeholder input.

Primary countermeasures correspond to collisions trends and are best suited for competitive HSIP grant applications.

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Safety Recommendations for Hot Spot Corridor 1

Ventura Road

from 5th Street to Wooley Road

KEY STATISTICS

132 TOTAL COLLISIONS

- 11 Pedestrian-Involved Collisions
- 12 Bicycle-Involved Collisions

6 KSI COLLISIONS

- 2 Pedestrian-Involved KSI Collisions
- 2 Bicycle-Involved KSI Collisions

CURRENT ROADWAY CHARACTERISTICS

General Plan Classification	Primary
Number of Lanes	5–6
Posted Speed	45 mph
AADT	41,000
Bike Facilities	Northbound Class II bike lane starts 200 feet south of 5th Street
Railroad Crossing	At Wooley Rd

CURRENT LAND USE CHARACTERISTICS

	Schools
X	Transit
X	Disadvantaged Community
X	SB 375
X	AB 1550
X	Justice40

KEY TRENDS

CORRIDOR
- 94 percent of collisions occurred at an intersection
- Top Violations: Unsafe Speed (28%), Vehicle Right of Way (17%), and Traffic Signals and Signs (15%)

5TH STREET
- Greater bike and pedestrian activity near retail plazas
- Gap in roadway lighting from 5th Street to Teal Club Road

7TH STREET
- Broadside collisions involving southbound left turns (lefts not fully protected)
- Bicyclist and pedestrian right-of-way violations

WOOLEY ROAD
- Rear end collisions, possibly due to signal visibility and right-turn queues
- Nighttime pedestrian collisions

RECOMMENDED COUNTERMEASURES: PRIMARY

COUNTERMEASURE	ISSUE AREA	CRASH REDUCTION FACTOR	APPLICABILITY FOR MAINTENANCE CYCLES
Leading Pedestrian Interval	Pedestrian Collisions at Signalized Intersections with Right-Turning Vehicles	60%	Signal Timing
Repurpose Roadway Space (Road Diet) with Class IV Separated Bike Lane	High Speeds, Bike Activity and Collisions	45%	
Intersection Lighting	Nighttime Collisions (Especially with Pedestrians)	40%	
Segment Lighting	Nighttime Collisions (Especially with Pedestrians)	35%	
Class II Bike Lanes (if no road diet; add buffer where feasible)	Bike Collisions	35%	Resurfacing
Additional Signal Heads (if repurposing roadway space (road diet))	Rear End and Broadside Collisions	15%	
Extend Yellow and All Red Clearance Time	Rear End and Broadside Collisions	15%	Signal Timing
High Visibility Crosswalks with Advance Stop Bars	Pedestrian Collisions at Signalized Intersections	15%	Resurfacing
Retroreflective Signal Backplates	Rear End and Broadside Collisions	15%	
Pavement Markings Through Intersection	Left-Turns at Intersections with Railroad Crossing	10%	Resurfacing

ESTIMATED CORRIDOR COST & BENEFIT

WITH ROAD DIET
BENEFIT: $31.8m
COST: $4.7m
BENEFIT/COST RATIO: 7

NO ROAD DIET
BENEFIT: $25.2m
COST: $2.5m
BENEFIT/COST RATIO: 10

Note: Though the project option without a road diet results in a higher B/C ratio, the road diet project is expected result in a greater reduction in collisions while providing for a more comfortable option for bicyclists.

Current roadway and land use characteristics

Note: *Several designations for Disadvantaged Communities are included as each designation is referenced for various grant applications. The designations include Senate Bill 535, Assembly Bill 1550, and the USDOT Justice40 Initiative.

Map with activity generators, such as retail plazas, transit stops, schools, and parks.

RECOMMENDED COUNTERMEASURES: SECONDARY

- Consider reaching out to commercial plaza owner(s) to explore consolidating driveways to address queuing by removing driveways within 200' – 250' of signalized intersections
- Green Conflict Striping at intersections and driveways
- Pedestrian and Bicyclist Warning Signage for right-turning vehicles at intersections
- Traffic Signal Confirmation Lights at signalized intersections (ongoing program by Oxnard Police Department)

RELATED CITY ACTIVITIES

- The City of Oxnard Public Works Department had developed guidelines of Leading Pedestrian Intervals and is beginning implementation.
- The City of Oxnard Public Works Department is installing a protected left-turn for northbound/southbound travel on Ventura Road at 7th Street.
- The County of Ventura may convert the flood channel, which begins at Ventura Road & Ninth Street and continues south past Wooley Road, into a linear park that would provide a separated multi-use path for people walking and bicycling.

Retail

Transit Stops

These conceptual recommendations require further feasibility assessments, detailed analysis, and community outreach prior to final design and implementation.

Secondary countermeasures are additional recommended strategies based on existing infrastructure, field observations, and stakeholder input.

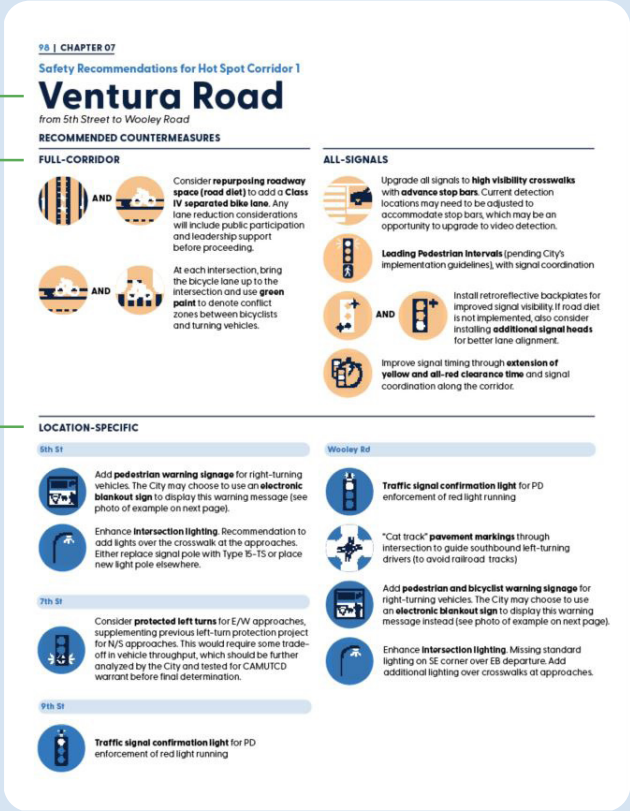
Related City activities are recently completed, ongoing, or upcoming City projects that are relevant to the key trends and safety strategies identified for each corridor.

What You'll See on the Hot Spot Corridor Recommendations Cutsheet

Corridor name and extents

Countermeasures recommended for systemic application (e.g. across the corridor or at similar locations, such as at all signalized intersections).

Countermeasures recommended for specific locations



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Safety Recommendations for Hot Spot Corridor 1

Ventura Road

from 5th Street to Wooley Road

RECOMMENDED COUNTERMEASURES

FULL-CORRIDOR

AND

Consider **repurposing roadway space (road diet)** to add a **Class IV separated bike lane**. Any lane reduction considerations will include public participation and leadership support before proceeding.

AND

At each intersection, bring the bicycle lane up to the intersection and use **green paint** to denote conflict zones between bicyclists and turning vehicles.

ALL-SIGNALS

Upgrade all signals to **high visibility crosswalks** with **advance stop bars**. Current detection locations may need to be adjusted to accommodate stop bars, which may be an opportunity to upgrade to video detection.

Leading Pedestrian Intervals (pending City's implementation guidelines), with signal coordination

AND

Install retroreflective backplates for improved signal visibility. If road diet is not implemented, also consider installing **additional signal heads** for better lane alignment.

Improve signal timing through **extension of yellow and all-red clearance time** and signal coordination along the corridor.

LOCATION-SPECIFIC

5th St

Add **pedestrian warning signage** for right-turning vehicles. The City may choose to use an **electronic blankout sign** to display this warning message (see photo of example on next page).

Enhance **intersection lighting**. Recommendation to add lights over the crosswalk at the approaches. Either replace signal pole with Type 15-TS or place new light pole elsewhere.

7th St

Consider **protected left turns** for E/W approaches, supplementing previous left-turn protection project for N/S approaches. This would require some trade-off in vehicle throughput, which should be further analyzed by the City and tested for CAMUTCD warrant before final determination.

9th St

Traffic signal confirmation light for PD enforcement of red light running

Wooley Rd

Traffic signal confirmation light for PD enforcement of red light running

"Cat track" **pavement markings** through intersection to guide southbound left-turning drivers (to avoid railroad tracks)

Add **pedestrian and bicyclist warning signage** for right-turning vehicles. The City may choose to use an **electronic blankout sign** to display this warning message instead (see photo of example on next page).

Enhance **intersection lighting**. Missing standard lighting on SE corner over EB departure. Add additional lighting over crosswalks at approaches.

Map with activity generators, such as retail plazas, transit stops, schools, and parks.

North of 5th St

Add new poles for **segment lighting**

Between 9th St and Wooley Rd

Speed feedback sign for southbound approach

Retail

Transit Stops

These conceptual recommendations require further feasibility assessments, detailed analysis, and community outreach prior to final design and implementation.

Continued countermeasures recommended for specific locations

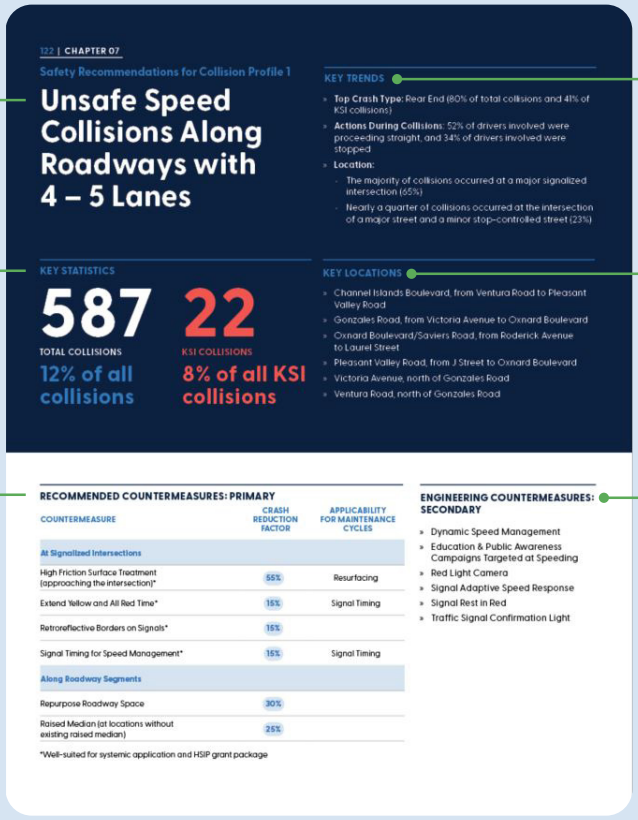
What You'll See on the Collision Profile Cutsheet

Collision Profile Name

Collision summary of total collisions and collisions where someone was killed or severely injured (KSI).

Primary countermeasures correspond to collisions trends and are best suited for competitive HSIP grant applications.

Map of collisions that match the collision profile. Some collisions are represented in multiple collision profiles.



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Safety Recommendations for Collision Profile 1

Unsafe Speed Collisions Along Roadways with 4 – 5 Lanes

KEY TRENDS

- **Top Crash Type:** Rear End (80% of total collisions and 41% of KSI collisions)
- **Actions During Collisions:** 52% of drivers involved were proceeding straight, and 34% of drivers involved were stopped
- **Location:**
  - The majority of collisions occurred at a major signalized intersection (65%)
  - Nearly a quarter of collisions occurred at the intersection of a major street and a minor stop-controlled street (23%)

KEY STATISTICS

587 TOTAL COLLISIONS — 12% of all collisions

22 KSI COLLISIONS — 8% of all KSI collisions

KEY LOCATIONS

- Channel Islands Boulevard, from Ventura Road to Pleasant Valley Road
- Gonzales Road, from Victoria Avenue to Oxnard Boulevard
- Oxnard Boulevard/Saviers Road, from Roderick Avenue to Laurel Street
- Pleasant Valley Road, from J Street to Oxnard Boulevard
- Victoria Avenue, north of Gonzales Road
- Ventura Road, north of Gonzales Road

RECOMMENDED COUNTERMEASURES: PRIMARY

COUNTERMEASURE	CRASH REDUCTION FACTOR	APPLICABILITY FOR MAINTENANCE CYCLES
At Signalized Intersections		
High Friction Surface Treatment (approaching the intersection)*	55%	Resurfacing
Extend Yellow and All Red Time*	15%	Signal Timing
Retroreflective Borders on Signals*	15%	
Signal Timing for Speed Management*	15%	Signal Timing
Along Roadway Segments		
Repurpose Roadway Space	30%	
Raised Median (at locations without existing raised median)	25%	

*Well-suited for systemic application and HSIP grant package

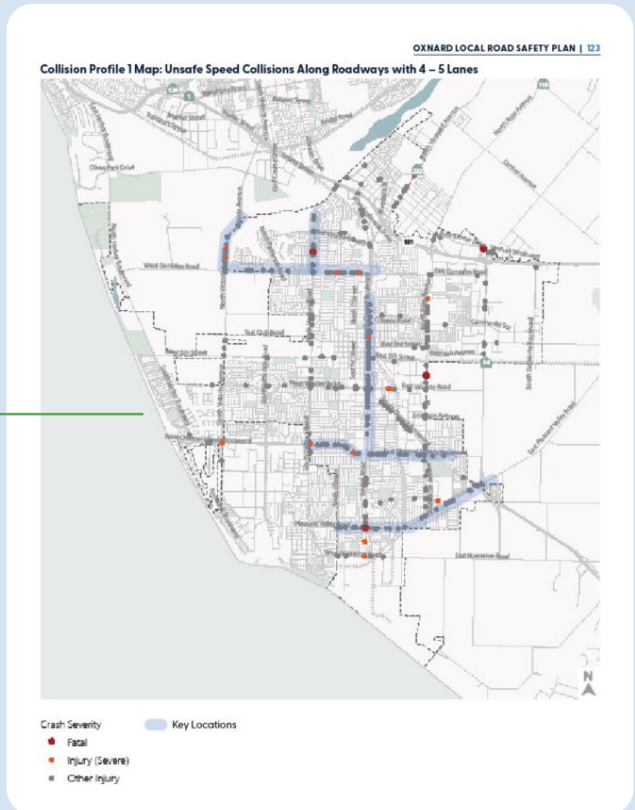
ENGINEERING COUNTERMEASURES: SECONDARY

- Dynamic Speed Management
- Education & Public Awareness Campaigns Targeted at Speeding
- Red Light Camera
- Signal Adaptive Speed Response
- Signal Rest in Red
- Traffic Signal Confirmation Light

Key collision trends that informed the identification of relevant countermeasures.

Key locations reflect locations with a high number of KSI collisions and/or a clustering of collisions.

Secondary countermeasures are additional recommended strategies that include existing City efforts, engineering countermeasures, and educational/enforcement programs.



OXNARD LOCAL ROAD SAFETY PLAN | 123

Collision Profile 1 Map: Unsafe Speed Collisions Along Roadways with 4 – 5 Lanes

Crash Severity
- Fatal
- Injury (Severe)
- Other Injury

Key Locations

Safety Recommendations for Hot Spot Corridor 1

Ventura Road

from 5th Street to Wooley Road

KEY STATISTICS

132
TOTAL COLLISIONS

- 11 Pedestrian-Involved Collisions
- 12 Bicycle-Involved Collisions

6
KSI COLLISIONS

- 2 Pedestrian-Involved KSI Collisions
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CURRENT ROADWAY CHARACTERISTICS

General Plan Classification	Primary
Number of Lanes	5-6
Posted Speed	45 mph
AADT	41,000
Bike Facilities	Northbound Class II bike lane starts 200 feet south of 5th Street
Railroad Crossing	At Wooley Rd

CURRENT LAND USE CHARACTERISTICS

	Schools
X	Transit
X	Disadvantaged Community
X	SB 375
X	AB 1550
X	Justice40

KEY TRENDS

CORRIDOR

- 94 percent of collisions occurred at an intersection
- Top Violations: Unsafe Speed (28%), Vehicle Right of Way (17%), and Traffic Signals and Signs (15%)

5TH STREET

- Greater bike and pedestrian activity near retail plazas
- Gap in roadway lighting from 5th Street to Teal Club Road

7TH STREET

- Broadside collisions involving southbound left turns (lefts not fully protected)
- Bicyclist and pedestrian right-of-way violations

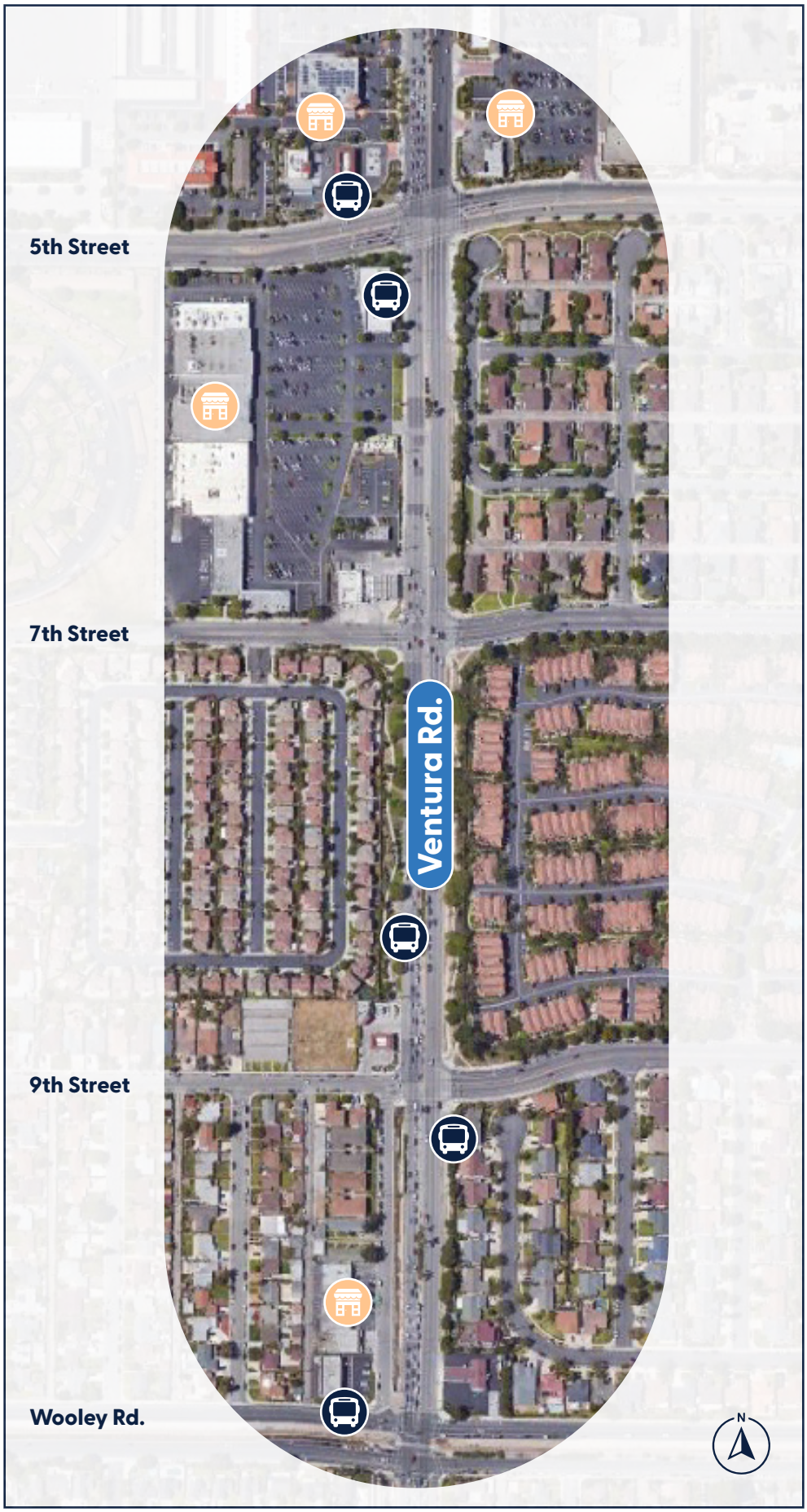
WOOLEY ROAD

- Rear end collisions, possibly due to signal visibility and right-turn queues
- Nighttime pedestrian collisions

RECOMMENDED COUNTERMEASURES: PRIMARY

COUNTERMEASURE	ISSUE AREA	CRASH REDUCTION FACTOR	APPLICABILITY FOR MAINTENANCE CYCLES	ESTIMATED CORRIDOR COST & BENEFIT
Leading Pedestrian Interval	Pedestrian Collisions at Signalized Intersections with Right-Turning Vehicles	60%	Signal Timing	**WITH ROAD DIET** **BENEFIT:** $31.8m **COST:** $4.7m **BENEFIT/COST RATIO:** 7 **NO ROAD DIET** **BENEFIT:** $25.2m **COST:** $2.5m **BENEFIT/COST RATIO:** 10
Repurpose Roadway Space (Road Diet) with Class IV Separated Bike Lane	High Speeds, Bike Activity and Collisions	45%		
Intersection Lighting	Nighttime Collisions (Especially with Pedestrians)	40%		
Segment Lighting	Nighttime Collisions (Especially with Pedestrians)	35%		
Class II Bike Lanes (if no road diet; add buffer where feasible)	Bike Collisions	35%	Resurfacing	
Additional Signal Heads (if repurposing roadway space (road diet))	Rear End and Broadside Collisions	15%		
Extend Yellow and All Red Clearance Time	Rear End and Broadside Collisions	15%	Signal Timing	
High Visibility Crosswalks with Advance Stop Bars	Pedestrian Collisions at Signalized Intersections	15%	Resurfacing	
Retroreflective Signal Backplates	Rear End and Broadside Collisions	15%		
Pavement Markings Through Intersection	Left-Turns at Intersections with Railroad Crossing	10%	Resurfacing	

Note: Though the project option without a road diet results in a higher B/C ratio, the road diet project is expected result in a greater reduction in collisions while providing for a more comfortable option for bicyclists.



RECOMMENDED COUNTERMEASURES: SECONDARY

- Consider reaching out to commercial plaza owner(s) to explore consolidating driveways to address queuing by removing driveways within 200' – 250' of signalized intersections
- Green Conflict Striping at intersections and driveways
- Pedestrian and Bicyclist Warning Signage for right-turning vehicles at intersections
- Traffic Signal Confirmation Lights at signalized intersections (ongoing program by Oxnard Police Department)

RELATED CITY ACTIVITIES

- The City of Oxnard Public Works Department had developed guidelines of Leading Pedestrian Intervals and is beginning implementation.
- The City of Oxnard Public Works Department is installing a protected left-turn for northbound/southbound travel on Ventura Road at 7th Street.
- The County of Ventura may convert the flood channel, which begins at Ventura Road & Ninth Street and continues south past Wooley Road, into a linear park that would provide a separated multi-use path for people walking and bicycling.
- The City of Oxnard Public Works Department applied for HSIP Cycle 11 funding for the Ventura Road corridor from Teal Club Road to Wooley Road.

Retail

Transit Stops

These conceptual recommendations require further feasibility assessments, detailed analysis, and community outreach prior to final design and implementation.

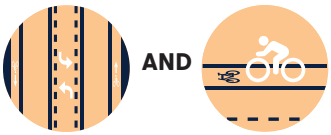
Safety Recommendations for Hot Spot Corridor 1

Ventura Road

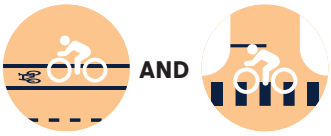
from 5th Street to Wooley Road

RECOMMENDED COUNTERMEASURES

FULL-CORRIDOR



Consider **repurposing roadway space (road diet)** to add a **Class IV separated bike lane**. Any lane reduction considerations will include public participation and leadership support before proceeding.

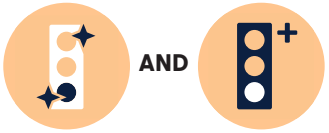


At each intersection, bring the bicycle lane up to the intersection and use **green paint** to denote conflict zones between bicyclists and turning vehicles.

ALL-SIGNALS

Upgrade all signals to **high visibility crosswalks** with **advance stop bars**. Current detection locations may need to be adjusted to accommodate stop bars, which may be an opportunity to upgrade to video detection.

Leading Pedestrian Intervals (pending City's implementation guidelines), with signal coordination



Install retroreflective backplates for improved signal visibility. If road diet is not implemented, also consider installing **additional signal heads** for better lane alignment.

Improve signal timing through **extension of yellow and all-red clearance time** and signal coordination along the corridor.

LOCATION-SPECIFIC

5th St

Add **pedestrian warning signage** for right-turning vehicles. The City may choose to use an **electronic blankout sign** to display this warning message (see photo of example on next page).

Enhance **intersection lighting**. Recommendation to add lights over the crosswalk at the approaches. Either replace signal pole with Type 15-TS or place new light pole elsewhere.

7th St

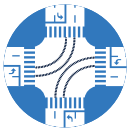
Consider **protected left turns** for E/W approaches, supplementing previous left-turn protection project for N/S approaches. This would require some trade-off in vehicle throughput, which should be further analyzed by the City and tested for CAMUTCD warrant before final determination.

9th St

Traffic signal confirmation light for PD enforcement of red light running

Wooley Rd

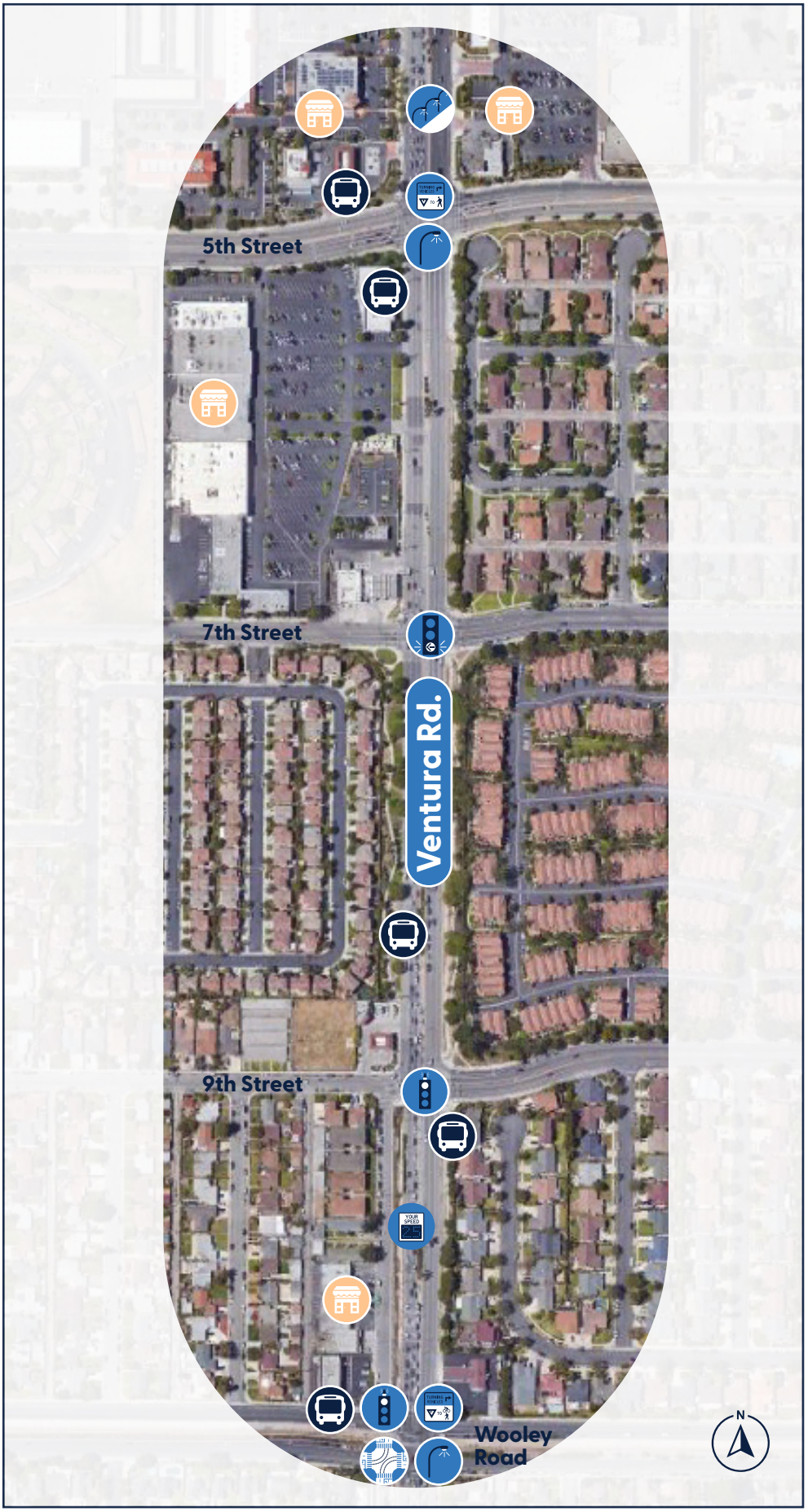
Traffic signal confirmation light for PD enforcement of red light running



"Cat track" **pavement markings** through intersection to guide southbound left-turning drivers (to avoid railroad tracks)

Add **pedestrian and bicyclist warning signage** for right-turning vehicles. The City may choose to use an **electronic blankout sign** to display this warning message instead (see photo of example on next page).

Enhance **intersection lighting**. Missing standard lighting on SE corner over EB departure. Add additional lighting over crosswalks at approaches.



North of 5th St

Add new poles for **segment lighting**

Between 9th St and Wooley Rd

Speed feedback sign for southbound approach

Retail

Transit Stops

These conceptual recommendations require further feasibility assessments, detailed analysis, and community outreach prior to final design and implementation.

Safety Recommendations for Hot Spot Corridor 2

Gonzales Road

from Victoria Avenue to Rose Avenue

KEY STATISTICS

344 TOTAL COLLISIONS

- 31 Pedestrian-Involved Collisions
- 30 Bicycle-Involved Collisions

15 KSI COLLISIONS

- 2 Pedestrian-Involved KSI Collisions
- 3 Bicycle-Involved KSI Collisions

CURRENT ROADWAY CHARACTERISTICS

General Plan Classification	Primary
Number of Lanes	Victoria Ave to C St: 4 lanes C St to Rose Ave: 5 – 6 lanes
Posted Speed	45 mph
AADT	Victoria Ave to Ventura Rd: 14,000 – 16,000 Ventura Rd to Indiana Dr: 20,000 – 30,000 Indiana Dr to Rose Ave: 40,000
Bike Facilities	Class II Bike lane
Railroad Crossing	At Oxnard Blvd

CURRENT LAND USE CHARACTERISTICS

X	Schools
X	Transit
X	Disadvantaged Community
X	SB 375
X	AB 1550
X	Justice40

KEY TRENDS

- Approximately a third of collisions occurred at night and were primarily rear end (34%) or broadside (27%) collisions
- 96 percent of collisions occurred at an intersection and majority were either a rear end collision (41%) or broadside collision (28%)
- Broadside collisions at intersections were nearly evenly split between intersections with (53%) and without (47%) fully protected left turns
- Broadside collisions at minor stop-controlled intersections
- Hit object collisions between Merion Way and Patterson Road
- Pedestrian crossing at minor stop-controlled intersections

RECOMMENDED COUNTERMEASURES: PRIMARY

COUNTERMEASURE	ISSUE AREA	CRASH REDUCTION FACTOR	APPLICABILITY FOR MAINTENANCE CYCLES	ESTIMATED CORRIDOR COST & BENEFIT*
Leading Pedestrian Interval	Pedestrian Collisions at Signalized Intersections with Right-Turning Vehicles	60%	Signal Timing	
Restrict Turning Movements with Raised Median	Broadside Collisions at Minor Stop-Controlled Intersections	50%		
Intersection Lighting	Nighttime Collisions (Especially with Pedestrians)	40%		**BENEFIT:** $38M
Flashing Beacon as Advance Warning	Rear End and Broadside Collisions at High Speeds	30%		**COST:** $6.7M
Fully Protected Left-Turns at Signalized Intersections	Left-turn Collisions at Unprotected Lefts	30%		
High Visibility Crosswalks with Advance Stop Bars	Pedestrian Collisions at Signalized Intersections	15%	Resurfacing	**BENEFIT/COST RATIO:** 6
Coordinate Signal Timing for Speed Management	High Speeds	15%	Signal Timing	
Extend Yellow and All Red Clearance Time	Rear End and Broadside Collisions	15%	Signal Timing	
Retroreflective Signal Backplates	Rear End and Broadside Collisions	15%		

*Note: the Estimated Benefit/Cost Ratio does not include long term considerations, such as the Pedestrian Hybrid Beacon at Bahia Drive and new pedestrian crossing at Entrada Drive.

RECOMMENDED COUNTERMEASURES: SECONDARY

- Additional Warning Signage to alert drivers of upcoming lanes merging
- Extend Bike Lane to Intersection
- Green Conflict Striping at intersections and driveways
- Maintain Trees to improve signal visibility
- Median Improvements, such as striping around median and paint on nose of median to increase visibility
- Speed Feedback Sign
- Reposition Crosswalks to improve pedestrian visibility for drivers making turns
- Traffic Signal Confirmation Lights at signalized intersections (ongoing program by Oxnard Police Department)

RELATED CITY ACTIVITIES

- The City of Oxnard Public Works Department has several ongoing projects along Gonzales Road:
  - Updating a variety of field equipment, such as controllers, push buttons, and signal heads, and changing detection loops to video detection
  - Implementing an adaptive traffic signal system
  - Installed one Leading Pedestrian Interval at Gonzales Road & Entrada Drive, in front of Pacifica High School
  - Adding Accessible Pedestrian Signal push buttons to key intersections near shopping centers and schools
- The City of Oxnard Public Works Department is developing guidelines for implementation of Leading Pedestrian Intervals.
- The City of Oxnard Police Department installed traffic signal confirmation lights at the Gonzales Road & Rose Avenue and Gonzales Road & Oxnard Boulevard intersections.

Retail

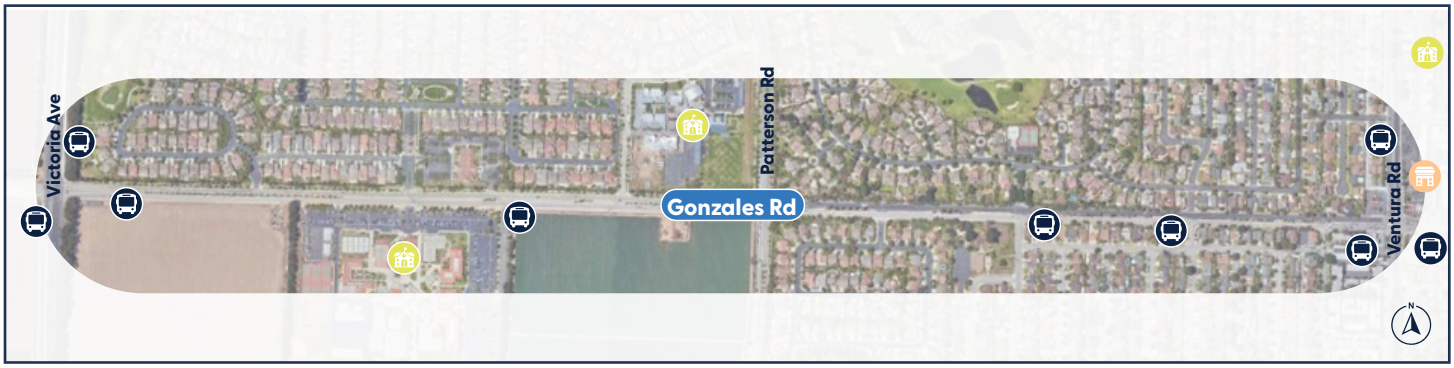
Schools

Transit Stops

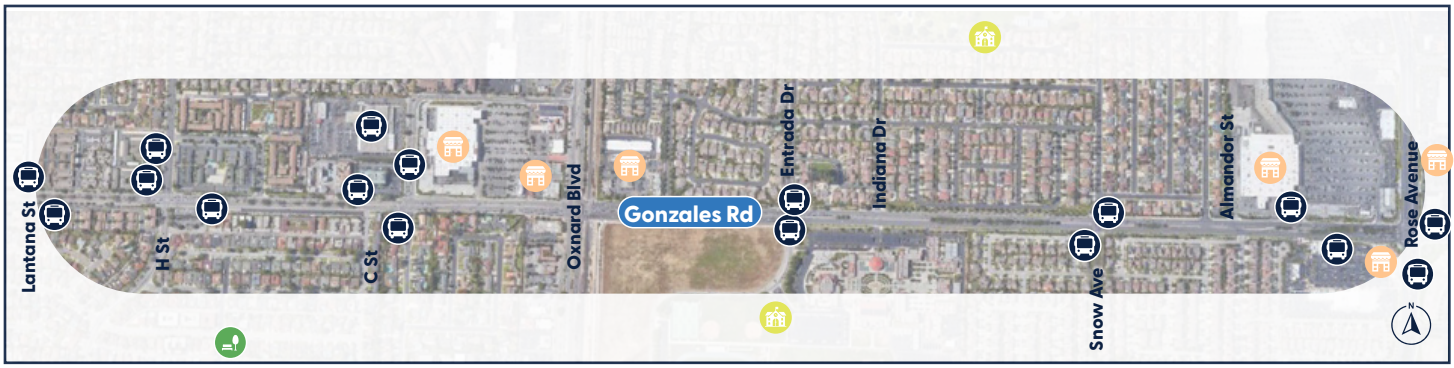
Parks

These conceptual recommendations require further feasibility assessments, detailed analysis, and community outreach prior to final design and implementation.

Gonzales Road from Victoria Avenue to Ventura Road



Gonzales Road from Lantana St to Rose Avenue



Safety Recommendations for Hot Spot Corridor 2

Gonzales Road

from Victoria Avenue to Ventura Road

RECOMMENDED COUNTERMEASURES

FULL-CORRIDOR

AND

The City plans to **narrow travel lanes** and **add a buffer** to the existing bike lane.

AND

At each intersection, bring the bicycle lane up to the intersection and use **green paint** to denote conflict zones between bicyclists and turning vehicles.

ALL-SIGNALS

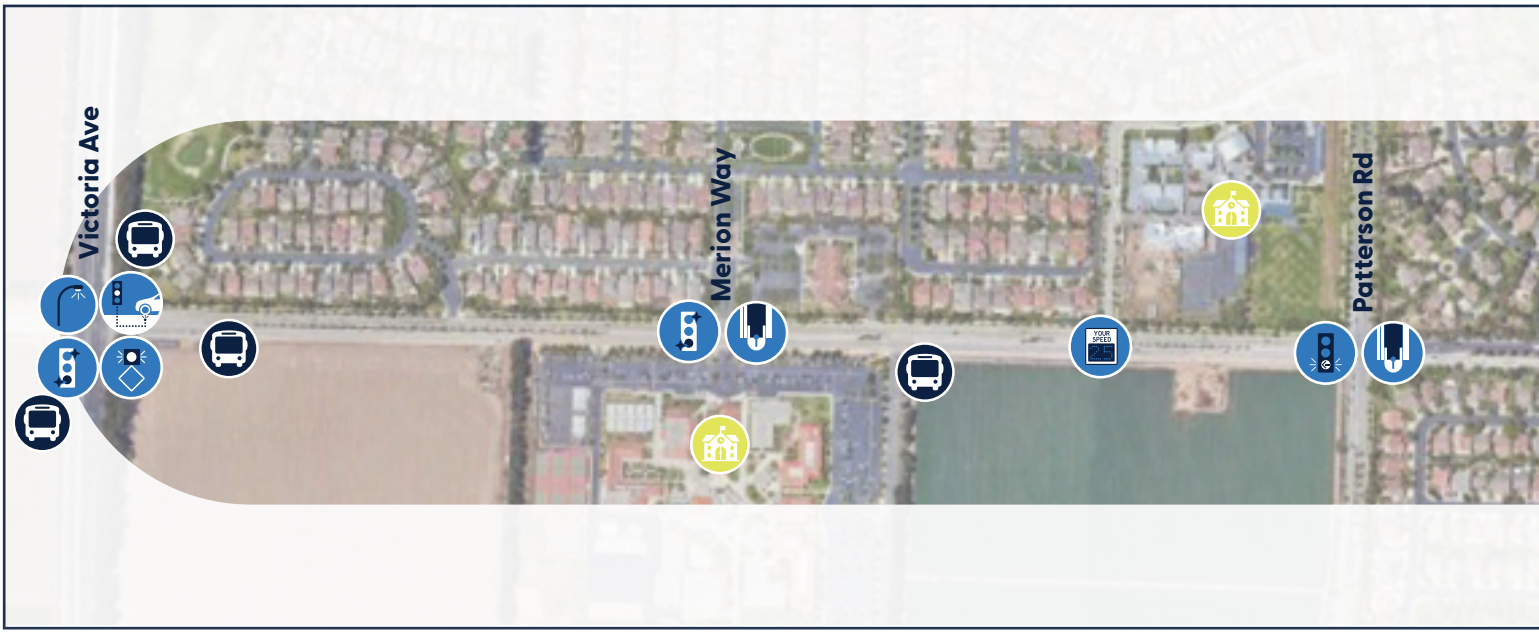
Upgrade all signals to **high visibility crosswalks** with **advance stop bars**. Current detection locations may need to be adjusted to accommodate stop bars, which may be an opportunity to upgrade to video detection.

Leading Pedestrian Intervals (pending City's implementation guidelines)

Improve signal timing through **extension of yellow and all-red clearance time.**

Coordinate signals for **speed management** (e.g. timed to lower speed).

Traffic signal confirmation light for PD enforcement of red light running



LOCATION-SPECIFIC

Victoria Rd

Consider installing **flashing beacon advance warning** for signal, by adding beacon to existing signal warning sign (NB/SB). City may also consider additional signal heads.

Retroreflective backplates

Intersection lighting

Merion Way

Retroreflective backplates

Median improvements, such as Striping around median and paint on nose of median to increase visibility

Between Merion Way and Patterson Rd

Speed feedback sign

Patterson Rd

Consider **protected left turns** in all directions. This would require some trade-off in vehicle throughput, which should be further analyzed by the City and tested for CAMUTCD warrant before final determination.

Median improvements, such as striping around median and paint on nose of median to increase visibility

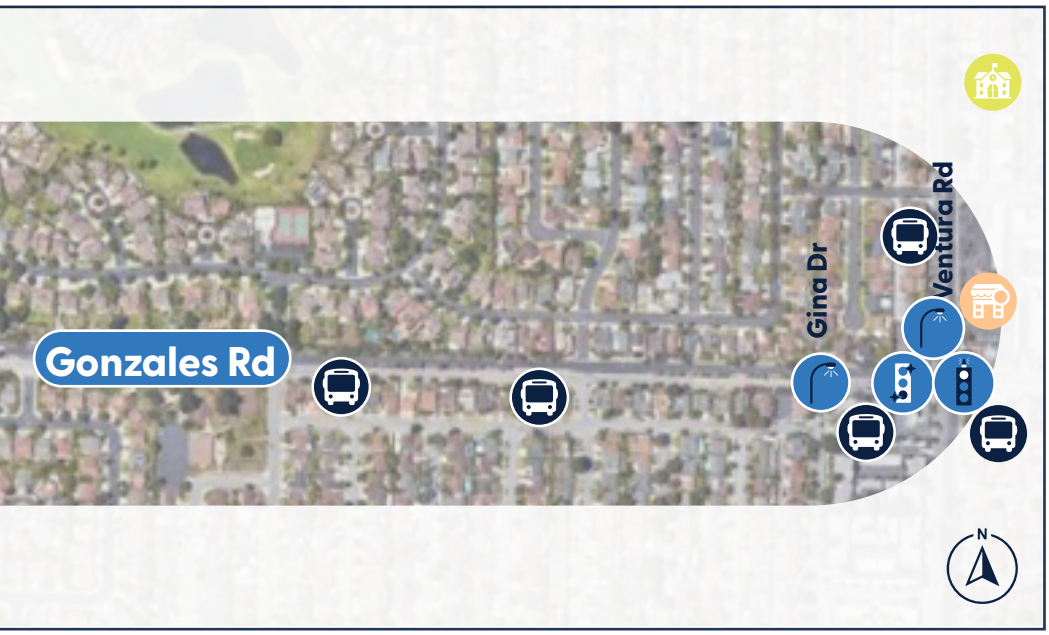
Gina Dr

Intersection lighting

Ventura Rd

Retroreflective backplates

Enhance **intersection lighting**: Existing standard lighting on mast arms to illuminate departures. Recommendation to add lights over the crosswalk at the approaches.



Safety Recommendations for Hot Spot Corridor 2

Gonzales Road

from Lobelia Drive to Rose Avenue (continued)

LOCATION-SPECIFIC

Lobelia Dr

Intersection lighting

Lantana St

Consider **protected left turns** in all directions. This would require some trade-off in vehicle throughput, which should be further analyzed by the City and tested for CAMUTCD warrant before final determination.

Retroreflective backplates

H St

Retroreflective backplates

Intersection lighting

C St

Consider **protected left turns** in all directions. This would require some trade-off in vehicle throughout, which should be further analyzed by the City and tested for CAMUTCD warrant before final determination.

Retroreflective backplates

Additional signage for WB Merge

No Right Turn on Red for northbound approach due to limited visibility of westbound approach. May be paired with enforcement and/or landscaping management to improve sight lines for drivers making a NB right turn.

Oxnard Blvd

Retroreflective backplates

Bahia Dr

Raised medians to restrict turn movements for left-turning vehicles out of Bahia (consider need for this improvement in the long term when City Sports Park is built). The City may also consider eliminating the WB right turn lane just west of Bahia, to limit vehicle conflicts between southbound right-turning vehicles and westbound vehicles. Any turning movement restriction considerations will include public participation and leadership support before proceeding.

Entrada Dr

Retroreflective backplates

Consider new **pedestrian crossing** when City Sports Park is built

Almanor St and Walmart Driveway

Raised medians to restrict turn movements (right out only – see Sonata Drive for example). Any turning movement restriction considerations will include public participation and leadership support before proceeding.

Rose Ave

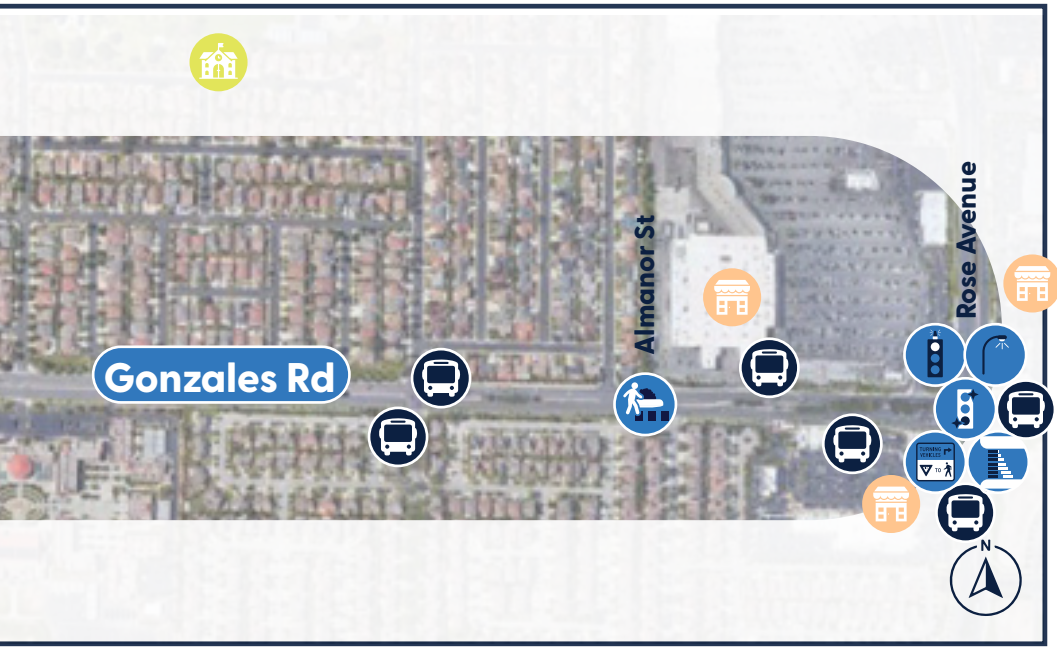
Traffic signal confirmation light for PD enforcement of red light running

Intersection lighting

Retroreflective backplates

Add **pedestrian warning signage** for right-turning vehicles. The City may choose to use an **electronic blankout sign** to display this warning message instead.

Reposition west leg crosswalk for better visibility to southbound right-turning drivers



Retail

Transit Stops

Schools

Parks

These conceptual recommendations require further feasibility assessments, detailed analysis, and community outreach prior to final design and implementation.

Safety Recommendations for Hot Spot Corridor 3

Wooley Road

from Donlon Avenue to Pacific Avenue

KEY STATISTICS

49

TOTAL COLLISIONS

- **4** Pedestrian-Involved Collisions
- **5** Bicycle-Involved Collisions

7

KSI COLLISIONS

- **3** Pedestrian-Involved KSI Collisions
- **2** Bicycle-Involved KSI Collisions

CURRENT ROADWAY CHARACTERISTICS

General Plan Classification	Secondary
Number of Lanes	4
Posted Speed	40 mph
AADT	15,000-18,000
Bike Facilities	None
Railroad Crossing	At Commercial Ave & Richmond Ave

CURRENT LAND USE CHARACTERISTICS

	Schools
	Transit
X	Disadvantaged Community
X	SB 375
X	AB 1550
X	Justice40

KEY TRENDS

- Primarily industrial uses with truck activity interacting with people walking and biking
- Bike (10%) and pedestrian (8%) collisions with a lack of bike lanes, sidewalks, and lighting
- Broadside collisions account for nearly half of the collisions on this corridor
- Signalized intersections (Commercial Avenue and Pacific Avenue) do not have fully protected left turns
- Top Violations: Vehicle Right of Way (33%), Unsafe Speed (14%), and Traffic Signals and Signs (12%)

RECOMMENDED COUNTERMEASURES: PRIMARY

COUNTERMEASURE	ISSUE AREA	CRASH REDUCTION FACTOR	APPLICABILITY FOR REGULAR MAINTENANCE CYCLES	ESTIMATED CORRIDOR COST & BENEFIT*
Sidewalk	Bike and Pedestrian Collisions along Corridor	80%		
Intersection Lighting	Bike and Pedestrian Collisions at/Approaching Intersections (Especially at Night)	40%		**BENEFIT:** $16.7M
Bike Lanes	Bike and Pedestrian Collisions along Corridor	35%	Resurfacing	**COST:** $3.6M
Fully Protected Left-Turns at Signalized Intersections	Broadside Left-turn Collisions at Signalized Intersections	30%		**BENEFIT/COST RATIO:** 5
Pedestrian Crossing	Bike and Pedestrian Collisions at/Approaching Intersections (Especially at Night)	25%	Resurfacing	
High Visibility Crosswalks with Advance Stop Bars	Pedestrian Collisions at Signalized Intersections	15%	Resurfacing	

*Note: the Estimated Benefit/Cost Ratio does not include long term considerations, such as widening sidewalks, adding bike lanes, and adding new pedestrian crossings.

RECOMMENDED COUNTERMEASURES: SECONDARY

- ADA-Compliant Curb Ramps with Tactile Warning Devices for existing and new sidewalks
- Green Conflict Striping at Intersections with bike lanes

RELATED CITY ACTIVITIES

- Wooley Road has existing Class II bike lanes from Harbor Boulevard to C Street. The City of Oxnard Bicycle and Pedestrian Facilities Master Plan includes recommendations to install Class II bike lanes on Wooley Road from C Street to Saviers Road, designate Class III bike routes from Saviers Road to Richmond Avenue, and Class II bike lanes from Richmond Avenue to Rice Avenue.

Retail

Railroad

These conceptual recommendations require further feasibility assessments, detailed analysis, and community outreach prior to final design and implementation.

Safety Recommendations for Hot Spot Corridor 3

Wooley Road

from Donlon Avenue to Pacific Avenue

RECOMMENDED COUNTERMEASURES

LONG TERM CORRIDOR OPTIONS

AND

Fill **sidewalk gap**s and **widen sidewalks i**n the long term. Additional right-of-way may be needed for implementation.

Consider **Bike lanes** in the long-term, with vertical separation of buffer where feasible. Additional right-of-way may be needed for implementation.

At each intersection, use **green paint** to denote conflict zones between bicyclists and turning vehicles.

LOCATION-SPECIFIC

Between Donlon Ave and Factory Lane

Raised median from Donlon Avenue to approximately halfway towards Factory Lane to prevent drivers from using the two-way left turn lane as an extended left turn lane to Saviers Road/ Oxnard Boulevard. Median will have mountable curb to allow for truck turning movements.

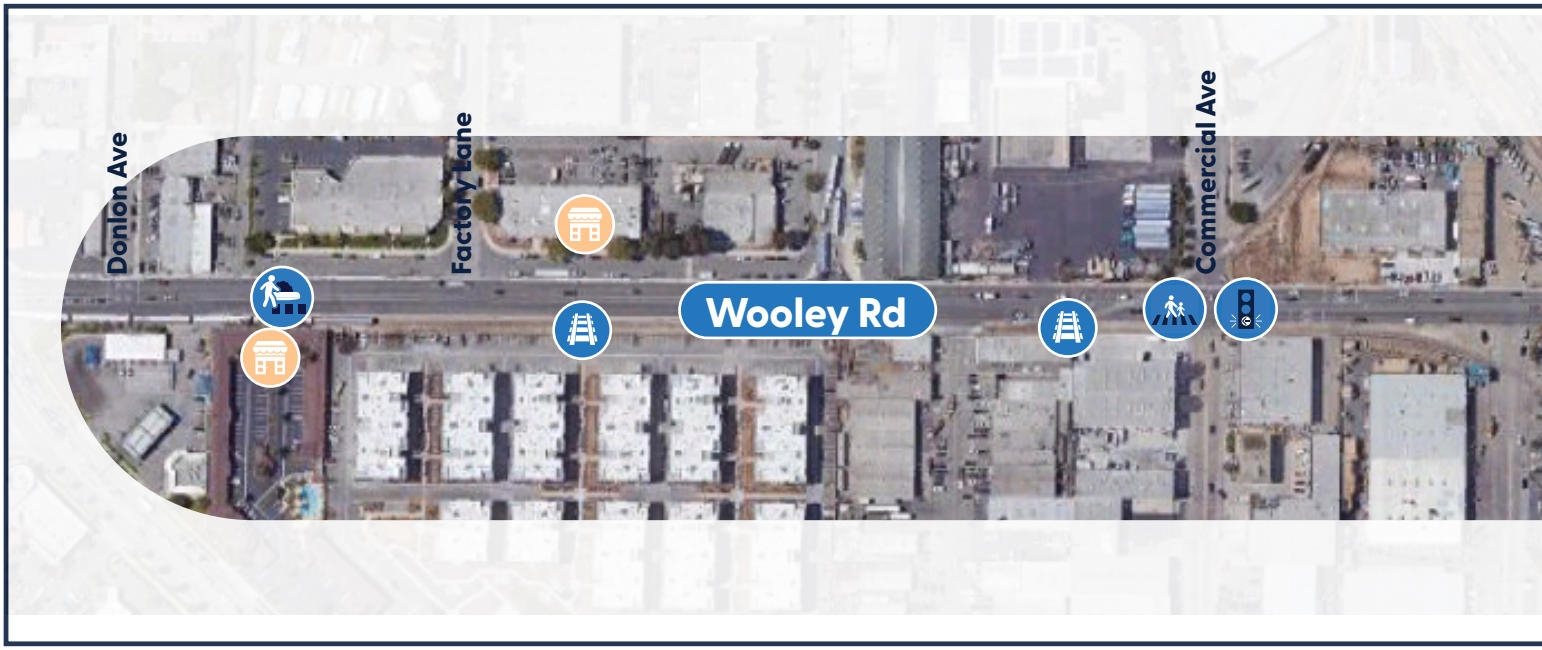
Commercial Ave

New crosswalk(s), currently missing on all legs

Consider protect lefts (E/W). This would require some trade-off in vehicle throughput, which should be further analyzed by the City and tested for CAMUTCD warrant before final determination.

Richmond Ave

Add **intersection lighting** to NW corner for WB approach



LOCATION-SPECIFIC

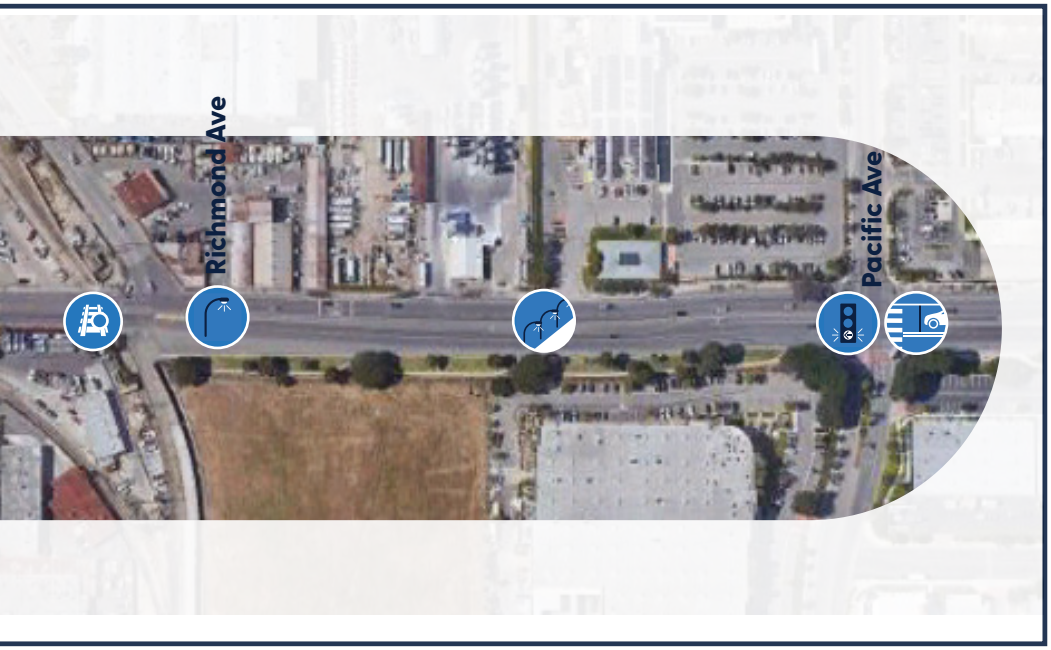
Between Richmond Ave and Pacific Ave

Install new **segment lighting** on both sides of the street, where long distances are currently present between poles

Pacific Ave

Consider **protected left turns** in all directions. This would require some trade-off in vehicle throughput, which should be further analyzed by the City and tested for CAMUTCD warrant before final determination.

Upgrade all signals to **high visibility crosswalks** with **advance stop bars**. Current detection locations may need to be adjusted to accommodate stop bars, which may be an opportunity to upgrade to video detection.



Retail

Railroad

These conceptual recommendations require further feasibility assessments, detailed analysis, and community outreach prior to final design and implementation.

Safety Recommendations for Hot Spot Corridor 4

Saviers Road

From Laurel Street to Pleasant Valley Road

KEY STATISTICS

257 TOTAL COLLISIONS

15 KSI COLLISIONS

- **38** Pedestrian-Involved Collisions
- **25** Bicycle-Involved Collisions
- **6** Pedestrian-Involved KSI Collisions
- **1** Bicycle-Involved KSI Collisions

KEY TRENDS

- High bike and pedestrian activity generated by schools, retail, and transit
- 83 percent of broadside collisions occurred at intersections without fully protected lefts (Laurel Street, Bryce Canyon Avenue, Yucca Street, and Bard Road)
- 87 percent of collisions occurred at an intersection and 66 percent of collisions occurred at a signalized intersection
- Broadside collisions for vehicles turning into/out of plaza driveways and limited pedestrian crossing opportunities between retail plazas

CURRENT ROADWAY CHARACTERISTICS

General Plan Classification	Primary
Number of Lanes	Laurel St to Dollie St: 5-6 lanes Dollie St to Pleasant Valley Rd: 4 lanes
Posted Speed	40 mph
AADT	Laurel St to Bard Rd: 20,000 – 25,000 Bard Rd to Pleasant Valley Rd: 10,000 – 14,000
Bike Facilities	Southbound bike lane from Yucca St to Pleasant Valley Rd
Railroad Crossing	N/A

CURRENT LAND USE CHARACTERISTICS

X	Schools
X	Transit
X	Disadvantaged Community
	SB 375
X	AB 1550
X	Justice40

RECOMMENDED COUNTERMEASURES: PRIMARY

COUNTERMEASURE	ISSUE AREA	CRASH REDUCTION FACTOR	APPLICABILITY FOR MAINTENANCE CYCLES	ESTIMATED CORRIDOR COST & BENEFIT*
Leading Pedestrian Interval	Pedestrian Collisions at Signalized Intersections	60%	Signal Timing	
Pedestrian Signal (includes Pedestrian Hybrid Beacon (HAWK))	Broadside Collisions at Unsignalized Intersections	55%		
Upgrade Pedestrian Crossing	Rear End Collisions at Existing Midblock Pedestrian Crossing	35%		
New Signals	Broadside Collisions at Unsignalized Intersections and Midblock	30%		**BENEFIT:** $112.7M
Repurpose roadway space (road diet) to have 2 travel lanes in each direction with Class IV Separated Bike Lane	High Speeds, Schools, Bike and Pedestrian Activity, and Bike Collisions	30%	Resurfacing (bike lane)	**COST:** $6M
Flashing Beacon to Alert Drivers of Pedestrian Crossing	Rear End Collisions at Existing Midblock Pedestrian Crossing	30%		**BENEFIT/COST RATIO:** 19
Fully Protected Left-Turns at Signalized Intersections	Broadside Collisions at Signalized Intersections (including Left Turns)	30%		
Restrict Left Turns with Raised Median	Broadside Collisions at Unsignalized Intersections and Midblock	25%		
High Visibility Crosswalks with Advance Stop Bars	Pedestrian Collisions at Signalized Intersections	15%	Resurfacing	
Retroreflective Signal Backplates	Rear End and Broadside Collisions	15%		

*Note: the Estimated Benefit/Cost Ratio assumes a Pedestrian Hybrid Beacon instead of a signal between Bryce Canyon Avenue and Yucca Street and does not include the signals between Laurel Street and Channel Islands Boulevard as these considerations would be longer term.

RECOMMENDED COUNTERMEASURES: SECONDARY

- Additional Warning Signage to alert drivers of upcoming lanes merging.
- Green Conflict Striping at Intersections and Driveways
- Refresh Pavement Markings

RELATED CITY ACTIVITIES

- The City of Oxnard Bicycle and Pedestrian Facilities Master Plan includes the following recommendations for Saviers Road & Yucca Street: additional marked crosswalk with Rectangular Rapid Flashing Beacon, enhanced pedestrian median refuge, and speed feedback signs.
- The City of Oxnard Sidewalk Survey includes the following recommendations for Saviers Road from Thomas Avenue to Yucca Street:
  - Upgrade bus stops to meet ADA compliance
  - Reconstruct curb ramps to meet ADA compliance
  - Upgrade pedestrian push buttons to meet ADA compliance
  - Install curb extensions
  - Install high-visibility crosswalks
  - Increase pedestrian crossing time
- The City of Oxnard Public Works Department will be constructing traffic signal improvements at Saviers Road & Laurel Street, Saviers Road & Bryce Canyon Avenue, Saviers Road & Bard Road, and Saviers Road & Pleasant Valley Road. The improvements include new signal poles, mast arms, signal heads, protected left-turn phasing, LED lighting, and detection loops.
- The City of Oxnard Public Works Department is developing guidelines for implementation of Leading Pedestrian Intervals.
- The City of Oxnard Police Department installed traffic signal confirmation lights at the Saviers Road & Channel Islands Boulevard intersection.

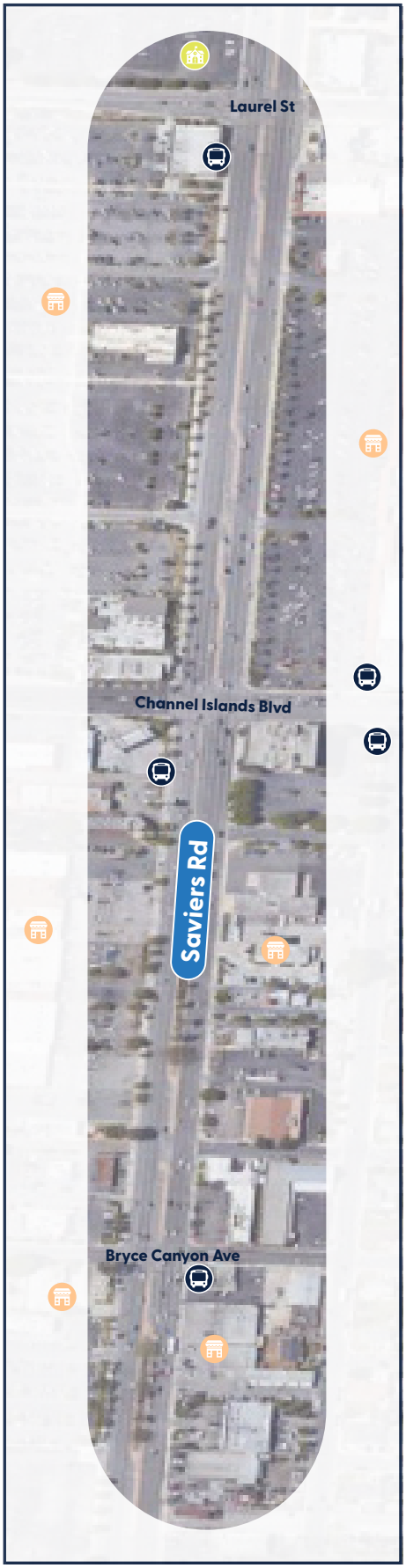
These conceptual recommendations require further feasibility assessments, detailed analysis, and community outreach prior to final design and implementation.

Retail

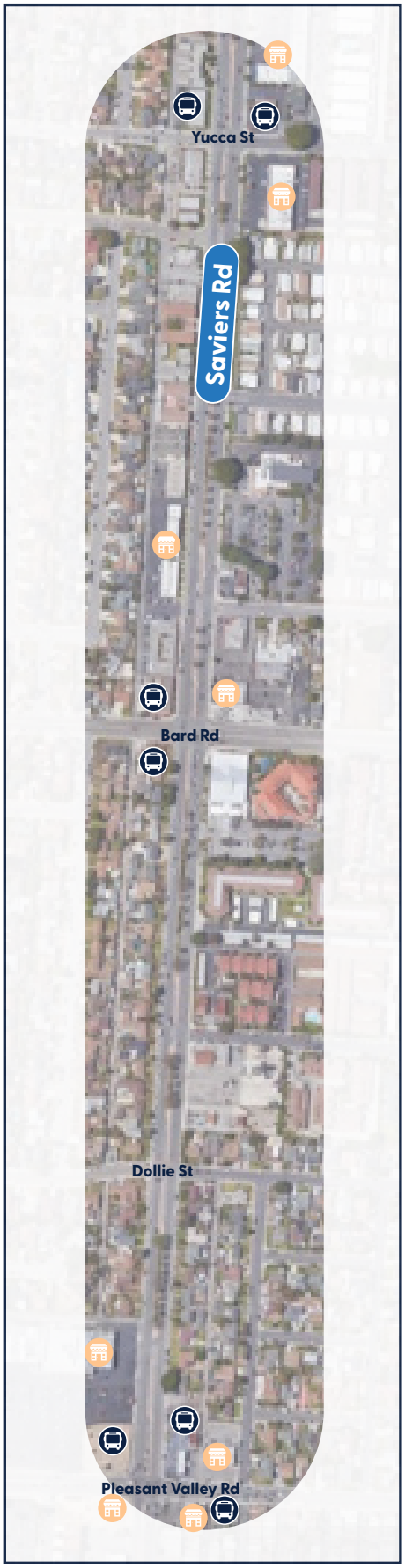
Transit Stops

Schools

Saviers Road from Laurel Street to Yucca Street



Saviers Road from Yucca Street to Pleasant Valley Road



Safety Recommendations for Hot Spot Corridor 4

Saviers Road

from Laurel Street to Yucca Street

RECOMMENDED COUNTERMEASURES

FULL-CORRIDOR

Consider repurposing roadway space, which would reduce travel lanes to 2 lanes in each direction and add Class IV separated bike lanes. Any lane reduction considerations will include public participation and leadership support before proceeding.

At each intersection, use **green paint** to denote conflict zones between bicyclists and turning vehicles.

ALL-SIGNALS

Upgrade all signals to **high visibility crosswalks** with **advance stop bars**. Current detection locations may need to be adjusted to accommodate stop bars, which may be an opportunity to upgrade to video detection.

Leading Pedestrian Intervals (pending City's implementation guidelines)

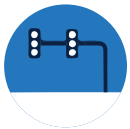
LOCATION-SPECIFIC

Laurel St

Protected left turns in SB and EB/WB directions. This would require some trade-off in vehicle throughout, which should be further analyzed by the City and tested for CAMUTCD warrant before final determination.

Refresh pavement markings. Existing markings are particularly faded at this intersection.

Between Laurel and Channel Islands



Consider installing one or two new **partial signals** (at the midblock turning locations). These signals could also provided a pedestrian crossing opportunity. New signals provide the opportunity to separate conflicting vehicle movements, but come with trade-off considerations regarding vehicle throughput and travel times. The City may also consider access management to restrict turns at this location.

Channel Islands Blvd

Retroreflective backplates

Refresh pavement markings. Existing markings are particularly faded at this intersection.

Intersection lighting

Increase red/yellow clearance time, which can be made in conjunction with other timing improvements, such as pedestrian walk time

Hughes Dr

Extend median to restrict access to right in/ right out. The dense street grid in this area allows for nearby access point options.

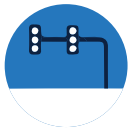
Bryce Canyon Ave

Retroreflective backplates

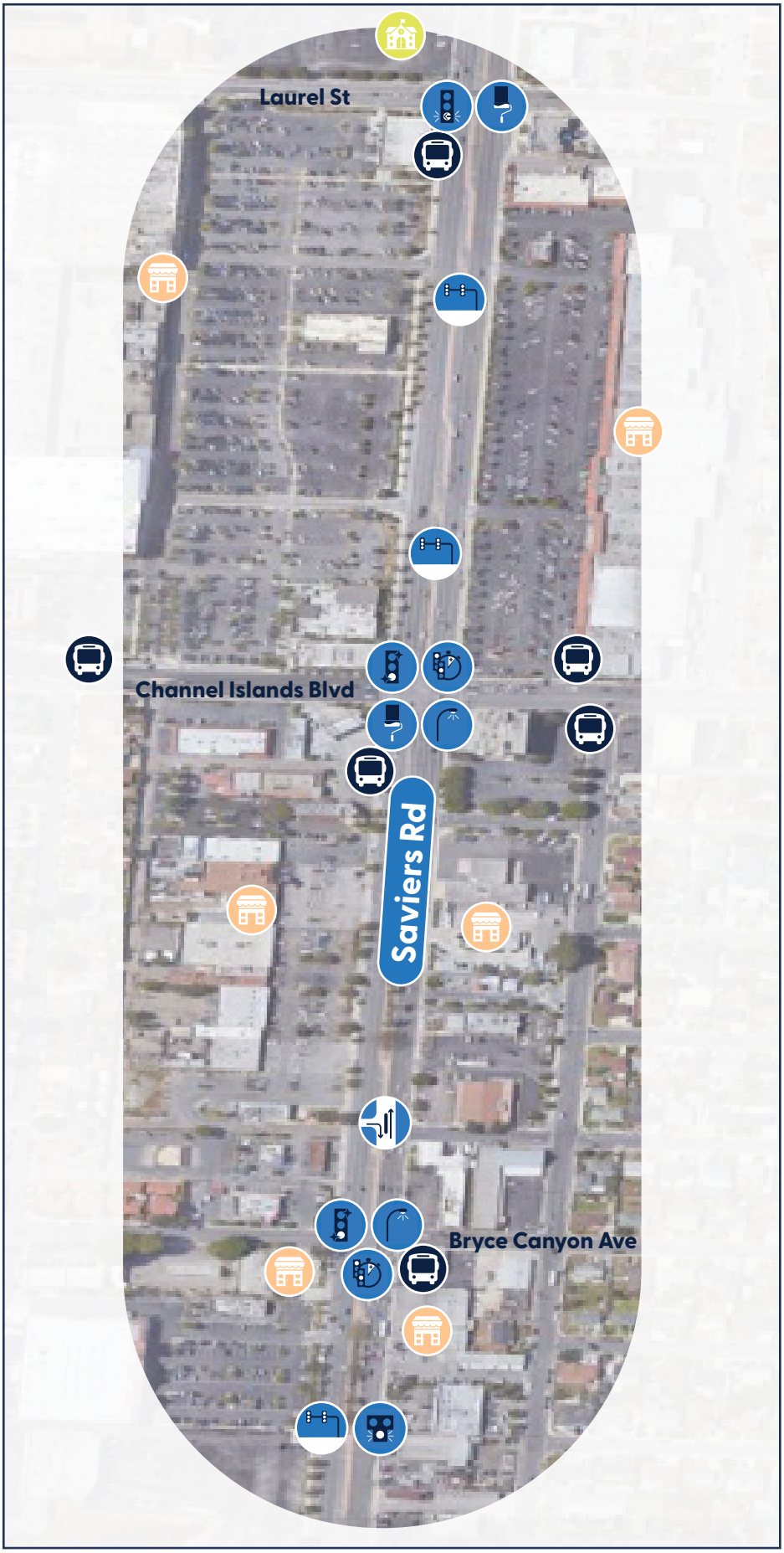
Install intersection Lighting on Bryce Canyon Ave and Saviers Ave.

Increase red/yellow clearance time, which can be made in conjunction with other timing improvements, such as pedestrian walk time

Between Bryce Canyon and Yucca



Signal (would require driveway modification) OR **Pedestrian Hybrid Beacon** (would require restricting left turns out of driveway) at plaza driveway. New signals provide the opportunity to separate conflicting vehicle and pedestrian movements, but come with trade-off considerations regarding vehicle throughput and travel times. The City may also consider access management to restrict turns at this location.



Retail

Transit Stops

Schools

Safety Recommendations for Hot Spot Corridor 4

Saviers Road

from Yucca Street to Pleasant Valley Road

LOCATION-SPECIFIC

Yucca St

Retroreflective backplates

Increase red/yellow clearance time, which can be made in conjunction with other timing improvements, such as pedestrian walk time

Johnson Road

Extend median to restrict access to right in/right out. The dense street grid in this area allows for nearby access point options.

Bard Road

Consider **protected left turns** for E/W, supplementing City's left-turn protection project for N/S approaches. This would require some trade-off in vehicle throughput, which should be further analyzed by the City and tested for CAMUTCD warrant before final determination.

Install intersection lighting on the approaches to illuminate the crosswalks

Increase red/yellow clearance time, which can be made in conjunction with other timing improvements, such as pedestrian walk time

Retroreflective backplates

Dollie St

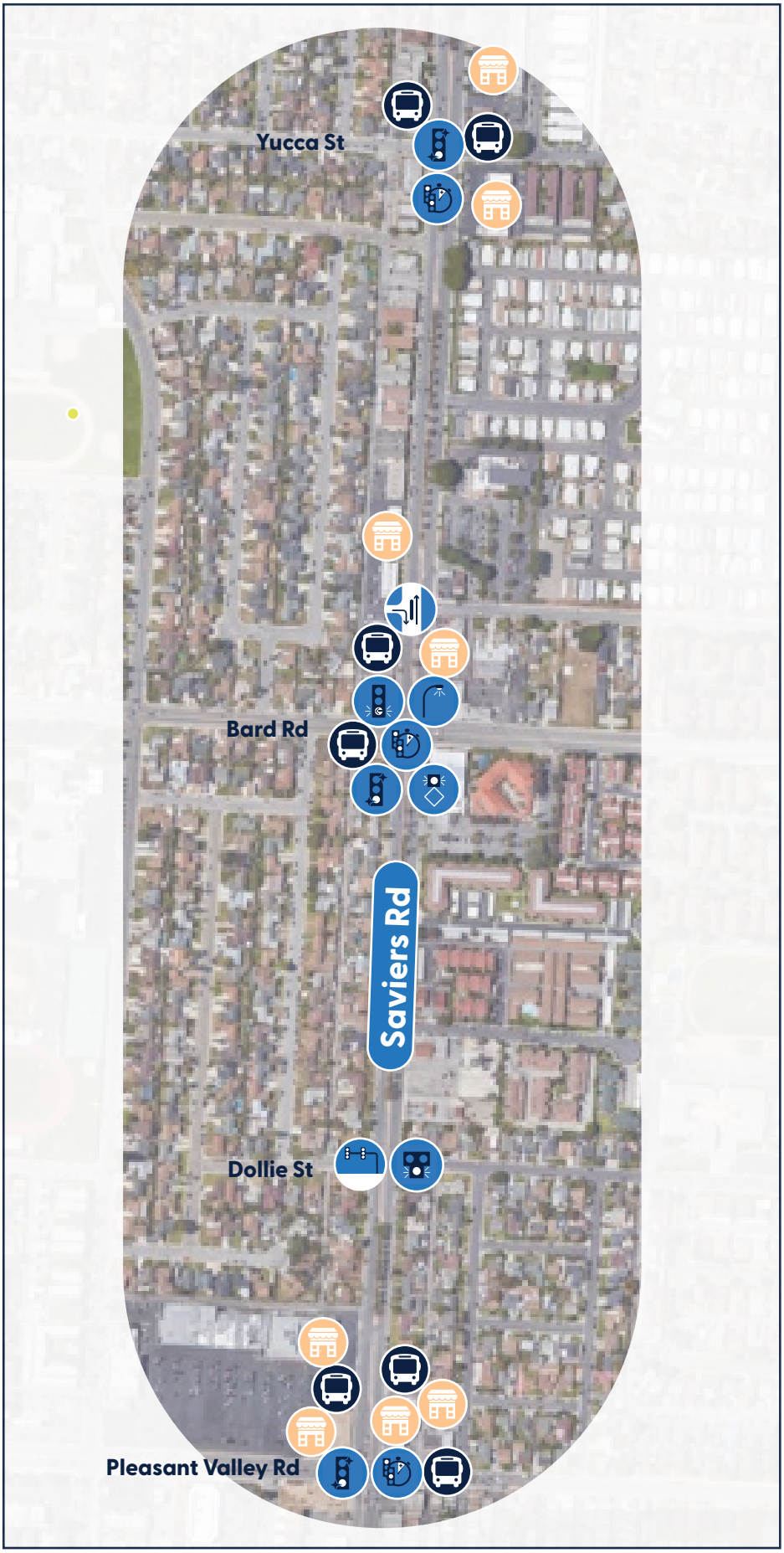
OR

Signal OR **Pedestrian Hybrid Beacon** to upgrade pedestrian crossing

Pleasant Valley Rd

Retroreflective backplates

Increase red/yellow clearance time, which can be made in conjunction with other timing improvements, such as pedestrian walk time



Retail

Transit Stops

These conceptual recommendations require further feasibility assessments, detailed analysis, and community outreach prior to final design and implementation.

Safety Recommendations for Hot Spot Corridor 5

Bard Road

from Saviers Road to Pleasant Valley Road

KEY STATISTICS

130
TOTAL COLLISIONS

- **11** Pedestrian-Involved Collisions
- **8** Bicycle-Involved Collisions

11
KSI COLLISIONS

- **1** Pedestrian-Involved KSI Collisions
- **2** Bicycle-Involved KSI Collisions

CURRENT ROADWAY CHARACTERISTICS

General Plan Classification	Secondary
Number of Lanes	4
Posted Speed	35 mph
AADT	8,000-12,000
Bike Facilities	Bike Lane
Railroad Crossing	Between San Simeon Ave and Terrace Ave

CURRENT LAND USE CHARACTERISTICS

X	Schools
X	Transit
X	Disadvantaged Community
X	SB 375
X	AB 1550
X	Justice40

KEY TRENDS

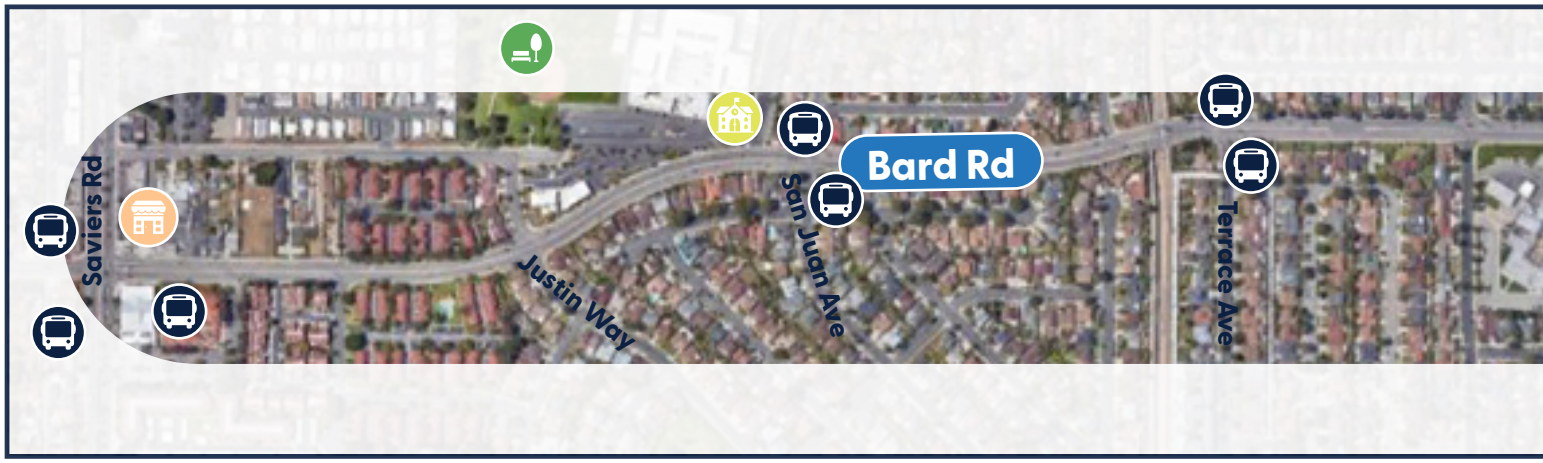
- Inconsistent intersection control along corridor (e.g. All-Way Stop-Controlled and Minor Street Stop-Controlled)
- Nearly all (99%) of collisions occurred at an intersection
- 55 percent of collisions were broadside collisions and primarily occurred at signals without protected left-turn and at multi-lane stop-controlled intersections
- 42 percent of collisions were due to a Vehicle Right of Way violation
- Bike and pedestrian right-of-way violations and nighttime collisions

Retail

Transit Stops

Schools

Parks



RECOMMENDED COUNTERMEASURES: PRIMARY

COUNTERMEASURE	ISSUE AREA	CRASH REDUCTION FACTOR	APPLICABILITY FOR REGULAR MAINTENANCE CYCLES	ESTIMATED CORRIDOR COST & BENEFIT*
Leading Pedestrian Interval	Pedestrian Right of Way Violations at Signalized Intersections (Including with Turning Vehicles)	60%		
Pedestrian Hybrid Beacon	Pedestrian Access	55%		
Convert to All-Way Stop-Controlled Intersection	Inconsistent Intersection Control	50%	Signal Timing	
Intersection Lighting	Bicycle and Pedestrian Collisions at Night at Signalized and Unsignalized Intersections	40%	Signal Timing	
Fully Protected Left-Turns at Signalized Intersections	Broadside Collisions at Signalized Intersections (including Left Turns)	30%	Resurfacing	
Repurpose roadway space (road diet) with Mini-Roundabouts and Enhanced Bike Lane	Inconsistent Intersection Control, Broadside Collisions at Stop-Controlled Intersections, and Bike and Pedestrian Collisions	30%		
Narrow Raised Median for Median Stop Sign	Multi-Lane Stop-Controlled Intersection	25%		
Pedestrian Crossing	Pedestrian Access	25%		
Raised Median as Pedestrian Refuge	Pedestrian Access	25%		
Extend Yellow and All Red Clearance Time	Broadside Collisions at Signalized Intersections (including Left Turns)	15%		
Flashing Beacon to Reinforce Driver Awareness of Stop Signs	Inconsistent Intersection Control, Broadside Collisions at Stop-Controlled Intersections, and Bike and Pedestrian Collisions	15%		
High Visibility Crosswalks with Advance Stop Bars	Pedestrian Right of Way Violations at Signalized Intersections (Including with Turning Vehicles)	15%		
Retroreflective Signal Backplates	Rear End Collisions	15%	Resurfacing (bike lane)	
Upgrade to Larger Stop Signs	Multi-Lane Stop-Controlled Intersection	15%		

WITH ROAD DIET BENEFIT: $16.7M

COST: $840K

BENEFIT/ COST RATIO: 20

NO ROAD DIET BENEFIT: $28.8M

COST: $2.8M

BENEFIT/ COST RATIO: 10

*Note: the Estimated Benefit/Cost Ratio does not include longer term considerations, such as the pedestrian improvements near the Child Development Center Driveway, and the recommendations at Saviers Road & Bard Road as they are included in the Saviers Road corridor estimates.

RECOMMENDED COUNTERMEASURES: SECONDARY

- Additional Warning Signage to alert drivers of upcoming lanes merging
- Flashing LED Stop Sign
- Green Conflict Striping at Intersections
- Refresh Pavement Markings
- Restrict Left-Turns with porkchop island
- Pair installation of mini-roundabouts with public education campaign

RELATED CITY ACTIVITIES

- The City of Oxnard Public Works Department will install a Rectangular Rapid Flashing Beacon at Bard Road & Justin Way.
- The City of Oxnard Public Works Department will install protected left-turns for all approaches, new signal poles, LED lighting, and detection loops at Bard Road & Rose Avenue.
- The City of Oxnard Public Works Department will be constructing traffic signal improvements at Saviers Road & Bard Road. The improvements include new signal poles, mast arms, signal heads, protected left-turn phasing, LED lighting, and detection loops.
- The City of Oxnard Public Works Department is developing guidelines for implementation of Leading Pedestrian Intervals.
- The City of Oxnard Public Works Department applied for HSIP Cycle 11 funding for the Bard Road corridor from Saviers Road to Pleasant Valley Road.

These conceptual recommendations require further feasibility assessments, detailed analysis, and community outreach prior to final design and implementation.

Safety Recommendations for Hot Spot Corridor 5

Bard Road

from Saviers Road to Pleasant Valley Road

RECOMMENDED COUNTERMEASURES

FULL-CORRIDOR

AND

Consider **repurposing roadway space (road diet)**, which would reduce travel lanes to one lane in each direction. Repurposing roadway space would enable enhancements, such as a buffer, to the existing bike lanes and present an opportunity to install **mini-roundabouts** at unsignalized intersections. Repurposing roadway space would also bring consistency along Bard Road since Bard Road is already one lane in each direction west of Saviers Road. Any lane reduction considerations will include public participation and leadership support before proceeding. An alternative to repurposing roadway space is to **install larger LED Stop** signs (36' x 36') to conform to MUTCD standards at unsignalized intersections, paired with travel lane narrowing.

Refresh pavement markings

Speed pavement legends

ALL EACH INTERSECTION

Intersection lighting

Bring bike lane to the intersection (currently drops off 200' before the intersection)

Green paint to denote conflict zones between bicyclists and turning vehicles.

LOCATION-SPECIFIC

Saviers Rd

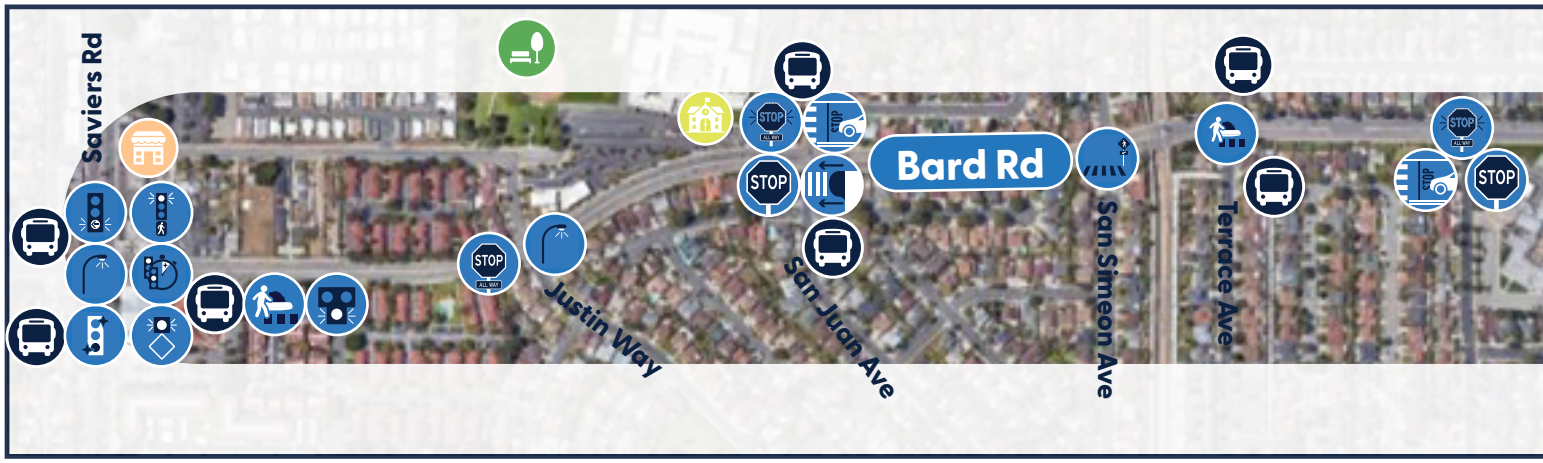
Consider **protected left turns** for E/W, supplementing City's left-turn protection project for N/S approaches. This would require some trade-off in vehicle throughput, which should be further analyzed by the City and tested for CAMUTCD warrant before final determination.

Install intersection lighting to illuminate the crosswalks at the approaches

Increase red/yellow clearance time

Leading pedestrian interval (pending City's implementation guidelines)

Retroreflective backplates



Child Development Center Driveway

AND/OR

Raised median and/or **Pedestrian Hybrid Beacon.** The City may also consider using a raised median to restrict access at this driveway to right-in/right-**out only.**

Justin Way

Convert to **All-Way Stop** (if no road diet), to provide for more uniform intersection control along the corridor. Consistent intersection control can help drivers know what interactions to expect while traveling down a corridor; may be applicable for other locations, such as C Street north of 2nd Street.The City may also choose to continue with installing an RRFB, as planned, and consider stop control in the future.

Install **intersection lighting** on both sides of crosswalk

San Juan Ave

Options if no road diet:

LED stop signs

Upgrade to **high visibility crosswalks** with staggered stop bars

Upgrade to **larger stop signs**

Curb extension for the southwest corner to relocate stop sign for better visibility

San Simeon Ave

Install E/W **crosswalk** along Bard

Terrace Ave

Porkchop island to **prohibit lefts out**

Anchorage St

Options if no road diet:

LED stop signs

Upgrade to **high visibility crosswalks** with staggered stop bars

Upgrade to **larger stop signs**

Rose Ave

Leading pedestrian interval (pending City's implementation guidelines)

Upgrade to **high visibility crosswalks** with advanced stop bars

Retail

Transit Stops

Schools

Parks

These conceptual recommendations require further feasibility assessments, detailed analysis, and community outreach prior to final design and implementation.

Safety Recommendations for Collision Profile 1

Unsafe Speed Collisions Along Roadways with 4 – 5 Lanes

KEY TRENDS

- **Top Crash Type:** Rear End (80% of total collisions and 41% of KSI collisions)
- **Actions During Collisions**: 52% of drivers involved were proceeding straight, and 34% of drivers involved were stopped
- **Location:**
  - The majority of collisions occurred at a major signalized intersection (65%)
  - Nearly a quarter of collisions occurred at the intersection of a major street and a minor stop-controlled street (23%)

KEY STATISTICS

587

TOTAL COLLISIONS

12% of all collisions

22

KSI COLLISIONS

8% of all KSI collisions

KEY LOCATIONS

- Channel Islands Boulevard, from Ventura Road to Pleasant Valley Road
- Gonzales Road, from Victoria Avenue to Oxnard Boulevard
- Oxnard Boulevard/Saviers Road, from Roderick Avenue to Laurel Street
- Pleasant Valley Road, from J Street to Oxnard Boulevard
- Victoria Avenue, north of Gonzales Road
- Ventura Road, north of Gonzales Road

RECOMMENDED COUNTERMEASURES: PRIMARY

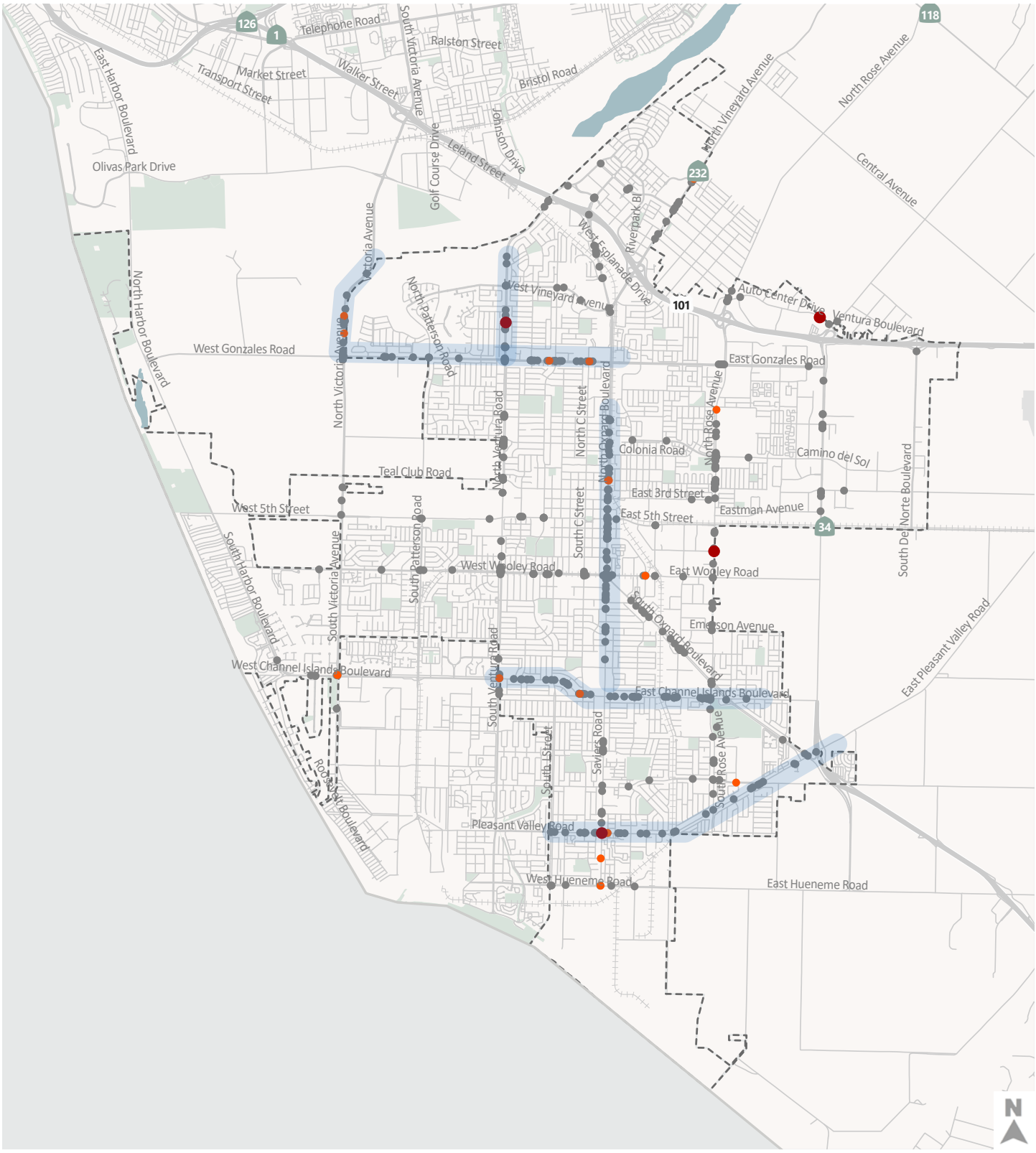
COUNTERMEASURE	CRASH REDUCTION FACTOR	APPLICABILITY FOR MAINTENANCE CYCLES
At Signalized Intersections		
Extend Yellow and All Red Time*	15%	Signal Timing
Retroreflective Borders on Signals*	15%	
Signal Timing for Speed Management*	15%	Signal Timing
Along Roadway Segments		
Repurpose Roadway Space	30%	
Raised Median (at locations without existing raised median)	25%	

*Well-suited for systemic application and HSIP grant package

ENGINEERING COUNTERMEASURES: SECONDARY

- Dynamic Speed Management
- Education & Public Awareness Campaigns Targeted at Speeding
- Signal Adaptive Speed Response
- Signal Rest in Red
- Traffic Signal Confirmation Light

Collision Profile 1 Map: Unsafe Speed Collisions Along Roadways with 4 – 5 Lanes



Crash Severity

- Fatal
- Injury (Severe)
- Other Injury

Key Locations

Safety Recommendations for Collision Profile 2

Broadside Collisions at Signals without Fully Protected Left Turns

KEY TRENDS

- **Top Violations:** Vehicle Right of Way (43%) and Traffic Signal and Signs (36%)
  - Majority of these collisions involved left turn yielding violations or running a red light
- 40% of drivers at fault were turning left
- Approximately a quarter of collisions occurred at night

KEY STATISTICS

684

TOTAL COLLISIONS

14% of all collisions

34

KSI COLLISIONS

13% of all KSI collisions

KEY LOCATIONS

- Channel Islands Boulevard, from M Street to Statham Boulevard
- Downtown Oxnard, at and around 5th Street & Oxnard Boulevard
- Oxnard Boulevard, from Glenwood Drive to 5th Street
- Rose Avenue, from Emerson Avenue to Bard Road
- Saviers Road, from Hill Street to Bard Road

RECOMMENDED COUNTERMEASURES: PRIMARY

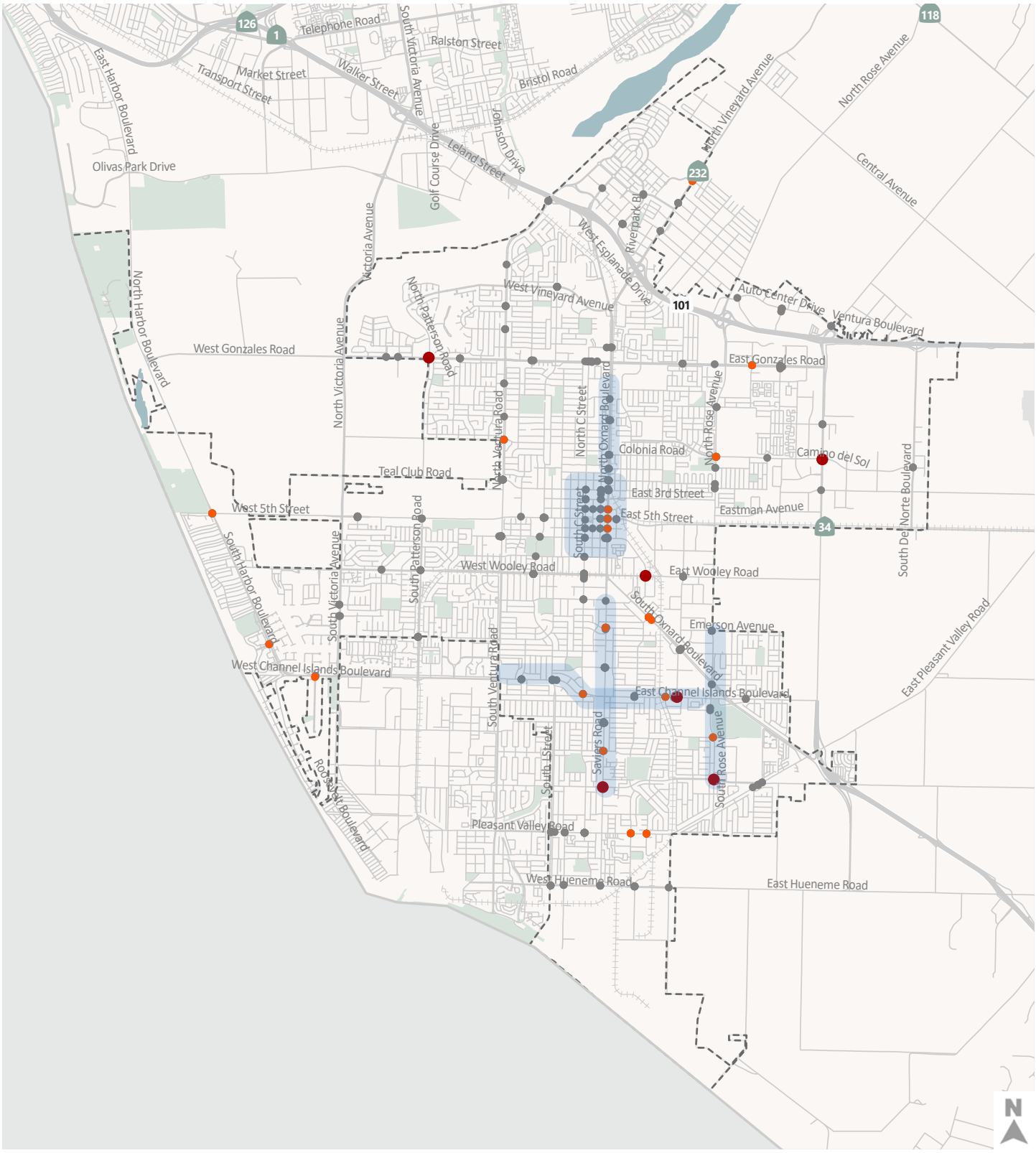
COUNTERMEASURE	CRASH REDUCTION FACTOR	APPLICABILITY FOR MAINTENANCE CYCLES
Protected Left Turn Phase*	30%	
Extend Yellow and All Red Time*	15%	Signal Timing
Retroreflective Borders on Signals*	15%	

*Well-suited for systemic application and HSIP grant package

ENGINEERING COUNTERMEASURES: SECONDARY

- Traffic Signal Confirmation Light

Collision Profile 2 Map: Broadside Collisions at Signals without Fully Protected Left Turns



Crash Severity

- Fatal
- Injury (Severe)
- Other Injury

Key Locations

Safety Recommendations for Collision Profile 3

Driving Under the Influence of Drugs or Alcohol at Primary Roadway Intersections

KEY STATISTICS

206
TOTAL COLLISIONS
4% of all collisions

24
KSI COLLISIONS
9% of all KSI collisions

KEY TRENDS

- **Top Crash Type:**
  - Rear End (36%)
  - Broadside (25%)
- **Top Crash Types for KSI CollisionsRear End (36%):**
  - Broadside (26%)
  - Hit Object (22%)
  - Vehicle/Pedestrian (22%)
- **Location**
  - Split fairly evenly between signalized and non-signalized intersections

RECOMMENDED COUNTERMEASURES: PRIMARY

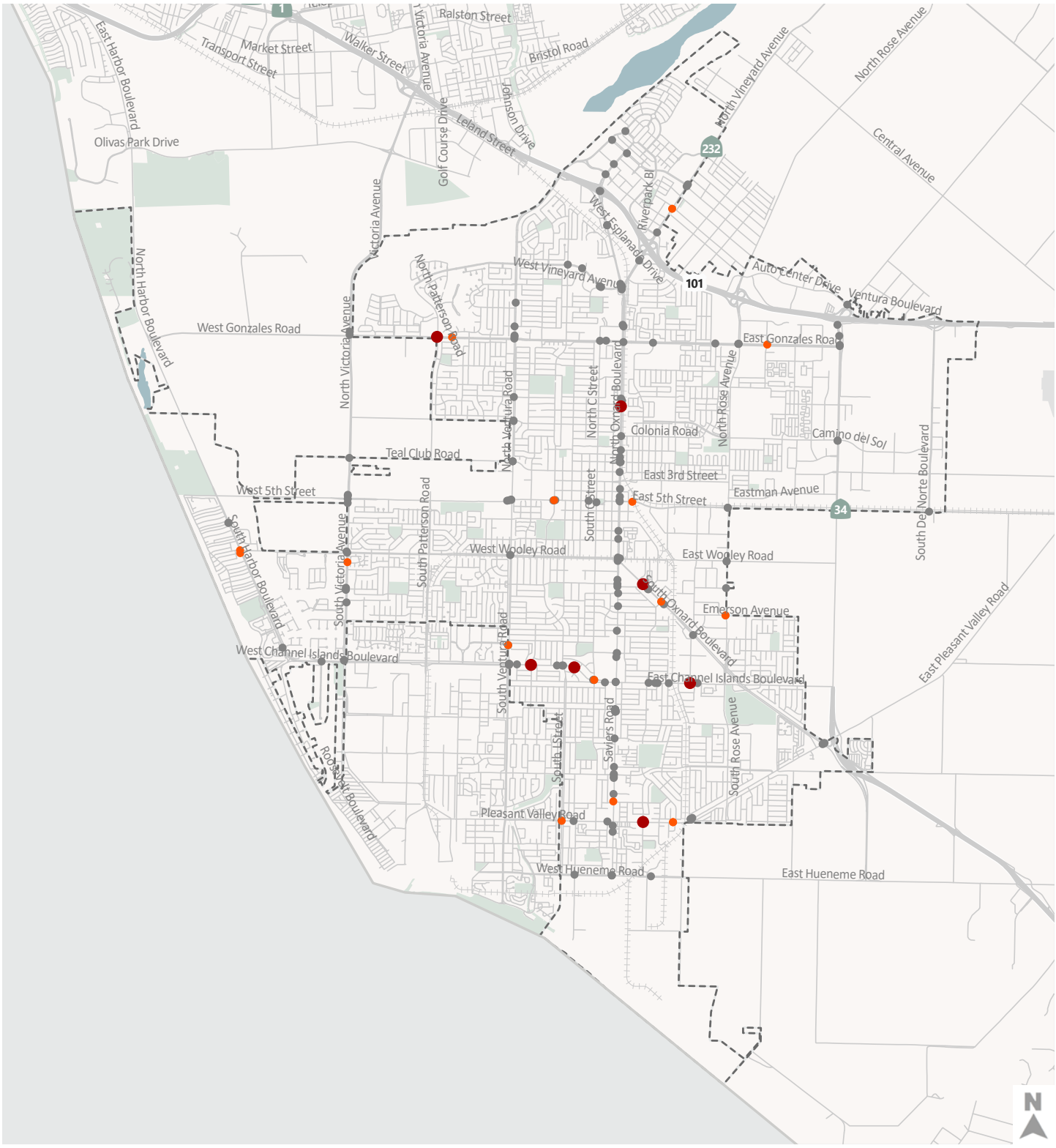
COUNTERMEASURE	CRASH REDUCTION FACTOR	APPLICABILITY FOR MAINTENANCE CYCLES
At Signalized Intersections		
Raised Median/Access Control and Turn Restrictions	50%	
Extend Yellow and All Red*	15%	Signal Timing
Retroreflective Borders*	15%	
Along Roadway Segments		
Remove or Relocate Fixed Objects	35%	
Raised Median (at locations without existing raised median)	25%	

*Well-suited for systemic application and HSIP grant package

ENGINEERING COUNTERMEASURES: SECONDARY

- Education and Public Awareness Campaign Targeted at DUI
- High-Visibility Enforcement for DUI
- Public Health Partnership on DUI Prevention
- Safe Ride Home
- Traffic Signal Confirmation Light

Collision Profile 3 Map: Driving Under the Influence of Drugs or Alcohol at Primary Roadway Intersections



Crash Severity

- Fatal
- Injury (Severe)
- Other Injury

Key Locations

Safety Recommendations for Collision Profile 4

Nighttime Collisions on 4 - 5 Lane Roadways

KEY TRENDS

» **All Collisions:**
  - Top Crash Types: Broadside (34%) and Rear End (25%)
  - Top Violations: Vehicle Right of Way (21%), Unsafe Speed (20%), and DUI (17%)

» **KSI Collisions**
  - Top Crash Types: Vehicle/Pedestrian (28%) and Broadside (24%)
  - Top Violations: Pedestrian Violation (23%) and DUI (20%)

» **Location**
  - This profile accounts for 33 percent of pedestrian KSI collisions and 25 percent of bike KSI collisions

KEY STATISTICS

751
TOTAL COLLISIONS
16% of all collisions

79
KSI COLLISIONS
31% of all KSI collisions

KEY LOCATIONS

» 5th Street, from Ventura Road to H Street/Hobson Way
» Channel Islands Boulevard, from Ventura Road to Rose Avenue
» Gonzales Road, from Victoria Avenue to C Street
» Oxnard Boulevard, from Roderick Avenue to Wooley Road
» Oxnard Boulevard, from Ash Street to Date Street
» Pleasant Valley Road, from J Street to Oxnard Boulevard
» Rose Avenue, from Cesar Chavez Drive to Camino Del Sol
» Ventura Road, from Juniper Street to Channel Islands Boulevard
» Vineyard Avenue, from Thames River Drive to Olive Street
» Wooley Road, from Ventura Road to Rose Avenue

RECOMMENDED COUNTERMEASURES: PRIMARY

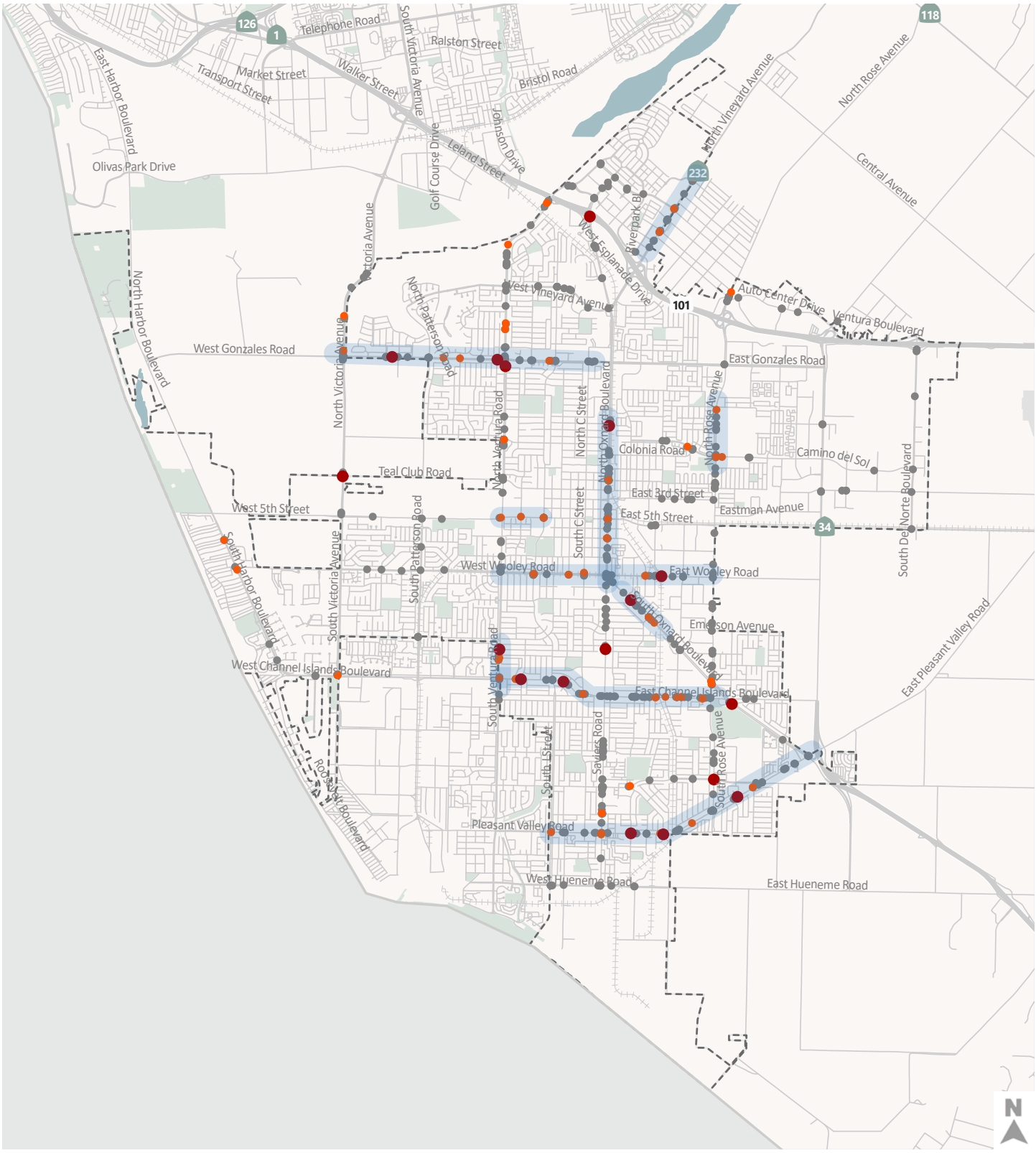
COUNTERMEASURE	CRASH REDUCTION FACTOR	APPLICABILITY FOR MAINTENANCE CYCLES
At Signalized Intersections		
Raised Median/Access Control and Turn Restrictions	50%	
Intersection Lighting	40%	
Protected Left Turn Phase*	30%	
Retroreflective Borders on Signals*	15%	
At Non-Signalized Intersections		
Pedestrian Signal (includes Pedestrian Hybrid Beacon (HAWK))*	55%	
Intersection Lighting	40%	
Enhanced safety features for pedestrian crossing at uncontrolled location (e.g. flashing beacons, curb extensions, advanced "stop" or yield markings)*	35%	
Along Roadway Segments		
Remove or Relocate Fixed Objects	35%	
Roadway Segment Lighting	35%	
Raised Median	25%	
Object Markers*	15%	
Signs with New Fluorescent Sheeting*	15%	

*Well-suited for systemic application and HSIP grant package

RECOMMENDED COUNTERMEASURES: SECONDARY

» Green Conflict Striping at Intersections
» Refresh Pavement Markings
» Upgrade to High Visibility Crosswalks
» Education and Public Awareness Campaign Targeted at DUI
» High-Visibility Enforcement for DUI
» Public Health Partnership on DUI Prevention
» Safe Ride Home

Collision Profile 4 Map: Nighttime Collisions on 4 - 5 Lane Roadways



Crash Severity

- Fatal
- Injury (Severe)
- Other Injury

Key Locations

Safety Recommendations for Collision Profile 5

Hit Object Collisions at Major Intersections

KEY TRENDS

» **Actions During Collisions**
- Top Violations: Improper Turning (31%), Unsafe Speed (27%), and Driving Under the Influence (22%)
- The majority of drivers at fault were proceeding straight prior to the collision (57%)

» **Location**
- Collisions were split fairly evenly between signalized (52%) and non-signalized (48%) intersections

» **Time of Day**
- Over half (56%) of collisions occurred at night

KEY STATISTICS

143
TOTAL COLLISIONS
4% of all vehicle collisions

20
KSI COLLISIONS
13% of all vehicle KSI collisions

KEY LOCATIONS

» Channel Islands Boulevard from C Street to Saviers Road
» Gonzales Road, from Merion Way to Rose Avenue
» Pleasant Valley Road & Longfellow Way
» Rose Avenue, from Socorro Way to Camino del Sol
» Rose Avenue, from 3rd Street to 5th Street
» Wooley Road, from Novato Drive to Escalon Drive

RECOMMENDED COUNTERMEASURES: PRIMARY

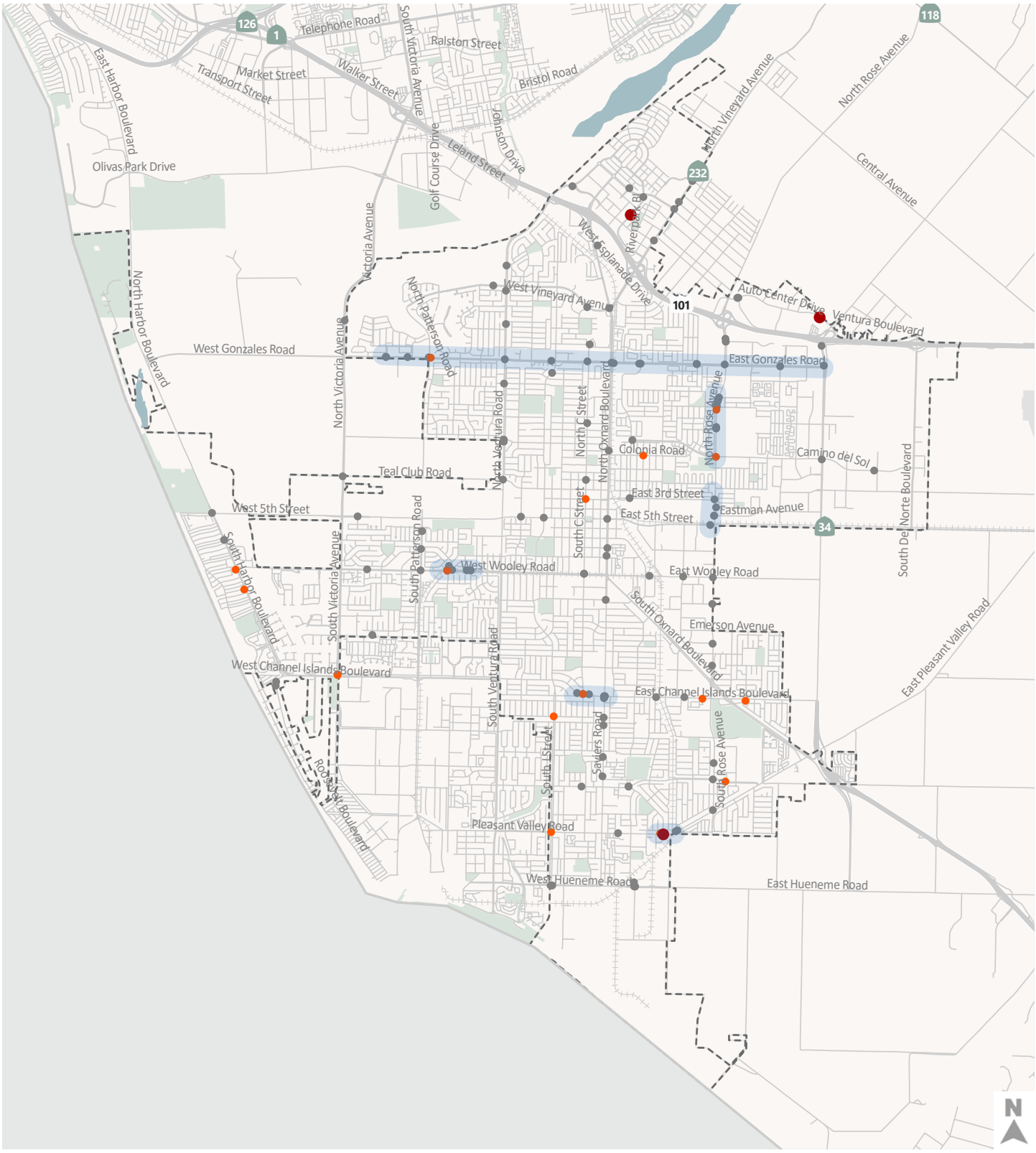
COUNTERMEASURE	CRASH REDUCTION FACTOR	APPLICABILITY FOR MAINTENANCE CYCLES
At Signalized Intersections		
Raised Median/Access Control and Turn Restrictions	50%	
Intersection Lighting	40%	
At Non-Signalized Intersections		
Intersection Lighting	40%	
Along Roadway Segments		
Remove or Relocate Fixed Objects	35%	
Roadway Segment Lighting	35%	
Object Markers*	15%	

*Well-suited for systemic application and HSIP grant package

RECOMMENDED COUNTERMEASURES: SECONDARY

» Education and Public Awareness Campaign Targeted at DUI
» High-Visibility Enforcement for DUI
» Public Health Partnership on DUI Prevention
» Safe Ride Home

Collision Profile 5 Map: Hit Object Collisions at Major Intersections



Crash Severity

- Fatal
- Injury (Severe)
- Other Injury

Key Locations

Safety Recommendations for Collision Profile 6

Pedestrian or Bicycle-Involved Collisions on Roadways with 2 - 3 Lanes and ≤ 25 mph Posted Speed Limit

KEY STATISTICS

232
TOTAL COLLISIONS
29% of all bike/ped collisions

25
KSI COLLISIONS
25% of all bike/ped KSI collisions

KEY TRENDS

- **Actions During Collisions**
  - In collisions involving a pedestrian, most pedestrians were crossing outside of a marked crosswalk (31%), crossing in a crosswalk at an intersection (18%), or in the road (12%)
  - Top Violations: Pedestrian Violation (20%) and Pedestrian Right of Way Violation
- **Age**
  - Approximately half of the people involved in collisions were vulnerable populations, either under 19 years old (36%) or over 60 years old (13%)
- **Location**
  - Nearly 75 percent of collisions occurred at an intersection
  - The majority of collisions occurred at either minor unsignalized intersections (50%) or midblock (27%)
- **Time of Day**
  - Approximately 30 percent of collisions occurred at night, and of those nighttime collisions, 80 percent occurred at an intersection

KEY LOCATIONS

- 7th Street, from M Street to Meta Street
- A Street, from Robert Avenue to 6th Street
- C Street, Redwood Street to Glacier Avenue
- Cooper Road, from Hayes Avenue to Juanita Avenue

RECOMMENDED COUNTERMEASURES: PRIMARY

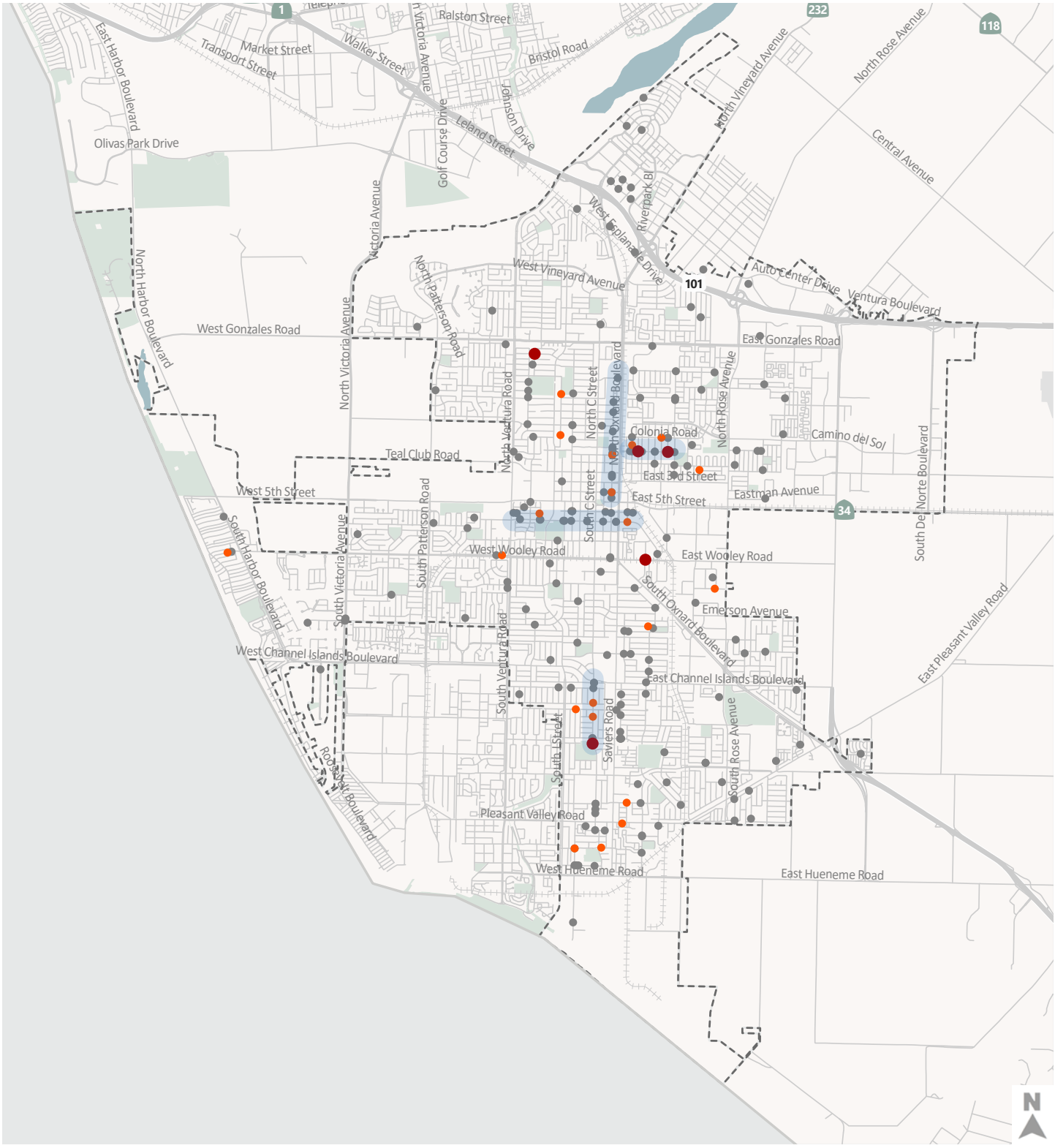
COUNTERMEASURE	CRASH REDUCTION FACTOR	APPLICABILITY FOR MAINTENANCE CYCLES
At Non-Signalized Intersections		
Intersection Lighting	40%	
Enhanced safety features for pedestrian crossing at uncontrolled location (e.g. flashing beacons, curb extensions, advanced "stop" or yield markings)*	35%	Resurfacing
New Pedestrian Crossing	25%	Resurfacing
Improve Sight Distance with Red Curb/Daylighting	20%	
Along Roadway Segments		
Bike Lanes*	35%	Resurfacing
Raised Crosswalk	35%	Resurfacing
Rectangular Rapid Flashing Beacon*	35%	

*Well-suited for systemic application and HSIP grant package

RECOMMENDED COUNTERMEASURES: SECONDARY

- Education and Public Awareness Campaign targeted at increasing awareness of bicyclist and pedestrians
- High Visibility Crosswalk (at non-signalized intersections)
- Refresh Pavement Markings
- Traffic Calming/Bicycle Boulevard Elements (e.g. curb extensions/bulb-outs, speed humps, mini-roundabouts)

Collision Profile 6 Map: Pedestrian or Bicycle-Involved Collisions on Roadways with 2 - 3 Lanes and ≤ 25 mph Posted Speed Limit



Crash Severity

- Fatal
- Injury (Severe)
- Other Injury

Key Locations

Safety Recommendations for Collision Profile 7

Pedestrian or Bicycle-Involved Collisions at Major Non-Signalized Intersections

KEY STATISTICS

214
TOTAL COLLISIONS
27% of all bike/ped collisions

38
KSI COLLISIONS
38% of all bike/ped KSI collisions

KEY TRENDS

» **Actions During Collisions**
- In collisions involving a pedestrian, the majority of people were crossing outside of a crosswalk (43%), crossing in the crosswalk at the intersection (28%) or in the road (17%)
- In collisions involving a bicyclist, the top violations involved bicyclists riding the wrong way (41%), vehicle right of way (16%), or improper turning (15%). The majority of vehicle right of violations involved not yielding at a stop sign or yielding to oncoming traffic when turning from a property or alley.

» **Age**
- Approximately a third of people involved in all collisions are under 19 years old
- Two-thirds of the people involved in KSI collisions were vulnerable populations, either under 19 years old (42%) or over 60 years old (24%)

» **Time of Day**
- Over a third of all collisions and over half of KSI collisions occurred at night

KEY LOCATIONS

» Bard Road, from Saviers Road to Anchorage Street
» C Street, from Ivywood Drive to 1st Street
» C Street, from Wolff Street to Canterbury Way
» Camino del Sol, from Higuera Drive to Colonia Road
» Gonzales Road & Lobelia Drive
» Hemlock Street, from Victoria Avenue to Brookside Avenue
» Saviers Road, from Wolff Street to Iris Road
» Wooley Road, from Piedmont Street to Richmond Avenue
» Wooley Road & Seahorse Way

RECOMMENDED COUNTERMEASURES: PRIMARY

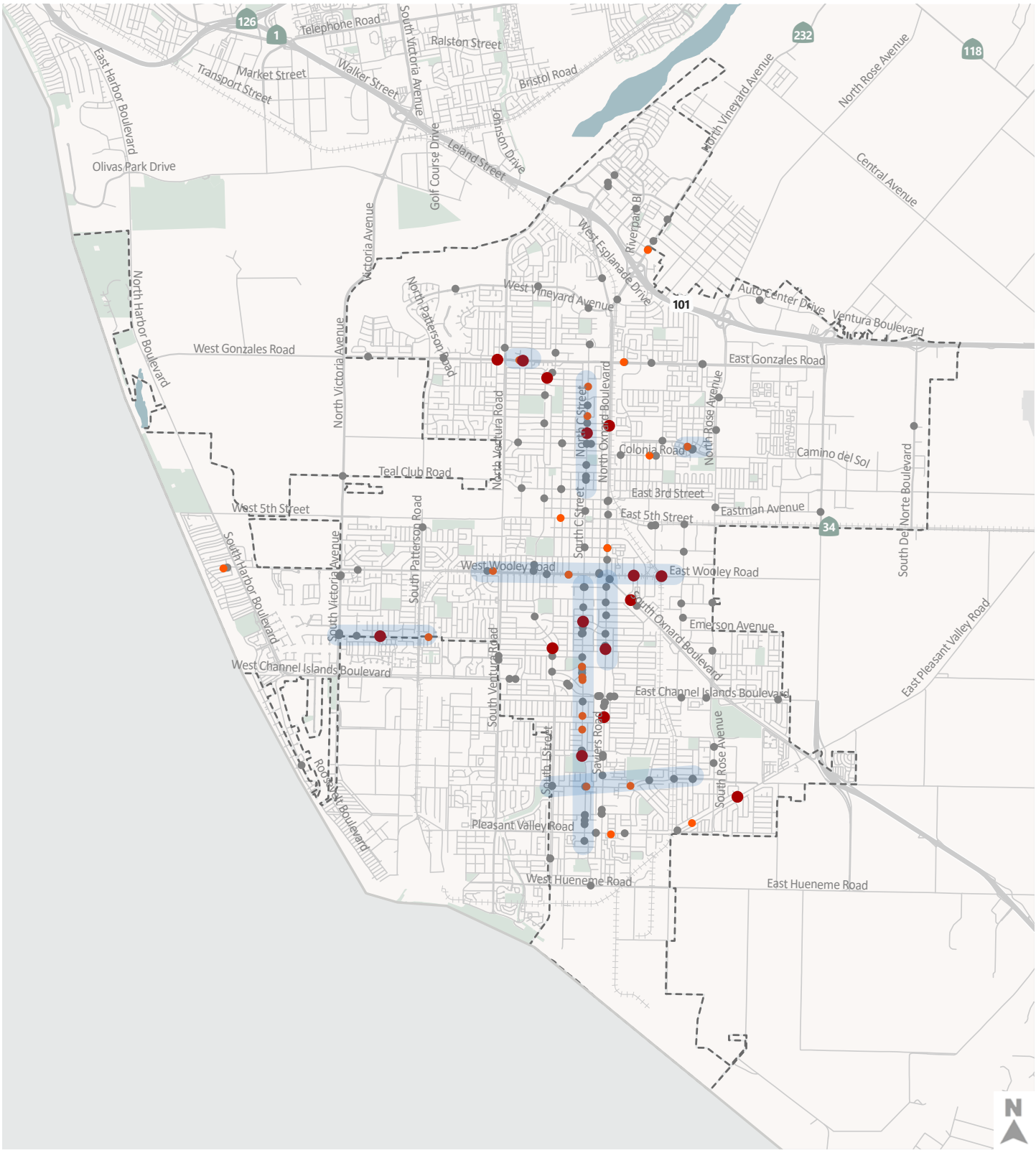
COUNTERMEASURE	CRASH REDUCTION FACTOR	APPLICABILITY FOR MAINTENANCE CYCLES
At Non-Signalized Intersections		
Pedestrian Signal (includes Pedestrian Hybrid Beacon (HAWK))	55%	
Raised Median/Access Control and Turn Restrictions	50%	
Intersection Lighting	40%	
Enhanced safety features for pedestrian crossing at uncontrolled location (e.g. flashing beacons, curb extensions, advanced "stop" or yield markings)*	35%	Resurfacing
Improve Sight Distance with Red Curb/Daylighting	20%	
Larger or Additional Stop Signs at Stop-Controlled Intersections*	15%	
Along Roadway Segments		
Separated Bike Lanes*	45%	
Raised Crosswalk	35%	Resurfacing
Repurpose Roadway Space	35%	
Raised Median	25%	

*Well-suited for systemic application and HSIP grant package

RECOMMENDED COUNTERMEASURES: SECONDARY

» Education and Public Awareness Campaign targeted at increasing awareness of bicyclist and pedestrians
» Green Conflict Striping at intersections
» High Visibility Crosswalk (at non-signalized intersections)
» Refresh Pavement Markings

Collision Profile 7 Map: Pedestrian or Bicycle-Involved Collisions at Major Non-Signalized Intersections



Crash Severity

- Fatal
- Injury (Severe)
- Other Injury

Key Locations

Safety Recommendations for Collision Profile 8

Bicycle-Involved Collisions with Vehicles Proceeding Straight at Signals

KEY TRENDS

» **Actions During Collisions**
  - The top violations for all collisions were Traffic Signals and Signs (30%) where a person driving ran a red light or a person biking was riding the wrong way (21%)

» **Age**
  - 27 percent of collisions involved someone under the age of 19, and the majority of those collisions occurred near a school (74%) during/after school dismissal (39%)

» **Time of Day**
  - The majority of collisions occurred during the day (70%), primarily during the late afternoon and early evening, from 3 PM – 7 PM (35%)

KEY STATISTICS

84

TOTAL COLLISIONS

25% of all bike collisions

9

KSI COLLISIONS

32% of all bike KSI collisions

KEY LOCATIONS

» 5th Street, from Ventura Road to K Street
» Oxnard Boulevard, from C Street to Entrada Drive
» Oxnard Boulevard, from Colonia Road to Wooley Road
» Rose Avenue, from Channel Islands Boulevard to Bard Road
» Rose Avenue, from 3rd Street to 5th Street
» Saviers Road, from Laurel Street to Pleasant Valley Road
» Wooley Road, from Ventura Road to Oxnard Boulevard/Saviers Road

RECOMMENDED COUNTERMEASURES: PRIMARY

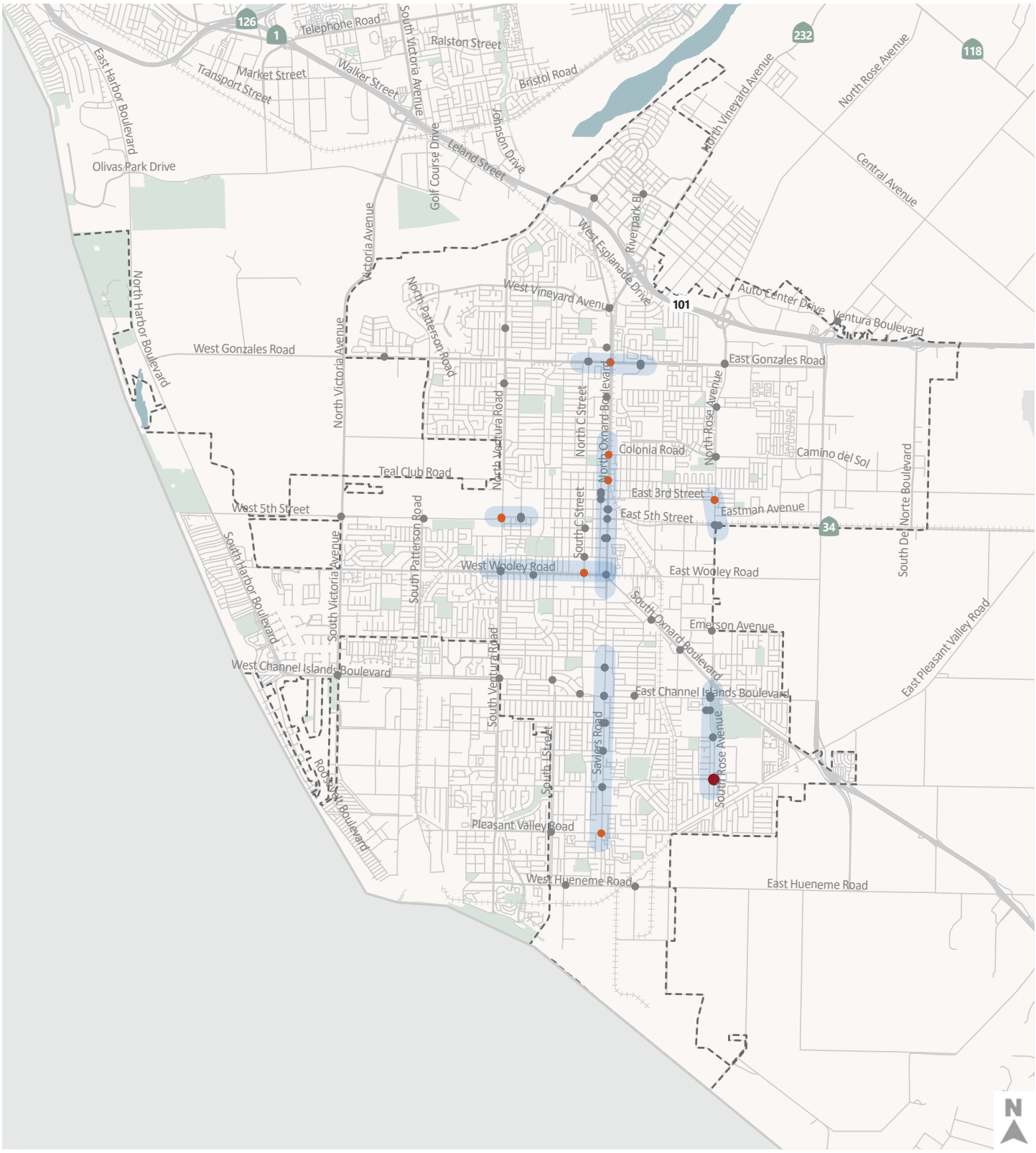
COUNTERMEASURE	CRASH REDUCTION FACTOR	APPLICABILITY FOR MAINTENANCE CYCLES
At Non-Signalized Intersections		
Leading Pedestrian Intervals paired with Sign R9-5 "Bikes Use Ped Signal"*	60%	Signal Timing
Separated Bike Lanes	45%	
Class II Bike Lanes*	35%	Resurfacing
Extend Yellow and All Red Time*	15%	Signal Timing

*Well-suited for systemic application and HSIP grant package

RECOMMENDED COUNTERMEASURES: SECONDARY

» Education and Public Awareness Campaign targeted at increasing awareness of bicyclist and pedestrians
» Green Conflict Striping at intersections
» Signal Rest in Red
» Traffic Signal Confirmation Light

Collision Profile 8 Map: Bicycle-Involved Collisions with Vehicles Proceeding Straight at Signals



Crash Severity

- Fatal
- Injury (Severe)
- Other Injury

Key Locations

Safety Recommendations for Collision Profile 9

Pedestrian-Involved Collisions on Roadways with 4 - 5 Lanes and 30 - 45 mph Speed Limit

KEY STATISTICS

166
TOTAL COLLISIONS
37% of all ped collisions

32
KSI COLLISIONS
44% of all ped KSI collisions

KEY TRENDS

- **Actions During Collisions:**
  - The majority of collisions involved either a pedestrian right of way violation (39%) or pedestrian violation (35%). The pedestrian right of way violation primarily involved drivers not yielding at the crosswalk, and the pedestrian violation primarily involved pedestrians crossing outside of a crosswalk.
  - Most collisions involved a pedestrian crossing in a crosswalk at an intersection (45%), followed by pedestrians crossing outside of a crosswalk (25%) and walking in the road (14%)
  - The majority of collisions involve a driver proceeding straight or some other non-turning movement (70%). 17 percent of collisions involved a driver turning left, and 12 percent of collisions involved a driver turning right.
- **Location**
  - The vast majority of collisions occurred at major intersections (90%) and most of the major intersection collisions were at major signalized intersections (68%)
- **Time of Day**
  - 44 percent of collisions occurred at night, primarily between 7 PM and 6 AM (38%)

KEY LOCATIONS

- Channel Islands Boulevard & Gisler Avenue
- Gonzales Road, from Ventura Road to Lantana Street
- Oxnard Boulevard, from Esplanade Drive to Forest Park Boulevard
- Oxnard Boulevard, from Ash Street to Date Street
- Oxnard Boulevard/Saviers Road, from Robert Avenue to Elm Street
- Saviers Road, from Channel Islands Boulevard to Bard Road
- Ventura Road, from Devonshire Drive to Doris Avenue
- Ventura Road, from Juniper Street to Friedrich Lane
- Vineyard Avenue, from Sycamore Street to Forest Park Boulevard
- Wooley Road, from Commercial Avenue to Richmond Avenue

RECOMMENDED COUNTERMEASURES: PRIMARY

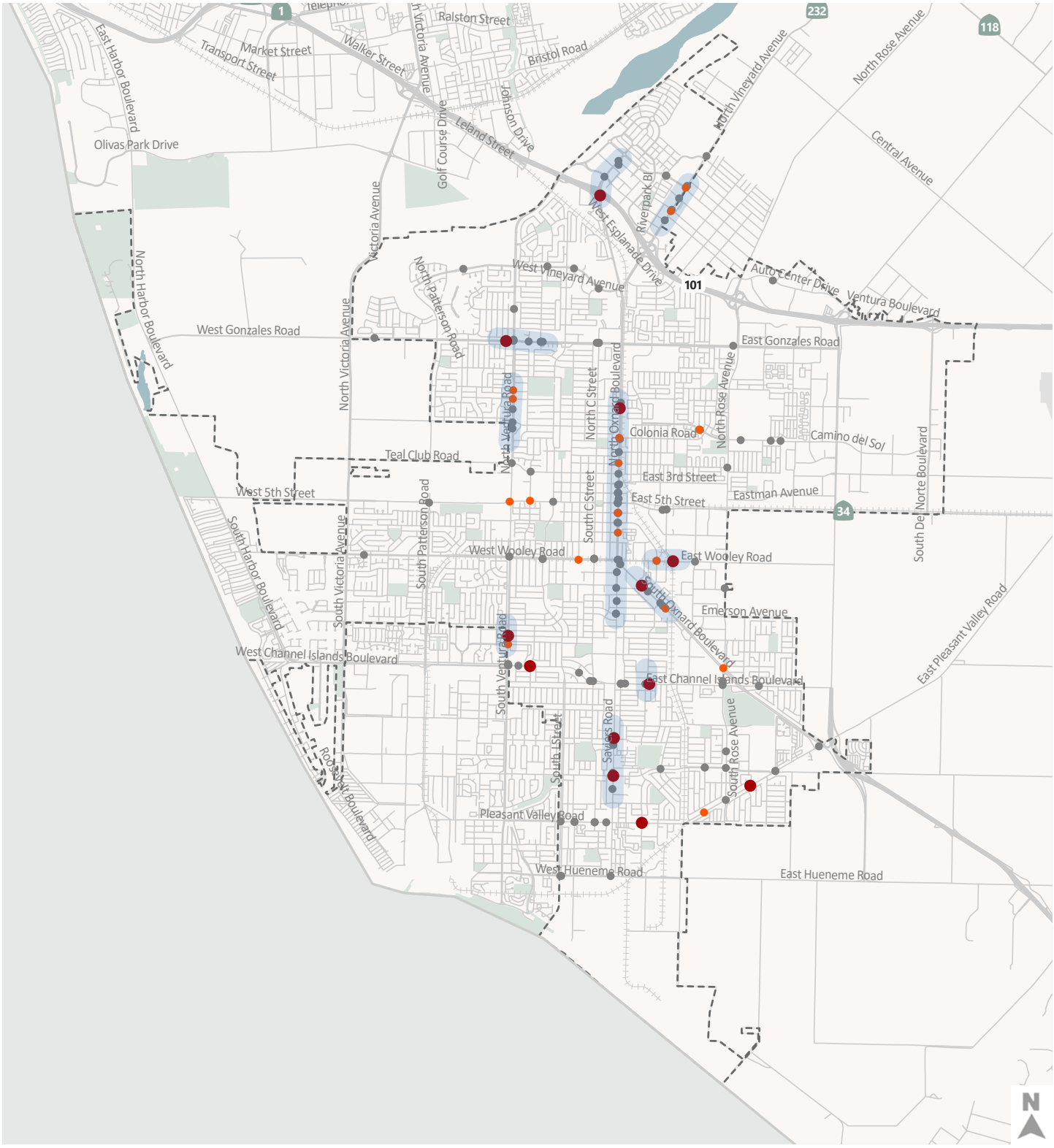
COUNTERMEASURE	CRASH REDUCTION FACTOR	APPLICABILITY FOR MAINTENANCE CYCLES
At Signalized Intersections		
Leading Pedestrian Interval*	60%	Signal Timing
Intersection Lighting	40%	
Protected Left Turn Phase*	30%	
High Visibility Crosswalk with Advanced Stop Bar*	15%	Resurfacing
At Non-Signalized Intersections		
Pedestrian Signal (includes Pedestrian Hybrid Beacon (HAWK))	55%	
Intersection Lighting	40%	
Enhanced safety features for pedestrian crossing at uncontrolled location (e.g. flashing beacons, curb extensions, advanced "stop" or yield markings)*	35%	Resurfacing
Rectangular Rapid Flashing Beacon*	35%	
Along Roadway Segments		
Repurpose Roadway Space	35%	
Raised Median	25%	

*Well-suited for systemic application and HSIP grant package

RECOMMENDED COUNTERMEASURES: SECONDARY

- Education and Public Awareness Campaign targeted at increasing awareness of pedestrians
- High Visibility Crosswalks (at non-signalized intersections)

Collision Profile 9 Map: Pedestrian-Involved Collisions on Roadways with 4 - 5 Lanes and 30 - 45 mph Speed Limit



Crash Severity

- Fatal
- Injury (Severe)
- Other Injury

Key Locations

Safety Recommendations for Collision Profile 10

Pedestrian-Involved Collisions Midblock Along Primary Roadways

KEY TRENDS

» **Actions During Collisions**
  - The majority of collisions involved a pedestrian crossing outside of a crosswalk (56%) and a pedestrian violation (50%)

» **Location**
  - Most collisions occurred near a pedestrian attraction, such as within 1,000 feet of retail (94%) or within 500 feet of a bus stop (50%)

» **Time of Day**
  - 56 percent of collisions occurred at night, primarily between 6 PM and 12 AM (56%)

KEY STATISTICS

16
TOTAL COLLISIONS
4% of all ped collisions

5
KSI COLLISIONS
7% of all ped KSI collisions

KEY LOCATIONS

» Saviers Road, from Bryce Canyon Avenue to Yucca Street
» Ventura Road, from Devonshire Drive to Doris Avenue
» Ventura Road & 5th Street

RECOMMENDED COUNTERMEASURES: PRIMARY

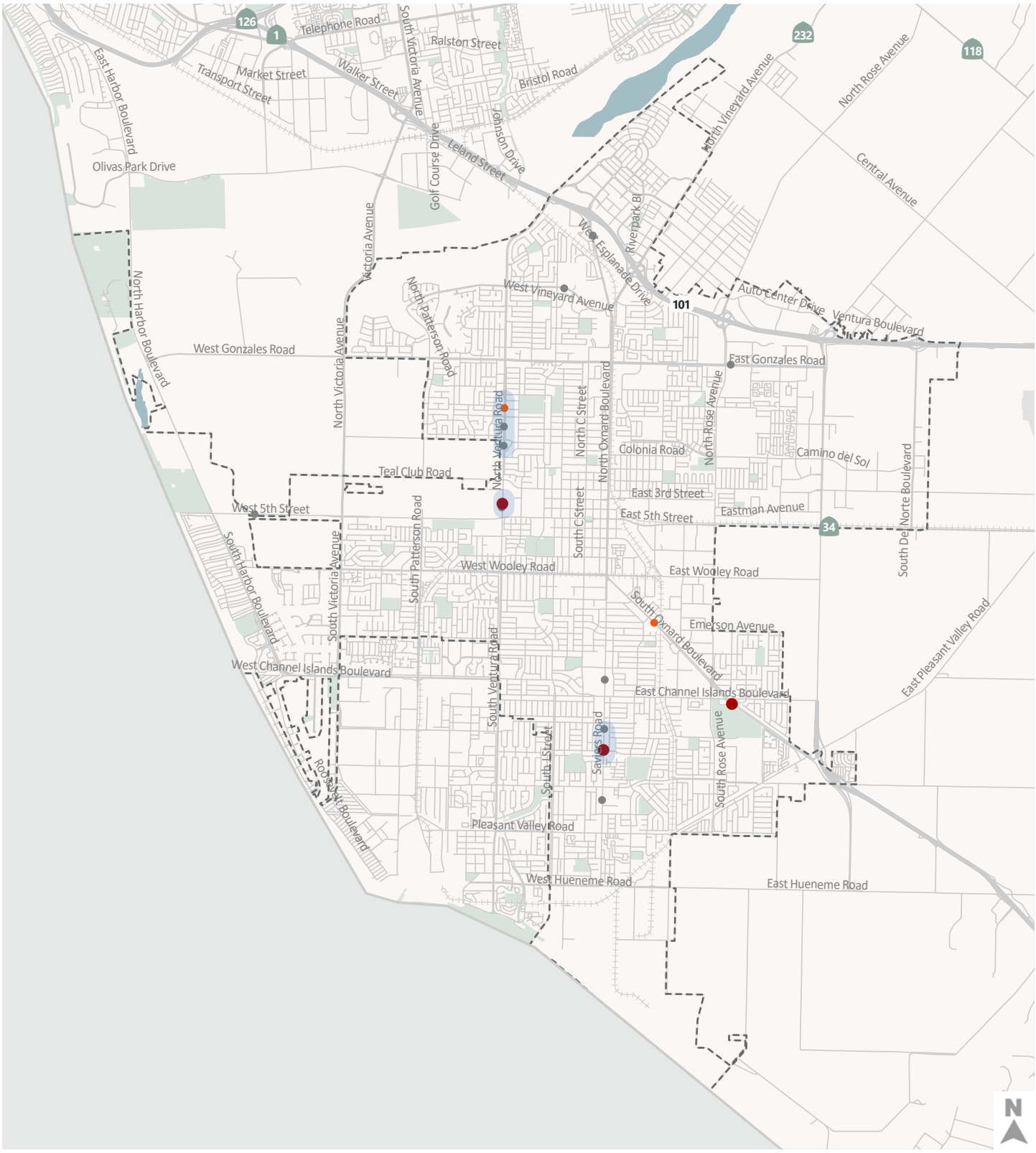
COUNTERMEASURE	CRASH REDUCTION FACTOR	APPLICABILITY FOR MAINTENANCE CYCLES
At Non-Signalized Intersections		
Pedestrian Signal (includes Pedestrian Hybrid Beacon (HAWK))	55%	
Enhanced safety features for pedestrian crossing at uncontrolled location (e.g. flashing beacons, curb extensions, advanced "stop" or yield markings)*	35%	Resurfacing
Along Roadway Segments		
Repurpose Roadway Space	35%	
Roadway Segment Lighting	40%	
Raised Median	25%	

*Well-suited for systemic application and HSIP grant package

ENGINEERING COUNTERMEASURES: SECONDARY

» Education and Public Awareness Campaign targeted at increasing awareness of pedestrians
» High Visibility Crosswalk (at non-signalized intersections)

Collision Profile 10 Map: Pedestrian-Involved Collisions Midblock Along Primary Roadways



Crash Severity

- Fatal
- Injury (Severe)
- Other Injury

Key Locations

08
Evaluation and Implementation Program

This chapter describes the process that can be used by the City to evaluate the success of the LRSP, ensure implementation, and identify funding sources for projects.


Oxnard Bl
SCHOOL BUS
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Evaluation and Implementation Program

Evaluation

An ongoing evaluation program helps to inform future decision-making and allows the City to understand how it is performing relative to the goal of reducing collisions and collision severity in each of its emphasis areas.

Annual Traffic Safety Report

Annual monitoring and reporting of safety trends is an important component of evaluating the success of Oxnard's roadway safety efforts. The Annual Traffic Safety Report can help City staff to strategically prioritize future investment and understand the impact of prior investments. This report can also serve as an important tool for communicating Oxnard's ongoing safety efforts to the public. In addition to the proposed Annual documentation, Caltrans requires that the LRSP be updated every 3 to 5 years.

A summary of the metrics to be documented in the Annual Traffic Safety Report is included below. A template for the Annual Traffic Safety Report is included in **Appendix D.**

ANNUAL TRAFFIC SAFETY REPORT METRICS

Category	Performance Metric
Number of Countermeasures Implemented	Engineering countermeasures Education, engagement, and enforcement campaigns or programs
Funding Secured for Future Countermeasures	Infrastructure grants Program grants
Collisions	**KSI collisions:** Total KSI collisions Percent of Collisions resulting in KSI **Pedestrian and bicycle collisions:** Total pedestrian and bicycle collisions Percent of pedestrian and bicycle collisions resulting in KSI **Collisions within each emphasis area:** Number of collisions within each emphasis area Percent of collisions in each emphasis area resulting in KSI **Demographic data associated with collisions, to track disproportionate impacts on communities:** Percent of collisions involving victims aged under 19 or over 65 Share collision victims by race/ethnicity, compared with Citywide statistics
Before/After Studies for Projects and Programs that have been Implemented	Number of collisions in project influence area Percent of collisions resulting in KSI in project influence area
Speeds and Speed Limit Compliance	85th percentile speeds Number of unsafe speed violations Number of segments with posted speed reduction

Implementation

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.

Culturally-Relevant and Equity-Oriented Considerations for Implementation

COMMUNITY ENGAGEMENT

Community engagement is not a one-size-fits-all model. By developing culturally-relevant and equity-oriented engagement strategies, all participants are not only invited into conversations about safety, but the conversations are set up and facilitated in a way that accounts for barrier to participation. These engagement strategies can help education and programming around traffic safety reach a larger audience and be more impactful.

In Oxnard, culturally-relevant and equity-oriented community engagement may include sharing information in multiple languages, particularly English and Spanish, and via multiple mediums, such as text and audio, to reach communities that speak indigenous languages, particularly Mixteco, that cannot be easily translated into printed materials or communities with limited literacy. Oxnard also has a large migrant farmworker community that primarily speaks indigenous languages (Mixteco) and who have unique travel patterns. Members of this community are also concerned with situations of isolated or unstable housing and citizenship.

Hosting safety-related engagement events at existing community events, such as soccer matches at local parks, the Community Market at Oxnard College, or monthly community meetings hosted by the Mixteco Indigenous Community Organizing Project (MICOP), may provide better accessibility and comfort for this unique audience to receive information and provide feedback. The creation of a Street Safety Ambassador Program can also help to build awareness within specific communities around roadway safety issues. Culturally-relevant and equity-based community engagement should be considered during the implementation of all roadway safety projects.

ENFORCEMENT

Enforcement of traffic laws is a common strategy to increase street safety, but historical enforcement techniques and strategies have raised concerns about racial profiling, police violence, and the impacts of policing on communities of color. According to the US Department of Justice, Black and Hispanic people are more likely than white people to experience use of force when they are stopped by police. A study of traffic stop data in major cities across California in 2020 found that Black and Hispanic people were more likely to be stopped for minor traffic violations than white people. Black Californians were twice as likely to be searched and nearly three times as likely to experience use of force than white individual.[23]

To ensure that efforts to improve safety recognize that all people have the right to move about their communities safely, cities have shifted to equity-based strategies that target specific reckless behaviors that pose the highest safety risk while working to mitigate potential inequities in enforcement. In Oxnard, this could look like installing red light confirmation signals at locations with a high number of collisions involving red light violations. The red light confirmation signals are an example of enforcement that is automated and data-driven rather than driven by an individual police officer's discretion. Equity considerations can be implemented in a range of enforcement strategies, such as enacting progressive fine structures, and analyzing demographic data in traffic citations.

BEST PRACTICE RESOURCES

LOS ANGELES DEPARTMENT OF TRANSPORTATION

The Los Angeles Department of Transportation (LADOT) Vision Zero Division launched the Dignity-Infused Community Engagement (DICE) strategy in 2019, which aims to center community members in the Vision Zero planning process from the beginning and weave all perspectives and lived experiences into the technical planning process. The DICE approach includes collaboration with local community-based organizations (CBOs); the provision of childcare, transportation, interpretation, and food at all engagement events; and the development of unique, culturally relevant engagement approaches that weave in community identity and markers.

BIKEVC AND COMMUNITY ENVIRONMENTAL COUNCIL

BikeVC (formerly Bike Ventura), a non-profit organization focused on equitable bicycle education, empowerment, and advocacy, and Community Environmental Council (CEC), a non-profit organization focused on climate action, conducted a Community Transportation Needs Assessment in disadvantaged areas of Oxnard with funding from the California Air Resources Board in 2020.[24] The BikeVC and CEC team coordinated with the Mixteco Indigenous Community Organizing Project (MICOP), a non-profit organization focused on supporting indigenous migrant communities in California's Central Coast, to survey and interview community members, particularly migrant farmworker families, in Mixteco and Spanish, at food distribution sites with incentives, such as bike lights, to encourage people to participate. The project team also held pop-up bike repair events and a clean mobility demonstration event with bilingual and trilingual interpreters at locations in the communities identified with the greatest need (e.g. the Colonia Gym, Meta St Homes, and Camino del Sol). This needs assessment illustrates the significance of meeting people in their community and taking time to build relationships and trust to gain meaningful insight on the challenges and desires people have around safety and mobility.

CITY OF PHILADELPHIA DRIVING EQUITY ACT

In November 2021, Philadelphia Mayor Jim Kenney signed the Driving Equity Act, which banned the Philadelphia Police Department from conducting traffic stops within the city for secondary violations.[25] Secondary violations include driving with a broken brake light, a single headlight, or a registration plate that is not clearly visible. The purpose of this legislation is to reduce the number of interactions between the police and drivers, particularly as data that showed Philadelphia police pulled over a disproportionate number of Black drivers for secondary traffic violations compared to white and Latino drivers.

Several other jurisdictions across the country, such as Minneapolis and Los Angeles, are scaling back or reassessing the role of police in secondary traffic stops with the intent to address historic inequities in enforcement and focus enforcement efforts on more serious and dangerous offenses, such as speeding..

Implementing and Sustaining a Culture of Transportation Safety

Implementing and sustaining a culture of transportation safety will be a key component in Oxnard achieving its roadway safety goals. Shifting the culture to uphold safety as the top transportation priority both within City departments and among Oxnard residents will help lead to the development of a Safe System. The table on the following page describes the top three recommendations for achieving this culture shift, key partners in this work, and examples relevant to Oxnard.

Safe Road Users

Focus on human vulnerability when planning and implementing street safety strategies, with an emphasis on people who travel by foot, bicycle or wheelchair, children and seniors. Prioritize equitable strategies that will best serve the Oxnard community.

Safe Roads

Prioritize roadway design changes throughout Oxnard that address the factors contributing to severe injury and fatal collisions, including improvements that separate modes in time and space, and reduce severity if collisions do occur.

Safe Speeds

Use a multidisciplinary approach - roadway design, policy, education, and enforcement strategies - that induces drivers to travel at safe speeds that will reduce injuries even when human error inevitably leads to collisions.

Safe Vehicles

Proactively plan for a connected and autonomous vehicle fleet, accounting for related safety considerations, prioritizing investments in advanced signal infrastructure and other ITS projects.

Post-Crash Care

Partner with law enforcement and emergency response to identify strategic investments in areas such as collision response, collision site assessment, and collision reporting and database management practices.

Why the Safe System approach?

Safe System is the foundational roadway safety strategy nationally and in California.

California: 2020-2024 Strategic Highway Safety Plan

- Integrate Equity into all aspects of the plan to address institutional and systemic biases.
- Implement Safe System Approach which aims to eliminate fatal and serious injuries for all road users through a holistic view of the roadway system.
- Caltrans has adopted a 2050 Vision Zero goal.

National: USDOT National Roadway Safety Strategy

- The USDOT National Roadway Safety Strategy is built on the Safe System approach.
- FHWA fully supports the vision of zero deaths and serious injuries on the Nation's roads.
- New federal grant funding programs, such as the Safe Roads and Streets for All (SS4A) grant, require a local commitment to Vision Zero and Safe System.

TOP THREE RECOMMENDATIONS FOR IMPLEMENTING AND SUSTAINING A CULTURE OF TRANSPORTATION SAFETY IN OXNARD

Recommendation	Partners	Examples	Opportunity
Incorporate safety strategies into existing programs, such as street maintenance and repair and CIP	Public Works Department, City Council	**City of Goleta: 2019-21 Citywide Strategic Plan** The City of Goleta lists in its Citywide Strategic Plan the goal of incorporating Vision Zero plans into transportation project design, specifically for repaving projects. **City of Alameda: Vision Zero Action Plan – Capital Projects List** The City of Alameda specifically identifies the CIP projects that align with its Vision Zero Action Plan and updates this list annually. The City also indicates if these projects are on their designated "high injury corridors" and where they include socially vulnerable areas. **City of Alameda: Policy on Street Width, Lane Width, Crosswalks, and Bulb-Outs (2020)** Alameda has adopted a resolution requiring right-of-way space be allocated during roadway redesign and repaving projects to align with safety priorities, including minimizing turning speeds and pedestrian crossing distances, setting a standard 10 foot travel lane width, and providing for separated bike lanes as a default	Require "Connection to Safety" section (similar to General Plan Consistency required section) for all roadway projects in CIP, including whether or not projects are located at hot spots identified within the LRSP Document how safety projects have been prioritized for implementation in CIP Adopt roadway design guidelines and policies that prioritize safety
Fiscal and employee resources to sustain efforts	Public Works Department, City Council	**City of Tampa: Vision Zero Coordinator** The City of Tampa has a dedicated staff member to manage the city's Vision Zero Action Plan. The role includes planning and design work, public relations, and community engagement. **City of Boulder: Transportation Operations Engineer - Vision Zero** Boulder has an engineer dedicated to Vision Zero. The role includes reviewing crash data and coordinating with various stakeholders, such as law enforcement and street maintenance. **Safety Champion: Elected Official – Mayor John Bauters** Emeryville Mayor John Bauters believes that elected officials can help "set the tone" and bring the community together to address concerns. Mayor Bauters has committed to prioritizing improvements along the high-injury network and a commitment to a permanent slow streets program. **City of Fort Worth: Safety/Mobility Bond Package** Voters within the City of Fort Worth supported a bond measure to allocate $5 million to the City's Vision Zero Program. The bond measure includes multimodal safety improvements, such as new crosswalks, streetlights, and flashing beacons.	Hire 1 FTE tasked with coordination, delivery, and evaluation of safety projects Identify elected official, community stakeholder, and internal staff safety champions Identify dedicated funding source for safety project implementation *and* maintenance

Recommendation	Partners	Examples	Opportunity
Strategic partnerships to cultivate citywide culture of transportation safety	Elected officials, School Districts, Schools, Oxnard Police Department, and advocacy groups	**City of Oxnard and Oxnard Police Department: Supporting unhoused residents to increase roadway safety.** The City of Oxnard through its **Five-Year Homeless Plan** identified safety improvements to reduce crashes between vehicles and unhoused individuals. This includes providing safe crossings between shelters and social services. Additionally, education campaigns could be leveraged through the Oxnard Police Department's **Overdose Rescue Kit Distribution** by including roadway safety information, improving outreach to unhoused community members. **Oxnard Police Department Educational Programs: Choose Your Ride and Know Your Limit** These programs by the Oxnard Police Department are intended to help educate drivers on the risks of impaired driving and some of the options that are available rather than getting behind the wheel while under the influence. **Los Angeles County: Vision Zero Plan 2020-2025** Los Angeles County created an organizational structure to oversee the County's Vision Zero Action Plan. This structure is comprised of a variety of stakeholder groups both within the County, external organizations, and the community as a whole. **City of Fremont: Vision Zero 2020 Action Plan** The City of Fremont Vision Zero Action Plan calls on including everyone to make safety a citywide priority. Examples include the City newsletter highlighting the Vision Zero Program, a local Girl Scout starting a program to prevent distracted driving, and local community college students creating educational videos. **Community-Based Organizations:** Vision Zero grant money directed to nonprofit organizations serving disadvantaged communities is a critical aspect of increasing roadway safety. In Washington DC, money from automated traffic enforcement was distributed via a grant to a Gearin' Up Bicycles, which encourages cycling through pop-up bike shops and education campaigns specifically in historically underserved neighborhoods. Local opportunities to leverage similar benefits include organizations like the Oxnard Bike HUB.	Identify safety as a Citywide priority, across all departments Infuse safety in all City and community programs Connect with homeless services providers to incorporate pedestrian safety topics and resources in outreach

What does culture shift for a community look like in practice?

1

Choice: Not adopting a Vision Zero goal

Consequences:

- Lack of focus on elimination of fatalities and severe injuries
- Safety is not core driver of capital projects, which may result in fringe safety improvements

Shift: Adopt a Vision Zero goal

2

Choice: Focus on vehicle throughput over safety

Consequences:

- Pedestrians disproportionately experience delay compared to vehicles
- Pedestrian crossing opportunities do not reflect desire lines
- Bicyclists lack sufficient roadway space to comfortably travel along corridors

Shifts:

- Think about person delay rather than LOS. Prioritize pedestrian desire lines, access, delay, and exposure time when making crosswalk spacing and marking decisions.
- Establish minimum sidewalk and bicycle lane dimensions and standard designs that provide sufficient space for all modes

Funding

While the primary purpose of this LRSP is to prepare the City of Oxnard to submit successful Highway Safety Improvement Program (HSIP) applications, safety projects can be funded through a wide range of additional sources at the regional, state, and federal levels. HSIP funds are largely awarded based on a benefit/cost analysis using a set of Caltrans-approved countermeasures with documented collision reduction factors and historic collision data. While many safety projects will perform well in the HSIP process, others may be successfully funded through other sources that consider additional factors, such as the Active Transportation Program (ATP). The sources in this chapter may be used to fund a broad scope of projects targeting air quality and sustainability, affordable housing, and transportation. Successful projects often entail creative solutions that address impact areas beyond transportation safety alone.

In addition to grant funding opportunities, there are several additional opportunities for Oxnard to find financial support for implementing safety projects, including identifying dedicated General Fund support, local bonds and sales tax measures, and identifying roadway safety enhancements related to new public

Funding Opportunities

LOCAL AND REGIONAL SOURCES

SCAG COMMUNITY STREETS MINI-GRANT PROGRAM

Competitive community grant program that funds safety projects. Awards are made up to $10,000. Projects aim to build street-level community resiliency and increase the safety of people most harmed by traffic injuries and fatalities.

NEXT FUNDING OPPORTUNITY

2023 TBD; Previous cycle closed April 2022

SCAG SUSTAINABLE COMMUNITIES PROGRAM

Provides direct technical assistance to SCAG member jurisdictions to complete planning and policy efforts that enable implementation of the regional SC.

Grants are available in four categories: Civic Engagement, Equity & Environmental Justice; Smart Cities & Mobility Innovations; Housing & Sustainable Development; Active Transportation & Safety.

NEXT FUNDING OPPORTUNITY

Call for projects opening in Fall 2022 for Civic Engagement, Equity & Environmental Justice; Prevoius cycle funding 2020

VCTC TRANSPORTATION DEVELOPMENT ACT (TDA) AND CONGESTION MITIGATION AND AIR QUALITY (CMAQ) GRANT OPPORTUNITIES

The Ventura County Transportation Commission (VCTC) makes available funding from Article 3 of the TDA and the CMAQ available for infrastructure projects involving non-motorized modes, as well as projects that reduce pollution and/or congestion across the County. TDA funds can be used on bicycle and pedestrian projects in addition to bicycle and pedestrian safety and outreach measures. CMAQ funds may be used on bike/pedestrian improvements.

NEXT FUNDING OPPORTUNITY

September 23, 2022

STATE SOURCES

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 (SRTS), 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, Office of State Programs.

NEXT FUNDING OPPORTUNITY

TBD; Previous cycle closed June 15, 2022

CALIFORNIA NATURAL RESOURCES AGENCY URBAN GREENING PROGRAM

This program supports projects that "use natural systems or systems that mimic natural systems to achieve multiple benefits." Eligible projects include "Non-motorized urban trails that provide safe routes for travel between residences, workplaces, commercial centers, and schools."

NEXT FUNDING OPPORTUNITY

TBD; Previous cycle closed Spring 2022

CALIFORNIA OFFICE OF TRAFFIC SAFETY (OTS) GRANT PROGRAMS

OTS administers traffic safety grants in the following areas: Alcohol Impaired Driving, Distracted Driving, Drug-Impaired Driving, Emergency Medical Services, Motorcycle Safety, Occupant Protection, Pedestrian and Bicycle Safety, Police Traffic Services, Public Relations, Advertising, and Roadway Safety and Traffic Records.

NEXT FUNDING OPPORTUNITY

2023 TBD; Previous cycle closed January 31, 2022

CALIFORNIA STRATEGIC GROWTH COUNCIL (SGC) TRANSFORMATIVE CLIMATE COMMUNITIES (TCC) PROGRAM

The Transformative Climate Communities (TCC) Program empowers the communities most impacted by pollution to choose their own goals, strategies, and projects to reduce greenhouse gas emissions and local air pollution.

NEXT FUNDING OPPORTUNITY

TBD; Previous cycle closed July 1, 2022

CALTRANS SUSTAINABLE COMMUNITIES GRANTS

To encourage local and regional planning that furthers state goals, including, but not limited to, the goals and best practices cited in the Regional Transportation Plan Guidelines adopted by the California Transportation Commission.

NEXT FUNDING OPPORTUNITY

Grant applications due October 2022

HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

HSIP is a core federal-aid program to States for the purpose of achieving a significant reduction in fatalities and serious injuries on all public roads. California's Local HSIP focuses on infrastructure projects with nationally recognized crash reduction factors (CRFs). This is the primary grant funding source to support roadway projects identified through the LRSP.

NEXT FUNDING OPPORTUNITY

Cycle 11 application materials due September 12, 2022.

SB 1 LOCAL STREETS AND ROADS PROGRAM (LSRP)

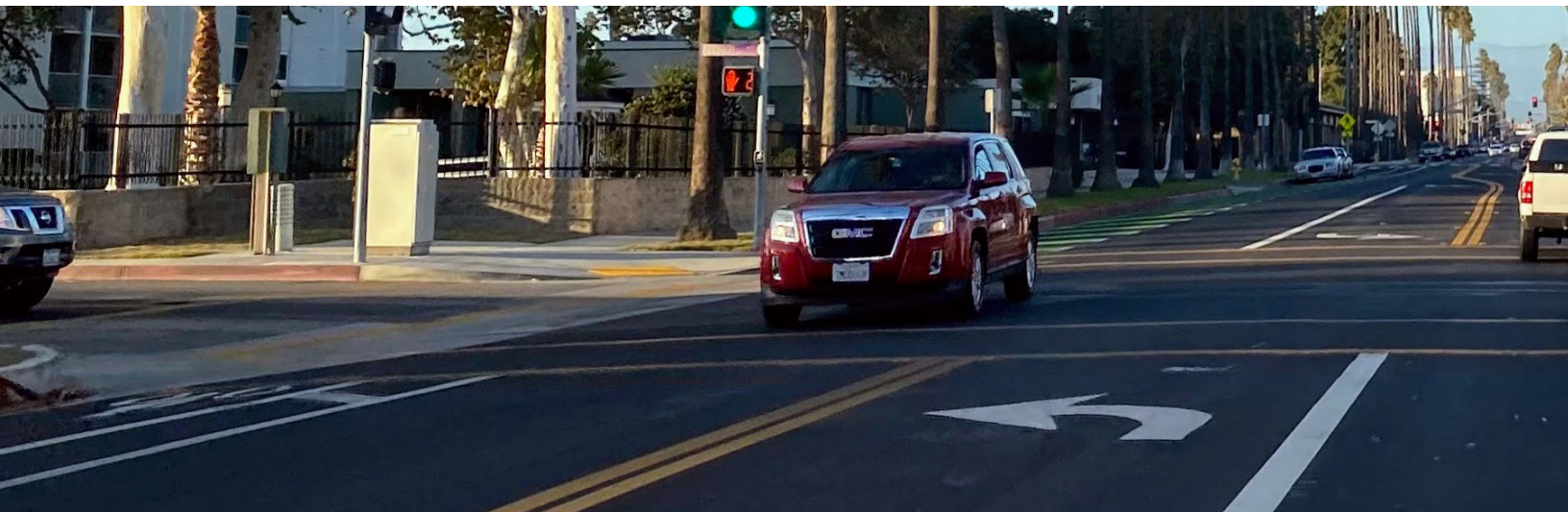
SB 1 dedicated approximately $1.5 billion per year in new formula revenues apportioned by the State Controller to cities and counties for basic road maintenance, rehabilitation, and critical safety projects on the local streets and roads system.

NEXT FUNDING OPPORTUNITY

Expected Fall 2022

SB 1 SOLUTIONS FOR CONGESTED CORRIDORS PROGRAM (SCCP)

The Solutions for Congested Corridors Program funds projects designed to reduce congestion in highly traveled and highly congested corridors. This statewide, competitive program makes $250 million available annually for



projects that implement specific transportation performance improvements and are part of a comprehensive corridor plan by providing more transportation choices while preserving the character of local communities and creating opportunities for neighborhood enhancement.

NEXT FUNDING OPPORTUNITY

2023 TBD

SB 1 STATE TRANSPORTATION IMPROVEMENT PROGRAM (STIP)

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.

NEXT FUNDING OPPORTUNITY

Biennial, 2024 TBD; Previous cycle closed Spring 2022

SB1 LOCAL PARTNERSHIP PROGRAM (LPP)

The purpose of this program is to provide local and regional transportation agencies that have passed sales tax measures, developer fees, or other imposed transportation fees with a continuous appropriation of $200 million annually from the Road Maintenance and Rehabilitation Account to fund road maintenance and rehabilitation, sound walls, and active transportation projects. There is also a competitive grant portion of this project.

NEXT FUNDING OPPORTUNITY

2023 TBD

SGC AFFORDABLE HOUSING AND SUSTAINABLE COMMUNITIES (AHSC) PROGRAM

The Affordable Housing and Sustainable Communities (AHSC) Program makes it easier for Californians to drive less by making sure housing, jobs, and key destinations are accessible by walking, biking, and transit.

NEXT FUNDING OPPORTUNITY

Round 7 due date in February 2023

FEDERAL SOURCES

RAISE GRANTS (FORMERLY BUILD AND TIGER)

The Rebuilding American Infrastructure with Sustainability and Equity, or RAISE Discretionary Grant program, provides a unique opportunity for the DOT to invest in road, rail, transit and port projects that promise to achieve national objectives. The program selection criteria this cycle encompass safety, environmental sustainability, quality of life, economic competitiveness, state of good repair, innovation, and partnerships with a broad range of stakeholders. The first round of RAISE grants awarded $417m to bicycle and pedestrian projects, and $30m for planning grants (eligible for the first time).

NEXT FUNDING OPPORTUNITY

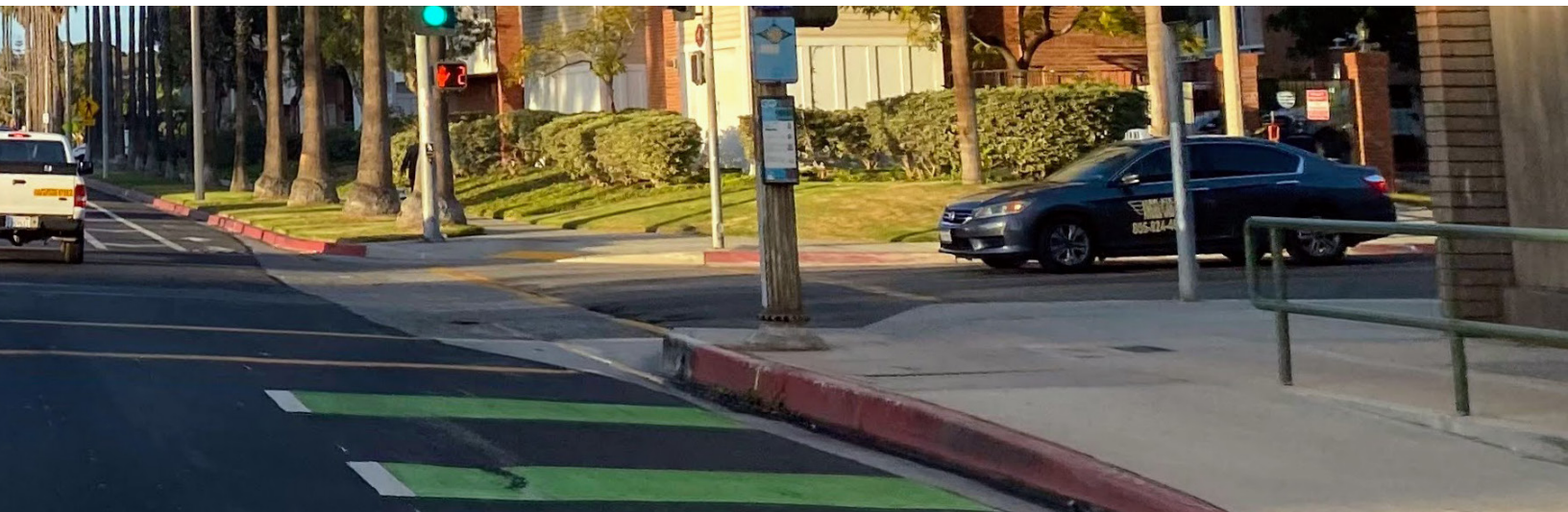
TBD; Previous cycle closed April 2022

SAFE STREETS FOR ALL GRANTS

The recent federal infrastructure bill established the new Safe Streets for All program to provide $5 billion in grant funding to develop and implement Vision Zero safety plans. Current legislation emphasizes funding of planning efforts, but the focus on implementation funding is expected to increase over the next few years.

NEXT FUNDING OPPORTUNITY

Notice of Funding Opportunity open, applications due September 15, 2022



Roadway Design Standard Considerations

In addition to project-specific safety countermeasures shown in the countermeasure toolbox, the City may choose to consider updating and developing new roadway design and signal policies to help guide the implementation of safety-focused decisions network-wide. Options for these policy changes are listed below.

Signal Policies

» **Accessible Pedestrian Signal (APS) Push Buttons:** Continue to implement APS push buttons at all signals

» **Emergency Vehicle Preemption:** Continue to implement emergency vehicle preemption at all signals.

» **Flash Don't Walk Time:** Review City practice for calculating pedestrian clearance time with the next update to City signal timing policy, using best practice guidance, with special considerations for longer walk times near schools and senior centers.

» **Leading Pedestrian Intervals (LPI):** Implement LPIs at signals in high pedestrian activity locations, such as Downtown, schools, and retail areas, as well as locations with history of pedestrian collisions with turning vehicles.

» **Maximum Cycle Length:** Consider establishing a practice to determine a maximum cycle length for a corridor or intersection, especially at hot spot locations. Shorter signal cycles can reduce overall pedestrian wait times and result in improved pedestrian compliance.

» **Minimum Green Time:** Review industry best practices, State and Federal guidance to update the practice for calculating minimum green time with the next update to City signal timing policy. The time for pedestrians and/or bicyclists crossing with a phase must also be considered and included in the minimum phase length.

» **Pedestrian Countdown Signals:** Continue to implement pedestrian countdown heads at all signals.

» **Pedestrian Recall:** Consider implementing pedestrian recall mode to traffic signals with high pedestrian activity or collision history. This means that the pedestrian would not have to push a button in order to see the "Walk" phase.

» **Signal Coordination to Support Lower Speeds:** Investigate opportunity locations for controlling the travel speed of vehicles by optimizing the cycle length, splits, and offsets to the posted speed or lower where appropriate. The concept of a "slow green wave" is a series of traffic signals coordinated to allow for uninterrupted traffic flow of vehicles traveling at the speed limit or lower and require those traveling at faster speeds to stop more frequently.

» **Yellow and All Red Clearance Time:** Review City practice for calculating intersection clearance times and update signal timing policy to match industry best practice.

Street Design Policies

- **Advance Stop Bars:** Advance stop bars should be used at all stop-controlled and signalized intersections with marked crosswalks.
- **Bike Lane Conflict Zones:** Design new and upgrade existing bike lanes to extend to the intersection, using green conflict striping for conflict zones with turning vehicles.
- **Bikeway Selection:** Use best practice guidance, such as FHWA Bikeway Selection Guide, to select bike facilities for implementation based on roadway elements such as speed and vehicle volume.
- **Crosswalk Markings:** Establish policy for recommended use of high visibility crosswalk striping and use of "triple four" crosswalk design with raised pavement markers. Priority locations include signals, school crossings, areas with high pedestrian demand, and crossings with collision history.
- **Curb Cuts/Driveway Placement:** Consolidate existing retail driveways and plan for fewer driveways in future development where possible, to eliminate potential conflict points.
- **Dual Curb Ramps:** As intersections are upgraded, install directional dual curb ramps, to allow for better accessibility to crosswalks.
- **Lane Widths:** Consider narrowing existing vehicle travel lane widths and adopting maximum lane width guidelines, based on roadway context. A reduction in lane width produces a traffic calming effect by encouraging drives to travel at slower speeds. Other considerations for setting minimum lane widths are truck routes, transit routes, and locations where adjacent lanes are in the opposite direction.
- **Red Curb/Daylighting:** Red curb should be installed at unsignalized intersections and driveway locations to provide for sufficient sight lines between drivers and people traveling on foot, by bike, or by car. This practice is also known as "daylighting" the intersection.
- **Roadway and Pedestrian-Scale Lighting:** Use best practice guidance to identify locations where additional roadway and pedestrian-scale lighting may be needed. Prioritize locations with nighttime collisions.
- **Sidewalk Widths:** Recommend that the City consider a contextual approach to setting the minimum widths of sidewalks with the next update to the street design standards. In accordance with ADA accessibility guidelines, sidewalks should at least 5 feet in width. A contextual approach for sidewalk width setting could take into consideration the street type and surrounding land use, requiring wider sidewalks on some streets to enhance safety and comfort for pedestrians.
- **Uncontrolled Crosswalk Enhancement Selection:** Use best practice guidance, such as FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations, to select crosswalk enhancements (e.g. Pedestrian Hybrid Beacon, Rectangular Rapid Flashing Beacon, pedestrian refuge islands) based on roadway elements such as speed and vehicle volume.

Other Policies

» **Bus Stop Placement and Supportive Facilities:** Prioritize pedestrian and bike safety improvements that provide connections to Oxnard Transit Center and bus stops. At minimum, bus stops should be co-located with an adjacent crosswalk (within 100 feet).

» **Pedestrian Crossing Guidelines:** Develop a policy to guide the spacing of marked crosswalks throughout the City based on context, such as proximity to schools and other key destinations, transit stops, and hot spot locations.

» **Quick Build Toolkit:** Identify a quick build toolkit that meets the City's design standards, which can allow for lower cost and quicker implementation for many safety countermeasures, such as curb extensions, bike facilities, and traffic calming.

» **Speed Limit Setting:** Follow new AB 43 policies in reviewing and updating posted speeds throughout the City, with an emphasis on identified hot spot and collision profile locations.

» **Traffic Calming Project Prioritization:** Develop a traffic calming toolkit and strategy for implementation, which includes prioritizing projects based on hot spot locations and safety trends identified in the LRSP.

Appendices

Appendix A
Stakeholder Meeting Summaries

Appendix B
Existing Efforts Memorandum and Opportunity Areas Matrix

Appendix C
Collision Analysis Memo and Crossroads Data Management Plan

Appendix D
Annual Traffic Safety Report Template

APPENDIX A
Stakeholder Meeting Summaries


Oxnard Blvd
PESOS
CAMBIO DE CHEQUES

Oxnard Local Road Safety Plan Stakeholder Meeting #1

Thursday, September 23
11:00 AM – 12:30 PM

Notes

1. Introductions
    a. Mentimeter results included as attachment
2. Overview of Roadway Safety
    a. Local Road Safety Plan Overview
        i. The LRSP covers all modes of transportation (walking, biking, taking transit, driving)
    b. Connection to the Oxnard Sustainable Transportation Plan
        i. All comments shared with the STP and LRSP teams will be incorporated into both projects.
    c. Overview of the Safe System approach
3. Oxnard Safety Vision and Values
    a. Current projects:
        i. The City has received funding to develop Safe Routes to School plans for 26 schools (Phase I). Of those 26 schools, 5 schools have received additional funding to implement improvements. The City is looking into using federal relief funds to implement crosswalks across the city, including around schools. The City will submit a grant application for a second round of

LOCATION:

Teams Video Call

ATTENDEES:

Tony Briscoe, Oxnard School District
Norma Magana, Oxnard School District
Corina Cherry, Oxnard Union High School District
Ted Lawrence, Oxnard Union High School District
Chris Renbarger, Oxnard College
Lt. Cesar Romero, Oxnard College
Sgt. Rick Vazquez, Oxnard Police Department
Commander Alex Arnett, Oxnard Police Department
Officer Jose Diaz, Oxnard Police Department
Scott Brewer, Oxnard Fire Department
Austin Novstrup, Gold Coast Transit
Amanda Fagan, VCTC Planning
Debbie O'Leary, City of Oxnard
Tim Bochum, City of Oxnard
Steve Brown, Fehr & Peers
Emily Finkel, Fehr & Peers
Rachel Om, Fehr & Peers

Safe Routes to School funding to cover the remaining schools in the city.

b. Safety concerns:
    i. Driving under the influence
    ii. Driving too fast
    iii. Drivers don't stop at stop signs
    iv. Lack of Class IV infrastructure to separate bicyclists, pedestrians, and vehicles
    v. Uneven sidewalks due to tree roots
    vi. Lack of awareness around people traveling in wheelchairs
    vii. Poor driving habits, such as at schools for pick up and drop off.

4. State of Safety in Oxnard
    a. Overview of recent safety efforts
    b. Overview of collision trends
    c. Overview of collision locations
        i. Skateboarders near skate park riding wrong way
        ii. Bus stops at schools: staff try to coordinate traffic flow but can be challenging given high levels of activity
        iii. Drivers passing bus stops with red flashers on
        iv. Gary & Rose: City recently signalized the intersection, added crosswalks, and bicycle detection.
        v. Rio School District: lack of sidewalks or bike lanes due to boundaries near County/unincorporated areas.
5. Mapping Activity
    a. Input additional comments here: https://arcg.is/1SG99v0 or reach out to Rachel with specific locations.
6. Project Next Steps
    a. Introduction to Safety Countermeasures
    b. Grant funding opportunities:
        i. Ventura County Transportation Commission's Incident Responders Grant Program Round 2 call for applications is available now, with applications due on September 30th. Grant guidelines and

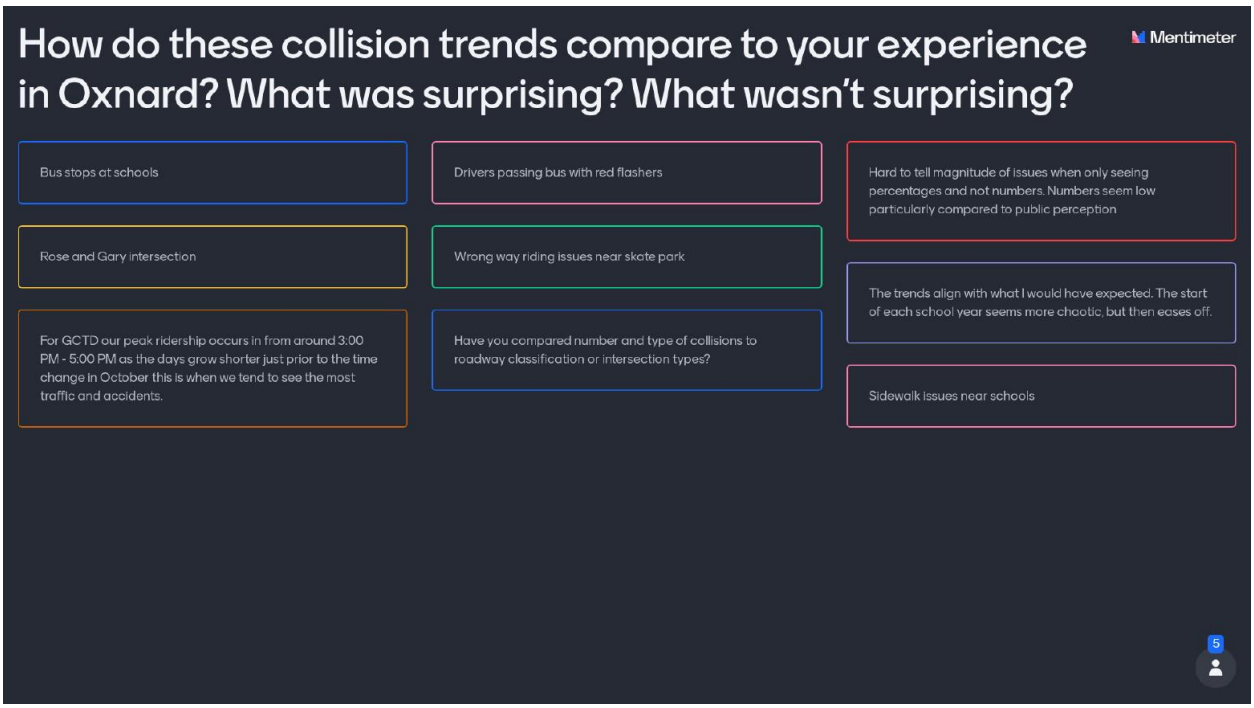
application information are available here: https://www.goventura.org/work-with-vctc/grant-opportunities/

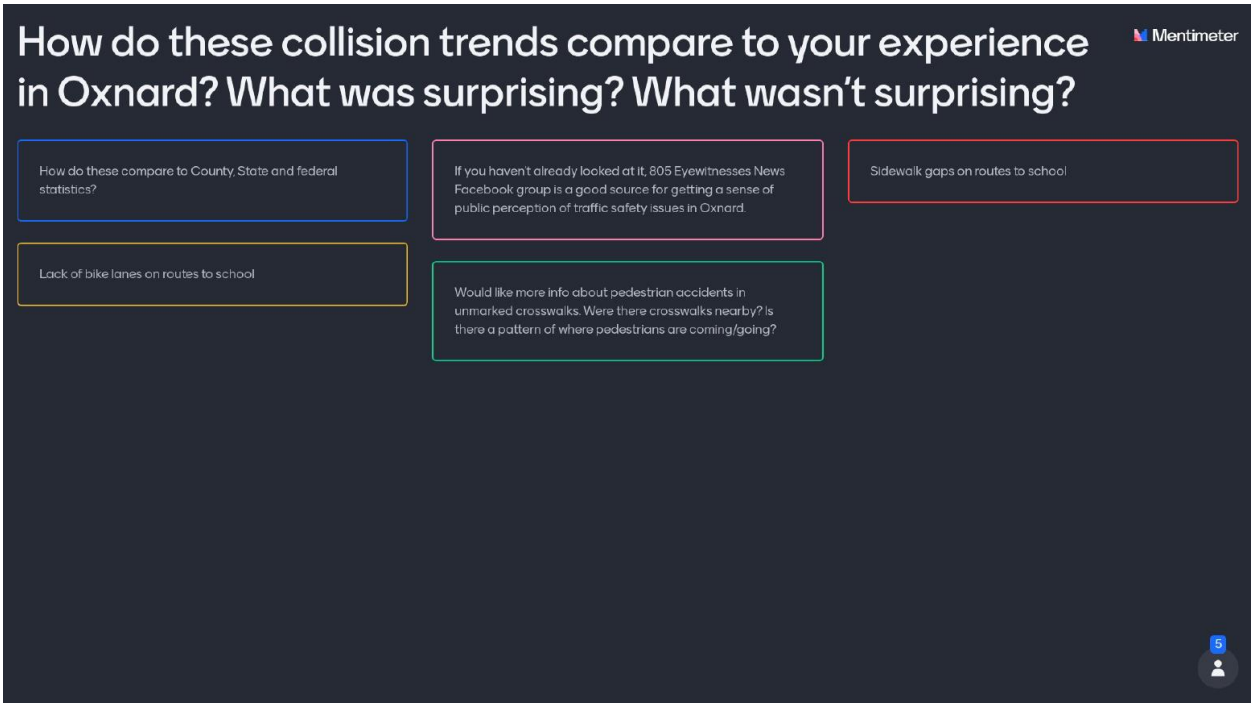
ii. The City will coordinate with schools to share how schools can apply for grant funding or support the City in applying for grant funding.

iii. Request for schools to send maps of detailed school boundaries, preferably in a GIS file (e.g. shapefile) to understand where students are traveling to/from.

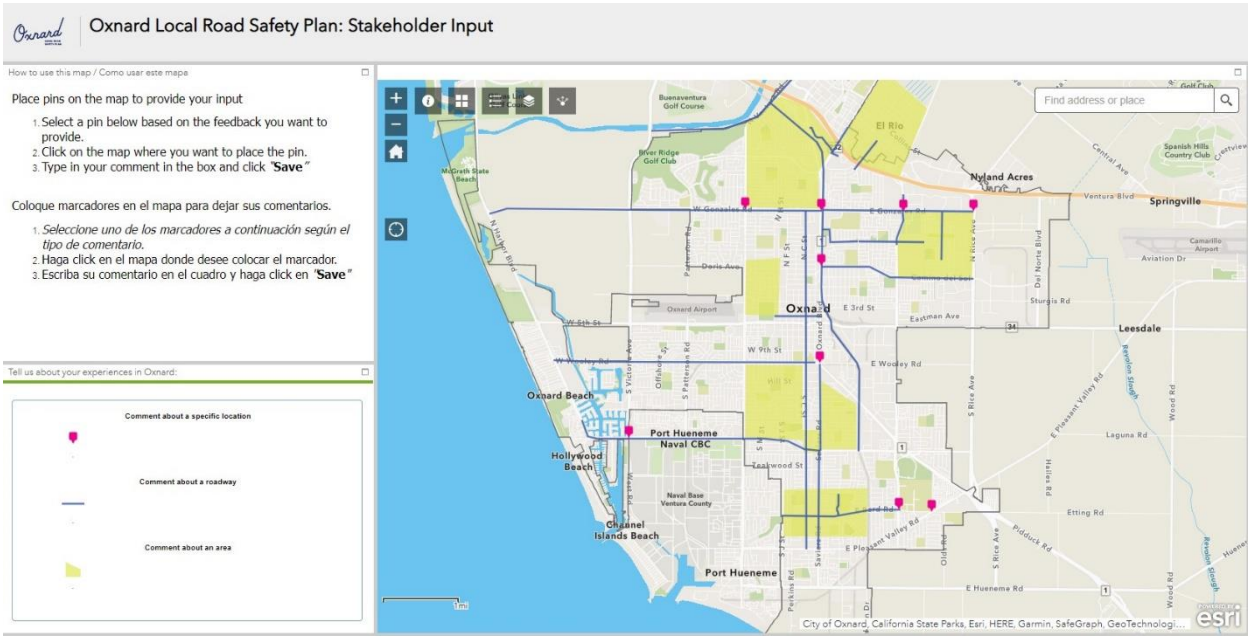
Mentimeter Results:


Imagine you're traveling down the street near your home or business in Oxnard - what are your safety concerns?
Mentimeter
3
Someone driving under the influence
5
Someone driving too fast
2
Lack of bicycle infrastructure
1
Lack of pedestrian crossings
2
Lighting conditions
4
Other
8


How do these collision trends compare to your experience in Oxnard? What was surprising? What wasn't surprising?
Mentimeter
Bus stops at schools
Drivers passing bus with red flashers
Hard to tell magnitude of issues when only seeing percentages and not numbers. Numbers seem low particularly compared to public perception
Rose and Gary intersection
Wrong way riding issues near skate park
The trends align with what I would have expected. The start of each school year seems more chaotic, but then eases off.
For GCTD our peak ridership occurs in from around 3:00 PM - 5:00 PM as the days grow shorter just prior to the time change in October this is when we tend to see the most traffic and accidents.
Have you compared number and type of collisions to roadway classification or intersection types?
Sidewalk issues near schools
5



Mapping Activity Results:



Oxnard Local Road Safety Plan Stakeholder Meeting #2

Thursday, April 7
3:00 PM – 4:00 PM

Notes

1. Introductions
    a. Since our last meeting, what have you noticed while traveling in Oxnard?
        i. More people walking, skateboarding, and biking, including for commuting.
        ii. Less students riding the bus due to COVID-19, and getting dropped off, biking, or walking instead.
        iii. Missing sidewalks in unincorporated parts of El Rio.
            1. Ventura County Public works received grant funding to install sidewalks, crosswalk improvements, and flashing lights for some pedestrian crossings. Construction is expected to begin in 2024.
        iv. Curvy roads have limited visibility for pedestrian crossings.
2. Project Recap and Status Update
    a. Completed safety analysis
    b. Wrapping up countermeasure selection
    c. Working on draft report
3. Emphasis Areas
    a. Collision Hot Spot Locations
        i. Gonzales Road:

LOCATION:

Teams Video Call

ATTENDEES:

Rita Galvan, Oxnard School District
Corina Cherry, Oxnard Union High School District
Wael Saleh, Rio School District
Lt. Cesar Romero, Oxnard College
Sergeant Rick Vazquez, Oxnard Police Department
Sergeant Rocky Marquez, Oxnard Police Department
Commander Marc Amon, Oxnard Police Department
Corporal Mike Wood, Oxnard Police Department
Austin Novstrup, Gold Coast Transit District
Claire Grasty, VCTC Transit
Amanda Fagan, VCTC Planning
Debbie O'Leary, City of Oxnard
Tatiana Arnaout, City of Oxnard
Steve Brown, Fehr & Peers
Emily Finkel, Fehr & Peers
Rachel Om, Fehr & Peers

1. Support for more pedestrian crossing locations across Gonzales Rd to accommodate pedestrian desire lines.
    a. The recommended pedestrian safety improvements along Gonzales take pedestrian collisions and pedestrian desire lines into consideration.
2. Identified need for pedestrian crossing infrastructure for bus stop west of Rose Ave & Gonzales Rd.
    a. Bus stops are one of the pedestrian generators that are taking into consideration for pedestrian safety improvements.
3. Police Department supportive of retroreflective backplates
    a. This will be noted in the LRSP.

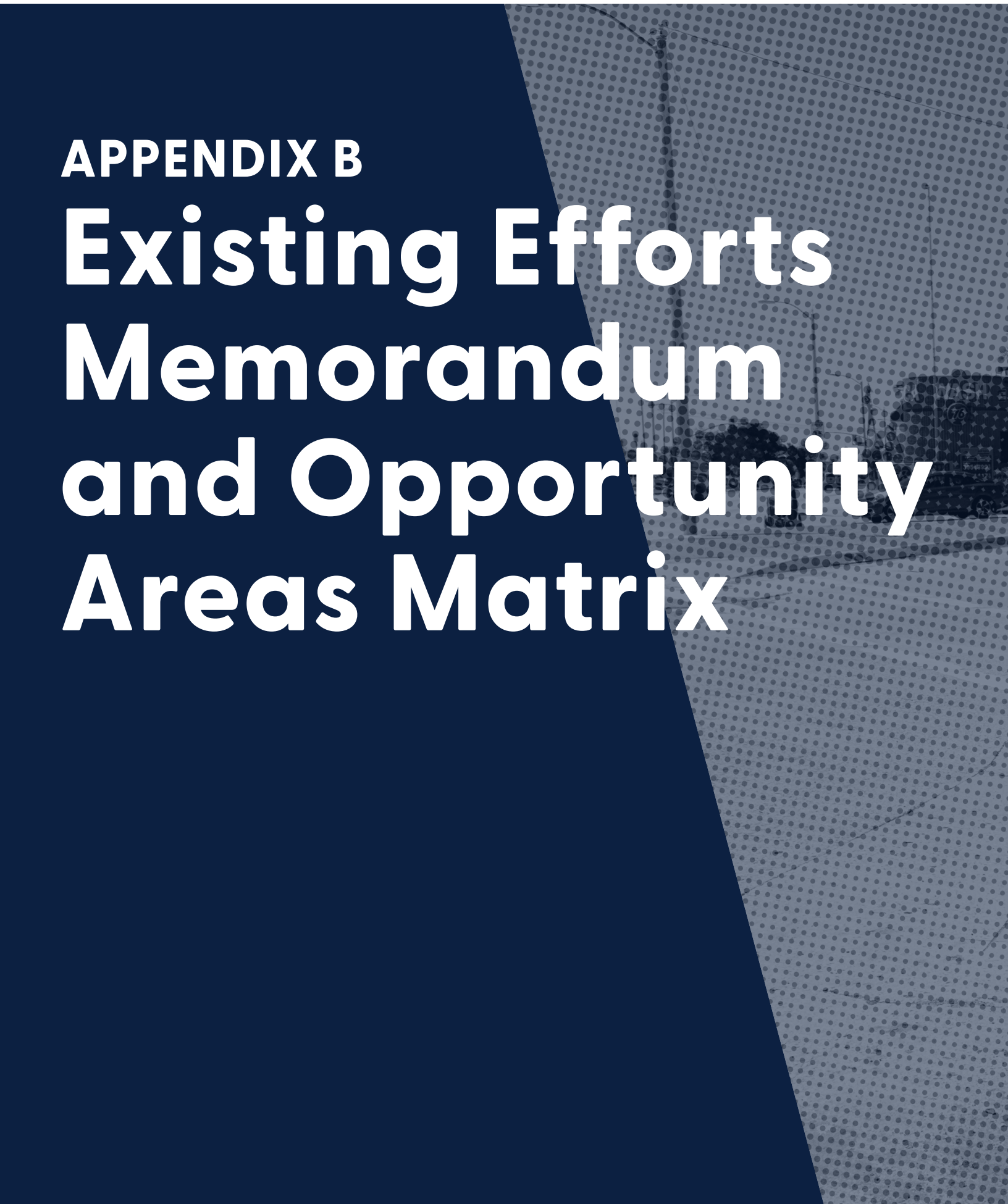
b. Collision Profiles
    i. Identified need for sidewalks in El Rio to support safe routes to school, such as for Rio Real and Rio Plaza Elementary Schools
        1. Will be addressed through Ventura County Public Works grant
    ii. GCTD supportive of curb extensions that could double as bus bulb outs, such as along C Street and Bard Rd, two of GCTD's busiest routes.
        1. This will be noted in the LRSP.

4. Partnership Opportunities
    a. VCTC Transit: ongoing campaign focused on increased awareness of people walking and biking (e.g. remind drivers to look both ways before turning right)
        i. This is a great example to include as part of the educational efforts for the LRSP.
    b. GCTD: ongoing late night safe rides pilot program
        i. GCTD to share flier with Oxnard PD to distribute at sobriety checkpoints
    c. Identified need for funding for school buses
        i. The LRSP will identify a variety of funding sources to support safety. School districts may be eligible to apply for the recently announced

Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project: https://californiahvip.org/. The program has a Public School Bus Set-Aside: https://californiahvip.org/wp-content/uploads/2022/03/HVIP-School-Bus-Fact-Sheet.pdf

d. Request for enforcement at school pick up/drop off (school zone speed limit) and for school buses (vehicles not stopping when bus is loading/unloading students)
    i. This partnership opportunity will be documented in the LRSP. This will also be addressed in the City's upcoming Safe Routes to School Program.
e. Oxnard PD: has OTS (bike and pedestrian focus) and OTS STEP grants for enforcement and education programs
    i. This will be noted in the LRSP and is an opportunity for partnership with the City's upcoming Safe Routes to School program.

5. Project Next Steps
    a. Implementation & Evaluation
    b. Draft Local Road Safety Plan



APPENDIX B
Existing Efforts Memorandum and Opportunity Areas Matrix

FEHR PEERS

Memorandum

Date: May 2022

To: Debbie O'Leary, City of Oxnard

From: Rachel Om, Emily Finkel, and Alex Melaragno, Fehr & Peers

Subject: Oxnard Local Road Safety Plan: State of the Current City Systems and Planning Documents Review

LA-3267

Existing Safety Efforts

Over the past several years, the City of Oxnard (City) has made investments in roadway safety through project implementation, grant applications, maintenance activities, and adoption of planning documents that identify priorities and future projects. Planning documents that have specific safety-related goals, policies, projects, and recommendations were reviewed to set the foundation for the LRSP. The planning documents include:

- Oxnard General Plan Circulation Element
- Bicycle and Pedestrian Facilities Master Plan (BPMP)
- Downtown Oxnard Vision Plan Charrette Report
- Oxnard Sidewalk Survey Report
- Oxnard Transportation Demand Management (TDM) Plan
- Capital Improvement Plan (CIP)
- Complete Streets Safety Assessment (CSSA)
- Downtown Strategic Plan
- Green Alleys Plan
- Oxnard Corridor Community Transportation Improvement Plan (OCCTIP)

City maintenance programs that are relevant to traffic safety were also reviewed to document safety considerations in routine City functions. The programs include the Streets Division of Public

Works, the Pavement Management System (PMS) Update, the City's Intelligent Transportation System (ITS) Master Plan, and the City's 311 Reporting System.

This summary organizes Oxnard's existing roadway safety efforts into the five categories of a Safe System, as defined by FHWA: safe roads, safe speeds, safe road users, post-crash care and safe vehicles.

Opportunity areas – specific locations where safety improvement opportunities have been identified through multiple prior planning efforts – are identified at the end of this memo. These opportunity areas will be included in the final Local Road Safety Plan.

Safe Roads

The Safe Roads Element of the Safe System Approach includes the physical design of roadways, including the separation of users in time and space, and whether designs are accommodating to human mistakes and injury tolerance levels. Roadway design projects with a focus on safety enhancements are summarized here.

Capital Improvement Program (CIP)

The City of Oxnard's 2021 CIP, *Our Assets, Our Safety, Our Future: 2021-2026 City of Oxnard Five Year Capital Improvement Program*, includes the following roadway safety projects:

Completed or Under Construction (as of May 2022)

- **Pedestrian Beacon Installation:** Completed in April 2020, new pedestrian crossing flashing beacons and signage along with ADA improvements and crosswalks were implemented in various locations throughout the City.
- **Rose Avenue & Gary Drive New Traffic Signal:** Completed in May 2020, the City installed a new traffic signal and pedestrian ADA improvements and crosswalks at the intersection of Rose Avenue & Gary Drive by Oxnard College.
- **Signal Improvements:** Funded and planned signal upgrade projects in the CIP consist of new signal heads, protected left turn phasing, bicycle detection, and LED lights at five intersections along Oxnard Boulevard and Saviers Road. Expected completion Winter 2022.
- **Sidewalks**: New sidewalks are under design for Rose Avenue from Auto Center Drive to Collins Street. Expected completion Fall 2022. New sidewalks are also planned for Ventura Blvd between Rose Ave and Balboa St. Expected completion is June 2023.
- **Active Transportation Improvements:** The funded active transportation projects in the CIP include Class II and III bicycle lanes, bicycle detection, and pedestrian curb extensions throughout the city. Completed in Winter 2021, new bicycle facility locations include C

Street from W. Gonzales Road to Hueneme Rd. Bicycle lanes are under design for Oxnard Boulevard from US-101 to Gonzales Road. Expected completion is December 2023.

- **Grade Separation:** The City plans to construct grade separation bridge over UPRR tracks, two new signals, bike lanes and sidewalks at Rice Avenue & Fifth Street. Expected completion Summer 2025.

Additional Projects

- 4th Street Mobility Improvements: widen sidewalks, upgrade streetlights, install bike facilities, and improve bus stop
- Adaptive traffic signals on Rose Avenue and Gonzales Road for 33 intersections
- Etting Road bike lane and sidewalks
- Hemlock Street curb extensions and pedestrian crossing beacons
- La Colonia bicycle boulevards and green alleys
- Traffic signal modernization at City's 164 signals

Adopted Plans

The City's Circulation Element, BPMP, OCCTIP, Downtown Vision Plan, Green Alleys Plan, TDM Plan, CSSA, and Oxnard Vision Plan feature infrastructure recommendations that prioritize safer roadway design.

Circulation Element: The Circulation Element establishes a goal for safe bicycle and pedestrian circulation throughout the city. For example, the Circulation Element recommends closing gaps in bicycle and sidewalk connectivity and improving ADA compliance at curb ramps and crosswalks.

Complete Streets Safety Assessment: The Oxnard Complete Streets Safety Assessment includes a review of existing conditions, a walk audit, and recommendations to improve safety and accessibility for people walking and biking in Oxnard. The CSSA benchmarks key strengths, enhancement areas, and opportunity areas for the City's existing bicycle and pedestrian programs, policies, and practices. Recommendations include curb extension, high visibility crosswalks, sidewalk widening, increasing pedestrian crossing time, and conflict striping at intersections for bike lanes.

Bicycle and Pedestrian Facilities Master Plan: The BPMP provides recommendations for Class I, II, and III bicycle facilities throughout Oxnard, as well as ADA improvements, countdown timer pedestrian signal heads, and pedestrian refuge islands. The plan also defines priority bicycle and pedestrian projects for the City to implement as funding becomes available.

Oxnard Corridor Community Transportation Improvement Plan: The OCCTIP recommends infrastructure upgrades, such as shared bike lanes, sidewalks, new signals, roundabouts, and ADA improvements, at various locations throughout the city along with funding recommendations.

Downtown Vision Plan and Downtown Strategic Plan: The Downtown Vision Plan and Downtown Strategic Plan are important documents in Oxnard's Safe Roads efforts as they feature extensive community engagement and input. These plans identify and recommend opportunities for safer roadway infrastructure specifically in Downtown Oxnard, including complete streets concepts and safe bicycle connectivity in the Downtown core.

Green Alleys Plan: The Green Alleys Plan integrates Safe Roads concepts into Oxnard's network of alleyways. This Plan incorporates a shared street approach to alleys by reimagining them as places with pedestrian, bicycle, and community-serving opportunities. Safety improvements outlined in the Green Alleys Plan include signage, bicycle facilities, and pedestrian crossing enhancements, and priority locations include La Colonia, South Winds, and Downtown.

Oxnard Vision Plan: As a part of the Southern California Association of Governments HQTA pilot, the Oxnard Vision Plan includes Safe Roads goals of promoting safety, reducing collisions, and supporting multi-modal travel in Downtown Oxnard. Specific infrastructure recommendations in the Oxnard Vision Plan include bicycle facilities, curb extensions, pedestrian scramble crosswalks and other crossing enhancements, and lighting improvements.

Accessible Sidewalk and Ramp Upgrades: The 2015 Sidewalk Survey included an inventory of existing sidewalks, curb ramps, and traffic calming devices. The Sidewalk Survey also provides recommendations for high priority areas.

Grant-Funded Projects

The City of Oxnard has received Active Transportation Program (ATP) and Highway Safety Improvement Program (HSIP) for roadway design projects.

ATP Grant Funding: In 2021, Oxnard received funding for a Safe Routes to Schools program and mobility improvements for the 4th Street corridor through the most recent ATP Cycle 5. The Safe Routes to Schools improvements include physical curb extensions, accessible curb ramps, high-visibility crosswalks, roadside signs, traffic pavement markings and striping, and rectangular rapid flashing beacons (RRFBs) at six elementary schools. The Safe Routes to Schools program also includes walkability assessment at 26 schools to identify infrastructure improvements. The mobility improvements for the 4th Street corridor include pedestrian crossing enhancements, bicycle facilities, street lighting, and modified traffic signals.

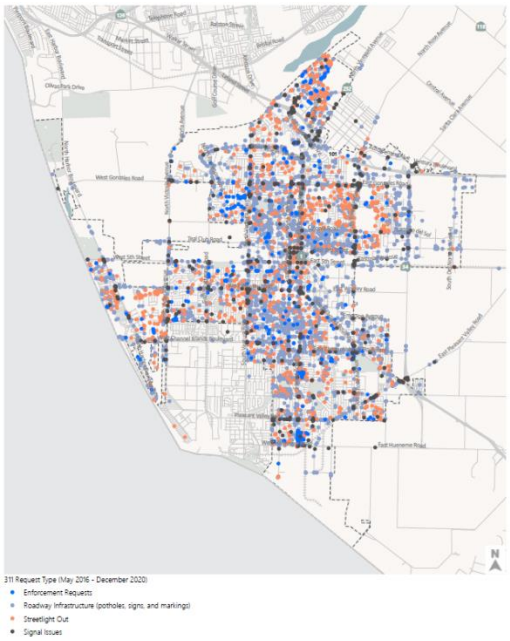
HSIP Grant Funding: In 2021, Oxnard received HSIP funding as part of the most recent HSIP Cycle 10 for signal improvements, streetlights, and accessible crossing facilities at ten intersections, as well as pedestrian crossing upgrades near Ramona Elementary School.

Maintenance Programs

Streets Division of Public Works: The Streets Division of Public Works currently employs a reactive approach to repairs, under the philosophy that quickly addressing street maintenance issues avoids negative safety implications that may stem from disrepair. The division focuses on repairing inadequate structures back to their original, intended state. Although much of the Streets Division work is inherently related to safety, the division does not currently prioritize maintenance based on collision or other safety data, nor does it have in place a process for bundling safety improvement projects with maintenance projects for priority safety locations.

Pavement Management System (PMS): The PMS evaluates pavement conditions throughout the city and presents budget scenarios for maintaining or improving overall pavement condition. Recommendations range from light maintenance to full reconstruction, the latter of which presents opportunities for bundling maintenance with safety improvements, such as pedestrian crossing enhancements or bicycle lanes. However, this is currently not a feature of the PMS program.

311 Reporting System: The City began accepting non-emergency requests and reports through a 311 Reporting System in May 2016. Requests and reports cover a wide range of topics, such as potholes, overgrown landscape, faded street markings, and water waste and leaks, and are routed to the relevant department. Transportation safety-related requests made between May 2016 and December 2020 were reviewed to provide additional context for the collision data. The majority of transportation safety-related requests are concentrated in the central part of the city between Ventura Road and Oxnard Boulevard with the majority of requests related to potholes, signs, and roadway markings.



Safe Speeds

The Safe Speeds element of the Safe System Approach focuses on infrastructure and policy changes that specifically target speed as a major factor in collisions and collision severity.

Speed is a major concern for active transportation safety in Oxnard, with the BPMP noting that 64% of bicycle collisions occur on the City's high-speed, high-volume arterial roadways. The City collects speed data and performs a speed limit review every five years, as identified in the CSSA, and as of May 2022, is in the process of conducting a speed survey .

Oxnard's adopted plans contain infrastructure and program recommendations that support Safe Speeds efforts. These include speed radar trailers (BPMP), lane narrowing on Oxnard Boulevard and A Street to encourage slower speeds (Downtown Vision Plan), and a neighborhood pace car to slow down speeders on residential roadways while children walk to school (Sidewalk Survey).

Safe Road Users

The Safe Road Users element of the Safe System Approach addresses safety from a behavioral perspective by focusing on education, engagement, and enforcement.

Education

The CSSA notes several ongoing Safe Road Users educational efforts, such as traffic safety education programs led by the Oxnard Police Department and coordination between City departments and school districts to identify safety needs. The BPMP and Sidewalk Survey include Safe Road User recommendations. The BPMP recommends "Share the Road" campaigns that include the distribution of educational flyers and the creation of a multi-modal access guide. The Sidewalk Survey recommends staff and agency training on street safety topics such as pedestrian design treatments, and open street events where educational materials about Safe Road Users concepts may be distributed.

Enforcement

Enforcement measures, both traditional and innovative, to equitably serve the goal of Safe Road Users have been highlighted in Oxnard's BPMP and Sidewalk Survey. Innovative policies include targeted enforcement in high collision areas or areas with high active transportation volumes, as well as concentrated enforcement during the start of the school year. Coordination between City staff, the public, and the Police Department are also noted as innovative enforcement opportunities to serve the Safe Road Users element. On the more traditional side, the Sidewalk Survey includes recommendations for increased driver fines, speed enforcement in school zones, and speed radar trailers, which establish a nexus between the Safe Road Users and Safe Speeds elements.

Grant-Funded Programs

The upcoming Safe Routes to Schools program, described under Safe Roads, also includes bicycle and pedestrian safety educational workshops, bicycle and pedestrian rodeos, and coordination with Oxnard Police Department to develop action plans for 26 schools, including the six schools receiving infrastructure improvements. The Oxnard Police Department also received Office of Traffic Safety (OTS) grant funding for educational outreach on bicycle and pedestrian safety and enforcement, safety items for distribution, and enforcement of bicycle and pedestrian safety violations. The grant funding also allocates funds to the Police Department to target DUIs with

sobriety checkpoints and educational campaigns (e.g. "Know Your Limit"), distracted driving, motorcycle safety, and traffic violations.

Post-Crash Care

While much of the Safe System Approach centers on collision prevention, Post-Crash Care is an important element in reducing fatalities or life-changing complications when collisions do occur. Within road design, Post-Crash Care involves the balance of prioritizing access for active transportation modes while considering emergency vehicle access needs.

As a Post-Crash Care baseline, the CSSA notes that City staff review collision reports monthly, as well as whenever requests are made for infrastructure improvements. The Sidewalk Survey also recommends the City use collision data to monitor collision trends and collaborate with the Police Department, first responders, and health professionals to develop more efficient reporting and robust datasets to drive post-crash analysis. The City's ITS Master Plan includes a goal to improve public safety and incident response times by including investments, such as emergency vehicle pre-emption, as part of signal and infrastructure upgrades.

Safe Vehicles

Some existing and emerging on-board vehicle technologies require investments in public infrastructure in order to function properly. For example, lane departure warning technology, common on newer vehicles, requires regular maintenance of roadway striping and the use of highly retroreflective materials to maximize effectiveness. The City's pavement management system and resurfacing program would support the effectiveness of this technology. Emerging Vehicle-to-Infrastructure (V2I) technologies will likely require integration with existing infrastructure, and the City's ITS Master Plan includes emergency vehicle pre-emption and transit signal priority investments for each phase of the plan.

In addition to technological and infrastructure investments, the City of Oxnard has made safety interventions that recognize the role particular vehicles play in safer roadways. In 2019, the City re-routed trucks away from Oxnard Boulevard in Downtown Oxnard based on concerns of narrow streets and tight turns.

Opportunity Areas

Based on the planning documents review, fifteen opportunity areas were selected to form a baseline for priority safety improvements in the city. While all safety-related planning documents were reviewed, not all plans are represented in the final list of opportunity areas. Corridors and intersections that meet at least one of the following selection criteria were selected as opportunity areas:

- Mentioned in three or more plans
- Existing conditions were verified through field visits
- Majority of proposed improvements are related to safety
- Located outside of the Downtown Oxnard area to provide citywide geographic coverage as most other plans were focused on the central area of the City and the Oxnard Corridor

The opportunity areas were identified in their respective plans through data analysis, field visits, and community engagement. Most locations contain several distinct safety recommendations, and some components of those recommendations may have confirmed funding though the CIP.

The fifteen locations are listed below and the detailed Opportunity Areas Matrix is presented in the **Appendix**.

- Oxnard Boulevard from Esplanade Drive to Wooley Road
- C Street from Gonzales Road to Channel Islands Boulevard
- 5th Street from C Street to Rice Avenue
- B Street from 3rd Street to Wooley Road
- A Street from Colonia Road to Wooley Road
- Wooley Road from Harbor Boulevard to Rice Avenue
- Esplanade Drive from Vineyard Avenue to Oxnard Boulevard
- Mandalay Beach Road from Falkirk Avenue to Costa de Oro
- Saviers Road from Thomas Avenue to Yucca Street
- Oxnard Bouelvard from Wooley Road to Pleasant Valley Road
- Oxnard Boulevard & 1st Street
- Oxnard Boulevard & Colonia Road
- Pacifica High School & Gonzales Road
- Oxnard Boulevard & 5th Street/7th Street
- Wooley Road & E Street/C Street

Appendix: Opportunity Areas Matrix

Location	Type	2030 General Plan	BPFMP	OCCTIP	HOTA/Oxnard Vision Plan	Downtown Strategic Plan	Downtown Vision Plan	Oxnard TDM Plan	Oxnard CSSA	Green Alleys Plan	Sidewalk Survey Report	Recommendations
Oxnard Boulevard *Esplanade Dr to Wooley Rd*	Corridor		●	●	●	●	●			●		▪ Bicycle Enhancements ▪ Signal Upgrades ▪ Pedestrian Crossing Enhancements ▪ Sidewalk Upgrades ▪ Lane Narrowing ▪ Lighting ▪ Green Alleys
C Street *Gonzales Rd to Channel Islands Blvd*	Corridor		●		●	●				●		▪ Bicycle Enhancements ▪ Lane Narrowing ▪ Lighting ▪ Speed Limit Modification ▪ Pedestrian Crossing Enhancements ▪ Green Alleys
5th Street *C St to Rice Ave*	Corridor		●	●	●					●		▪ Pedestrian Crossing Enhancements ▪ Bicycle Enhancements ▪ Lane Narrowing ▪ Green Alleys
B Street *3rd St to Wooley Rd*	Corridor				●	●				●	●	▪ Bicycle Enhancements ▪ Lighting ▪ Pedestrian Crossing Enhancements ▪ Sidewalk Upgrades ▪ Green Alleys
A Street *Colonia Rd to Wooley Rd*	Corridor				●	●	●			●		▪ Bicycle Enhancements ▪ Lighting ▪ Pedestrian Crossing Enhancements ▪ Sidewalk Upgrades ▪ Green Alleys
Oxnard Boulevard & **1st**	Intersection							●				▪ Protected Left Turns ▪ Pedestrian Crossing Enhancements ▪ Curb Extensions ▪ Lighting ▪ Upgraded Signage & Markings
Wooley Road *Harbor Blvd to Rice Ave*	Corridor		●					●	●			▪ Bicycle Enhancements ▪ Green Alleys
Oxnard Boulevard & **Colonia Road**	Intersection							●				▪ Pedestrian Crossing Enhancements ▪ Curb Extensions ▪ Pavement Marking ▪ Slip Lane Closure ▪ Upgraded Signage & Markings ▪ Right Turn Restrictions
Pacifica High School & **Gonzales Road**	School							●				▪ Sidewalk Upgrades ▪ Pedestrian Crossing Enhancements ▪ Curb Extensions ▪ Speed Feedback Signs ▪ Signalization ▪ Lane Narrowing ▪ Bicycle Enhancements
Oxnard Boulevard & **5th, 7th St**	Intersection							●				▪ Protected Left Turns ▪ Pedestrian Crossing Enhancements ▪ Sidewalk Enhancements ▪ Curb Extensions ▪ Upgraded Signage & Markings
Wooley Road & **E Street, C Street**	Intersection							●				▪ Sidewalk Upgrades ▪ Pedestrian Crossing Enhancements ▪ Curb Extensions ▪ Left Turn Restrictions ▪ Protected Left Turns
Esplanade Drive *Vineyard Ave to Oxnard Blvd*	Corridor										●	▪ Pedestrian Crossing Enhancements
Mandalay Beach Road *Falkirk Ave to Costa de Oro*	Corridor										●	▪ Pedestrian Crossing Enhancements
Saviers Road *Thomas Ave to Yucca St*	Corridor										●	▪ Pedestrian Crossing Enhancements ▪ Curb Extensions
Oxnard Boulevard *Wooley Rd to Pleasant Valley Rd*	Corridor			●								▪ Bicycle Enhancements ▪ Pedestrian Crossing Enhancements ▪ Sidewalk Upgrades ▪ Signalizations ▪ Road Diet

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APPENDIX C
Collision Analysis Memo & Crossroads Data Management Plan


SPEED
LIMIT
35
NO
STOPPING
ANY
TIME

Memorandum

Date: January 6, 2022

To: Debbie O'Leary

From: Rachel Om, Emily Finkel, and Steve Brown

Subject: Collision History and Data Collection/Assessment Memorandum

LA21-3267

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." Collision data and contextual data were collected and analyzed as part of this plan, as well as anecdotal input from City staff and community stakeholders.

This memorandum summarizes the results of a comprehensive collision analysis for the City of Oxnard, which will inform project prioritization and countermeasure selection for the City. This analysis reflects injury collisions that occurred on City of Oxnard roadways (excluding grade-separated facilities, such as US-101 and portions of SR-1) between 2016 and 2020 according to the Transportation Injury Mapping System (TIMS) and the City of Oxnard Record Management System (RMS) database as of August 23, 2021.

TIMS reports injury collisions from the Statewide Integrated Traffic Records System (SWITRS), and the City of Oxnard RMS includes injury and property damage only collisions that are reported to SWITRS. Both collision datasets were reviewed to create a comprehensive collision dataset for this analysis[1]. The final collision dataset is primarily comprised of collisions from the TIMS dataset because the collision dataset from the City's RMS was not fully geocoded. Collisions where someone was killed or severely injured (KSI) that were in the City's RMS, but not reported to TIMS due to data processing issues, were manually added to the TIMS dataset. To improve the collision reporting process, the City is implementing the Crossroads Software Collision Report Writer; details about this effort will be in the Crossroads data management plan.

[1] Collision data were not directly downloaded from SWITRS because TIMS geocodes all the collisions with sufficient location information in SWITRS.

Collision Database Limitations

In general, collision databases have been found to have certain reporting biases, including:

- Collisions involving people walking, on bicycles, or on motorcycles are less likely to be reported than collisions only involving people driving[2].
- Property damage only collisions are less likely to be reported[3].
- Younger victims are less likely to report collisions[3].
- Alcohol-involved collisions may be under-reported[4].

Race, income, immigration status, and English proficiency may also impact reporting, but there is limited research on these factors. In Oxnard, the majority of the population is Hispanic (73%) followed by Non-Hispanic White (13%), Asian (8%), and Black (2%)[5]. The median household income is $78,981 whereas the Oxnard-Thousand Oaks-Ventura metro area median household income is $92,236[6]. Approximately 34 percent of Oxnard residents are foreign-born[7], and 18 percent are not U.S. citizens[8].

Summary of Trends

With the above reporting biases in mind, this analysis identified several collision trends and risk factors in Oxnard, including:

- People walking and biking are more likely to be killed or severely injured in a collision. More than half of collisions involving a fatality involved someone walking or biking.
- Drugs or alcohol increased the likelihood that a collision will be more severe.
- Unsafe speeding accounted for nearly a quarter of all injury collisions
- Bicycle and pedestrian collisions primarily occurred during the PM peak period, and late at night, when visibility is limited and people may be traveling at higher speeds.[9]

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[2] Winters, M., Branion-Calles, M. (2017) *Cycling safety: Quantifying the underreporting of cycling incidents in Vancouver, British Columbia*. Journal of Transport & Health.

[3] Imprialou, M-I. and Quddus, M.A. (2017). *Crash data quality for road safety research: current state and future directions*. Accident Analysis and Prevention.

[4] Miller T.R., Gibson R., Zaloshnja E., Blincoe L.J., Kindelberger J., Strashny A., Zhang Y. Annals of Advances in Automotive Medicine/Annual Scientific Conference. Association for the Advancement of Automotive Medicine; Barrington, IL, USA: 2012. Underreporting of driver alcohol involvement in United States police and hospital records: Capture-recapture estimates.

[5] U.S. Census Bureau. (2019). *2019 American Community Survey 1-Year Estimates Table B03002*.

[6] U.S. Census Bureau. (2019). *2019 American Community Survey 1-Year Estimates Table B19001*.

[7] U.S. Census Bureau. (2019). *2015 - 2019 American Community Survey 5-Year Estimates Table B05006.*

[8] U.S. Census Bureau. (2019). *2015 – 2019 American Community Survey 5-Year Estimates Table C05001.*

[9] National Highway Traffic Safety Administration National Center for Statistics and Analysis (2007) *Passenger Vehicle Occupant Fatalities by Day and Night – A Contrast*. Traffic Safety Facts Research Note.

- Bicycle and pedestrian collisions that occurred in the middle of the night, such as between 3 AM – 6 AM, were more likely to result in a fatality or severe injury.
- Pedestrians crossing outside of a marked crossing accounted for over half of the pedestrian-involved collisions that resulted in a fatality or severe injury.
- Nearly 90 percent of collisions occurred within an intersection sphere of influence[10], and approximately 31 percent of those collisions occurred where a primary road intersects with a minor road.
- Nearly 70 percent of collisions that occurred at a signalized intersection were at an intersection without fully protected left turn phases.

The following sections present citywide collision trends, collision hot spots, and a systemic analysis that pairs contextual factors with collision attributes.

Collision Landscape

From 2016 to 2020, there were 4,751 injury collisions of which 259 collisions (5%) with victims killed or severely injured (KSI, additional details in the green box). On average, 12 people were killed each year in Oxnard by traffic violence. **The number of injury collisions increased from 2016 to 2017 and 2018, then generally trended in 2020** (Figure 1). Travel patterns in 2020 shifted due to the COVID-19 pandemic as people were working and attending school remotely and are likely not representative of longer-term typical conditions. Travel patterns may continue to shift as people return to previous travel patterns or establish new travel patterns.

Killed or Severely Injured in a Collision

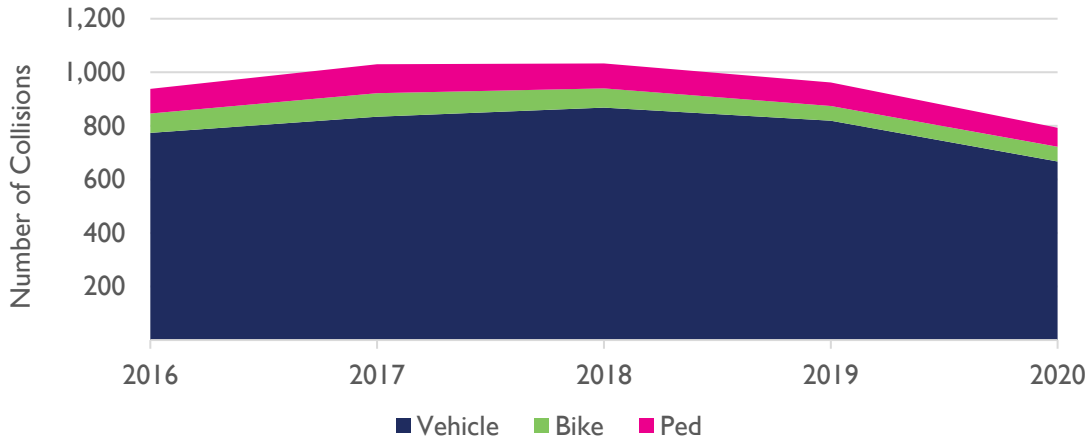
Severe injuries resulting from a traffic collision can result in a number of catastrophic impacts, including permanent disability, lost productivity and wages, and ongoing healthcare costs. These injuries can include:

- Broken or fractured bones
- Dislocated or distorted limbs
- Severe lacerations
- Severe burns
- Skull, spinal, chest or abdominal injuries
- Unconsciousness at or when taken from the collision scene

Throughout this plan, the acronym KSI is used to denote collisions where someone was killed or severely injured.

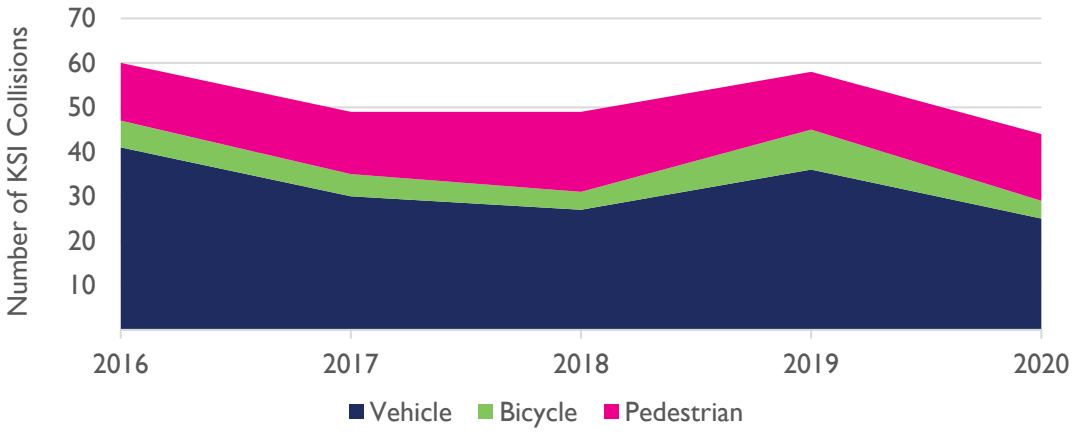
[10] The intersection area of influence was defined as a 50-foot radius around minor intersections and a 250-foot radius around major intersections.

Figure 1 – Injury Collisions by Year by Mode (2016 – 2020)



From 2016 to 2019, the number of KSI collisions trended inversely to the number of injury collisions where KSI collisions decreased in 2017 and 2018 but increased in 2019 (Figure 2). KSI collisions followed the same pattern as total injury collisions with a decrease in 2020. Collisions involving a pedestrian are disproportionately represented in KSI collisions as these collisions make up a larger share of KSI collisions compared to total injury collisions. Similar to the five-year trend, KSI collisions accounted for 5% - 6% of total injury collisions each year.

Figure 2 – KSI Collisions by Year by Mode (2016 – 2020)

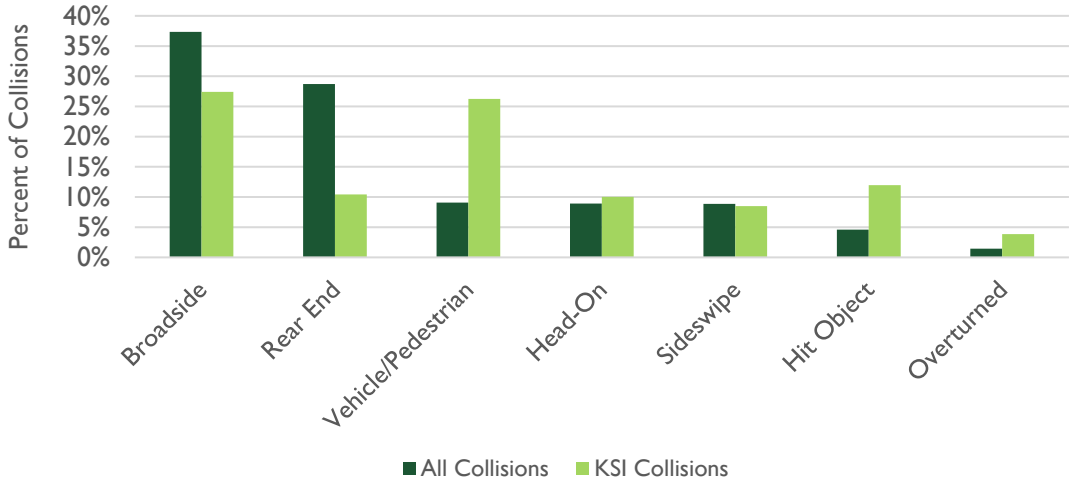


Collision Characteristics

The most common collision types in Oxnard were Broadside (37%), Rear End (29%), and Head-On (9%), Sideswipe (9%), and Vehicle/Pedestrian (9%) (

Figure 3). **For KSI collisions, Broadside collisions were most common (27%), followed by Vehicle/Pedestrian (26%) and Hit Object collisions (12%). This trend further illustrates the disproportionate share of KSI collisions involving pedestrians in Oxnard.** Hit Object collisions were also more likely to result in a KSI compared to other common collision types.

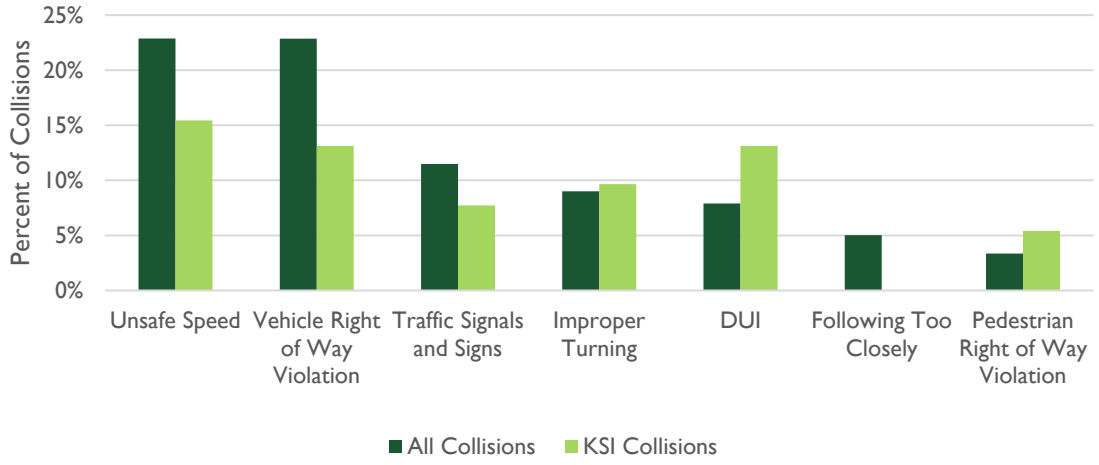
Figure 3 – Injury Collisions by Collision Type (2016 – 2020)



Collision reports note a Primary Collision Factor (PCF), which is the reporting officer's determination of the primary cause, or violation, of the collision. **In Oxnard, the most common violations were Unsafe Speed (23%), Vehicle Right of Way Violation (23%), and Traffic Signals and Signs (11%),** per Figure 4. The majority of Vehicle Right of Way violations included drivers not yielding after left turn or U-turn, drivers not yielding at stop sign, and drivers not yielding to oncoming traffic when entering or crossing the road from property or alley. The majority of Traffic Signals and Signs violations included drivers not stopping at line or stop bar.

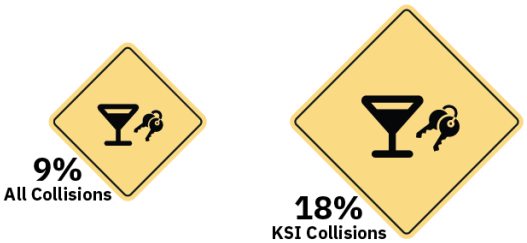
For KSI collisions, the most common violations were Unsafe Speed (15%), Pedestrian Violation (14%), Driving/Bicycling Under the Influence (13%), and Vehicle Right of Way Violation (13%). The Pedestrian Violation PCF indicates that the pedestrian violated a rule of the road, such as crossing on a red signal, as opposed to the Pedestrian Right of Way Violation PCF (4%), where the driver violates the pedestrian's right of way.

Figure 4 – Injury Collisions by Violation (2016 – 2020)



A driver under the influence of alcohol and/or drugs increases the likelihood of a collision resulting in a severe injury or a fatality (Figure 5). **While nine percent of all collisions involved drugs or alcohol, 18 percent of KSI collisions involved drugs or alcohol.**

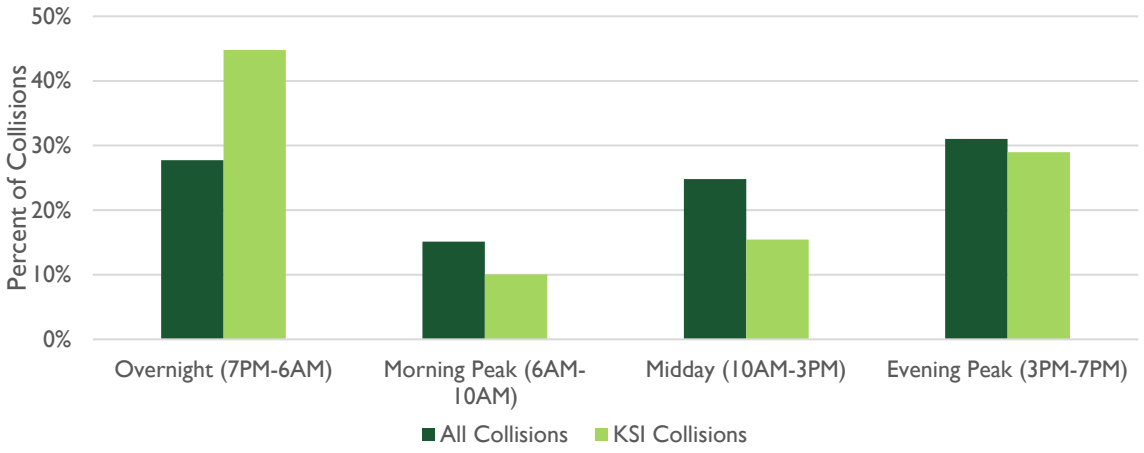
Figure 5 – DUI Injury Collisions for All and KSI Collisions



Studying the timing of collisions can provide context about the surrounding traffic and lighting conditions, which informs the selection of countermeasures. **The highest share of all collisions occurred between 3 PM and 7 PM, which is when many people are returning from work and school** (Figure 6). The number of collisions occurring between 3 PM and 7 PM may also be affected by seasonal changes, such as Daylight Savings Time, which can influence visibility as people's commutes shift from being before to after sunset.

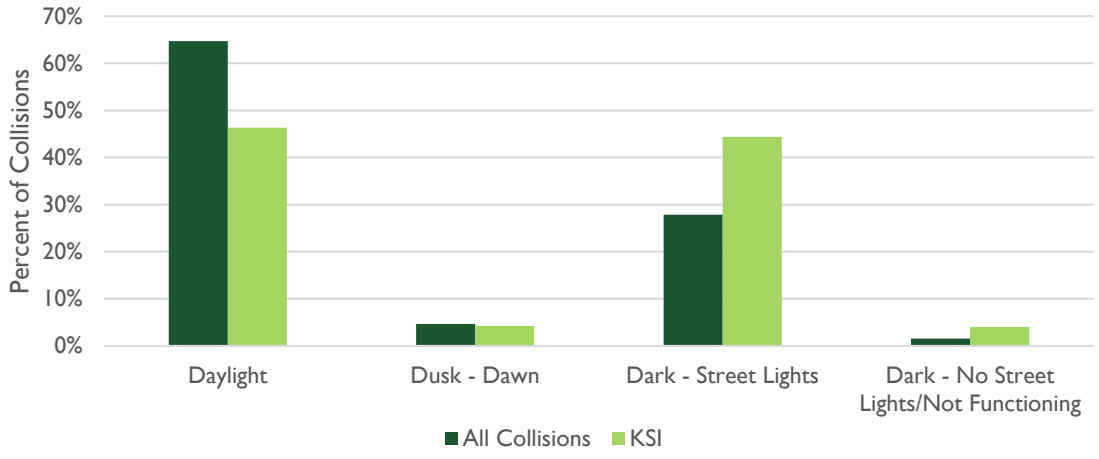
The highest share of KSI collisions occurred between 7 PM and 6 AM, which may indicate there may be night-related issues, such as visibility and speeding when fewer cars are on the road.

Figure 6 – Injury Collisions by Time of Day (2016 – 2020)



Roadway lighting conditions can influence the visibility of roadway users, especially pedestrians and bicyclists, and road infrastructure. **While 30 percent of all collisions occurred during nighttime, nighttime collisions accounted for 48 percent of KSI collisions** (Figure 7).

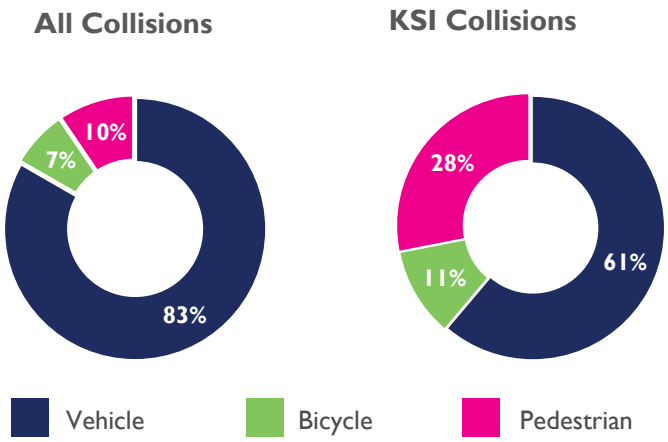
Figure 7 – Injury Collisions by Lighting Conditions (2016 – 2020)



Collision Characteristics by Mode

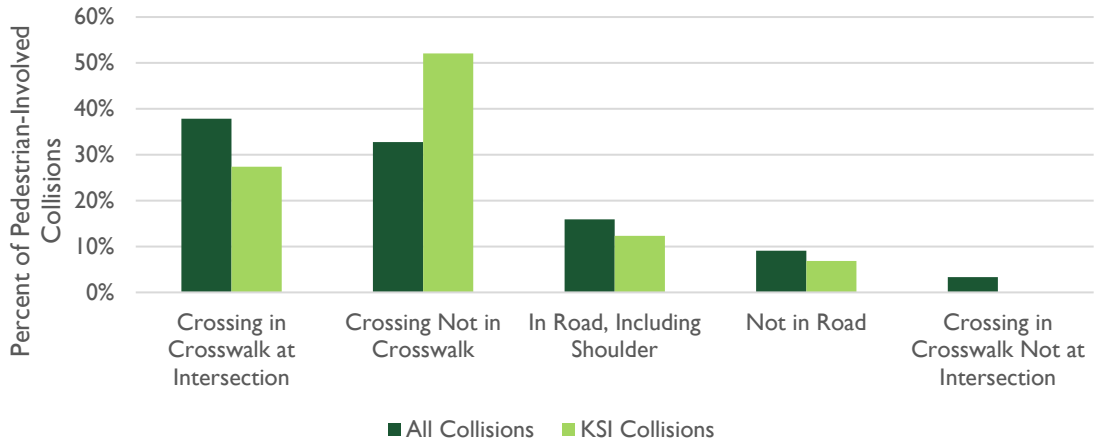
People walking and biking were involved in 17 percent of total collisions but 39 percent of KSI collisions (Figure 8). People walking were particularly over-represented in KSI collisions, as they were involved in ten percent of all collisions but 28 percent of KSI collisions. Additionally, 52 percent of the City's fatal collisions involved either a bicyclist or a pedestrian.

Figure 8 – Injury Collisions by Mode (2016 – 2020)



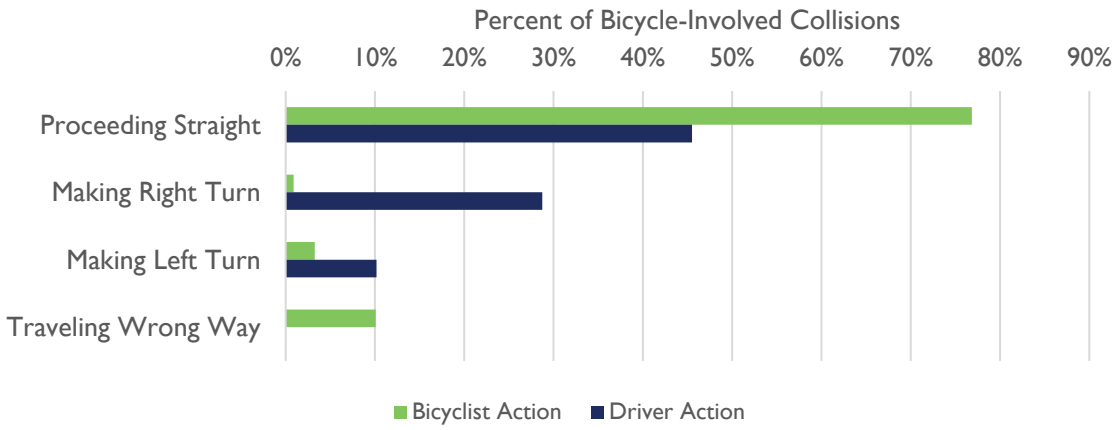
A large share of injuries to people walking occurred when people were crossing in the crosswalk at an intersection (38%) or crossing not in a crosswalk (33%), per Figure 9. For KSI collisions, pedestrians crossing not in a crosswalk made up the largest share (52%) of pedestrian-involved KSI collisions. Collisions where people crossed the street outside of crosswalks and walked 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.

Figure 9 – Pedestrian Action Preceding Injury Collision (2016 – 2020)



In collisions involving someone biking, the majority of people biking were either proceeding straight (77%) or traveling the wrong way on the road (i.e. traveling against the flow of vehicular traffic; 10%) before the collision occurred (Figure 10). **The majority of people driving were also proceeding straight (46%) followed by making either a right turn (29%) or left turn (10%).** Collisions involving a turning movement may indicate a need to increase drivers' awareness of bicyclists by increasing the visibility of bicyclists with signage and striping.

Figure 10 – Movement Preceding Collision for Bicycle-Involved Injury Collisions (2016 – 2020)

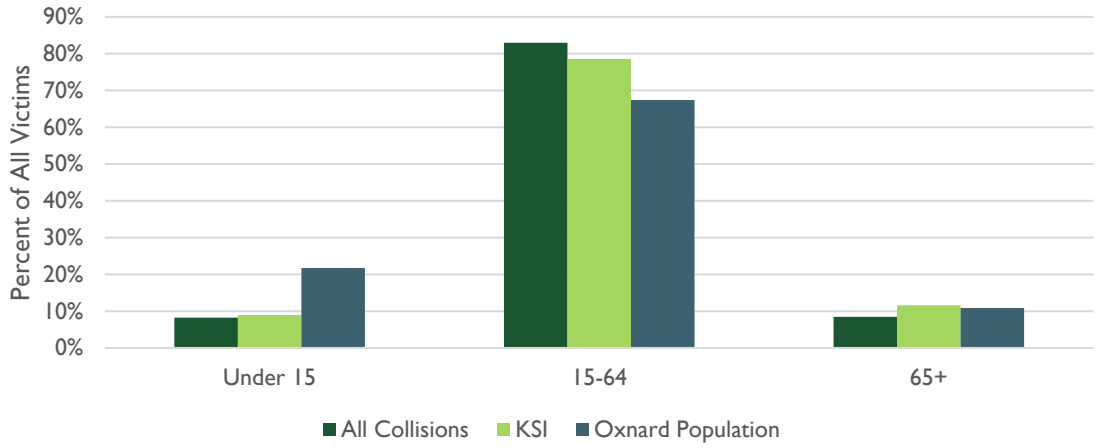


Appendix A presents detailed tables that summarize the top violations, crash types, time of day, and driver movement at fault for all collisions and KSI collisions for all injury collisions and by mode.

Victim Profile

The collision data indicate that vulnerable age groups (under 15 and 65+ years of age) have not experienced a significantly disproportionate share of all collisions in Oxnard. People under the age of 15 make up 22 percent of the City's population but represent less than ten percent of all injury and KSI collisions (Figure 11). People 65 years and older make up 11 percent of the City's population but represent 8 percent of all collisions and 12 percent of KSI collisions. People under the age of 15 or over the age of 65 are generally not part of the driving population and are walking, biking, or taking transit. Younger victims are less likely to report collisions, and collisions involving people walking or biking are less likely to be reported[11,12]. Therefore, safety improvements should still be considered with people in vulnerable age groups in mind.

Figure 11 – Victims by Age Compared to Census Data (2016 – 2020)

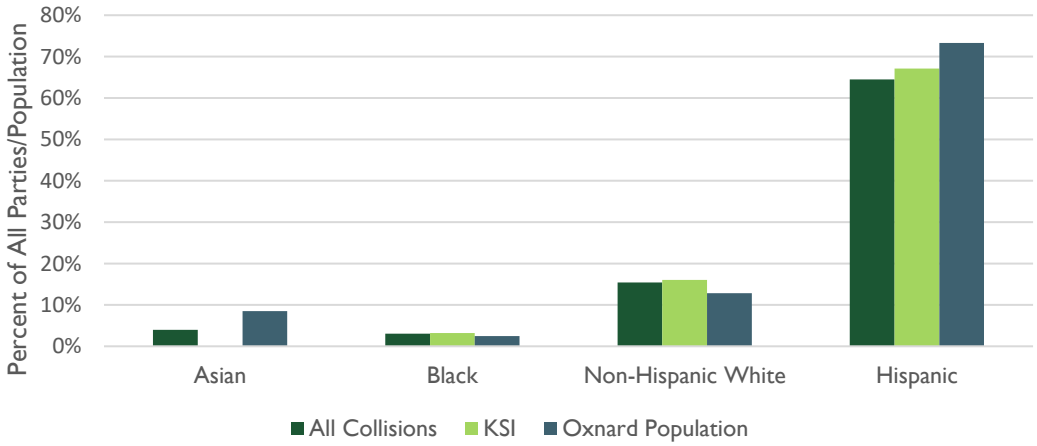


[11] Imprialou, M-I. and Quddus, M.A. (2017). *Crash data quality for road safety research: current state and future directions*. Accident Analysis and Prevention.

[12] Winters, M., Branion-Calles, M. (2017) *Cycling safety: Quantifying the underreporting of cycling incidents in Vancouver, British Columbia*. Journal of Transport & Health.

In collision reports, race is reported at the party level and determined at the discretion of the reporting officer. This means that if people of multiple races are present in a vehicle, only the driver's race will be reported. **The distribution of parties by race generally reflects the racial makeup of Oxnard** (Figure 12). Parties identified as Non-Hispanic White are slightly overrepresented in collisions as people identified as Non-Hispanic White account for 15 percent of parties in all collisions, 16 percent of parties in KSI collisions, and 13 percent of the population of Oxnard. Parties identified as Hispanic account for a smaller share of parties of all collisions (64%) and KSI collisions (67%) compared to the population of Oxnard (73%). Race, income, immigration status, and English proficiency may impact collision reporting, but there is limited research on these factors.

Figure 12 – Parties by Race compared to Census Data (2016 – 2020)



Collisions by Neighborhood

The City of Oxnard has 61 designated neighborhoods, and 97 percent of collisions occurred in one of these designated neighborhoods. Table 1 through Table 4 list the top five neighborhoods for all injury, KSI, bicycle-involved, and pedestrian-involved collisions. The highest share of all injury collisions (8%) and KSI collisions (7%) occurred in the Kamala Park neighborhood. The highest share of bicycle-involved (11%) and pedestrian-involved collisions (8%) also occurred in the Kamala Park neighborhood. **For each collision category, the top five neighborhoods are located around Downtown Oxnard and the surrounding central area of the city.** For all injury collisions, the top five neighborhoods cover ten percent of the city area but account for 25 percent of citywide collisions. In addition to Downtown Oxnard generating a lot of activity with the Oxnard Transit Center and commercial areas, the central area of Oxnard also has a denser roadway network with many alleys and minor roadways intersecting major roadways, such as Oxnard Boulevard, compared to other parts of the city. A full collision summary by neighborhood can be found in Appendix B.

Table 1 – All Injury Collisions by Neighborhood (2016 – 2020)

Neighborhood	Percent of City Area	Total Injury Collisions	Percent of Total Collisions
Kamala Park	2%	364	8%
Five Points Northeast	2%	162	3%
La Colonia	2%	207	4%
Pacific Avenue Commercial Area	3%	268	6%
Wilson	1%	210	4%

Table 2 – KSI Collisions by Neighborhood (2016 – 2020)

Neighborhood	Percent of City Area	KSI Collisions	Percent of Total KSI Collisions
Kamala Park	2%	19	7%
Five Points Northeast	2%	15	6%
La Colonia	2%	12	5%
Pacific Avenue Commercial Area	3%	10	4%
Wilson	1%	10	4%

Table 3 – Bike Collisions by Neighborhood (2016 – 2020)

Neighborhood	Percent of City Area	Bike Collisions	Percent of Bike Collisions	KSI Bike Collisions	Percent of KSI Bike Collisions
Kamala Park	2%	38	11%	3	11%
Pacific Avenue Commercial Area	3%	25	7%	0	0%
Wilson	1%	22	6%	2	7%
Sea Air	1%	18	5%	3	11%
Five Points Northeast	2%	17	5%	3	11%

Table 4 – Pedestrian Collisions by Neighborhood (2016 – 2020)

Neighborhood	Percent of City Area	Ped Collisions	Percent of Ped Collisions	KSI Ped Collisions	Percent of KSI Ped Collisions
Kamala Park	2%	38	8%	6	8%
Wilson	1%	31	7%	5	7%
La Colonia	2%	23	5%	6	8%
Five Points Northeast	2%	20	4%	6	8%
Hobson Park East	1%	20	4%	2	3%

Hot Spot Analysis

We used a collision mapping process to identify the top intersections and corridors that account for a disproportionate share of collisions. In safety analyses, locations with a higher number of crashes are often referred to as "hot spots"[13]. The term "hot spot" is used throughout this report to differentiate the conventional, more reactive approach that looks at observed crash patterns from the more proactive systemic analysis approach. The top ten intersections were identified for all injury collisions, weighted collisions, and collisions per million entering vehicles. The top ten roadway segments were identified for all injury collisions, weighted collisions, and collisions per million vehicle miles traveled. Intersections and roadway segments with less than three collisions were omitted for this analysis.

[13] U.S. Department of Transportation Federal Highway Administration. (2018). *Guidebook on Identification of High Pedestrian Crash Locations.*

Intersections

To associate collisions to intersections, a set of non-overlapping areas of influence were generated based on a 50-foot radius around minor intersections and a 250-foot radius around major intersections[14]. Major intersections are defined as intersections where a primary road meets a primary, secondary, or minor road and where a secondary road meets a secondary or minor road.

Total Injury Collisions

The ten intersections with the highest number of total injury collisions are at major intersections, which have relatively high traffic volumes and increased exposure (Table 5). Figure 13 illustrates the total injury collisions by intersection with the top ten intersections highlighted in blue. Appendix C summarizes the top ten intersections for six intersection classifications:

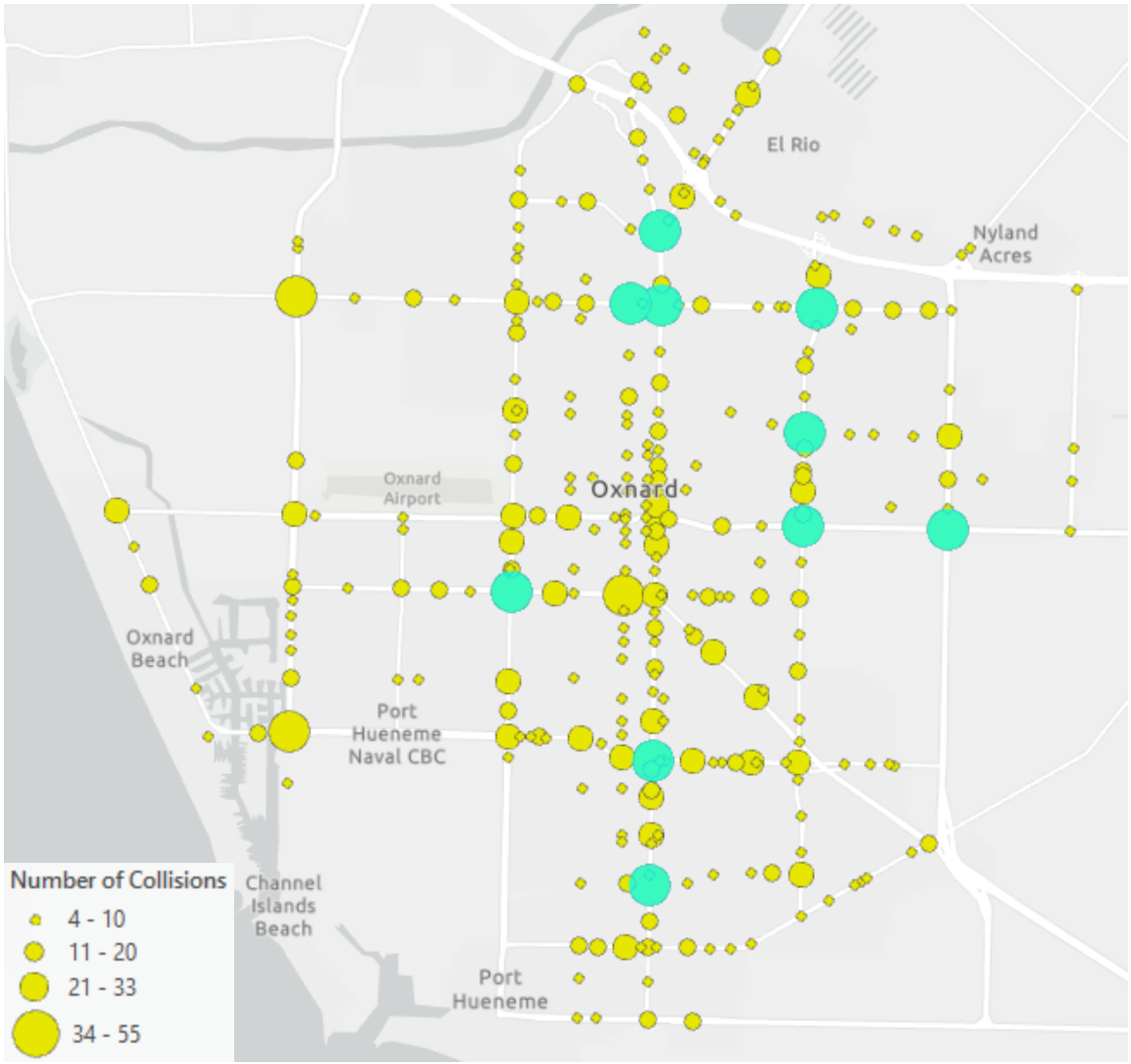
- Primary-Primary
- Primary-Secondary
- Primary-Minor
- Secondary-Secondary
- Secondary-Minor
- Minor-Minor

Table 5 – Top Ten Intersections by Total Collisions (2016 – 2020)

Intersection Name	Intersection Classification	Total Injury Collisions	KSI Collisions
E Gonzales Rd & N Rose Ave	Primary-Secondary	55	0
Wooley Rd & Ventura Rd	Secondary-Secondary	46	0
W Bard Rd & Saviers Rd	Primary-Secondary	45	2
N Vineyard Ave & Oxnard Blvd	Primary-Primary	43	1
E Fifth St & S Rice Ave	Primary-Primary	40	1
E Fifth St & S Rose Ave	Primary-Secondary	40	0
N C St & W Gonzales Rd	Primary-Secondary	39	1
W Channel Islands Blvd & Saviers Rd	Primary-Primary	38	0
S Victoria Ave & W Channel Islands Blvd	Primary-Secondary	37	2
N Rose Ave & Camino Del Sol	Secondary-Secondary	37	2

[14] The radius for minor intersections was determined by the length of centerline striping at stop-signs, and the radius for major intersections was determined by the length of the striping for left-turn turn pockets.

Figure 13 – Intersections by Total Injury Collisions (2016 – 2020)



Note: The top ten intersections with the highest number of injury collisions are highlighted in blue.

Weighted Score

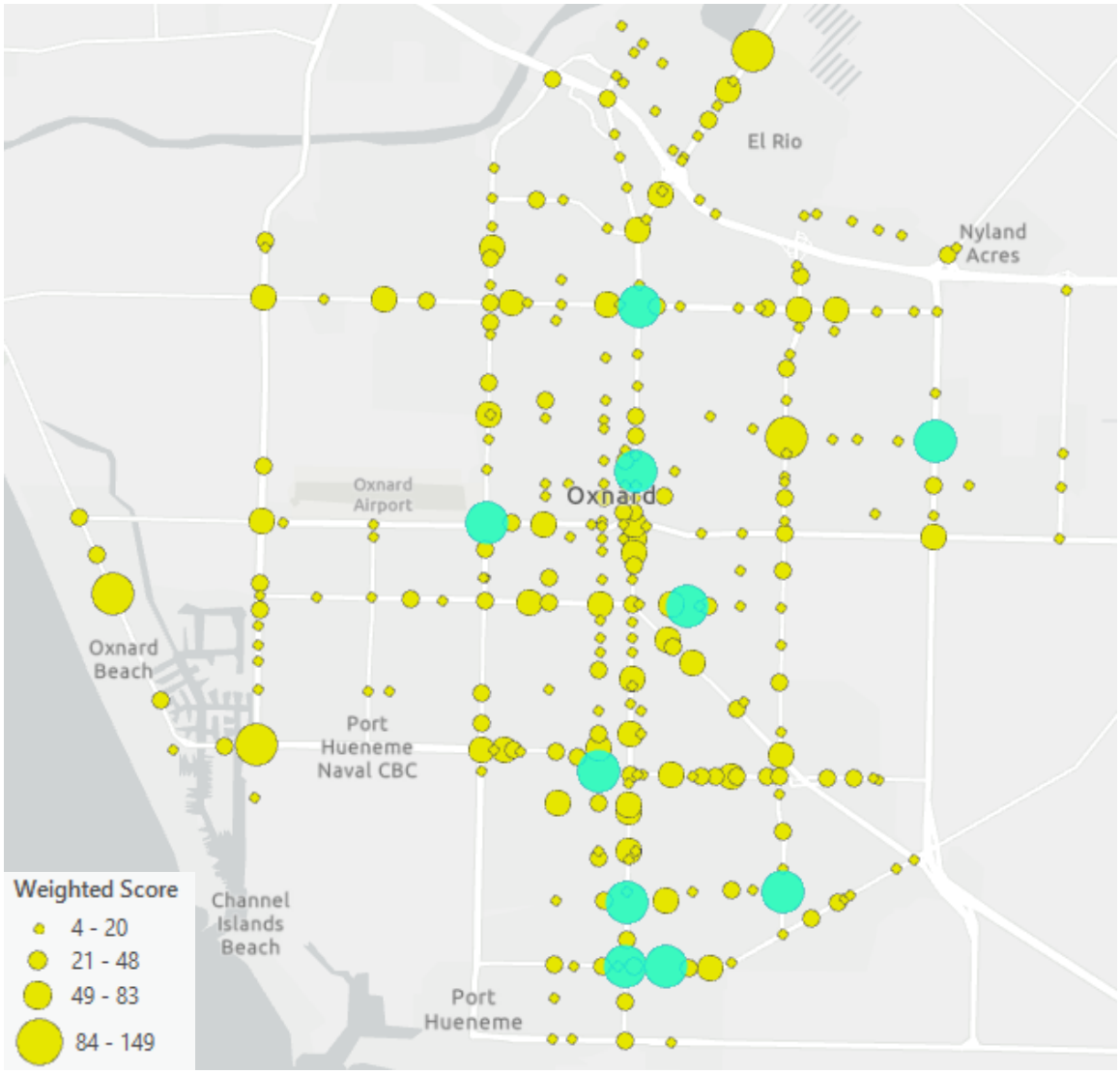
Collisions were weighted by severity: collisions where the highest degree of injury was a fatality or severe injury received a weight of 27. The weight of 27 for KSI collisions was calculated by comparing the average cost of a fatality or severe injury ($2.1 million) to the average cost of other visible injury, complaint of pain, and property damage only ($78.8 thousand) for a ratio of 27:1. The collision costs are found in the Caltrans Local Road Safety Manual Benefit/Cost Ratio Calculations[15]. Table 6 lists the top ten intersections by the total weighted score. Figure 14 illustrates the weighted score by intersection with the top ten intersections highlighted in blue.

Table 6 – Top Ten Intersections by Total Weighted Score (2016 – 2020)

Intersection Name	Intersection Classification	Weighted Score	Total Injury Collisions	KSI Collisions
W Pleasant Valley Rd & Saviers Rd	Primary-Primary	149	19	5
S Ventura Rd & W Fifth St	Primary-Primary	137	33	4
S Rose Ave & E Bard Rd	Secondary-Secondary	135	31	4
E Wooley Rd & Commercial Ave	Secondary-Minor	123	19	4
W Channel Islands Blvd & S C St	Primary-Secondary	110	32	3
N Rice Ave & Camino Del Sol	Primary-Secondary	104	26	3
W Bard Rd & Saviers Rd	Primary-Secondary	97	45	2
N Oxnard Blvd & 1st St	Primary-Minor	97	19	3
Cypress Rd & E Pleasant Valley Rd	Primary-Minor	95	17	3
Thames River Dr & N Vineyard Ave	Primary-Minor	93	15	3

[15] Caltrans. (2020). *Local Roadway Safety: A Manual for California's Local Road Owners*. https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/2020/lrsm2020.pdf

Figure 14 – Intersections by Total Weighted Score (2016 – 2020)



Note: The top ten intersections with the highest weighted score are highlighted in blue.

Collision Rates

In order to control the results for traffic volume (the number of collisions is naturally higher with more volume), we calculated a collision rate based upon the number of Collisions per Million Entering Vehicles (MEV) as follows:

$$\frac{C\ x\ 1{,}000{,}000}{V\ x\ 365\ x\ N}$$

Where:

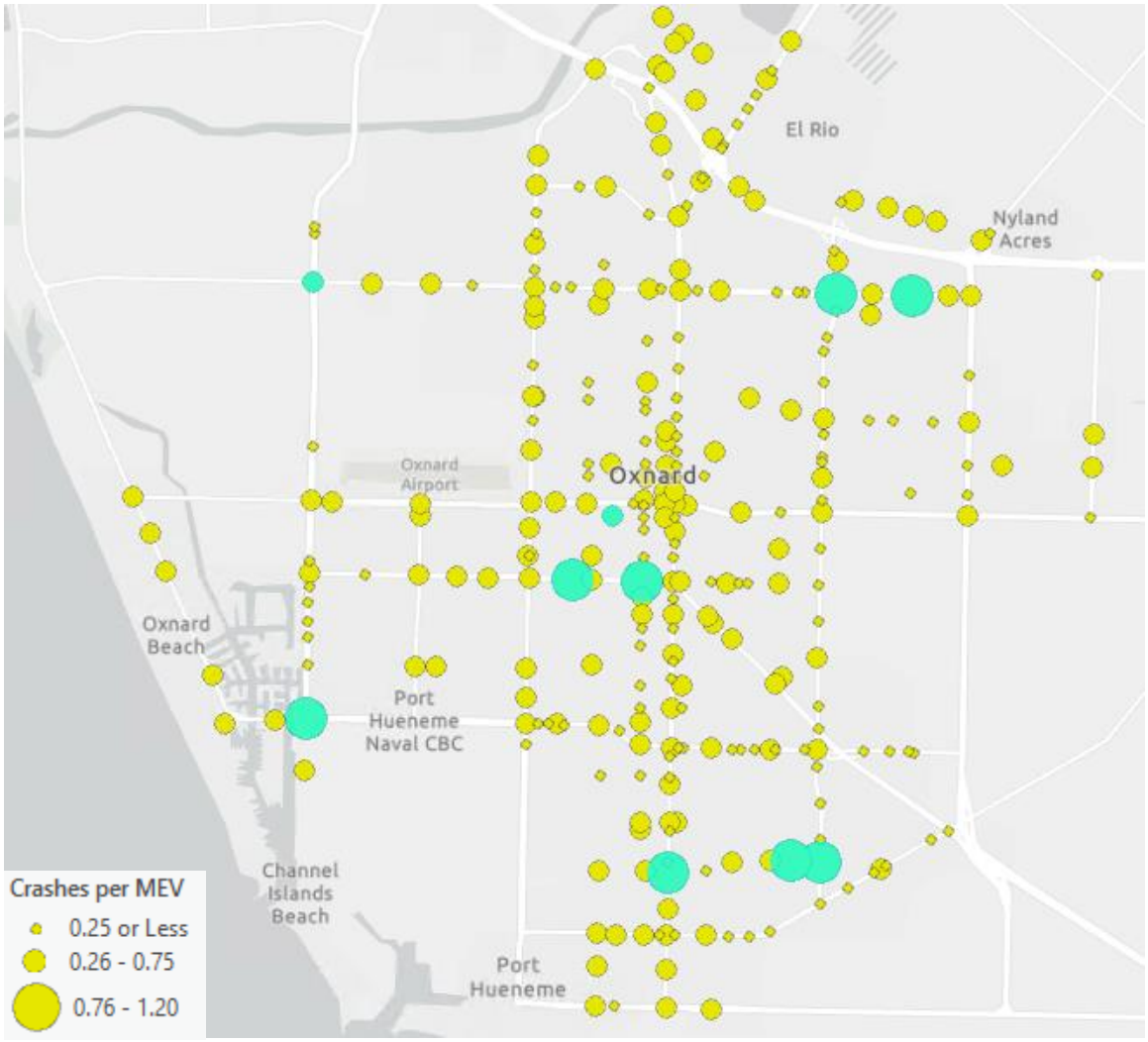
- C = Number of Collisions
- V = Average Daily Intersection Entering Volume, which was calculated by adding the AADT for segments at the intersection and dividing in half to remove the exiting volumes
- N = Number of Analysis Years (5 years for 2016 to 2020)

The following ten intersections have the highest collision rate normalized by traffic volumes (Table 7). Figure 15 illustrates the Collisions per MEV by intersection with the top ten intersections highlighted in blue.

Table 7 – Top Ten Intersections by Collisions per Million Entering Vehicles (2016 – 2020)

Intersection Name	Intersection Classification	Collisions per MEV	Total Injury Collisions	KSI Collisions
W Bard Rd & Saviers Rd	Primary-Secondary	1.20	45	2
S Rose Ave & E Bard Rd	Secondary-Secondary	0.87	31	4
E Gonzales Rd & N Rose Ave	Primary-Secondary	0.85	55	0
Anchorage St & E Bard Rd	Secondary-Minor	0.85	17	0
Lombard St/Outlet Center Dr & E Gonzales Rd	Primary-Minor	0.85	17	0
W Wooley Rd & S J St	Secondary-Secondary	0.84	29	1
S Victoria Ave & W Channel Islands Blvd	Primary-Secondary	0.83	37	2
W Wooley Rd & S C St	Secondary-Secondary	0.76	36	1
W Gonzales Rd & N Victoria Ave	Primary-Primary	0.74	35	1
Pacific Ave & Ives Ave	Secondary-Minor	0.73	8	0

Figure 15 – Intersections by Collisions per Million Entering Vehicles (2016 – 2020)



Note: The top ten intersections with the highest crashes per MEV are highlighted in blue.

Segments

To account for Oxnard's dense roadway network in identifying roadway segment hot spots, collisions that were more than 50 feet away from an intersection were matched to the nearest roadway segment. As a result, some collisions were double assigned to an intersection and a roadway segment.

The following ten roadway segments have the highest total number of collisions (Table 8). Figure 16 illustrates the total collisions with the top ten roadway segments highlighted in blue.

Table 8 – Top Ten Roadway Segments by Total Collisions (2016 – 2020)

Road Name	From	To	Class	Total Injury Collisions	KSI Collisions
Saviers Rd	W Channel Islands Blvd	Alley (Near Laurel St)	Primary	22	0
N Rose Ave	E Gonzales Rd	Lockwood St	Secondary	20	0
N Vineyard Ave	W Esplanade Dr	Craig Dr	Primary	18	0
N Victoria Ave	Flax Pl	W Gonzales Rd	Primary	16	2
E Gonzales Rd	N Rose Ave	Alley (Near Sonata Dr)	Primary	12	0
N Rose Ave	Camino De La Luna	Camino Del Sol	Secondary	12	0
S Ventura Rd	N Ninth St	W Wooley Rd	Primary	12	0
N Rose Ave	E Gonzales Rd	Mc Grath Dr	Secondary	11	0
S Oxnard Blvd	E Date St	Midblock (Near Sunkist Cir)	Primary	10	3
N Oxnard Blvd	Citrus Grove Ln	Vineyard Ave	Primary	10	2

Figure 16 – Roadway Segments by Total Injury Collisions (2016 – 2020)

Note: The top ten roadway segments with the highest number of injury collisions are highlighted in blue.

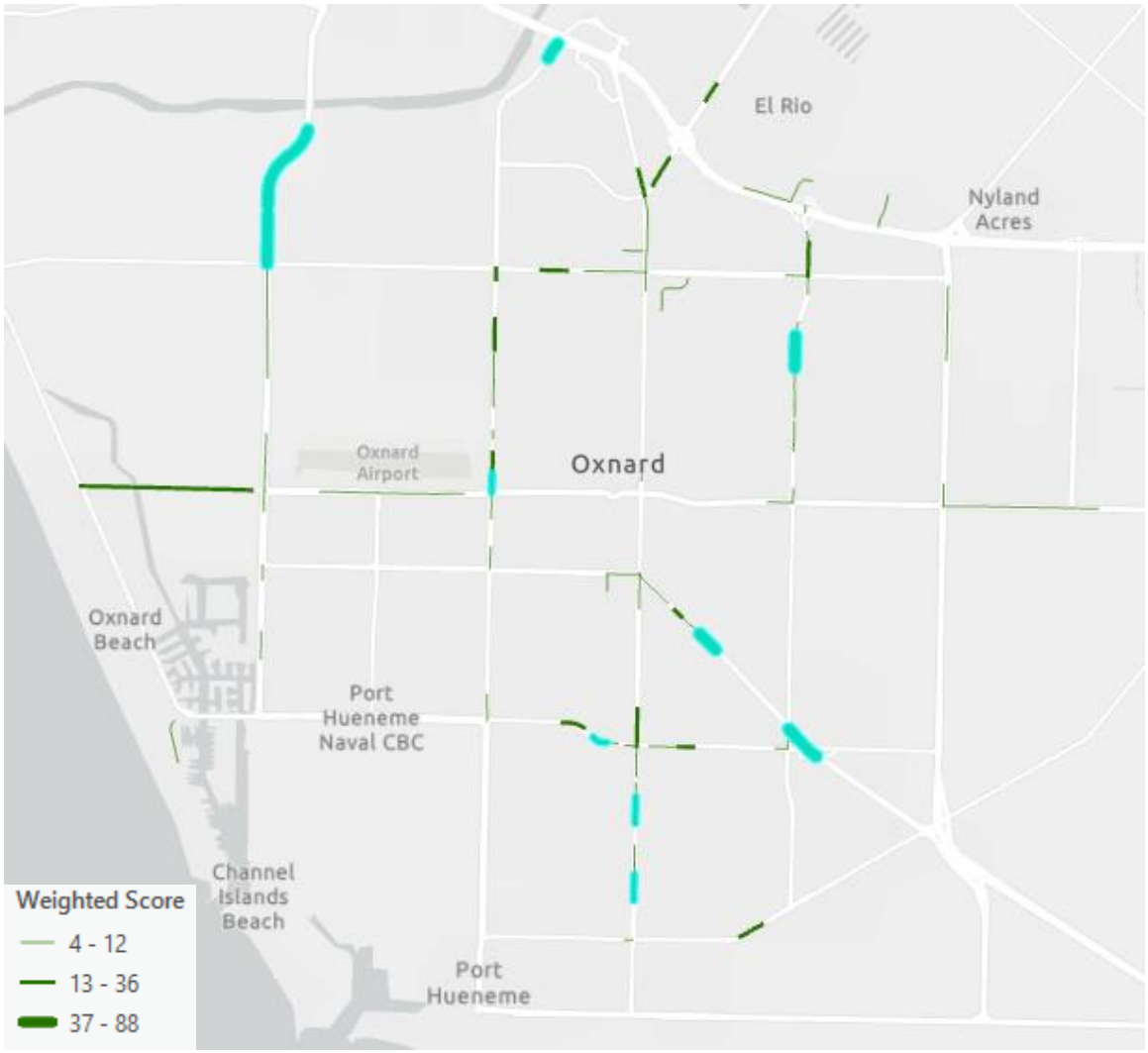
Weighted Score

Consistent with the intersection analysis, collisions were weighted by severity for the roadway segment analysis with KSI collisions receiving a weight of 27 and other injury collisions receiving a weight of one. Table 9 lists the top ten roadway segments by the total number of weighted collisions. Figure 17 illustrates the weighted score with the top ten roadway segments highlighted in blue.

Table 9 – Top Ten Roadway Segments by Weighted Score (2016 – 2020)

Road Name	From	To	Class	Weighted Score	Total Collisions	KSI Collisions
N Victoria Ave	Gum Tree St	City Boundary	Primary	88	10	3
N Victoria Ave	Flax Pl	W Gonzales Rd	Primary	68	16	2
S Oxnard Blvd	E Date St	Midblock (Near Sunkist Cir)	Primary	62	10	2
N Rose Ave	N Rose Ave & Camino De La Luna	Cesar Chavez Dr & N Rose Ave	Secondary	61	9	2
N Ventura Rd	Wagon Wheel Rd	Railroad Crossing	Secondary	56	4	2
S Oxnard Blvd	Rose Ave	Channel Island Blvd	Primary	56	4	2
Saviers Rd	E Yucca St	Plaza Driveway	Primary	36	10	1
Saviers Rd	W Bard Rd	Fashion Park Pl	Primary	35	9	1
S Ventura Rd	W Fifth St	Plaza Dwy	Primary	33	7	1
W Channel Islands Blvd	S C St	The Palms Apts Dwy	Primary	33	7	1

Figure 17 – Roadway Segments by Weighted Collisions (2016 – 2020)



Note: The top ten roadway segments with the highest weighted score are highlighted in blue.

Collisions per Million Vehicle Miles Traveled

The number of Collisions per Million Vehicle Miles Traveled (MVMT) was calculated to account for exposure. The Collisions per MVMT was calculated as follows:

$$\frac{C\ x\ 1{,}000{,}000}{V\ x\ L\ x\ 365\ x\ N}$$

Where:

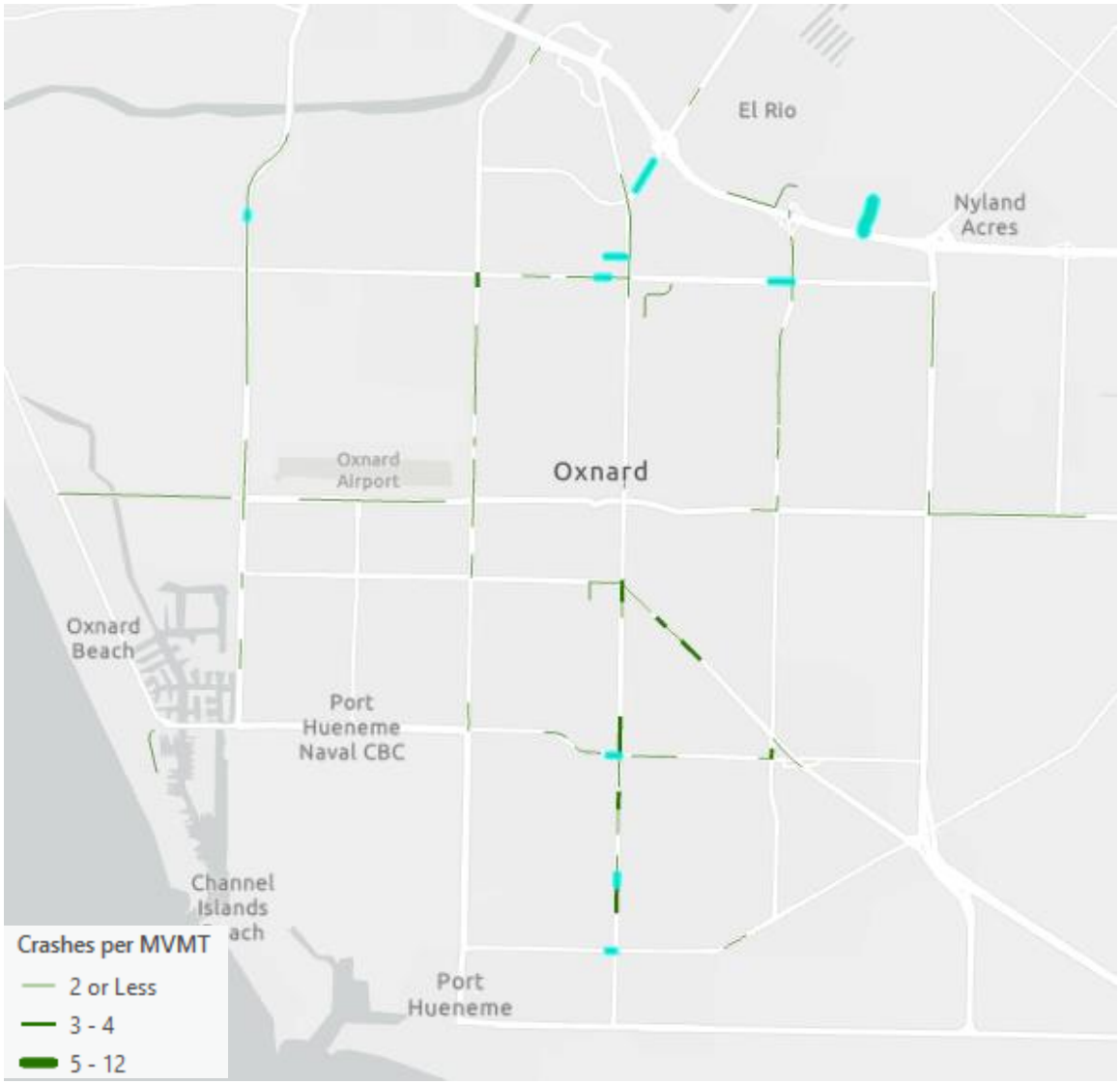
- C = Number of Collisions
- V = Segment AADT
- L = Length of Segment in Miles
- N = Number of Analysis Years (5 years for 2016 to 2020)

Table 10 lists the top ten roadway segments by the Collisions per MVMT. Figure 18 illustrates the weighted score with the top ten roadway segments highlighted in blue.

Table 10 – Top Ten Roadway Segments by Collisions per Million Vehicle Miles Traveled (2016 – 2020)

Road Name	From	To	Class	Collisions per MVMT	Total Collisions	KSI Collisions
Paseo Mercado	Auto Center Dr	Ventura Bl	Minor	12	5	0
N Victoria Ave	Flax Pl	Gum Tree St	Primary	4	8	0
Citrus Grove Ln	Oxnard Bl	Blackberry Cir	Minor	4	4	0
N Vineyard Ave	W Esplanade Dr	Sb 101 On Ramp	Primary	4	4	0
E Gonzales Rd	N Rose Ave	Alley (Near Sonata Dr)	Primary	3	12	0
Saviers Rd	W Channel Islands Blvd	Alley (Near Laurel St)	Primary	2	22	0
N Vineyard Ave	W Esplanade Dr	Craig Dr	Primary	2	18	0
S Oxnard Blvd	E Date St	Midblock (Near Sunkist Cir)	Primary	2	10	2
Saviers Rd	W Bard Rd	Fashion Park Pl	Primary	2	9	1
Saviers Rd	Wolff St	E Wooley Rd & Oxnard Bl	Primary	2	9	0

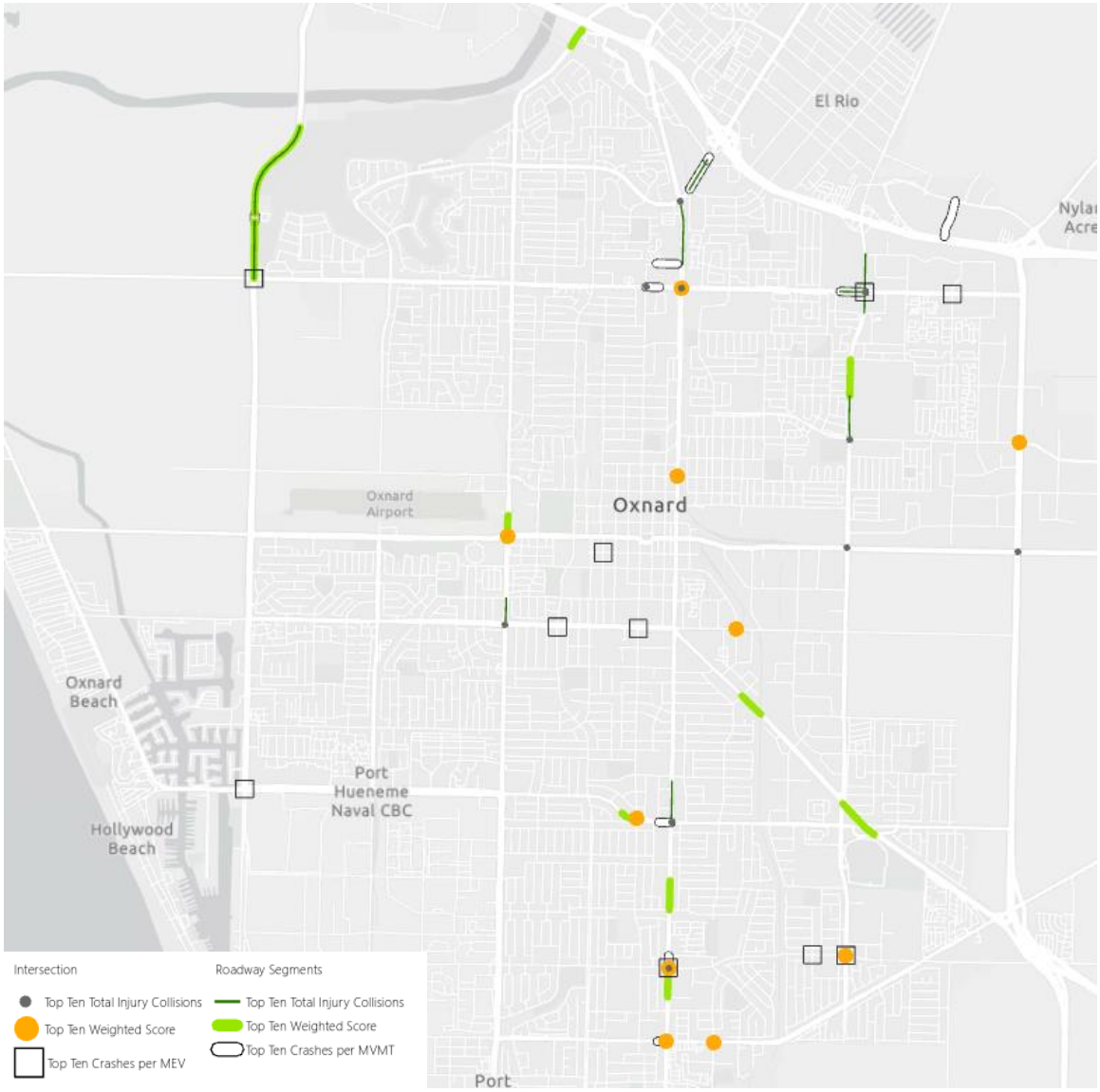
Figure 18 – Roadway Segments by Collisions per Million Vehicle Miles Traveled (2016 – 2020)



Note: The top ten roadway segments with the highest crashes per MVMT are highlighted in blue.

Figure 19 illustrates the top ten intersections and roadways for each collision metric. Several intersections, such as Oxnard Boulevard & Gonzales Road and Rose Avenue & Gonzales Road, and roadways, such as Ventura Road (north of Gonzales Road) and Gonzales Road (west of Rose Avenue) are reflected in more than one collision metric.

Figure 19 – Top Ten Intersections and Roadways for Total Collisions, Weighted Collisions, and Collisions per MEV/MVMT

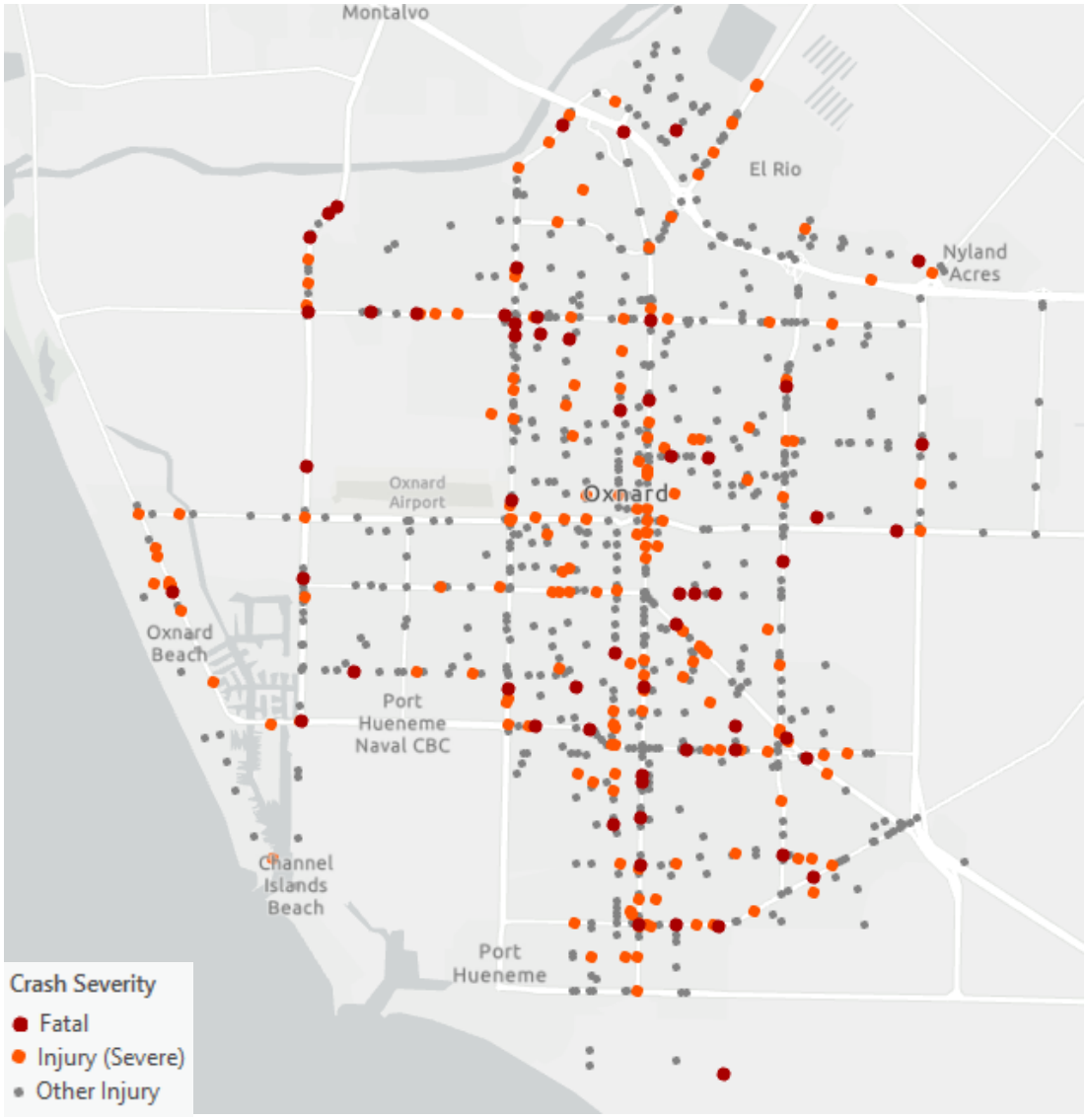


Systemic Analysis

Systemic analysis is a proactive safety approach that evaluates an entire roadway network using a defined set of criteria. Systemic analysis 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, intersection, and land use 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 twofold approach to identify key safety issues and locations to prioritize hot spot analysis and development of collision types. Figure 20 illustrates the injury collisions by collision severity in Oxnard from 2016 to 2020.

Figure 20 – Injury Collisions in Oxnard (2016 - 2020)



Contextual Data Overview and Methodology

To better understand systemic collision patterns in Oxnard, contextual factors were analyzed in conjunction with collision characteristics. Contextual factors include roadway characteristics, roadway facilities, land use characteristics, and driver behavior. The area of influence for each contextual factor varied based on the level of anticipated activity each contextual factor would generate (e.g. a school has a much larger area of influence than a transit stop). Major intersections are defined as intersections that include a primary or secondary road. The contextual factors and their respective areas of influence are summarized in the table below.

Roadway Characteristics	**Distance**
Number of Lanes	50'
Posted Speed Limit	50'
Roadway Classification: • Primary • Secondary • Minor	50'
Traffic Signal • Fully Protected Left Turn Phases	50' Minor Roadway 250' Major Roadway
Intersection Classification • Major Intersection: includes a Primary or Secondary Road • Minor Intersection: Minor-Minor	50' Minor Roadway 250' Major Roadway
Intersection Area of Influence	50' Minor Intersection 250' Major Intersection
Location Type • Major Intersection • Minor Intersection • Midblock	50' Minor Intersection 250' Major Intersection 250'+ Midblock
Average Annual Daily Traffic (AADT)	50'
Roadway Facilities	**Distance**
Streetlights	75'
Railroad Crossing	150'
On-Street Bicycle Facility	100'
Truck Route	100'
Pavement Condition Index	50'
Land Use Characteristics	**Distance**
Disadvantaged or Low-Income Community based on SB 535 or AB 1550 designation	Inside or within 100' of boundary
Schools	1,000'
Parks	1,000'

Bus stop	500'
Transit Station	1320'
Commercial	1000'
Driver Behavior	**Distance**
Hard Braking Hot Spot • Low • Medium • High	100'
Harsh Acceleration Hot Spot • Low • Medium • High	100'

Roadway characteristics (except for AADT), roadway facilities, and land use characteristics were provided by the City of Oxnard and the California Air Resources Board. AADT estimates for 2019 were obtained through StreetLight, a data platform that provides traffic count estimates and other mobility metrics using data from location-based services, such as mobile devices and GPS units. AADT estimates were obtained for 2019 as traffic conditions in 2020 and 2021 were not representative of typical conditions due to the COVID-19 pandemic. Locations with a relatively high number of hard braking or harsh acceleration instances were identified using Wejo, a data platform that provides driver behavior and speeds using data obtained from on-board vehicle sensors, including devices that are built into the vehicle that provide data to the vehicle manufacturer and devices that are installed by the vehicle owner, such as for monitoring fleet vehicles, and from insurance companies for use in monitoring driver behavior and providing insurance discounts/setting premiums. All data are anonymous and cannot be traced back to any individual roadway user. The dataset used in the hard braking and harsh acceleration analysis is based on approximately 192,000 observations citywide.

Community Input Through 311 Requests

The following transportation-related 311 requests from May 2016 to July 2021 were provided by the City of Oxnard:

- Pothole
- Sidewalk Repair
- Street Markings
- Street Signs
- Streetlight Out
- Traffic
    - General Issues
    - Enforcement Issues
    - Signal Issues

From May 2016 to July 2021, there were 9,325 transportation-related 311 requests. Key findings are summarized below with maps illustrating issues with noticeable trends:

- The majority of transportation-related 311 requests were for potholes, which were generally spread throughout the city. There was a concentration of requests along the north-south corridors of the City.
- Street sign, streetlight out, and general traffic issue requests were fairly evenly spread throughout the City.

Figure 21 illustrates sidewalk repair requests which are generally widespread throughout the City, with a concentration of requests:

- North of 5th Street, between Highway 1 and Patterson Road.
- South of 5th Street and north of Channel Islands Boulevard between Victoria Avenue and Ventura Road.
- South of 5th Street. and north of Oxnard Blvd between Rose Avenue and Highway 1.

Figure 21 – Sidewalk Repair 311 Request Hot Spots (2016 - 2021)

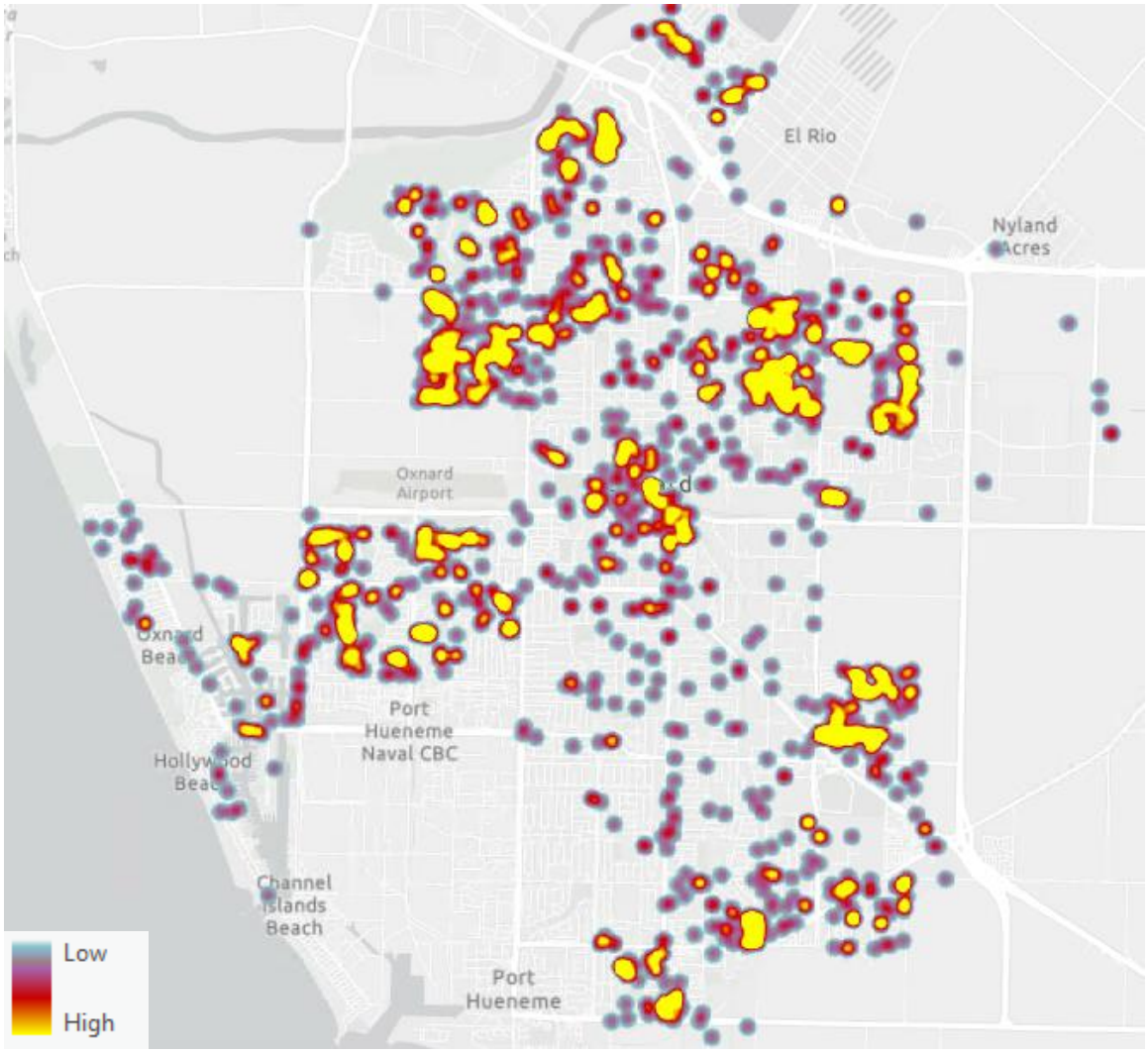
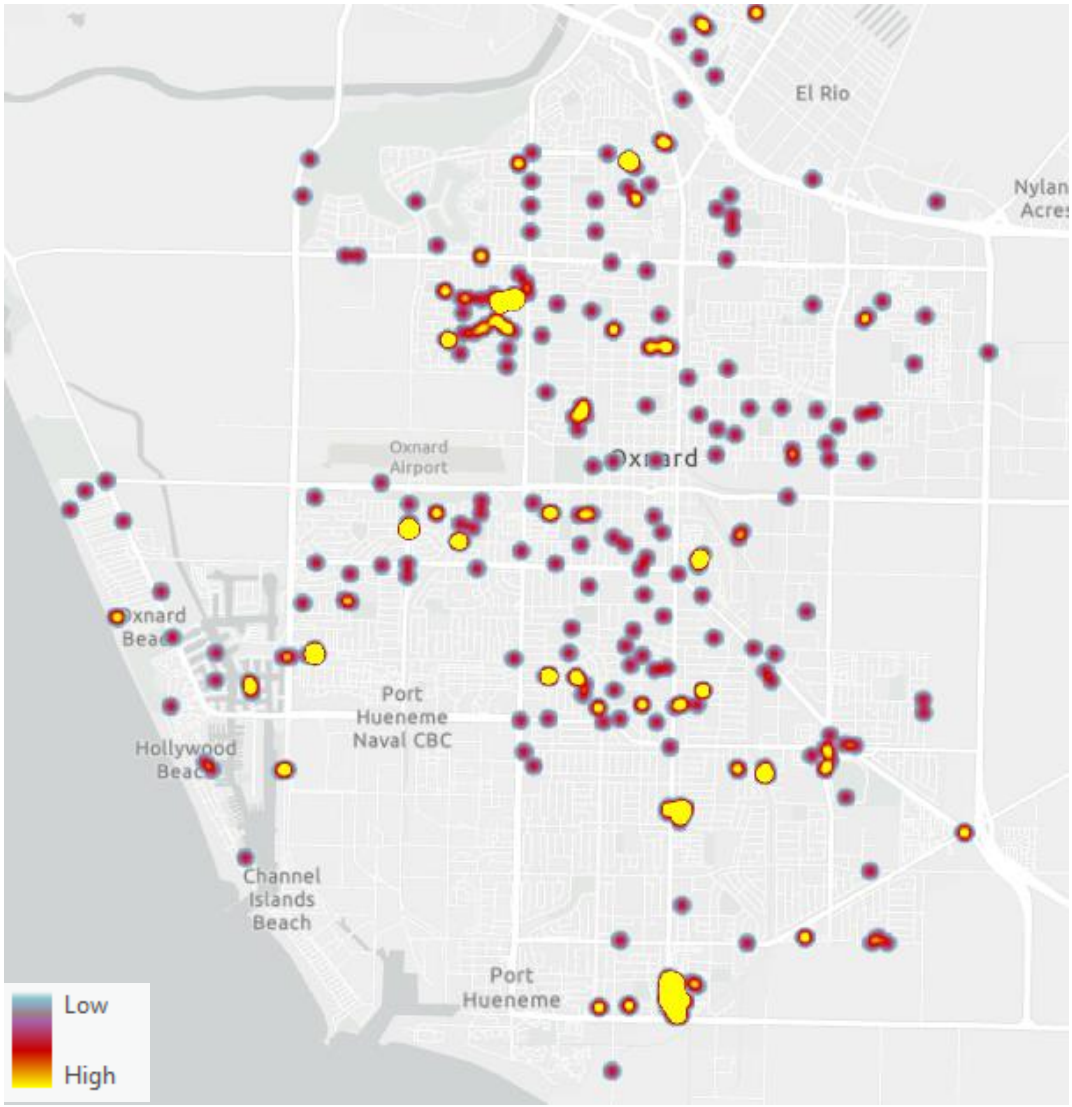


Figure 22 illustrates 311 requests for enforcement, which cover requests around:

- Illegal parking
- Unsafe passenger loading/unloading (e.g. around schools)
- Speeding
- Drivers not stopping at stop signs

There were a cluster of enforcement requests in the residential area southeast of the Gonzales Road & Ventura Road intersection. Many of these requests were around RVs parked for extended periods of time with several requests around speeding. Another cluster of enforcement requests along Saviers Road, south of Channel Islands Boulevard, and near Hueneme Road were around vehicles parked along yellow and red curbs.

Figure 22 – Enforcement 311 Request Hot Spots (2016 - 2021)



Systemic Matrix

Collision data were paired with contextual data in a series of systemic matrices. Outputs from the collision analysis were used to populate a set of matrices that have collision data in rows and contextual data in columns for collisions across the Oxnard roadway network. The matrices help identify combinations of factors that contributed to a high number of total collisions and KSI collisions. The identified combinations inform the development of collision profiles that will be paired with applicable countermeasures to be applied at locations that match the collision profile throughout the city. Matrices were created for each mode for total injury (Table 11) and KSI collisions (Table 12). The systemic matrices by mode for all injury collisions and KSI collisions can be found in Appendix D.

Table 11 - Systemic Matrix: All Injury Collisions (2016 - 2020)

Mode:	All Collisions	Roadway Type												Location Type					Intersection Class						Driver Behavior		Land Use Characteristics				TOTAL
	Lanes:	3 Lanes or Less				4 Lanes					6+ Lanes			Signal		Unsignalized Intersection		Midblock	Primary-Primary	Primary-Secondary	Primary-Minor	Secondary-Secondary	Secondary-Minor	Minor-Minor	Hard Braking Hot Spot	Harsh Acceleration Hot Spot	Disadvantaged or Low-Income Community	Near School	Near Park	Near Bus Stop	
	Speed:	15-25	30-35	40-45	50-55	15-25	30-35	40-45	50-55	60-65	30-35	40-45	50-55	Fully Protected Lefts	All Other Signals	Major	Minor															
Violation	Driving or Bicycling Under the Influence	78	36	9	1	0	45	125	24	6	1	30	20	56	106	119	38	56	48	39	89	26	74	39	38	51	332	141	125	204	375
	Unsafe Speed	144	79	27	18	2	135	372	72	6	25	147	60	248	356	281	70	132	126	172	314	68	187	76	189	200	972	408	300	645	1,087
	Improper Turning	117	32	15	12	0	47	120	27	3	4	41	10	48	97	139	57	87	31	41	95	22	90	61	29	29	371	182	152	216	428
	Vehicle Right of Way Violation	186	118	22	11	0	149	394	59	0	9	109	29	73	425	395	126	67	60	151	330	101	238	138	106	74	988	475	345	602	1,086
	Traffic Signals and Signs	51	47	2	1	0	104	190	36	4	12	65	34	141	277	73	42	13	55	117	156	73	85	44	95	115	496	241	164	351	546
Type	Head-On	103	25	11	3	1	55	146	27	2	3	35	12	54	166	90	56	57	40	74	83	33	76	58	54	47	379	189	144	219	423
	Sideswipe	104	45	9	3	0	57	112	15	3	4	44	25	70	108	134	46	63	43	47	95	22	92	52	53	52	371	179	150	234	421
	Rear End	156	90	26	16	1	185	487	96	7	39	183	78	350	440	356	72	146	181	227	399	96	227	78	247	286	1,220	497	372	834	1,364
	Broadside	272	195	29	18	0	268	616	100	8	24	175	70	238	684	549	186	118	126	264	536	183	348	196	220	206	1,610	752	535	1,049	1,775
	Vehicle/Pedestrian	140	47	8	1	0	58	91	10	1	3	66	5	61	124	108	74	64	35	48	105	21	77	83	42	57	387	227	164	257	431
Time of Day	mid-3 am	37	19	2	0	1	21	48	8	1	2	21	7	25	50	45	18	29	22	21	32	14	27	18	25	22	138	65	56	87	167
	3 am - 6 am	26	9	4	5	0	18	43	16	2	2	19	6	23	53	35	14	25	14	22	33	14	27	15	19	20	129	47	42	68	150
	6 am - 9 am	105	61	8	10	0	75	194	31	1	8	68	27	96	207	159	63	64	52	95	136	49	128	63	84	74	522	265	190	350	589
	9 am - noon	82	52	10	2	0	61	186	34	3	9	71	25	92	201	137	44	61	46	80	151	46	100	47	79	72	487	220	164	302	535
	noon- 3 pm	114	74	15	6	0	104	263	45	6	14	83	30	146	258	216	64	70	73	118	218	58	142	71	111	114	675	305	220	443	754
	3 pm - 6 pm	226	85	26	12	1	164	365	77	2	21	135	41	193	356	348	121	137	109	140	328	70	231	132	145	159	1,045	482	376	671	1,155
	6 pm - 9 pm	163	74	17	6	1	123	286	40	8	10	92	37	140	294	247	90	86	71	133	240	79	148	102	113	122	761	362	267	525	857
	9 pm - mid	77	39	9	7	0	76	160	25	2	7	47	23	87	163	132	37	53	54	72	135	38	80	37	60	91	425	183	137	270	472
Driver At Fault Movement	Proceeding Straight	406	228	39	22	0	326	753	146	12	49	249	103	474	738	633	215	274	239	330	607	198	455	218	339	386	2,094	930	720	1,382	2,334
	Making Right Turn	55	13	5	1	0	28	59	7	2	3	44	11	42	65	68	36	17	23	39	60	9	39	38	38	40	189	101	68	142	228
	Making Left Turn	129	65	29	13	1	147	347	54	3	9	91	28	74	436	256	96	54	64	144	302	84	154	114	95	77	826	395	283	494	916
Victim Age	Under 19	208	91	19	8	2	113	287	46	5	10	94	28	124	291	260	113	124	57	129	223	74	177	123	115	100	798	418	333	535	912
	60+	104	63	13	8	0	94	229	35	5	10	70	24	113	229	192	57	64	54	91	188	56	142	59	96	87	575	271	222	394	655
TOTAL		845	421	95	49	3	652	1,567	279	25	74	543	197	812	1,604	1,342	462	531	448	692	1,292	372	897	496	647	682	4,246	1,967	1,476	2,747	
	Share of roadway/intersections:	79%	4%	2%	2%	0%	2%	8%	2%	0%	0%	1%	0%	21%	79%	16%	84%														
	Share of collisions:	18%	9%	2%	1%	0%	14%	33%	6%	1%	2%	11%	4%	34%	66%	74%	26%														
	Collisions per mile:	2.4326	22.58	9.892	7.27878	N/A	73.76	46.98	33.85	22.06	97.04	108	105.9																		

Table 12 - Systemic Matrix: KSI Collisions (2016 - 2020)

Mode:	KSI Collisions	Roadway Type												Location Type					Intersection Class						Driver Behavior		Land Use Characteristics				TOTAL
	Lanes:	3 Lanes or Less				4 Lanes					6+ Lanes			Signal		Unsignalized Intersection		Midblock	Primary-Primary	Primary-Secondary	Primary-Minor	Secondary-Secondary	Secondary-Minor	Minor-Minor	Hard Braking Hot Spot	Harsh Acceleration Hot Spot	Disadvantaged or Low-Income Community	Near School	Near Park	Near Bus Stop	
	Speed:	15-25	30-35	40-45	50-55	15-25	30-35	40-45	50-55	60-65	30-35	40-45	50-55	Fully Protected Lefts	All Other Signals	Major	Minor														
Violation	Driving or Bicycling Under the Influence	6	2	1	0	0	4	13	4	1	0	2	1	0	10	12	4	8	1	4	9	2	6	4	1	0	31	10	13	16	34
	Unsafe Speed	13	0	2	0	0	5	14	3	0	0	1	2	5	11	10	3	11	5	3	9	0	9	3	4	4	36	12	13	19	40
	Improper Turning	7	1	1	1	0	2	8	4	1	0	0	0	1	6	9	1	8	1	4	5	0	6	1	0	1	21	11	10	11	25
	Vehicle Right of Way Violation	0	2	0	0	0	8	18	2	0	0	2	2	2	19	13	0	0	1	6	16	2	8	1	7	1	33	17	8	18	34
	Pedestrian Violation	5	6	0	0	0	10	10	0	1	1	2	1	2	11	14	4	5	3	3	8	3	1	0	1	3	34	18	15	20	36
Type	Head-On	6	2	1	0	0	6	8	2	0	0	1	0	1	8	9	2	6	0	5	5	1	7	2	1	1	22	8	10	13	26
	Vehicle/Pedestrian	18	9	2	0	0	12	15	0	1	1	8	2	7	16	23	13	9	2	2	5	0	8	1	6	7	67	28	23	40	68
	Rear End	1	0	1	1	0	7	10	3	1	0	2	1	5	10	7	1	4	5	4	8	2	3	1	3	4	26	13	8	18	27
	Broadside	6	2	0	1	0	11	37	5	0	1	5	3	5	34	26	3	3	6	8	33	6	11	4	12	2	65	34	18	35	71
	Hit Object	9	3	1	1	0	3	10	3	1	0	0	0	1	8	11	1	10	6	2	22	1	14	14	1	1	25	11	16	10	31
Time of Day	mid-3 am	2	0	0	0	0	6	8	0	0	0	4	1	2	7	9	0	3	3	1	8	1	5	0	3	2	16	9	10	9	21
	3 am - 6 am	2	1	2	3	0	1	2	0	1	0	0	1	0	6	3	0	4	1	3	1	1	3	0	1	1	11	3	1	5	13
	6 am - 9 am	3	3	1	0	0	3	7	1	0	0	2	1	3	7	5	3	3	3	4	4	0	4	3	3	1	21	12	3	16	21
	9 am - noon	4	2	0	0	0	1	7	0	0	1	4	0	3	5	6	2	3	1	0	7	1	5	2	2	1	19	11	8	13	19
	noon- 3 pm	4	2	0	0	0	3	7	4	2	0	2	1	3	6	6	1	9	2	5	5	0	3	2	4	2	22	7	12	11	25
	3 pm - 6 pm	16	3	0	0	0	9	23	3	0	0	2	0	1	17	23	7	8	2	4	17	2	15	8	2	0	52	27	21	24	56
	6 pm - 9 pm	8	6	1	0	0	10	17	4	2	1	2	3	4	20	19	5	6	4	4	22	3	10	5	7	4	52	22	18	35	54
	9 pm - mid	7	3	1	0	0	6	20	6	0	0	4	1	6	14	17	4	7	5	5	16	2	8	4	4	8	43	14	14	20	48
Driver At Fault Movement	Proceeding Straight	20	4	2	1	0	8	37	9	1	0	8	4	10	31	24	11	18	10	8	27	4	16	11	10	9	83	41	35	43	94
	Making Right Turn	1	0	1	0	0	1	5	0	1	0	0	0	1	3	5	0	0	1	1	2	1	4	0	1	1	9	3	2	7	9
	Making Left Turn	2	1	0	0	0	9	15	0	0	0	2	1	0	20	8	2	0	0	4	18	2	3	3	3	1	29	15	7	16	30
Victim Age	Under 19	19	5	1	1	0	10	33	9	2	1	8	3	8	22	34	7	21	5	6	27	5	21	8	11	6	83	35	34	49	92
	60+	7	8	1	0	0	2	9	1	1	0	2	1	3	8	14	6	1	3	1	10	1	10	6	4	2	31	20	10	20	32
TOTAL		46	20	5	3	0	39	93	18	5	2	20	8	22	84	88	22	43	21	26	81	11	53	24	27	19	237	106	88	133	
	Share of roadway/intersections:	79%	4%	2%	2%	0%	2%	8%	2%	0%	0%	1%	0%	21%	79%	16%	84%														
	Share of collisions:	18%	8%	2%	1%	0%	15%	36%	7%	2%	1%	8%	3%	21%	79%	80%	20%														
	Collisions per mile:	0.1324	1.073	0.521	0.44564	N/A	4.412	2.788	2.184	4.411	2.623	3.978	4.299																		

Key Findings

Key findings for contextual factors, all injury collisions, KSI collisions, and by mode are summarized below:

Contextual Factors

- Larger roadways typically have more activity and higher speed limits. In Oxnard, roadways with 4 lanes account for 12 percent of centerline miles but 53 percent of injury collisions occurred on these roadways. The majority of these collisions (33%) occurred on roadways with 4 lanes and 40 – 45 mph posted speed limit, which is also reflected for all collisions across the city.
- Injury collisions were concentrated in the central area of Oxnard, which has key primary roadways, such as Oxnard Boulevard and Saviers Road, and a relatively dense roadway network compared to other areas of the city. Primary roadways, which make up seven percent of centerline miles, accounted for 56 percent of collisions and the majority of intersection collisions occurred where primary roadways intersect with minor roadways and alleys, which were aggregated into the minor roadway category for this analysis.
- Signals with fully protected left turn phases reduce the amount of decision-making and potential conflict points at an intersection. The reduction in potential conflict points is reflected in the share of injury collisions that occur at signals with fully protected left turn phases (34%), which account for 22 percent of all signals, compared to the share of injury collisions that occur at signals without fully protected left turn phases (66%), which account for 78 percent of all signals in Oxnard.

All Collisions

- The highest share of injury collisions occurred on roadways with four lanes and 40 – 45 mph posted speed limit (33%). The next highest share of collisions occurred on roadways with three lanes or less and 15 – 25 posted speed limit (18%).
- Many injury collisions occurred at major intersections, particularly Primary-Minor intersections.
- Signalized intersections with fully protected left-turn phases had fewer injury collisions when compared to signalized intersections without fully protected left-turn phases. The difference is especially pronounced for broadside collisions where 26 percent of broadside collisions occurred at signalized intersection with fully protected left-turn phase.
- Hard braking and harsh acceleration hot spots are most associated with injury collisions involving an unsafe speed violation or a rear end or broadside crash type.
- A quarter of all injury collisions occurred in the afternoon peak, from 3 PM to 6 PM, particularly at signals without fully protected left-turn phases and at major intersections. The highest share of hard braking and harsh acceleration instances also occurred during this time period, which is when people are traveling from school or work.

- Many injury collisions occurred in a disadvantaged or low-income community and near bus stops.

KSI Collisions

Many of the trends observed for all injury collision were also observed for KSI collisions. There were several additional findings specific to KSI collisions:

- Although the highest share (36%) of KSI collisions occurred on roadways with four lanes and 40 – 45 mph posted speed limits, roadways with three lanes or less and 15 – 25 posted speed limit had a proportionally higher number of KSI collisions compared to the share of total collisions.
- The efficacy of signalized intersections with fully protected left-turn phases is even more pronounced for KSI collisions. There were nearly seven times more collisions at signalized intersections without fully protected left turn phases compared to signalized intersections with fully protected left turn phases.

Vehicle Collisions

Since vehicle collisions make up a large share of all collisions, the trends observed for all collisions and KSI collisions were also observed for all and KSI vehicle collisions.

Bicycle Collisions

- For broadside collisions that occurred at a signalized intersection, there were twice as many collisions that occurred at signalized intersections without protected left turn phases as there were at signalized intersections with fully protected left turn phases.
- Most injury collisions that occurred near schools occurred around school start and end times when students are traveling to and from school.
- The majority of injury collisions involving vulnerable populations (under 19 or 60+ years of age) occurred on roadways with three lanes and 15 – 25 mph posted speed limit or four lanes and 40 – 45 posted speed limit.
- The majority of drivers were either proceeding straight or making a right-turn before the collision occurred.

Pedestrian Collisions

- While 18 percent of total injury collisions occurred on roadways with three lanes or less with 15 – 25 mph posted speed limit, 35 percent of pedestrian collisions occurred on roadways with three lanes or less with 15 – 25 mph posted speed limit.
- Many injury collisions occurred at primary-minor intersections (27%) and minor-minor intersections (25%).

- Many injury collisions involved a pedestrian right-of-way violation at signalized intersections without protected left-turn phases.
- Most pedestrian collisions occurred in the afternoon peak period and early evening between 3 PM and 9 PM (45%).
- Most pedestrian collisions involved pedestrians either crossing in the crosswalk at intersections without protected left-turn phases or crossing not in a crosswalk at unsignalized intersections or midblock.

Appendix A: Top Collision Issues by Mode

The following tables summarize the top violation, type of collision, time of day, and driver movement at fault for all injury collisions and KSI collisions by mode. "Disproportionately KSI" indicates the top trend within that category that results in a severe injury or fatality most frequently. For comparison purposes, 5 percent of all injury collisions within the City resulted in a fatality or severe injury.

Top Issues for All Modes

Category	Top Issue: All Injury Collisions	Percent of All Injury Collisions	Top Issue: KSI Collisions	Percent of KSI Collisions	Disproportionately KSI	Percent of Category that is KSI
Violation	Unsafe Speed	23%	Unsafe Speed	15%	Pedestrian Violation	24%
Type	Broadside	37%	Broadside	27%	Vehicle/Ped	16%
Time of Day	3-6 pm	24%	3 – 6 pm	22%	Midnight – 3 am	13%
Driver Movement at Fault	Proceeding Straight	67%	Proceeding Straight	71%	N/A	N/A

Note: Under 19 years of age are also disproportionately KSI.

Top Issues for Vehicle-Only Collisions

Category	Top Issue: All Injury Collisions	Percent of All Injury Collisions	Top Issue: KSI Collisions	Percent of KSI Collisions	Disproportionately KSI	Percent of Category that is KSI
Violation	Unsafe Speed	26%	DUI	21%	DUI	9%
Type	Broadside	39%	Broadside	37%	Hit Object	15%
Time of Day	3 – 6 pm	25%	3 – 6 pm; 6 - 9 pm	22%	Midnight – 3 am	11%
Driver Movement at Fault	Proceeding Straight	69%	Proceeding Straight	69%	N/A	N/A

Note: Under 19 years of age are also disproportionately KSI.

Top Issues for Bicycle-Involved Collisions

Category	Top Issue: All Injury Collisions	Percent of All Injury Collisions	Top Issue: KSI Collisions	Percent of KSI Collisions	Disproportionately KSI	Percent of Category that is KSI
Violation	Wrong Side of Road	37%	Wrong Side of Road	21%	Improper Passing	20%
Type	Broadside	59%	Broadside	39%	Rear End	24%
Time of Day	3 – 6 pm	26%	3 - 6 pm	36%	3 am – 6 am	29%
Driver Movement at Fault	Proceeding Straight	48%	Proceeding Straight	75%	Proceeding Straight	16%

Note: Under 19 years of age and 60+ years of age are also disproportionately KSI.

Top Issues for Pedestrian-Involved Collisions

Category	Top Issue: All Injury Collisions	Percent of All Injury Collisions	Top Issue: KSI Collisions	Percent of KSI Collisions	Disproportionately KSI	Percent of Category that is KSI
Violation	Ped ROW Violation	35%	Ped Violation	49%	Pedestrian Violation	25%
Type	Crossing in Crosswalk at Intersection	38%	Crossing Not in Crosswalk	52%	Crossing Not in Crosswalk	26%
Time of Day	6 – 9 pm	24%	9 pm - midnight	25%	3 am – 6 am	38%
Driver Movement at Fault	Proceeding Straight	49%	Proceeding Straight	76%	Proceeding Straight	15%

Note: Under 19 years of age and 60+ years of age are also disproportionately KSI.

Appendix B: Injury Collisions in Oxnard by Neighborhood

Neighborhood	Total Collisions	Percent of Total Collisions	Bike Collisions	Percent of Bike Collisions	Ped Collisions	Percent of Ped Collisions	Vehicle Collisions	Percent of Vehicle Collisions	KSI Collisions	Percent of Total KSI Collisions	KSI Bike Collisions	Percent of KSI Bike Collisions	KSI Ped Collisions	Percent of KSI Ped Collisions	KSI Vehicle	Percent of KSI Vehicle Collisions	Weighted Collisions	Area (Sq Mi)	Share of City Area
Auto Center	62	1%	2	1%	2	0%	58	1%	4	2%	0	0%	1	1%	3	2%	166	0.35	1%
Bartolo Square North	22	0%	1	0%	2	0%	19	0%	1	0%	0	0%	0	0%	1	1%	48	0.21	1%
Bartolo Square South	90	2%	6	2%	9	2%	75	2%	7	3%	0	0%	3	4%	4	3%	272	0.19	1%
Blackstock North	36	1%	4	1%	9	2%	23	1%	3	1%	0	0%	2	3%	1	1%	114	0.23	1%
Blackstock South	31	1%	5	1%	3	1%	23	1%	2	1%	1	4%	0	0%	1	1%	83	0.28	1%
Bryce Canyon North	98	2%	5	1%	14	3%	79	2%	7	3%	1	4%	4	5%	2	1%	280	0.27	1%
Bryce Canyon South	97	2%	12	4%	19	4%	66	2%	4	2%	1	4%	2	3%	1	1%	201	0.17	1%
Cabrillo	51	1%	3	1%	4	1%	44	1%	5	2%	0	0%	3	4%	2	1%	181	0.57	2%
Cal-Gisler	138	3%	4	1%	17	4%	117	3%	7	3%	0	0%	3	4%	4	3%	320	0.45	2%
Carriage Square	113	2%	13	4%	15	3%	85	2%	8	3%	2	7%	5	7%	1	1%	321	0.46	2%
Channel Islands	79	2%	7	2%	4	1%	68	2%	2	1%	0	0%	0	0%	2	1%	131	0.76	3%
College Estates	83	2%	8	2%	5	1%	70	2%	6	2%	0	0%	0	0%	6	4%	239	0.31	1%
College Park	29	1%	1	0%	4	1%	24	1%	2	1%	0	0%	0	0%	2	1%	81	0.42	1%
Cypress	24	1%	2	1%	5	1%	17	0%	3	1%	0	0%	1	1%	2	1%	102	0.32	1%
Diamond Bar	3	0%	0	0%	1	0%	2	0%	2	1%	0	0%	0	0%	2	1%	55	0.11	0%
East Village	58	1%	1	0%	8	2%	49	1%	1	0%	0	0%	0	0%	1	1%	84	0.63	2%
El Rio	61	1%	0	0%	5	1%	56	1%	1	0%	0	0%	0	0%	1	1%	87	0.91	3%
El Rio West	52	1%	1	0%	8	2%	43	1%	4	2%	0	0%	3	4%	1	1%	156	0.16	1%
Five Points Northeast	162	3%	17	5%	20	4%	125	3%	15	6%	3	11%	6	8%	6	4%	552	0.46	2%
Fremont North	39	1%	3	1%	5	1%	31	1%	2	1%	1	4%	0	0%	1	1%	91	0.30	1%
Fremont South	30	1%	1	0%	7	2%	22	1%	1	0%	0	0%	1	1%	0	0%	56	0.27	1%
Golf Course	29	1%	2	1%	2	0%	26	1%	0	0%	0	0%	0	0%	0	0%	29	0.41	1%
Hobson Park East	174	4%	15	4%	20	4%	139	4%	7	3%	1	4%	2	3%	4	3%	356	0.34	1%
Hobson Park West	29	1%	3	1%	8	2%	18	0%	2	1%	0	0%	1	1%	1	1%	81	0.18	1%
Hollywood By The Sea	41	1%	3	1%	2	0%	36	1%	3	1%	0	0%	0	0%	3	2%	119	0.68	2%
Kamala Park	364	8%	38	11%	38	8%	289	7%	19	7%	3	11%	6	8%	10	6%	858	0.64	2%
La Colonia	207	4%	12	4%	23	5%	172	4%	12	5%	1	4%	6	8%	5	3%	519	0.51	2%
Lemonwood Eastmont	36	1%	1	0%	4	1%	31	1%	0	0%	0	0%	0	0%	0	0%	36	0.41	1%

Appendix B:
Injury Collisions in Oxnard by Neighborhood (2016-2020)

Neighborhood	Total Collisions	Percent of Total Collisions	Bike Collisions	Percent of Bike Collisions	Ped Collisions	Percent of Ped Collisions	Vehicle Collisions	Percent of Vehicle Collisions	KSI Collisions	Percent of Total KSI Collisions	KSI Bike Collisions	Percent of KSI Bike Collisions	KSI Ped Collisions	Percent of KSI Ped Collisions	KSI Vehicle	Percent of KSI Vehicle Collisions	Weighted Collisions	Area (Sq Mi)	Share of City Area
Mar Vista	3	0%	0	0%	0	0%	3	0%	0	0%	0	0%	0	0%	0	0%	3	0.12	0%
Marina West	51	1%	2	1%	1	0%	48	1%	1	0%	0	0%	0	0%	1	1%	77	0.50	2%
Nyeland Acres	6	0%	0	0%	0	0%	6	0%	0	0%	0	0%	0	0%	0	0%	6	0.24	1%
Orchard	126	3%	8	2%	9	2%	109	3%	2	1%	0	0%	0	0%	2	1%	178	0.30	1%
Ormond Beach Commercial Area	16	0%	1	0%	2	0%	13	0%	1	0%	0	0%	0	0%	1	1%	42	2.78	9%
Oxnard Dunes	11	0%	0	0%	0	0%	11	0%	2	1%	0	0%	0	0%	2	1%	63	0.32	1%
Oxnard Pacific	3	0%	0	0%	1	0%	2	0%	0	0%	0	0%	0	0%	0	0%	3	0.10	0%
Oxnard Shores	62	1%	2	1%	1	0%	59	1%	8	3%	1	4%	0	0%	7	4%	270	0.56	2%
Pacific Avenue Commercial Area	268	6%	25	7%	10	2%	233	6%	10	4%	0	0%	4	5%	6	4%	528	0.99	3%
Pleasant Valley Estates	54	1%	3	1%	8	2%	43	1%	8	3%	1	4%	2	3%	5	3%	262	0.31	1%
Pleasant Valley Village	67	1%	9	3%	4	1%	54	1%	6	2%	0	0%	0	0%	6	4%	223	0.22	1%
Redwood	25	1%	0	0%	2	0%	23	1%	2	1%	0	0%	0	0%	2	1%	77	0.23	1%
Rice Avenue Commercial Area	227	5%	7	2%	7	2%	213	5%	9	3%	0	0%	1	1%	8	5%	461	2.78	9%
Rio Lindo	185	4%	17	5%	15	3%	154	4%	3	1%	0	0%	1	1%	2	1%	263	0.61	2%
Riverpark	110	2%	7	2%	10	2%	93	2%	5	2%	0	0%	0	0%	5	3%	240	0.95	3%
Rose Park	14	0%	2	1%	5	1%	7	0%	0	0%	0	0%	0	0%	0	0%	14	0.21	1%
Sea Air	178	4%	18	5%	10	2%	150	4%	6	2%	3	11%	1	1%	2	1%	334	0.38	1%
Sea View Estates	94	2%	3	1%	3	1%	88	2%	2	1%	0	0%	0	0%	2	1%	146	0.39	1%
Sierra Linda	46	1%	2	1%	5	1%	39	1%	3	1%	2	7%	0	0%	1	1%	124	0.33	1%
Silver Strand	1	0%	0	0%	0	0%	1	0%	0	0%	0	0%	0	0%	0	0%	1	0.21	1%
South Bank	85	2%	5	1%	5	1%	75	2%	5	2%	0	0%	2	3%	3	2%	215	0.51	2%
Southwinds	106	2%	7	2%	15	3%	84	2%	7	3%	1	4%	2	3%	4	3%	288	0.25	1%
Teal Club	36	1%	0	0%	2	0%	34	1%	2	1%	0	0%	0	0%	2	1%	88	0.28	1%
Terrace Estates	41	1%	3	1%	2	0%	36	1%	3	1%	1	4%	1	1%	1	1%	119	0.22	1%
Tierra Vista	15	0%	1	0%	3	1%	11	0%	1	0%	0	0%	0	0%	1	1%	41	0.24	1%
Via Marina	39	1%	3	1%	3	1%	33	1%	2	1%	1	4%	0	0%	1	1%	91	0.47	2%
Victoria Estates	82	2%	3	1%	4	1%	75	2%	8	3%	1	4%	0	0%	7	4%	290	0.66	2%
Villa Capri	5	0%	0	0%	2	0%	3	0%	1	0%	0	0%	1	1%	0	0%	31	0.04	0%
Wagon Wheel	35	1%	0	0%	2	0%	33	1%	2	1%	0	0%	0	0%	2	1%	87	0.12	0%
West Village	119	3%	10	3%	10	2%	99	2%	3	1%	0	0%	0	0%	3	2%	197	0.79	3%
Wilson	210	4%	22	6%	31	7%	159	4%	10	4%	2	7%	5	7%	4	3%	470	0.43	1%

Appendix B:
Injury Collisions in Oxnard by Neighborhood (2016-2020)

Neighborhood	Total Collisions	Percent of Total Collisions	Bike Collisions	Percent of Bike Collisions	Ped Collisions	Percent of Ped Collisions	Vehicle Collisions	Percent of Vehicle Collisions	KSI Collisions	Percent of Total KSI Collisions	KSI Bike Collisions	Percent of KSI Bike Collisions	KSI Ped Collisions	Percent of KSI Ped Collisions	KSI Vehicle	Percent of KSI Vehicle Collisions	Weighted Collisions	Area (Sq Mi)	Share of City Area
Windsor North River Ridge	72	2%	6	2%	6	1%	60	2%	7	3%	0	0%	0	0%	7	4%	254	0.53	2%
Outside Of A Neighborhood	121	3%	6	2%	11	2%	104	3%	10	4%	1	4%	4	5%	5	3%	381	1.86	6%
Total	4751	100%	342	100%	452	100%	3962	100%	259	100%	28	100%	73	100%	159	100%	11485	29.97	100%

Appendix C: Top Ten Intersections for Total Injury Collisions by Intersection Classification

Top Ten Intersections by Total Injury Collisions: Primary-Primary Intersections

Intersection Name	Injury Collisions			KSI			Weighted Total Score	Crashes per MEV
	Total	Bike	Ped	Total	Bike	Ped		
E Gonzales Rd & N Oxnard Blvd	49	6	4	2	1	0	101	0.48
N Vineyard Ave & Oxnard Blvd	43	3	3	1	0	1	69	0.61
E Fifth St & S Rice Ave	40	0	1	1	0	0	66	0.57
W Channel Islands Blvd & Saviers Rd	38	2	5	0	0	0	38	0.46
W Gonzales Rd & N Victoria Ave	35	0	1	1	0	0	61	0.74
S Ventura Rd & W Fifth St	33	2	6	4	2	1	137	0.32
E Fifth St & S Oxnard Blvd	30	1	5	1	0	0	56	0.34
S Ventura Rd & W Channel Islands Blvd	25	1	3	1	0	0	51	0.40
W Gonzales Rd & N Ventura Rd	24	1	4	0	0	0	24	0.46
W Fifth St & S Victoria Ave	24	2	1	1	0	0	50	0.34

Top Ten Intersections by Total Injury Collisions: Primary-Secondary Intersections

Intersection Name	Injury Collisions			KSI			Weighted Total Score	Crashes per MEV
	Total	Bike	Ped	Total	Bike	Ped		
E Gonzales Rd & N Rose Ave	55	4	8	0	0	0	55	0.85
W Bard Rd & Saviers Rd	45	4	7	2	0	1	97	1.20
E Fifth St & S Rose Ave	40	2	1	0	0	0	40	0.51
N C St & W Gonzales Rd	39	3	4	1	0	0	65	0.63
S Victoria Ave & W Channel Islands Blvd	37	3	0	2	0	0	89	0.83
E Wooley Rd & Saviers Rd & Oxnard Bl	33	1	2	0	0	0	33	0.44
W Channel Islands Blvd & S C St	32	1	4	3	0	0	110	0.51
S Rose Ave & E Channel Islands Blvd	30	6	3	0	0	0	30	0.41
S J St & W Channel Islands Blvd	26	2	0	0	0	0	26	0.46
N Rice Ave & Camino Del Sol	26	0	0	3	0	0	104	0.38

Top Ten Intersections by Total Injury Collisions: Primary-Minor Intersections

Intersection Name	Injury Collisions			KSI			Weighted Total Score	Crashes per MEV
	Total	Bike	Ped	Total	Bike	Ped		
Laurel St & Saviers Rd	31	4	7	1	0	1	57	0.69
N Vineyard Ave & W Esplanade Dr	30	1	1	1	0	0	56	0.66
S Oxnard Blvd & E Seventh St	29	3	3	1	0	0	55	0.43
S Oxnard Blvd & E Date St	28	2	2	2	0	0	80	0.71
Bryce Canyon Ave & Saviers Rd	27	4	5	2	0	2	79	0.56
W Seventh St & S Ventura Rd	27	1	1	0	0	0	27	0.32
Gisler Ave & E Channel Islands Blvd	26	1	2	1	0	1	52	0.45
Statham Blvd & E Channel Islands Blvd	24	1	0	2	0	0	76	0.45
E Yucca St & Saviers Rd	22	3	6	2	0	1	74	0.46
S Oxnard Blvd & Statham Blvd	21	1	0	0	0	0	21	0.59

Top Ten Intersections by Total Injury Collisions: Secondary-Secondary Intersections

Intersection Name	Injury Collisions			KSI			Weighted Total Score	Crashes per MEV
	Total	Bike	Ped	Total	Bike	Ped		
Wooley Rd & Ventura Rd	46	5	2	0	0	0	46	0.56
N Rose Ave & Camino Del Sol	37	2	0	2	0	0	89	0.49
W Wooley Rd & S C St	36	2	3	1	1	0	62	0.76
S Rose Ave & E Bard Rd	31	1	1	4	1	0	135	0.87
W Wooley Rd & S J St	29	2	3	1	1	0	55	0.84
S H St & Hobson Way	26	0	1	1	0	0	52	0.61
S Rose Ave & E Third St	21	5	1	1	1	0	47	0.26
E Wooley Rd & Pacific Ave	13	2	1	0	0	0	13	0.36
S Patterson Rd & W Wooley Rd	13	0	0	0	0	0	13	0.34
E Wooley Rd & S Rose Ave	13	0	0	0	0	0	13	0.21

Top Ten Intersections by Total Injury Collisions: Secondary-Minor Intersections

Intersection Name	Injury Collisions			KSI			Weighted Total Score	Crashes per MEV
	Total	Bike	Ped	Total	Bike	Ped		
Lockwood St & N Rose Ave	24	1	2	0	0	0	24	0.45
E Wooley Rd & Commercial Ave	19	0	2	4	0	2	123	0.50
Rose Ave & E 1st St	18	0	1	0	0	0	18	0.23
Anchorage St & E Bard Rd	17	1	2	0	0	0	17	0.85
W Wooley Rd & Novato Dr	16	0	0	1	0	0	42	0.47
Cesar Chavez Dr & N Rose Ave	15	2	0	1	0	0	41	0.25
N Rose Ave & Santa Lucia Ave	13	0	0	0	0	0	13	0.17
N C St & Roderick Ave	12	0	0	0	0	0	12	0.42
Eastman Ave & S Rose Ave	12	2	1	0	0	0	12	0.18
N Rose Ave & San Gorgonio Ave	12	0	0	0	0	0	12	0.15

Top Ten Intersections by Total Injury Collisions: Minor-Minor Intersections

Intersection Name	Injury Collisions			KSI			Weighted Total Score	Crashes per MEV
	Total	Bike	Ped	Total	Bike	Ped		
Ventura Blvd & Balboa St	7	0	0	0	0	0	7	0.45
N A St & Magnolia Ave	6	0	2	1	0	1	32	0.60
Samuel Ave & E Yucca St	6	3	0	0	0	0	6	0.55
Ventura Blvd & Cortez St	6	0	0	0	0	0	6	0.35
E First St & N Roosevelt Ave	5	0	0	0	0	0	5	0.61
Ninth St & S H St	5	0	1	1	0	0	31	0.55
E Iris St & San Marino St	5	0	0	0	0	0	5	0.50
Ninth St & Ventura Service Rd	5	0	0	0	0	0	5	0.42
S F St & W Sixth St	4	2	1	0	0	0	4	0.73
Town Center Dr & Portico Way	4	0	1	0	0	0	4	0.31

Appendix D: Systemic Matrices

Mode:	Vehicle Collisions	Roadway Type												Location Type					Intersection Class						Driver Behavior		Land Use Characteristics				TOTAL
	Lanes:	3 Lanes or Less				4 Lanes					6+ Lanes			Signal		Unsignalized Intersection		Midblock	Primary-Primary	Primary-Secondary	Primary-Minor	Secondary-Secondary	Secondary-Minor	Minor-Minor	Hard Braking Hot Spot	Harsh Acceleration Hot Spot	Disadvantaged or Low-Income Community	Near School	Near Park	Near Bus Stop	
	Speed:	15-25	30-35	40-45	50-55	15-25	30-35	40-45	50-55	60-65	30-35	40-45	50-55	Fully Protected Lefts	All Other Signals	Major	Minor														
Violation	Driving or Bicycling Under the Influence	75	36	9	1	0	44	125	23	6	1	29	20	55	104	118	37	55	47	39	88	25	73	38	38	51	326	139	123	202	369
	Unsafe Speed	123	76	25	17	2	132	364	71	5	25	144	58	244	348	273	57	121	123	170	305	68	181	63	185	197	932	389	285	627	1,043
	Improper Turning	100	29	13	11	0	45	109	26	3	4	36	10	45	85	121	50	85	29	37	81	22	78	53	28	26	332	162	137	190	386
	Vehicle Right of Way Violation	160	112	21	11	0	137	379	59	0	6	104	27	64	401	377	113	61	55	142	309	99	226	123	101	69	923	430	311	562	1,016
	Traffic Signals and Signs	39	41	2	1	0	95	181	34	4	12	50	34	127	258	65	33	10	53	110	141	68	76	32	89	103	453	216	141	317	493
Type	Head-On	95	21	11	3	1	52	133	26	2	3	32	11	48	155	82	53	52	37	68	78	31	67	54	50	43	348	171	129	199	390
	Sideswipe	77	37	7	2	0	50	99	14	3	3	41	25	65	93	111	34	56	39	42	83	19	73	40	50	49	314	145	122	200	359
	Rear End	150	90	25	16	1	182	478	94	6	38	181	75	344	434	350	67	141	177	224	393	94	224	73	242	279	1,196	488	365	819	1,336
	Broadside	221	174	27	17	0	238	537	99	8	20	147	65	207	616	484	156	90	116	237	467	166	310	162	201	181	1,414	653	464	915	1,553
	Hit Object	40	10	10	5	1	18	75	17	3	1	30	3	24	48	67	19	55	0	2	0	0	2	1	15	16	171	79	72	92	213
Time of Day	mid-3 am	28	17	2	0	1	16	43	8	1	2	17	7	22	39	41	15	25	21	17	24	13	23	15	22	18	116	54	49	73	142
	3 am - 6 am	23	9	2	5	0	15	40	16	1	2	16	5	21	47	30	14	23	14	19	27	14	23	15	19	18	117	42	38	57	135
	6 am - 9 am	64	48	6	10	0	63	169	28	1	8	57	26	86	176	132	38	48	45	83	118	43	103	38	77	65	433	204	139	287	480
	9 am - noon	63	43	10	2	0	49	156	33	3	7	59	24	76	174	114	34	51	39	65	128	41	85	35	68	61	410	177	132	247	449
	noon- 3 pm	88	61	14	6	0	92	236	45	5	12	69	28	130	229	188	53	57	66	102	191	54	124	58	102	98	590	256	182	385	657
	3 pm - 6 pm	160	64	25	12	1	146	319	71	2	20	114	39	169	303	304	86	111	95	120	290	62	194	93	131	139	874	391	305	565	973
	6 pm - 9 pm	113	58	13	5	1	95	237	36	7	7	73	33	115	249	192	62	60	59	116	193	63	118	68	96	103	600	276	209	414	678
	9 pm - mid	62	33	7	5	0	64	136	25	2	6	31	20	73	139	109	27	43	45	68	105	34	67	27	48	74	347	146	113	227	391
Driver At Fault Movement	Proceeding Straight	347	209	35	21	0	310	723	144	12	46	240	99	457	707	590	179	253	228	322	582	188	419	178	325	369	1,962	858	654	1,297	2,186
	Making Right Turn	37	9	4	1	0	16	41	5	0	2	26	9	25	38	50	25	13	14	21	39	6	29	26	24	23	120	63	44	88	151
	Making Left Turn	112	58	26	13	1	130	326	52	3	9	79	28	70	383	248	84	52	62	132	270	79	143	99	90	70	756	347	255	449	837
Victim Age	Under 19	124	67	17	6	2	96	230	41	4	10	68	25	104	238	193	73	82	49	102	174	64	135	77	99	90	605	286	233	404	690
	60+	74	42	11	8	0	77	202	33	4	7	56	22	95	195	156	36	55	46	76	165	48	110	36	81	73	466	207	174	323	537
TOTAL		613	340	82	46	3	548	1,354	264	22	65	440	183	700	1,373	1,128	338	423	390	600	1,089	326	749	358	571	582	3,538	1,574	1,187	2,278	
	Share of roadway/intersections:	79%	4%	2%	2%	0%	2%	8%	2%	0%	0%	1%	0%	21%	79%	16%	84%														
	Share of collisions:	15%	9%	2%	1%	0%	14%	34%	7%	1%	2%	11%	5%	34%	66%	77%	23%														
	Collisions per mile:	1.7647	18.24	8.538	6.83314	N/A	61.99	40.6	32.03	19.41	85.24	87.52	98.33																		

Mode:	Vehicle KSI Collisions	Roadway Type												Location Type					Intersection Class						Driver Behavior		Land Use Characteristics				TOTAL
	Lanes:	3 Lanes or Less				4 Lanes					6+ Lanes			Signal		Unsignalized Intersection		Midblock	Primary-Primary	Primary-Secondary	Primary-Minor	Secondary-Secondary	Secondary-Minor	Minor-Minor	Hard Braking Hot Spot	Harsh Acceleration Hot Spot	Disadvantaged or Low-Income Community	Near School	Near Park	Near Bus Stop	
	Speed:	15-25	30-35	40-45	50-55	15-25	30-35	40-45	50-55	60-65	30-35	40-45	50-55	Fully Protected Lefts	All Other Signals	Major	Minor														
Violation	Driving or Bicycling Under the Influence	5	2	1	0	0	4	13	4	1	0	2	1	0	10	12	3	8	1	4	9	2	6	3	1	0	30	10	13	15	33
	Unsafe Speed	8	0	1	0	0	4	13	3	0	0	1	2	5	9	10	0	8	5	3	8	0	8	0	4	4	28	11	11	18	32
	Improper Turning	4	1	0	1	0	1	7	4	1	0	0	0	1	5	4	1	8	1	4	3	0	2	1	0	1	15	9	8	9	19
	Vehicle Right of Way Violation	0	1	0	0	0	7	18	2	0	0	1	2	1	19	11	0	0	0	6	16	2	6	1	6	1	30	15	6	16	31
	Traffic Signals and Signs	0	0	0	0	0	2	10	2	0	1	3	1	3	12	2	0	2	3	3	8	2	1	0	7	3	17	9	6	12	19
Type	Head-On	5	2	1	0	0	5	6	2	0	0	1	0	1	6	8	2	5	0	4	5	0	6	2	1	1	18	7	7	11	22
	Sideswipe	0	1	0	0	0	0	7	2	2	0	1	1	2	4	4	0	4	2	2	3	0	3	0	2	3	13	3	5	9	14
	Rear End	1	0	0	1	0	5	10	2	0	0	2	1	5	7	6	1	3	5	3	7	1	2	1	3	2	21	12	6	15	22
	Broadside	3	1	0	1	0	9	31	5	0	1	4	3	3	31	20	1	3	5	7	30	4	7	2	11	2	53	27	14	29	58
	Hit Object	9	3	1	1	0	3	10	3	1	0	0	0	1	8	11	1	10	0	0	0	0	0	0	1	1	25	11	16	10	31
Time of Day	mid-3 am	1	0	0	0	0	5	6	0	0	0	2	1	1	4	7	0	3	2	1	6	1	2	0	2	0	11	7	9	6	15
	3 am - 6 am	1	1	0	3	0	1	2	0	0	0	0	0	0	4	1	0	3	1	1	0	1	2	0	1	0	6	2	1	1	8
	6 am - 9 am	0	1	0	0	0	2	7	1	0	0	1	1	3	6	2	0	2	3	4	2	0	2	0	3	1	13	8	0	11	13
	9 am - noon	1	0	0	0	0	1	5	0	0	1	2	0	1	5	3	0	1	0	0	7	0	2	0	1	1	10	7	4	7	10
	noon- 3 pm	2	0	0	0	0	1	5	4	2	0	1	0	1	4	3	0	7	0	3	4	0	1	0	2	1	12	4	9	4	15
	3 pm - 6 pm	6	1	0	0	0	6	17	2	0	0	2	0	1	11	14	2	6	2	4	11	1	7	3	1	0	31	15	10	15	34
	6 pm - 9 pm	5	1	1	0	0	5	13	4	1	0	1	3	2	15	10	3	4	2	4	14	1	6	3	6	2	32	10	11	20	34
	9 pm - mid	5	3	1	0	0	1	10	6	0	0	1	1	4	8	10	1	5	4	4	7	1	6	1	3	5	24	9	9	15	28
Driver At Fault Movement	Proceeding Straight	12	2	0	1	0	7	33	9	1	0	4	3	6	27	18	5	16	7	8	24	2	10	5	7	5	62	33	30	34	72
	Making Right Turn	0	0	1	0	0	0	5	0	0	0	0	0	0	2	4	0	0	0	0	2	1	3	0	0	0	6	3	2	5	6
	Making Left Turn	1	1	0	0	0	8	14	0	0	0	1	1	0	17	8	1	0	0	4	15	2	3	2	3	0	25	11	5	13	26
Victim Age	Under 19	6	2	1	1	0	6	21	8	1	1	3	3	6	16	18	0	13	4	4	18	3	11	0	10	5	46	15	18	30	53
	60+	3	0	0	0	0	1	7	1	0	0	2	0	2	4	5	2	1	2	0	6	1	2	2	3	0	13	10	2	8	14
TOTAL		21	7	2	3	0	22	67	17	3	1	10	6	13	59	50	6	31	14	21	52	6	28	7	20	10	140	63	54	79	
	Share of roadway/intersections:	79%	4%	2%	2%	0%	2%	8%	2%	0%	0%	1%	0%	21%	79%	16%	84%														
	Share of collisions:	13%	4%	1%	2%	0%	14%	42%	11%	2%	1%	6%	4%	18%	82%	89%	11%														
	Collisions per mile:	0.0605	0.375	0.208	0.44564	N/A	2.489	2.009	2.063	2.647	1.311	1.989	3.224																		

Mode:	Bicycle Collisions	Roadway Type												Location Type					Intersection Class						Driver Behavior		Land Use Characteristics				TOTAL
	Lanes:	3 Lanes or Less				4 Lanes					6+ Lanes			Signal		Unsignalized Intersection		Midblock	Primary-Primary	Primary-Secondary	Primary-Minor	Secondary-Secondary	Secondary-Minor	Minor-Minor	Hard Braking Hot Spot	Harsh Acceleration Hot Spot	Disadvantaged or Low-Income Community	Near School	Near Park	Near Bus Stop	
	Speed:	15-25	30-35	40-45	50-55	15-25	30-35	40-45	50-55	60-65	30-35	40-45	50-55	Fully Protected Lefts	All Other Signals	Major	Minor														
Violation	Wrong Side of Road	21	14	2	0	0	15	53	5	0	3	13	2	23	34	41	11	19	0	0	1	1	0	0	0	17	117	55	41	80	128
	Unsafe Speed	6	0	0	1	0	3	5	1	0	0	1	2	4	4	3	5	3	3	1	7	0	0	5	4	3	18	8	5	8	19
	Improper Turning	9	3	1	1	0	0	8	1	0	0	5	0	2	8	15	2	1	1	2	11	0	10	3	1	3	26	13	8	20	28
	Vehicle Right of Way Violation	20	6	1	0	0	11	11	0	0	3	5	2	7	22	16	8	6	4	7	20	2	10	10	5	5	56	34	28	36	59
	Traffic Signals and Signs	7	6	0	0	0	8	7	2	0	0	14	0	12	18	7	5	2	0	7	14	5	9	7	5	11	36	20	20	28	44
Type	Head-On	4	3	0	0	0	2	10	0	0	0	3	1	5	7	8	1	2	2	4	4	2	8	1	3	3	21	13	12	15	23
	Sideswipe	16	3	2	1	0	6	6	0	0	1	2	0	3	10	13	6	5	2	4	7	2	11	6	2	1	33	18	17	22	37
	Rear End	3	0	1	0	0	3	7	2	1	1	2	1	4	5	5	2	5	2	2	5	2	3	2	3	6	17	7	4	12	21
	Broadside	43	20	2	1	0	26	73	1	0	4	28	5	31	63	59	25	25	9	25	64	16	36	29	18	25	180	88	62	123	203
	Vehicle/Pedestrian	8	6	0	0	0	3	8	7	0	0	13	0	13	15	12	2	3	6	9	13	2	8	4	8	12	41	25	16	23	45
Time of Day	mid-3 am	3	1	0	0	0	2	1	0	0	0	1	0	2	3	2	1	0	1	2	3	0	1	1	2	3	6	5	3	4	8
	3 am - 6 am	1	0	1	0	0	1	1	0	1	0	2	0	1	3	3	0	0	0	2	2	0	3	0	0	2	6	2	2	6	7
	6 am - 9 am	8	6	0	0	0	3	14	0	0	0	3	1	3	13	10	6	3	2	4	6	5	9	6	2	3	30	15	12	18	35
	9 am - noon	5	4	0	0	0	10	21	1	0	1	9	1	10	20	16	1	5	4	10	19	2	10	3	7	7	47	28	14	29	52
	noon- 3 pm	15	7	0	0	0	4	13	0	0	2	7	1	7	13	15	4	10	2	8	14	3	7	5	4	5	41	24	20	30	49
	3 pm - 6 pm	24	10	1	0	0	7	30	5	0	1	10	0	14	30	23	11	10	3	13	23	6	19	14	8	12	83	40	33	54	88
	6 pm - 9 pm	17	4	2	1	0	10	24	4	0	1	10	2	15	16	24	11	9	6	8	19	7	15	11	6	11	65	31	22	45	75
	9 pm - mid	2	1	1	1	0	5	7	0	0	1	3	2	5	6	7	2	3	2	1	11	2	2	2	6	6	22	10	8	15	23
Driver At Fault Movement	Proceeding Straight	13	3	0	1	0	6	5	2	0	2	4	2	9	8	9	7	5	5	3	7	3	8	7	7	8	37	16	13	22	38
	Making Right Turn	4	1	1	0	0	3	7	1	1	0	7	1	5	10	9	1	1	2	6	11	3	2	1	3	6	22	8	6	16	26
	Making Left Turn	1	2	1	0	0	3	6	0	0	0	3	0	2	11	1	0	2	0	3	7	1	1	2	0	1	15	8	5	10	16
Victim Age	Under 19	20	11	0	1	0	8	26	4	0	0	10	1	8	27	28	9	9	1	13	23	5	18	13	6	4	70	49	39	47	81
	60+	10	6	0	0	0	6	10	1	1	2	6	0	7	13	10	8	4	0	8	8	5	9	8	2	5	38	21	16	23	42
TOTAL		76	33	5	2	0	42	112	10	1	6	48	7	58	106	101	37	40	21	48	99	25	67	43	36	50	304	159	115	204	

Share of roadway/intersections:	79%	4%	2%	2%	0%	2%	8%	2%	0%	0%	1%	0%	21%	79%	16%	84%		
Share of collisions:	22%	10%	1%	1%	0%	12%	33%	3%	0%	2%	14%	2%	35%	65%	73%	27%		
Collisions per mile:	0.2188	1.77	0.521	0.29709	N/A	4.751	3.358	1.213	0.882	7.868	9.547	3.761						

Mode:	Bicycle KSI Collisions	Roadway Type												Location Type					Intersection Class						Driver Behavior		Land Use Characteristics				TOTAL
	Lanes:	3 Lanes or Less				4 Lanes					6+ Lanes			Signal		Unsignalized Intersection		Midblock	Primary-Primary	Primary-Secondary	Primary-Minor	Secondary-Secondary	Secondary-Minor	Minor-Minor	Hard Braking Hot Spot	Harsh Acceleration Hot Spot	Disadvantaged or Low-Income Community	Near School	Near Park	Near Bus Stop	
	Speed:	15-25	30-35	40-45	50-55	15-25	30-35	40-45	50-55	60-65	30-35	40-45	50-55	Fully Protected Lefts	All Other Signals	Major	Minor														
Violation	Wrong Side of Road	2	0	0	0	0	2	2	0	0	0	0	0	1	3	1	1	0	0	0	0	0	0	0	0	0	6	2	3	4	6
	Unsafe Speed	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	1	0	0	2	1	1	0	2
	Improper Turning	2	0	1	0	0	0	1	0	0	0	0	0	0	0	4	0	0	0	0	1	0	3	0	0	0	4	1	1	2	4
	Vehicle Right of Way Violation	0	1	0	0	0	1	0	0	0	0	1	0	1	0	2	0	0	1	0	0	0	2	0	1	0	3	2	2	2	3
	Traffic Signals and Signs	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1
Type	Head-On	1	0	0	0	0	1	1	0	0	0	0	0	0	2	1	0	0	0	1	0	1	1	0	0	0	3	0	2	2	3
	Sideswipe	2	1	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	2	1	0	0	3	1	1	1	3
	Rear End	0	0	1	0	0	2	0	1	1	0	0	0	0	3	1	0	1	0	1	1	1	1	0	0	2	5	1	2	3	5
	Broadside	2	1	0	0	0	2	5	0	0	0	1	0	2	2	6	1	0	1	0	3	2	4	1	1	0	10	5	3	5	11
	Vehicle/Pedestrian	2	0	0	0	0	0	0	0	0	0	3	0	3	0	1	1	0	3	0	0	0	1	1	3	1	5	2	0	2	5
Time of Day	mid-3 am	1	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	1	0	1	1	2	1	0	0	2
	3 am - 6 am	0	0	1	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0	1	0	0	1	2	0	0	2	2
	6 am - 9 am	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1
	9 am - noon	1	1	0	0	0	0	1	0	0	0	2	0	2	0	2	1	0	1	0	0	1	2	1	1	0	5	1	1	3	5
	noon- 3 pm	0	1	0	0	0	1	0	0	0	0	1	0	1	1	1	0	0	1	1	0	0	1	0	1	0	3	0	1	2	3
	3 pm - 6 pm	4	0	0	0	0	2	3	1	0	0	0	0	0	2	6	1	1	0	0	3	1	4	1	1	0	9	5	4	3	10
	6 pm - 9 pm	0	0	0	0	0	1	2	0	0	0	0	0	1	1	1	0	0	1	0	1	1	0	0	0	1	3	3	0	2	3
	9 pm - mid	0	0	0	0	0	1	1	0	0	0	0	0	0	2	0	0	0	0	0	1	1	0	0	0	0	2	0	2	1	2
Driver At Fault Movement	Proceeding Straight	2	0	0	0	0	1	0	0	0	0	3	0	3	1	1	1	0	2	0	0	2	1	1	2	2	5	3	0	3	6
	Making Right Turn	1	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0	1	0	0	1	2	0	0	1	2
	Making Left Turn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Victim Age	Under 19	2	0	0	0	0	2	4	1	0	0	1	0	1	2	5	1	1	0	1	2	2	3	1	1	0	10	4	4	1	10
	60+	1	2	0	0	0	0	0	0	1	0	0	0	0	1	2	1	0	0	1	0	0	2	1	0	1	4	2	1	3	4
TOTAL		7	2	1	0	0	5	7	1	1	0	4	0	5	7	12	3	1	4	2	5	4	9	3	4	3	27	10	8	13	
	Share of roadway/intersections:	79%	4%	2%	2%	0%	2%	8%	2%	0%	0%	1%	0%	21%	79%	16%	84%														
	Share of collisions:	25%	7%	4%	0%	0%	18%	25%	4%	4%	0%	14%	0%	42%	58%	80%	20%														
	Collisions per mile:	0.0202	0.107	0.104	0	N/A	0.566	0.21	0.121	0.882	0	0.796	0																		

Mode:	Pedestrian Collisions	Roadway Type												Location Type					Intersection Class						Driver Behavior		Land Use Characteristics				TOTAL
	Lanes:	3 Lanes or Less				4 Lanes					6+ Lanes			Signal		Unsignalized Intersection		Midblock	Primary-Primary	Primary-Secondary	Primary-Minor	Secondary-Secondary	Secondary-Minor	Minor-Minor	Hard Braking Hot Spot	Harsh Acceleration Hot Spot	Disadvantaged or Low-Income Community	Near School	Near Park	Near Bus Stop	
	Speed:	15-25	30-35	40-45	50-55	15-25	30-35	40-45	50-55	60-65	30-35	40-45	50-55	Fully Protected Lefts	All Other Signals	Major	Minor														
Violation	Pedestrian Right of Way Violation	40	22	4	0	0	28	36	2	0	2	21	1	15	69	39	27	7	1	0	0	0	1	1	0	18	139	97	65	104	157
	Pedestrian Violation	46	16	0	1	0	21	37	1	1	1	17	3	21	33	41	18	31	0	1	2	0	6	8	0	18	134	72	57	90	144
	Other Improper Driving	11	1	0	0	0	4	5	1	0	0	9	3	10	3	8	6	7	1	2	3	0	2	5	8	10	29	11	5	21	34
	Unsafe Speed	15	3	2	0	0	0	3	0	0	0	2	0	0	4	5	8	8	1	2	1	0	2	5	0	0	22	11	10	10	25
	Unsafe Starting or Backing	13	2	0	0	0	1	3	0	0	0	0	0	0	2	4	5	8	2	0	1	0	0	5	0	0	18	9	11	9	19
Type	Head-On	4	1	0	0	0	2	3	1	0	0	0	0	1	5	0	2	3	1	3	1	0	1	3	1	1	11	5	4	5	11
	Sideswipe	11	5	0	0	0	1	6	1	0	0	1	0	2	5	10	6	2	2	1	5	1	8	6	1	2	24	16	11	12	25
	Rear End	3	0	0	0	0	0	3	0	0	0	0	2	2	1	2	3	0	2	1	1	0	1	3	2	1	7	2	4	3	8
	Broadside	8	1	0	0	0	4	6	0	0	0	1	0	0	6	6	5	3	1	2	6	1	2	5	1	0	16	12	9	12	20
	Vehicle/Pedestrian	128	40	8	1	0	56	82	2	1	3	53	5	48	108	94	71	59	29	38	92	19	67	78	34	45	341	199	146	230	380
Time of Day	mid-3 am	6	1	0	0	0	3	4	0	0	0	3	0	1	8	2	2	4	0	2	5	1	3	2	1	1	16	6	4	10	17
	3 am - 6 am	2	0	1	0	0	2	1	0	0	0	1	1	1	3	2	0	2	0	1	4	0	1	0	0	0	6	3	2	5	8
	6 am - 9 am	33	7	2	0	0	9	11	3	0	0	8	0	7	18	17	19	13	5	8	12	1	16	19	5	6	59	46	39	45	74
	9 am - noon	14	5	0	0	0	4	10	0	0	1	3	0	6	8	9	9	5	3	7	4	3	6	9	4	4	32	17	19	27	37
	noon- 3 pm	11	6	1	0	0	9	14	0	0	0	7	1	9	17	13	7	3	5	9	13	1	11	8	5	11	45	25	19	28	49
	3 pm - 6 pm	42	11	0	0	0	11	16	1	0	0	12	2	10	24	21	24	16	11	7	16	2	18	25	6	8	88	52	38	53	95
	6 pm - 9 pm	33	12	2	0	0	18	25	0	1	2	9	2	10	29	31	17	17	6	9	28	9	15	23	11	8	96	55	36	66	104
	9 pm - mid	13	5	1	1	0	7	17	0	0	0	13	1	9	18	16	8	7	7	3	19	2	11	8	6	11	56	27	16	28	58
Pedestrian Action	Crossing in Crosswalk at Intersection	41	17	2	0	0	35	40	2	0	2	30	2	25	82	32	29	3	17	21	49	14	34	35	19	25	153	97	66	115	171
	Crossing in Crosswalk Not at Intersectio	3	0	0	0	0	2	5	0	0	0	4	1	5	4	3	0	3	2	3	4	0	3	0	4	2	12	9	6	12	15
	Crossing Not in Crosswalk	71	18	2	1	0	14	27	1	1	1	9	2	9	14	50	32	43	6	10	25	3	27	34	8	9	138	76	61	79	148
	In Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0
	Not In Road	13	4	1	0	0	5	10	1	0	0	5	2	7	7	10	10	7	4	9	5	1	6	10	5	6	35	18	14	23	41
Driver At Fault Movement	Proceeding Straight	46	16	4	0	0	10	25	0	0	1	5	2	8	23	34	29	68	6	5	18	7	28	33	7	9	95	56	53	63	110
	Making Right Turn	14	3	0	0	0	9	11	1	0	1	11	1	12	17	9	10	3	7	12	10	0	8	11	11	11	47	30	18	38	51
	Making Left Turn	16	5	2	0	0	14	15	2	0	0	10	0	2	43	7	12	0	2	9	26	4	10	13	5	6	55	41	23	36	64
Victim Age	Under 19	64	13	2	1	0	10	31	1	1	0	16	2	12	27	39	31	33	7	15	26	5	24	33	10	6	124	83	62	84	142
	60+	20	15	2	0	0	12	16	1	0	1	9	2	11	23	26	13	5	8	8	16	3	23	15	13	9	72	45	32	49	78
TOTAL		156	48	8	1	0	65	101	5	1	3	56	7	54	128	115	87	68	37	47	105	21	82	95	40	50	407	237	176	267	
		347.4	18.6	9.6	6.7	0.0	8.8	33.4	8.2	1.1	0.8	5.0	1.9	36		135		643									3340				
Share of roadway/intersections:		79%	4%	2%	2%	0%	2%	8%	2%	0%	0%	1%	0%	21%		79%															
Share of collisions:		35%	11%	2%	0%	0%	14%	22%	1%	0%	1%	12%	2%	30%		70%															
Collisions per mile:		0.4491	2.574	0.833	0.14855	N/A	7.353	3.028	0.607	0.882	3.934	11.14	3.761																		

Mode:	Pedestrian KSI Collisions	Roadway Type												Location Type					Intersection Class						Driver Behavior		Land Use Characteristics				TOTAL
	Lanes:	3 Lanes or Less				4 Lanes					6+ Lanes			Signal		Unsignalized Intersection		Midblock	Primary-Primary	Primary-Secondary	Primary-Minor	Secondary-Secondary	Secondary-Minor	Minor-Minor	Hard Braking Hot Spot	Harsh Acceleration Hot Spot	Disadvantaged or Low-Income Community	Near School	Near Park	Near Bus Stop	
	Speed:	15-25	30-35	40-45	50-55	15-25	30-35	40-45	50-55	60-65	30-35	40-45	50-55	Fully Protected Lefts	All Other Signals	Major	Minor														
Violation	Pedestrian Right of Way Violation	4	2	1	0	0	1	4	0	0	0	2	0	1	4	6	3	0	0	0	0	0	0	1	0	2	14	8	5	9	14
	Pedestrian Violation	5	6	0	0	0	10	10	0	1	1	2	1	2	11	14	4	5	0	0	0	0	1	2	0	3	34	18	15	20	36
	Other Improper Driving	1	1	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	1	0	1	0	1	1	3	1	0	3	3
	Unsafe Speed	4	0	1	0	0	0	1	0	0	0	0	0	0	1	0	2	3	0	0	0	0	0	0	0	0	6	0	1	1	6
	Improper Turning	1	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	1	1	0	2
Type	Head-On	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	2	1	2	0	2
	Sideswipe	0	2	0	0	0	0	2	0	0	0	1	0	0	1	4	0	0	0	0	2	0	3	0	0	0	4	4	1	2	5
	Overturned	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1
	Broadside	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	1	0	0	2	2	1	1	2
	Vehicle/Pedestrian	16	9	2	0	0	12	15	0	1	1	5	2	4	16	22	12	9	3	2	22	1	13	13	3	6	62	26	23	38	63
Time of Day	mid-3 am	0	0	0	0	0	1	2	0	0	0	1	0	0	3	1	0	0	0	0	2	0	2	0	0	1	3	1	1	3	4
	3 am - 6 am	1	0	1	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	1	1	0	0	0	0	0	3	1	0	2	3
	6 am - 9 am	2	2	1	0	0	1	0	0	0	0	1	0	0	1	3	2	1	0	0	2	0	2	2	0	0	7	4	3	5	7
	9 am - noon	2	1	0	0	0	0	1	0	0	0	0	0	0	0	1	1	2	0	0	0	0	1	1	0	0	4	3	3	3	4
	noon- 3 pm	2	1	0	0	0	2	2	0	0	0	0	1	1	2	2	1	2	1	2	1	0	1	2	1	1	8	3	3	5	8
	3 pm - 6 pm	6	2	0	0	0	1	3	0	0	0	0	0	0	4	3	4	1	0	0	3	0	4	4	0	0	12	7	7	6	12
	6 pm - 9 pm	3	5	0	0	0	4	2	0	1	1	1	0	1	4	8	2	2	1	0	7	1	4	2	1	1	17	9	7	13	17
	9 pm - mid	2	0	0	0	0	4	9	0	0	0	3	0	2	4	7	3	2	1	1	8	0	2	3	1	3	17	5	3	4	18
Pedestrian Action	Crossing in Crosswalk at Intersection	4	1	0	0	0	6	5	0	0	0	4	0	2	10	5	3	0	2	1	11	0	3	3	1	3	20	11	8	14	20
	Crossing in Crosswalk Not at Intersectio	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Crossing Not in Crosswalk	12	7	0	0	0	5	8	0	1	1	2	2	2	4	17	6	9	1	2	9	1	9	6	2	3	36	16	14	18	38
	In Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0
	Not In Road	0	2	0	0	0	0	3	0	0	0	0	0	0	2	1	1	1	0	1	0	0	2	2	0	0	5	2	1	4	5
Driver At Fault Movement	Proceeding Straight	6	2	2	0	0	0	4	0	0	0	1	1	1	3	5	5	11	1	0	3	0	5	5	1	2	16	5	5	6	16
	Making Right Turn	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	1	1
	Making Left Turn	1	0	0	0	0	1	1	0	0	0	1	0	0	3	0	1	0	0	0	3	0	0	1	0	1	4	4	2	3	4
Victim Age	Under 19	11	3	0	0	0	3	8	0	1	0	4	0	1	5	11	6	7	1	2	7	0	7	7	0	1	28	16	13	18	30
	60+	3	6	1	0	0	1	2	0	0	0	0	1	1	3	7	3	0	1	0	4	0	6	3	1	1	14	8	7	9	14
TOTAL		18	11	2	0	0	13	19	0	1	1	6	2	4	19	26	13	11	3	4	24	1	16	14	3	6	71	33	27	41	
		347.4	18.6	9.6	6.7	0.0	8.8	33.4	8.2	1.1	0.8	5.0	1.9	36		135		643	3340												
Share of roadway/intersections:		79%	4%	2%	2%	0%	2%	8%	2%	0%	0%	1%	0%	21%		79%		16%	84%												
Share of collisions:		25%	15%	3%	0%	0%	18%	26%	0%	1%	1%	8%	3%	17%		83%		67%	33%												
Collisions per mile:		0.0518	0.59	0.208	0	N/A	1.471	0.57	0	0.882	1.311	1.193	1.075																		

FEHR PEERS

Memorandum

Date: February 17, 2022

To: Debbie O'Leary

From: Rachel Om, Emily Finkel, Steve Brown, and Marshall Ballard

Subject: City of Oxnard Crossroads and Collision Data Management Plan

LA21-3267

Reliable collision data are essential for local agency safety practitioners to identify locations with an existing roadway safety problem, locations that are susceptible to future roadway crashes, and potentially effective countermeasures.[1] The purpose of the City of Oxnard Crossroads and Collision Data Management Plan, developed through the Oxnard Local Road Safety Plan, is to support ongoing City processes to ensure collision data are accurate and shared across departments for ongoing safety analysis that informs roadway safety improvements throughout the city.

The Fehr & Peers team facilitated discussions with the City of Oxnard Police traffic sergeant, Public Works staff, Information Technology staff, and Crossroads representatives to understand the City's current collision data workflow, challenges with maintaining and sharing collision data, and next steps for the City's collision data workflow. Conversations occurred May 2021, June 2021, and October 2021. The findings and recommendations of this plan reflect the status of managing Oxnard collision data as of October 2021.

Existing Collision Data Workflow

The Oxnard Police Department (OPD) maintains the City's collision data in a record management system (RMS), which is a comprehensive database that also include other records related to police operations, such as citations and arrests. OPD also maintains the City's collision data in Crossroads Software, which provides reporting and analytics for traffic collisions and citations. The intent of using Crossroads was to facilitate data sharing with the Public Works Department for roadway safety analysis and project development. However, discrepancies between the RMS and Crossroads database led to concerns about data quality. Therefore, this section documents the existing collision

[1] Caltrans. (2020). *Local Roadway Safety: A Manual for California's Local Road Owners*. https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/2020/lrsm2020.pdf

data workflow to identify pain points and opportunities for improved coordination. This is intended to ensure the identified pain points are addressed in the next steps for the City's collision data workflow.

Recording Collision Data

Officers can record collision data either at a crash site or at the police station. At a crash site, an officer can input collision data in their vehicle's mobile data terminal (MDT). However, most officers take notes at a crash site then input the collision report into the RMS upon returning to the station. After an officer submits a collision report, investigating officers will review the report and either follow up with the officer to correct errors or fill in missing information and finalize the data in the RMS.

Sharing Collision Data

Given the personal identifiable information in the collision data and other records, access to the RMS is limited to OPD staff. When the Oxnard Public Works Department needs collision data, Public Works staff submit a request to OPD to receive collision reports for specific locations and time periods.

Crossroads Software

Prior to Fall 2020, OPD would send PDF copies of collision reports to LexisNexis, a third-party vendor, to manually enter collision data into OPD's Crossroads database. OPD found this workflow resulted in data entry errors and duplicate entries and decided to manage their Crossroads database internally in Fall 2020. When OPD started to directly manage their Crossroads database, the collision records in Crossroads and the RMS were not consistent because OPD staff were learning how to run the built-in verification processes in Crossroads, such as street name, primary collision factor, and vehicle code verification. OPD staff have been coordinating with Crossroads staff to learn how to manage their Crossroads database and as of October 2021, OPD has verified that collision data for 2019 and 2020 are consistent and verified between their Crossroads database and RMS. As a next step, OPD is working to import the last ten years of collision data from their RMS to Crossroads to provide the Public Works department access to historical collision data to support traffic safety analysis.

Submitting Collision Data to SWITRS

OPD sends collision reports to the California Highway Patrol (CHP) Statewide Integrated Traffic Records System (SWITRS). OPD has coordinated with the City's IT department to program an automated daily script that queries the RMS for new collision reports and saves the PDF reports in a folder. The City's Records Management department then prints and mails the collision records to SWITRS on a regular basis.

Through the LRSP, Fehr & Peers compared collision data from 2016 to 2020 in the RMS to collision data for the same period downloaded from the Transportation Injury Mapping System (TIMS), which is a data platform by the UC Berkeley Safe Transportation Research and Education Center (SafeTREC) with geocoded injury collisions from SWITRS. Fehr & Peers identified injury collisions in the RMS that were not in the TIMS database. OPD reviewed the discrepancies and found that the additional collision records in RMS had not been sent to SWITRS because those collision records did not follow the naming convention that would enable those records to be queried by the daily automated script.

New Collision Data Workflow

Ventura County received grant funding to manage a multi-jurisdictional contract with Crossroads that provides participating jurisdictions in Ventura County access to the Crossroads Software collision report writer and analytics platform. The contract includes ongoing maintenance and support from Crossroads for at least five years and on-site training at Ventura County offices. By participating in this contract, OPD would be able to directly input collision data into Crossroads rather than importing from RMS. Oxnard Public Works staff would also be able to directly access collision data rather than submitting requests for each collision query. OPD requested local funding to participate in the County's contract and is working on establishing the necessary infrastructure and processes for a new collision data workflow.

Recording Collision Data

Officers can continue to record collision data either at a crash site or at the police station. The Crossroads collision report writer has an interface that mirrors a hard copy report and can be used on a desktop computer, MDT, or mobile device (iPhone, Android, and tablet). The collision report writer design and multi-device compatibility provide an improved and more reliable experience for officers recording collision data at a crash site.

The collision report writer also includes built-in validation that must be run before a report can be submitted. Validation includes ensuring the report is completed and flagging conflicting information. The collision report writer also includes a review process for investigating officers to review, comment, request changes, and approve reports within the application.

Sharing Collision Data

Collision data in Crossroads can be exported into the RMS so that OPD can have their operations data in one location for internal record keeping. This is an automated process that is set up according to an agency's preferences.

To share collision data with Public Works, OPD is working with Crossroads staff to set up a mirror database that will query the OPD Crossroads database daily so that Oxnard Public Works staff will have access to the most recent collision data. The firewall protections for the OPD network prevent

external departments to have direct access to any OPD data. Therefore, the mirror database queries the OPD collision database and extracts collision data without the personal identifiable information. This allows Public Works staff to access collision data from a Public Works network version of Crossroads on their computers.

Submitting Collision Data to SWITRS

In addition to accepting physical collision reports, CHP also accepts electronic collision reports from local agencies. Under the Ventura County Crossroads contract, OPD can transition their submission process from mailing physical collision reports to setting up an automated electronic submission to CHP in Crossroads.

Recommendations

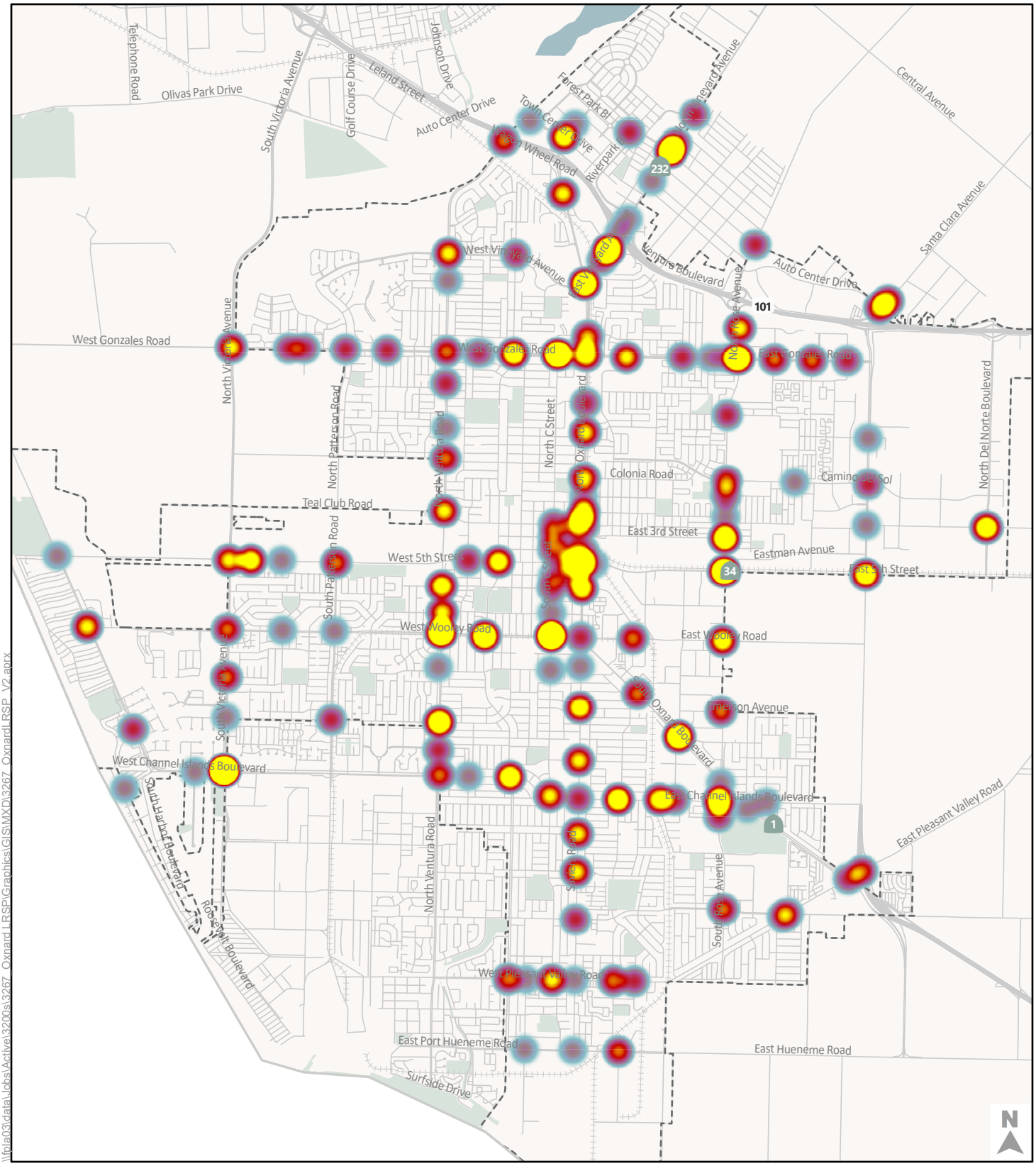
The following near-term and long-term recommendations consider the learning curve with setting up a new collision workflow. The near-term recommendations are applicable for the next one to two years of setting up and establishing a workflow, and the long-term recommendations are applicable to the remaining time of the Ventura County contract and beyond the contract timeframe.

Near-Term Recommendations

- Designate a collision data champion in OPD who will coordinate with Crossroads, Oxnard IT, Oxnard Public Works, and CHP to document workflows and set up a mirror database.
- OPD, IT, and Public Works staff attend on-site trainings offered by Crossroads staff at Ventura County offices.
- OPD uses the Crossroads collision report writer to send collision data to SWITRS. However, if OPD continues to send collision data from RMS via the automated script, implement a verification process to ensure consistency in the report naming convention.
- OPD and IT establish a verification process to confirm that all collision data in Crossroads are accurately exported to the RMS. The verification process could include reviewing a summary of one week of Crossroads and RMS data, such as the number of collisions, number of collisions involving someone killed or severely injured, and number of collisions by crash type. The purpose of this verification process is to ensure the data pipeline is functional.

Long-Term Recommendations

- Identify a funding source to continue using the Crossroads collision report writer after the Ventura County contract expires.
- Continue the verification process to ensure that all collision data in Crossroads is accurately exported to the RMS, Public Works, and CHP.
- Evaluate the costs associated with maintaining the new workflow.
- Coordinate a working group with the County and other users of the County's Crossroads contract to establish a path to sustained funding and use of the process and software.



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This map includes the following violations:
21453(a) - Driver not stopping at line on red signal
21453(c) - Driver not stopping at red arrow signal

Number of Red Light Violation Injury Collisions

Low

High

Oxnard Local Road Safety Plan
Red Light Violation Injury Collisions (2016 - 2020)

Oxnard Local Road Safety Plan

Red Light Violation* Injury Collisions (2016 - 2020)

Intersection	Number of Injury Collisions
CHANNEL ISLANDS BL & VICTORIA AV	16
WOOLEY RD & C ST	13
GONZALES RD & C ST	11
5TH ST & ROSE AV	10
GONZALES RD & ROSE AV	10
VINEYARD AV & FOREST PARK BL	10
WOOLEY RD & VENTURA RD	10
ESPLANADE DR & VINEYARD AV	8
STATHAM BL & OXNARD BL	8
VINEYARD AV & OXNARD BL	8
HEMLOCK ST & VENTURA RD	7
ROSE AV & 3RD ST	7
ROSE AV & CHANNEL ISLANDS BL	7
WOOLEY RD & J ST	7
5TH ST & OXNARD BL	7
5TH ST & RICE AV	6
7TH ST & OXNARD BL	5
OXNARD BL & 1ST ST	5
SAVIERS RD & ELM ST	5
VENTURA RD & 7TH ST	5
5TH ST & SOUTHHAMPTON PL	5
5TH ST & A ST	4
9TH ST & VENTURA RD	4
C ST & CHANNEL ISLANDS BL	4
C ST & PLEASANT VALLEY RD	4
OXNARD BL & CITRUS GROVE LN	4
SAVIERS RD & YUCCA ST	4

*The following red light violations are included:

21453(a) - Driver not stopping at line on red signal

21453(c) - Driver not stopping at red arrow signal

APPENDIX D
Annual Traffic Safety Report Template

City of Oxnard
Annual Traffic Safety Report
Report Year: 2020
Collision Data: 2016 - 2020

Safety Projects Summary					
Number of Completed Safety Projects				Number of Funded Safety Projects	
2	0	2	3	5	1
Engineering	Engagement	Education	Enforcement	Infrastructure	Program

Completed Projects: Number of Countermeasures Implemented

Type	*Location*	*Date*	*Description*
Engineering	Citywide	Apr-20	Pedestrian crossing flashing beacons, signage, ADA improvements, and crosswalks
Engineering	Rose Ave & Gary Dr	May-20	New traffic signal and pedestrian ADA improvements and crosswalks
Education	Citywide	2020	Oxnard Police Department conducted bicycle and pedestrian education citywide
Education	Citywide	2020	Oxnard Police Department continued their "Know Your Limit" campaign at restaurants and bars
Enforcement	Citywide	2020	Oxnard Police Department continued their "Choose Your Ride" campaign at restaurants and bars
Enforcement	Citywide	2020	Oxnard Police Department conducted sobriety checkpoints
Enforcement	Schools	2020	Oxnard Police Department enforced speed limits around school zones

Future Projects: Funding Secured for Future Countermeasures

Type	*Source*	*Amount*	*Timeline*	*Description*
Infrastructure	HSIP		Dec-22	Signal hardware upgrades, protected left turn phasing, accessible ped signals, and intersection lighting at 7 signals
Infrastructure	CIP		Dec-22	New signal heads, protected left turn phasing, bicycle detection, accessible pedestrian signals and LED lights at five intersections along Oxnard Bl and Saviers Rd
Infrastructure			Jun-23	New sidewalks for Ventura Bl between Rose Ave and Balboa St
Infrastructure			Dec-23	Bicycle lanes for Oxnard Bl from US-101 to Gonzales Rd
Infrastructure			Aug-25	Grade separation bridge over UPRR tracks, two new signals, bike lanes, and sidewalks at Rice Ave & 5th St
Program	ATP	$2m	May-22	Safe Routes to School: infrastructure projects at 6 schools and non-infrastructure analysis and programming at 26 schools

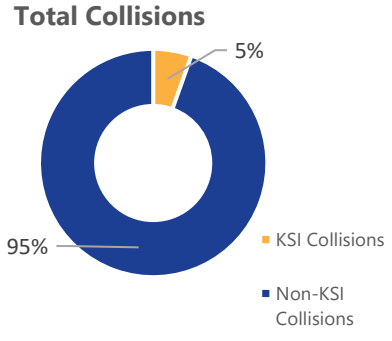
Note: This Annual Traffic Safety Report is an example of how the Annual Report can be filled out.

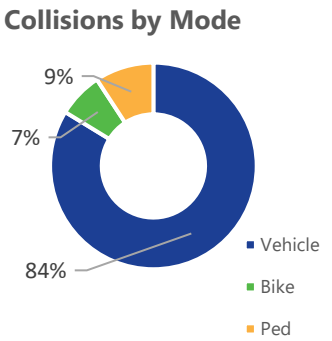
Collision Summary

Citywide

Citywide Collision Trends by Mode and Age

	Total		KSI		Age: Under 19 or 65+	
Collision Type	*Count*	*% of Total*	Count	*% of KSI*	*Count*	*% of Age*
All Injury Collisions	4751	-	259	-	2201	-
Bicycle Collisions	335	7%	21	8%	120	5%
Pedestrian Collisions	438	9%	59	23%	225	10%





Key Collison Factors

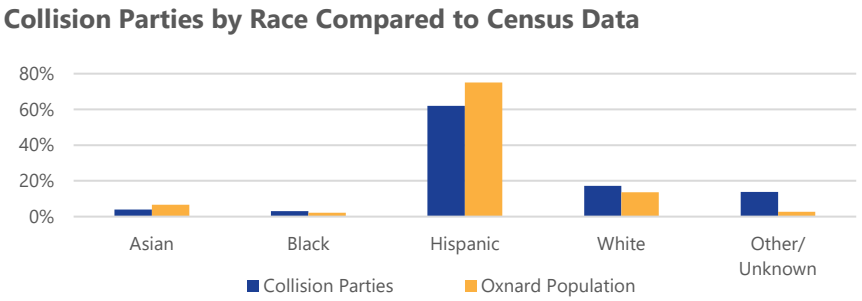
	Total		KSI	
Violations	*Count*	*% of Total*	*Count*	*% of KSI*
DUI	375	8%	34	13%
Unsafe Speed	1087	23%	40	15%

	Total		KSI	
Time of Day	*Count*	*% of Total*	*Count*	*% of KSI*
Night	1410	30%	126	49%
Day	3074	65%	120	46%

	Total		KSI	
Crash Types	*Count*	*% of Total*	*Count*	*% of KSI*
Broadside	1775	37%	71	27%
Hit Object	218	5%	31	12%

Collision Parties by Race Compared to Census Data

	Collision Parties		Oxnard Population	
Race	*Count*	*Percent*	*Count*	*Percent*
Asian	440	4%	13,643	7%
Black	331	3%	4,345	2%
Hispanic	6,824	62%	156,000	75%
White	1,886	17%	28,278	14%
Other/ Unknown	1,518	14%	5,456	3%
Total	10,999		207,722	



Note: This Annual Traffic Safety Report is an example of how the Annual Report can be filled out.

Emphasis Areas

1 Ventura Rd from 5th St to Wooley Rd

		Total		KSI	
		Count	% of Total	Count	% of KSI
Collision Type	All Injury Collisions	132	-	6	-
	Bicycle Collisions	12	9%	2	33%
	Pedestrian Collisions	11	8%	2	33%
Key Collision Factors	Unsafe Speed Viol.	37	28%	0	0%
	Vehicle ROW Viol.	22	17%	1	17%
	Broadside Collisions	46	35%	0	0%
	Rear End Collisions	48	36%	0	0%
	Night Collisions	42	32%	3	50%

2 Gonzales Rd from Victoria Ave to Rose Ave

		Total		KSI	
		Count	% of Total	Count	% of KSI
Collision Type	All Injury Collisions	344	-	15	-
	Bicycle Collisions	30	9%	3	20%
	Pedestrian Collisions	31	9%	2	13%
Key Collision Factors	Rear End Collisions	141	41%	2	13%
	Broadside Collisions	101	29%	6	40%
	Hit Object Collisions	17	5%	2	13%
	Night Collisions	105	31%	8	53%

3 Wooley Rd from Donlon Ave to Pacific Ave

		Total		KSI	
		Count	% of Total	Count	% of KSI
Collision Type	All Injury Collisions	49	-	7	-
	Bicycle Collisions	5	10%	2	29%
	Pedestrian Collisions	4	8%	3	43%
Key Collision Factors	Vehicle ROW Viol.	16	33%	1	14%
	Unsafe Speed Viol.	7	14%	1	14%
	Broadside Collisions	24	49%	2	29%
	Night Collisions	14	29%	3	43%

4 Saviers Rd from Laurel St to Pleasant Valley Rd

		Total		KSI	
		Count	% of Total	Count	% of KSI
Collision Type	All Injury Collisions	257	-	15	-
	Bicycle Collisions	25	10%	1	7%
	Pedestrian Collisions	38	15%	6	40%
Key Collision Factors	Rear End Collisions	79	31%	4	27%
	Broadside Collisions	92	36%	4	27%

5 Bard Road from Saviers Road to Pleasant Valley Road

		Total		KSI	
		Count	% of Total	Count	% of KSI
Collision Type	All Injury Collisions	130	-	11	-
	Bicycle Collisions	8	6%	2	18%
	Pedestrian Collisions	11	8%	1	9%
Key Collision Factors	Vehicle ROW Viol.	54	42%	4	36%
	Broadside Collisions	71	55%	7	64%
	Night Collisions	27	21%	3	27%

Note: This Annual Traffic Safety Report is an example of how the Annual Report can be filled out.

Before/After Studies

Project 1 New Signal at Rose Ave & Gary Dr
Study Area Rose Ave & Gary Dr (250')

Year	Before 2019	After 2020	Change	% Change
Total Collisions	0	1	1	
KSI Collisions	0	0	0	
85th Percentile Speed			0	

Program 1
Study Area

Year	Before	After	Change	% Change
Total Collisions			0	
KSI Collisions			0	
85th Percentile Speed			0	

Project 2
Study Area

Year	Before	After	Change	% Change
Total Collisions			0	
KSI Collisions			0	
85th Percentile Speed			0	

Program 2
Study Area

Year	Before	After	Change	% Change
Total Collisions			0	
KSI Collisions			0	
85th Percentile Speed			0	

Speeds and Speed Limit Compliance

1

Number of Segments with Posted Speed Reduction

Street	From	To	Before	After	Change
Bard Rd	Saviers Rd	Pleasant Valley Rd	35	30	-5

Note: The Speeds and Speed Limit Compliance section is filled in as an example for this Annual Traffic Safety Report Template

Note: This Annual Traffic Safety Report is an example of how the Annual Report can be filled out.

Oxnard LOCAL ROAD SAFETY PLAN

Public Works Department

305 West Third Street, East Wing, Third Floor
Oxnard, California 93030
Tel 805.385.8280

September 6, 2022

Steve Novotny, District Local Area Engineer
Caltrans Local Assistance, District 7
100 South Main Street
Los Angeles, CA 90012

Subject: City of Oxnard's Local Roadway Safety Plan Certification

Dear Mr. Novotny,

The City understands that in order to apply for Cycle 11 local Highway Safety Improvement Program (HSIP) grant funds, an agency must have completed their Local Roadway Safety Plan (LRSP) or an equivalent. The LRSP must be updated and validated at least every five years, is data driven and facilitates a comprehensive approach to addressing road safety.

In March 2020 and January 2021, the City received two cycles of HSIP grant funding to develop the LRSP. In April 2021, the City contracted with Fehr & Peers to draft the report. Their work included reviewing the state of the current City systems and planning documents, crash history data collection and assessment, development of countermeasures and implementation program, and detailed concept designs culminating in a final comprehensive LRSP.

In August 2022 Fehr & Peers delivered the final draft report, which staff certifies as complete. The City understands that Caltrans strongly recommends that the LRSP and its updates be approved by the agency's Board or Council. Therefore, the LRSP is scheduled to go before the City of Oxnard City Council for their adoption later this calendar year.

You may direct any questions to Kumar Neppalli at 805-385-8206, kumar.neppalli@oxnard.org or Debbie O'Leary at 805-200-5283, Debbie.oleary@oxnard.org.

Sincerely,

Michael L. Wolfe, P.E.
Public Works Director

cc: Tatiana Arnaout, City Engineer
Kumar Neppalli, Transportation Services Manager
Debbie O'Leary, Transportation Planner

CITY OF OXNARD CALIFORNIA

CITY COUNCIL AGENDA REPORT

REPORTS
AGENDA ITEM NO. K.1

DATE: January 17, 2023

TO: City Council

FROM: Michael Wolfe, Public Works Director, (805) 385-8055, michael.wolfe@oxnard.org

SUBJECT: Caltrans Required Local Roadway Safety Plan. (25 minutes)

RECOMMENDATION

That the City Council:

1. Receive a presentation and comment on the Local Roadway Safety Plan and

2. Adopt the Caltrans Required Local Roadway Safety Plan as final.

(This item is not considered a project under the California Environmental Quality Act.)

(Public Works and Transportation Committee approved 2-0.)

(Presentation will be live upon consultant's request.)

BACKGROUND

The California Department of Transportation (Caltrans) is required to have a Strategic Highway Safety Plan (SHSP), which is a statewide data-driven traffic safety plan that coordinates efforts of a wide range of organizations to reduce traffic accident fatalities and serious injuries on all public roads. In coordination with federal, state, local and private sector safety stakeholders, the SHSP establishes goals, objectives, and emphasis (or challenge) areas. The SHSP addresses the 4Es of traffic safety: Engineering, Enforcement, Education, and Emergency Services.

While the SHSP is used as a statewide approach for improving roadway safety, in 2022 Caltrans required local agencies to develop a Local Roadway Safety Plan (LRSP) to address unique roadway safety needs while contributing to the success of the SHSP.

Caltrans created a planning grant program for agencies to meet the new requirement and the City was a recipient of the new LRSP grant fund. To assist the City in developing the LRSP, on April 20, 2021 the City Council awarded a professional services agreement to the planning and design firm, Fehr & Peers. Fehr & Peers began work in May 2021 and has completed the Final Draft LRSP.

The process of preparing a LRSP includes creating a framework to systematically identify and analyze safety items and recommend safety enhancements. Preparing a LRSP facilitates the development of local agency partnerships and collaboration, resulting in a prioritized list of improvements and actions that can demonstrate a defined need and contribute to the statewide plan. A LRSP offers a proactive approach to safety enhancements and demonstrates a responsiveness to safety challenges.

DISCUSSION

Over the past 20 months, Fehr & Peers have led development of the LRSP with input from Public Works Staff, Oxnard Police Department, Oxnard Fire Department, Gold Coast Transit District, Ventura County Transportation Commission, Oxnard College, Oxnard School District, Oxnard Union High School District, and the Rio School District.

While the LRSP is a stand-alone document, it has been developed concurrently with the Caltrans grant funded City of Oxnard Sustainable Transportation Plan (STP), which is also being developed by Fehr & Peers. The STP is estimated to be complete in spring 2023 and is a more encompassing document that includes recommendations for improvements to the transportation network that go beyond safety-only. The STP is less technical in nature and has a large public outreach component. Fehr & Peers have utilized the public comments received during development of the STP to further inform the LRSP. In the future both the LRSP and STP will help to inform the Safe Routes to School Plan (SRTS), which is also currently underway.

The Draft LRSP is comprised of eight (8) chapters:

1. Introduction
2. Vision & goals
3. Safety Partners
4. Existing Efforts
5. Safety Analysis
6. Countermeasures Toolbox
7. Emphasis Areas & Strategies
8. Evaluation and Implementation Program

Public Works has begun work on some of the easier-to-implement recommendations identified in the Final Draft LRSP consistent with existing documents, regulations, and/or policies in place for the City. These include installation of bike lanes with buffer zones and green paint, curb extensions, retroreflective traffic signal backplates, upgrading several traffic signals with new protected left-turn phasing, video detection, traffic signal timing plan coordination, and changes to pedestrian clearance timings based on new standards.

Fehr & Peers provided a presentation to the Public Works & Transportation Committee on December 13, 2022 as well as to the Community Services, Public Safety, Housing & Development Committee on January 10, 2023. Upon adoption of the Final LRSP by the City Council, staff will review all safety countermeasures in depth to recommend to the City Council ready-to-go projects for the 2024 Highway Safety Improvement Program (HSIP) cycle. Complex or high-cost projects will be developed further to be recommended for outer year grant cycles and for inclusion in the Capital Improvement Program (CIP).

STRATEGIC PRIORITIES

This agenda item supports the Infrastructure and Natural Resources strategy. The purpose of the Infrastructure and Natural Resources strategy is to preserve and improve our roads, utilities, parks, trees, water supply and natural resources through effective planning, prioritization, and an equitable and efficient use of available funding.

FINANCIAL IMPACT

There is no financial impact to receiving the presentation or adopting the Local Roadway Safety Plan. Budget impacts of future recommendations for HSIP and CIP projects will be estimated and brought forth with the project recommendations.

COMMITTEE OUTCOME

Public Works and Transportation Committee approved 2-0.

Prepared by: Tatiana Arnaout, City Engineer

ATTACHMENTS

1. Final Draft Local Roadway Safety Plan
2. Certification Letter

3. Presentation