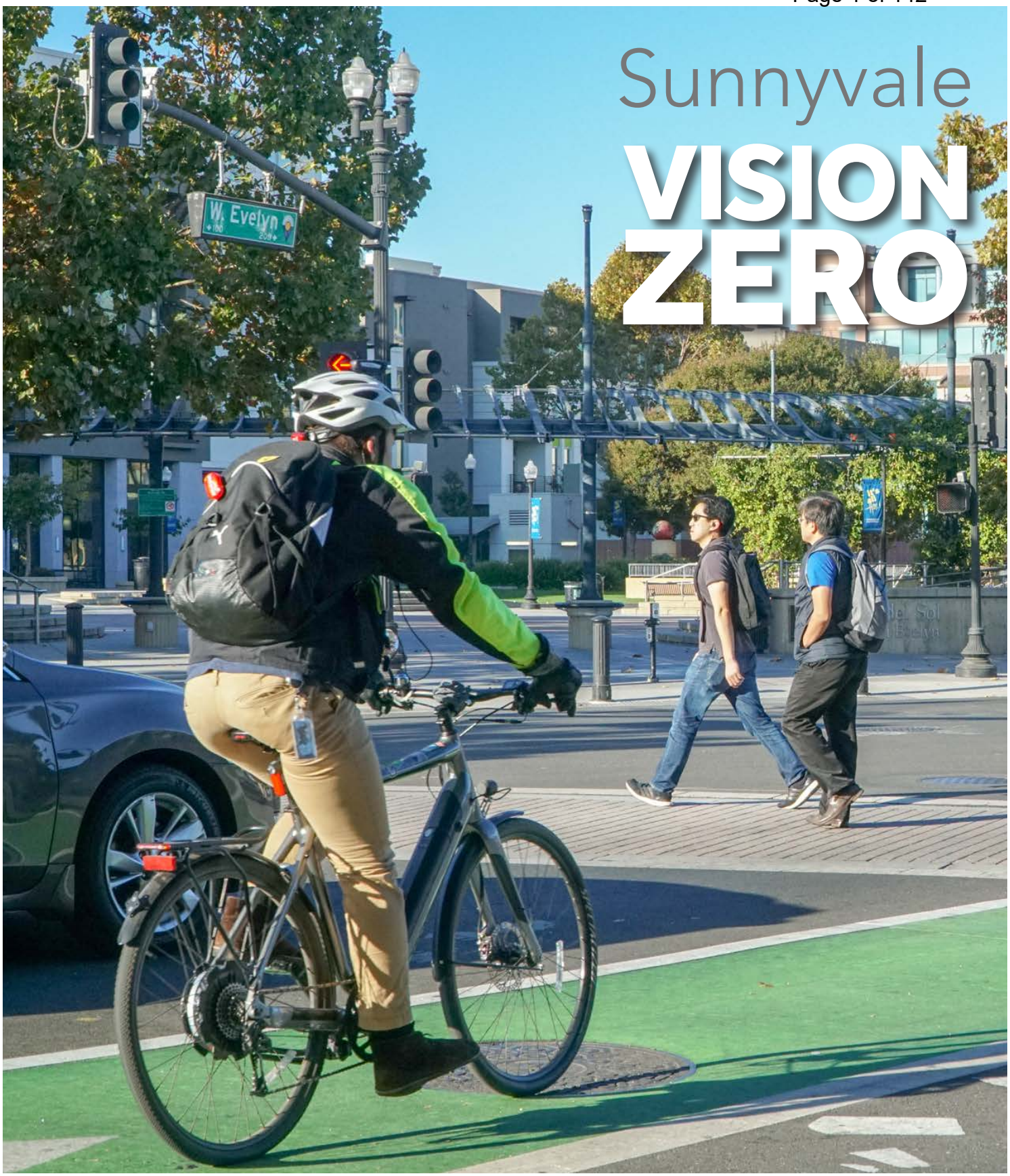
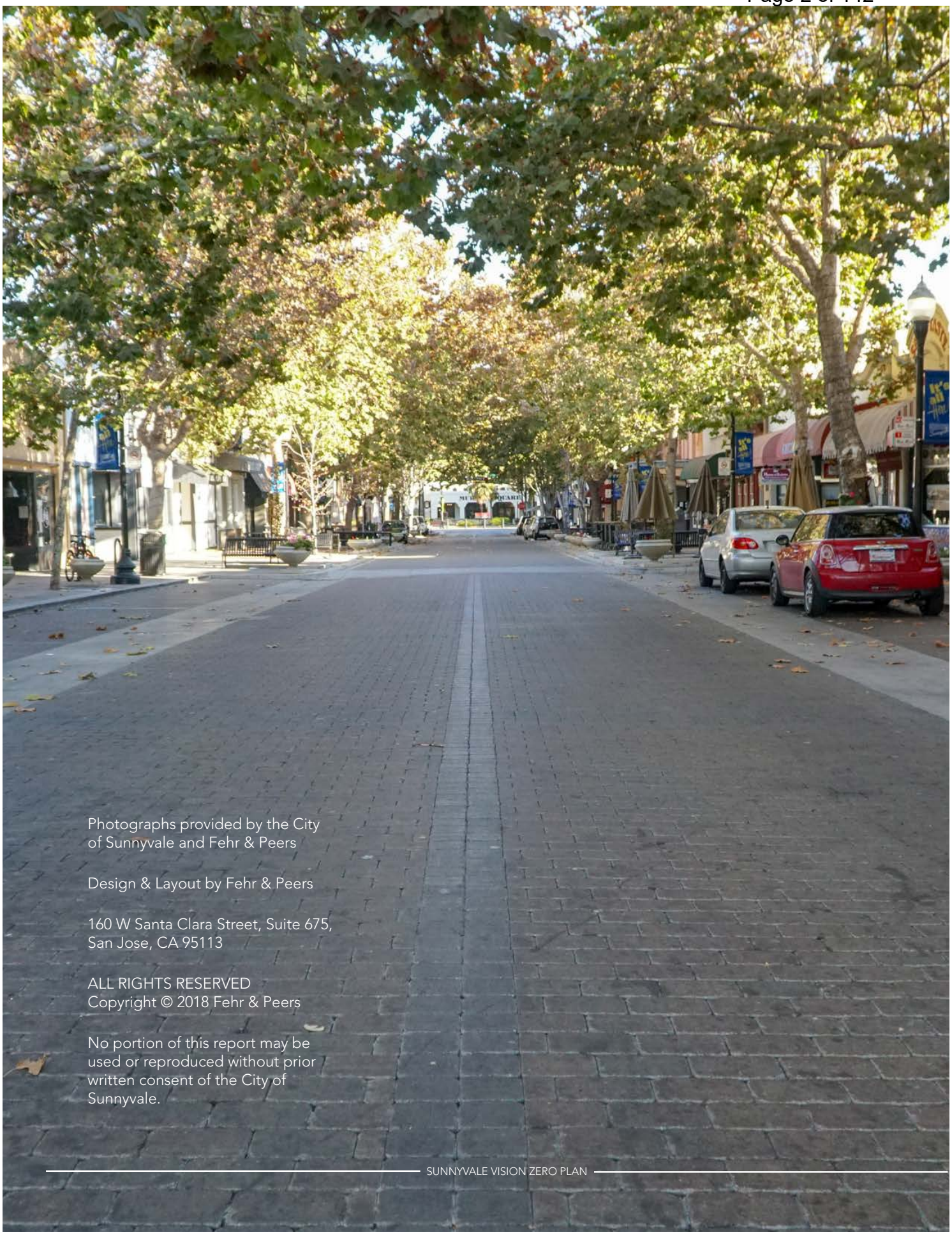
Sunnyvale VISION ZERO



Approved by City Council
July 30, 2019

Sunnyvale



Photographs provided by the City of Sunnyvale and Fehr & Peers

Design & Layout by Fehr & Peers

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ACKNOWLEDGEMENTS

Developing Sunnyvale's Vision Zero Plan has been a collaborative effort. It would not be as robust or reflective of community needs without the participation of a wide range of stakeholders. Thank you to the more than 400 community members who participated in the online survey and in-person workshops. Your input was invaluable in creating a successful Sunnyvale Vision Zero Plan. Thank you to the elected officials, Sunnyvale staff, Sunnyvale Bicycle and Pedestrian Advisory Commission, Santa Clara Valley Transportation Authority, and other Santa Clara County agencies and school districts that provided input during this process. Your feedback helped align this plan with local priorities, policies and existing programs.

Elected Officials
Larry Klein, Mayor
Russ Melton, Vice Mayor
Glenn Hendricks, Councilmember
Michael S. Goldman, Councilmember
Gustav Larsson, Councilmember
Nancy Smith, Councilmember
Mason Fong, Councilmember
Jim Griffith, Councilmember (Term ended in 2018)

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Sunnyvale Bicycle and Pedestrian Advisory Commission
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Susan Bremond, Vice Chair
Timothy Oey
Scott Swail
Kyle Welch
Leia Mehlman
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Catherine Barry (Term ended in 2018)
Angela Rausch (Term ended in 2018)

Key Stakeholders
Cupertino Union School District
Santa Clara County of Public Health
Santa Clara Valley Transportation Authority
Santa Clara Unified School District
Sunnyvale School District

Fehr & Peers Consultant Team
Dana Weissman
Matt Haynes
Jesse Cohn
Steve Davis
Sara Sadeghi
Victoria Caudullo
Michelle Chung
David Wasserman
Thao Nguyen

Note: Throughout this plan, reference to the "City" refers to the Sunnyvale government.

LETTER FROM THE CITY

To the Sunnyvale community,

Sunnyvale's Vision Zero Plan is a critical step towards eliminating citywide traffic fatalities and serious injuries. With this plan, we articulate a goal to reduce fatalities and serious injuries by 50 percent by 2029 and to continue improving traffic safety towards zero fatal and serious injury collisions in the ten years that follow. We see traffic collisions as preventable incidents that can be addressed, rather than accidents that cannot be avoided. We are willing to make some challenging decisions when traffic safety is at stake, and we are committed to monitoring our progress and continually adapting new ideas and lessons learned in support of Vision Zero.

As the region's innovative local economy continues to thrive, addressing traffic safety in Sunnyvale becomes even more important to ensure that all road users – pedestrians, bicyclists, transit users, drivers, and those with mobility impairments – can travel with safety, comfort, and ease, no matter their destination. Whether you are a resident of Sunnyvale, an employee working in Sunnyvale, a visitor making Sunnyvale your destination, or simply passing through, we are dedicated to providing you a safe multi-modal transportation network.

The City's approach to reaching Vision Zero is quantitative, collaborative and inclusive. The commitments outlined in this plan – and the priority projects the City will implement to achieve them – help to better connect and strengthen our community. Vision Zero builds on Sunnyvale's years of investment in transportation safety. Since 2012, Sunnyvale's collision rate has declined by 30 percent, and Sunnyvale now has fewer collisions than 80 percent of cities of comparable size in California. The City's commitment to this plan will further distinguish Sunnyvale as one of the safest in its class.

Thanks to the City Council's leadership, our community's participation in the planning process and the hard work of City staff, we have a Vision Zero Plan that will make our community safer well into the future.

Sincerely,

Kent Steffens, City Manager

TABLE OF CONTENTS


32 SHOPPING CTR

A CALL TO ACTION TO MAKE SUNNYVALE'S STREETS SAFER

From 2012 through 2017, 25 people lost their lives when traveling on Sunnyvale's streets. They include individuals from all neighborhoods within Sunnyvale, and they cross geographic and demographic boundaries. These deaths resulted in tragic personal loss for family and friends and significantly impacted the Sunnyvale community.

Over half of the traffic related deaths involved people walking or bicycling. People walking and bicycling in Sunnyvale are disproportionately impacted in traffic collisions. Twelve percent of all trips in Sunnyvale are made on foot, but over 35 percent of collisions resulting in a fatality or serious injury involve a pedestrian. Two percent of all trips in Sunnyvale are made by bicycle[1], but almost 20 percent of collisions resulting in a fatality or serious injury involve a bicyclist.

The annual number of collisions in Sunnyvale decreased by over 30 percent between 2012 and 2017, but collisions that involved a fatality or serious injury decreased by only 10 percent over that time period. The City's transportation planning efforts have made progress, but more still needs to be done to address safety in Sunnyvale.

In January 2016, the Sunnyvale City Council and Bicycle and Pedestrian Advisory Commission (BPAC) recognized the need for continued safety investment and committed to support Vision Zero through a Study Issue. The stated goal of the Study Issue was to develop a Sunnyvale Vision Zero Plan that "strives for the total elimination of traffic fatalities for all transportation modes." The City Council approved funding for the Plan in 2017.

Bicyclists and pedestrians involved in traffic collisions in Sunnyvale are **13 times** more likely to be killed or seriously injured than drivers involved in collisions.

[1] 2012 California Household Travel Survey. Daily Mode Share, City of Sunnyvale (All Trip Purposes).

ABOUT VISION ZERO

What is Vision Zero?

Vision Zero sets an ambitious long-term goal to eliminate traffic fatalities and serious injuries, starting with an immediate commitment to reduce fatalities and serious injuries in the near term. Vision Zero programs are a departure from the status quo in several major ways:

1. Vision Zero takes a "safety first" approach, prioritizing traffic safety over other transportation considerations.
2. Vision Zero acknowledges that traffic deaths and serious injuries are preventable.
3. Vision Zero is a multidisciplinary approach that brings together a diverse set of stakeholders to address the complex problem of traffic safety.

Vision Zero began in Sweden in 1997, when the country adopted a national transportation policy that "the long-term goal of traffic safety is that nobody shall be killed or seriously injured as a consequence of traffic accidents."[2] Since 2014, Vision Zero has been building momentum in the United States. Starting with New York City, Vision Zero policies have spread across American cities, adopted in both large cities like Chicago, Seattle, San Francisco and Los Angeles, as well as smaller jurisdictions like Boulder, Colorado; Durham, North Carolina; and Somerville, Massachusetts. As of January 2018, 35 U.S. cities have committed to Vision Zero in a meaningful way, according to the national Vision Zero Network - a nonprofit organization working to define and advance Vision Zero in communities across the U.S. Sunnyvale is joining a global movement with a strong national network to help cities share best practices to improve roadway safety.

Early results are promising. In New York City, 2017 had the fewest traffic fatalities on record, marking the fourth consecutive year of declining traffic deaths under New York City's Vision Zero program. Closer to home, Fremont, California has seen a 25 percent reduction in major traffic collisions in the first two years since adopting its Vision Zero Plan.[3] While progress has been made, cities recognize the road to zero will be long. Sweden's initial goal was to eliminate fatalities by 2020; the country has since adjusted their reduction target to 50 percent by 2020 and to zero deaths by 2050.

[2] Rosencrantz, H., Edvardsson, K., & Hansson, S. O. (2007). Vision zero–Is it irrational? Transportation research part A: Policy and practice, 41(6), 559-567.

[3] Vision Zero Network. Vision Zero 101: Approach for Mid-Sized Cities webinar. Delivered by Hans Larsen, Public Works Director, Fremont, California. September 20, 2017.

Collisions, Not Accidents

The City of Sunnyvale commits to using the word "collision," not "accident." "Accident" implies that nothing could have been done to prevent an incident, while "collision" recognizes that these traffic incidents can be systemically addressed. In a 2014 letter to Federal Highway Administration staff, George L. Reagle, Associate Administrator for Motor Carriers at the U.S. Department of Transportation wrote:[4]

> Changing the way we think about events and the words we use to describe them affects the way we behave. Motor vehicle crashes occur "when a link or several links in the chain" are broken. Continued use of the word "accident" implies that these events are outside human influence or control. In reality, they are predictable results of specific actions…
>
> The Federal Highway Administration has joined the National Highway Traffic Safety Administration in declaring that the word "accident" will no longer be used in materials we publish, in speeches or other statements, or in communications with the media and others.

[4] Reagle, G.L. A Crash is Not an Accident. Federal Motor Carrier Safety Administration. March 4, 2014. https://www.fmcsa.dot.gov/newsroom/crash-not-accident

Incorporating the E's into Vision Zero

Effective multimodal planning has long been associated with the five E's: Engineering, Education, Enforcement, Encouragement, and Evaluation. In recent years, planners have begun to incorporate two additional E's: Engagement and Equity. Together, these seven concepts are the backbone of multimodal transportation planning, and they can be applied to the Vision Zero context.

Engineering: Implementing infrastructure changes that improve safety for drivers, bicyclists, and pedestrians.

Education: Giving people the skills, knowledge and confidence to travel safely.

Enforcement: Applying regulations that manage speed and roadway behavior.

Encouragement: Creating a safety culture where people feel comfortable using the travel mode of their choice.

Evaluation: Tracking progress in reducing fatalities and serious injuries.

Engagement: Working closely with the community when identifying safety concerns and developing solutions.

Equity: Ensuring that solutions serve everyone in the community, particularly low-income and minority populations.

VISION STATEMENT & GUIDING PRINCIPLES

The City of Sunnyvale Vision Zero Plan reflects the City's commitment to reducing traffic fatalities and serious injuries. It is a road map for action and a tool for measuring progress towards the City's safety goals.

Vision Statement

Sunnyvale Vision Zero is a community-driven and data-driven initiative to eliminate preventable traffic fatalities and serious injuries. In the coming years, Sunnyvale will aim to reduce collisions through improved transportation infrastructure and programming, achieving a **50 percent reduction in fatalities and serious injuries by 2029** and continued progress towards zero in the ten years that follow.

Guiding Principles

The following principles guide the actions of the Sunnyvale Vision Zero Plan:

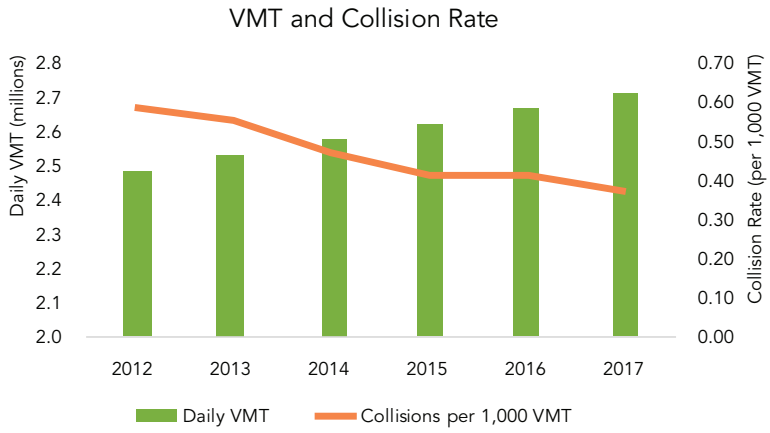
1. Traffic deaths are unacceptable and preventable.
2. Transportation options should be safe for all users, for all modes of transportation, in all communities, and for people of all ages and abilities.
3. Safety is a primary consideration in the development of transportation projects for all users.
4. Actions toward Vision Zero should embody a quantitative, collaborative, and equitable approach.
5. Human error is inevitable and unpredictable; the transportation system should be designed to anticipate error and minimize injury severity.
6. Speed is a fundamental predictor of collision severity survival. The transportation system should be designed for speeds that safely accommodate all modes of travel.
7. Ongoing evaluation should measure performance against the Sunnyvale Vision Zero Plan objectives.

BUILDING ON PRIOR INVESTMENTS IN SUNNYVALE

The City of Sunnyvale is already working to increase the availability of safe and comfortable multimodal transportation choices for all residents, helping meet citywide goals to reduce carbon emissions, improve public health through increased physical activity, and improve quality of life for everyone. The Sunnyvale Vision Zero Plan builds on the City's past and ongoing efforts to improve safety and multimodal access throughout the community.

The City of Sunnyvale 2035 General Plan Land Use and Transportation Element (LUTE) states that the City will "provide safe access to city streets for all modes of transportation. Safety considerations of all transport modes shall take priority over capacity considerations." With this pledge, the City recognizes its commitment to promote a healthy and safe environment through responsible stewardship of the transportation network. The adoption of Vision Zero makes the prioritization of safe travel for all modes a primary focus.

Between 2012 and 2017, Sunnyvale's daily vehicle miles traveled (VMT) increased by **9%**, while the total number of collisions decreased. As a result, the collision rate (collisions per 1,000 VMT) decreased by **37%** between 2012 and 2017.



Previous transportation investments have paid off; Sunnyvale has fewer collisions than 80 percent of cities of comparable size in California (120,000 to 160,000 population).[5] Sunnyvale's fatality crash rate of 2.8 annual traffic deaths per 100,000 population is substantially below the 9.2 rate for California and the 11.6 rate for the nation.[6] However, the City remains committed to eliminating fatal and serious injury collisions.

[5] California Office of Traffic Safety. 2015 OTS Rankings.

[6] Insurance Institute for Highway Safety, Highway Loss Data Institute. 2016 General statistics state by state.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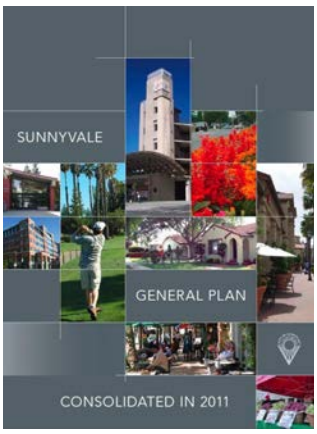
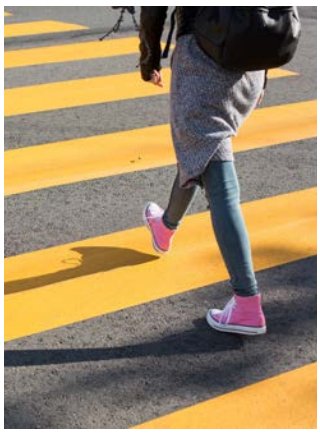
Plans and Policies

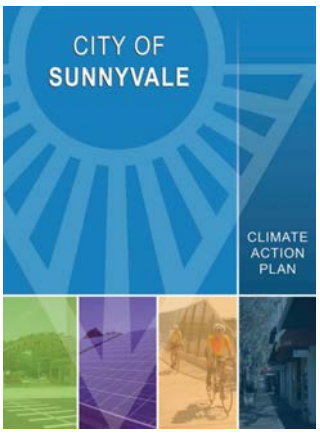
The Sunnyvale Vision Zero Plan builds on the City's progress towards improving street safety through a range of transportation plans, design guidelines, and area plans. These City resources complement safety efforts by the County and State, including the Santa Clara County Valley Transportation Plan 2040, grade separations plans, and Complete Streets program.



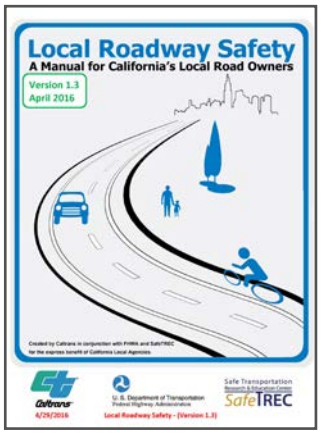
Sunnyvale General Plan - Land Use and Transportation Element: Updated in 2017, promotes safe streets and healthy living for all users. These policies support multimodal infrastructure improvements that address bicycle and pedestrian safety, convenience and connectivity. The General Plan's comprehensive, safety-oriented complete streets policy is further strengthened by a recently adopted City Council Resolution on complete streets.



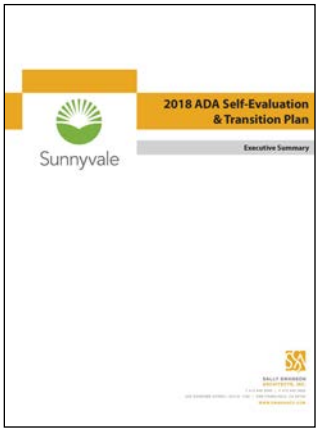
Sunnyvale Active Transportation Plan (ATP): Includes the Sunnyvale Bicycle Master Plan, Safe Routes to School Plan, and Pedestrian and Safety Circulation Plan. Is currently being developed and will be completed in 2020. The ATP will identify priority bicycle and pedestrian projects and improvements that contribute towards reducing collisions involving pedestrians and bicyclists throughout Sunnyvale.



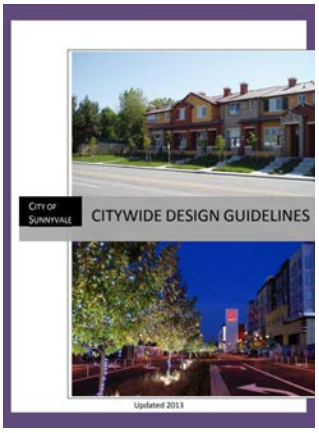
Sunnyvale Climate Action Plan 1.0 and Climate Action Playbook 2.0: Together include over 100 actions for reducing citywide greenhouse gas emissions, several of which relate to improving "sustainable circulation and transportation options." Specific actions cite improving the safety of bicyclists and pedestrians through roadway design and enforcement.



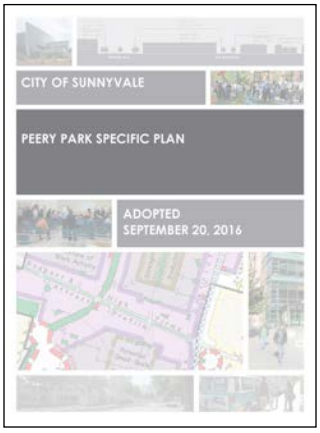
Systemic Safety Analysis Report Program (SSARP): Funded by California Department of Transportation (Caltrans), supports collision analysis, street safety issue initiation, and development of a list of systemic low-cost safety countermeasures that can be used in future statewide grant applications. Sunnyvale was awarded $250,000 in SSARP funds in 2017 to implement this program.



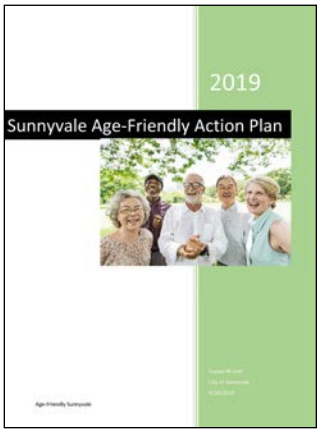
Sunnyvale Americans with Disabilities Act Self-Evaluation and Transition Plan (Draft): Focuses on ensuring access and usability for all persons with disabilities. It includes an ADA self-evaluation, a review of the City's ADA policies and practices, and a barrier assessment and remediation for public facilities.



Sunnyvale Design Guidelines: Including the citywide Design Guidelines, the Parking Structure Design Guidelines, and the Mixed-Use Development Toolkit, provide design guidelines for private developers to encourage safe site access, to create interesting and comfortable streetscapes, and to promote less dependence on cars.



Sunnyvale Specific, Precise, and Sense of Place Plans: Address multimodal transportation connectivity and safety through recommended streetscape improvements and intersection enhancements. Examples include the Fair Oaks Junction Sense of Place Plan, East Sunnyvale Sense of Place Plan, Downtown Specific Plan, Moffett Park Specific Plan, Peery Park Specific Plan, Lawrence Station Area Plan, and El Camino Real Corridor Specific Plan.



Sunnyvale Age-Friendly Action Plan (Draft): An "age-friendly city" optimizes opportunities for health, participation and security for all people, to ensure quality of life and dignity as people age. In September 2017, the City of Sunnyvale was formally designated an Age-Friendly City by the World Health Organization and American Association of Retired Persons. As part of the commitment to the Age-Friendly network, the City is developing an action plan that encompasses the City's values and vision and provides for sustainable growth. The plan is expected to be adopted in fall 2019.

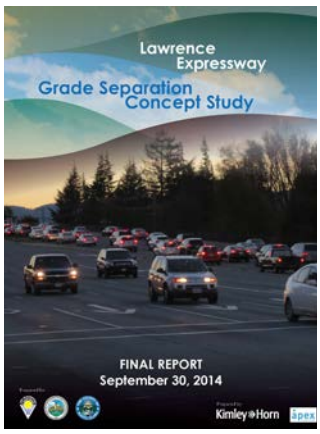
Infrastructure Changes

The Sunnyvale Vision Zero Plan builds on the City's progress towards improving street safety through past and ongoing infrastructure projects.

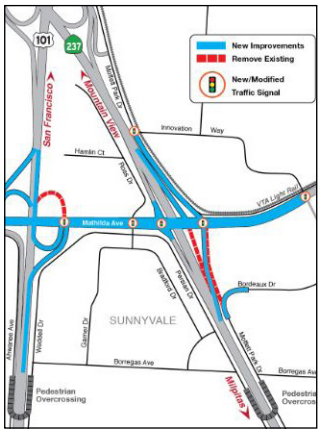
Fair Oaks Bridge: For more than four years, the City has been working with the community and Caltrans towards rehabilitating the Fair Oaks Avenue Bridge. Located between Kifer Road and Evelyn Avenue, the bridge crosses over the Caltrain tracks and Hendy Avenue. Once complete, this safety enhancement project will maintain the same number of automobile lanes, add a new separated sidewalk on the east side of the bridge, and widen the bridge's existing bicycle lanes.

Mary Avenue Overcrossing: The Mary Avenue Overcrossing project will relieve north-south traffic congestion, improve multimodal access between Moffett Park and other areas, and support smart growth in the Moffett Park area. The project would provide a multimodal connection from Mary and Almanor avenues, over US-101, SR-237 and Moffett Park Light Rail Station to 11th Avenue and Discovery Way (formerly E Street) in Moffett Park.

Bernardo Avenue Undercrossing: The Bernardo Avenue Undercrossing project is a joint effort between the City of Sunnyvale and the City of Mountain View to provide a key pedestrian and bicycle connection to employment centers and VTA Light Rail in the northern section of each jurisdiction. The undercrossing will provide pedestrian and bicycle access between North Bernardo Avenue and South Bernardo Avenue under the Caltrain Railroad and Central Expressway.



Lawrence Expressway Grade Separation Project: The purpose of the Lawrence Expressway Grade Separation Project is to identify potential improvements along the Lawrence Expressway at the intersections of Reed Avenue/ Monroe Street, Kifer Road, and Arques Avenue that will address existing and future traffic congestion in the study area. The proposed concepts (2014) have been evaluated based on safety benefits associated with eliminating conflict points at existing intersections and improved pedestrian and bicycle safety.



Mathilda Avenue Improvements: The project reconfigures the US 101 and SR 237 interchanges with Mathilda Avenue, including modification to on- and off-ramps; removal, addition, and signalization of intersections; and provision of new left-turn lanes. In addition, the project will modify bicycle and pedestrian facilities, street lighting, ramp metering, signage, and light rail crossing facilities.

Green Bike Lanes: Green bike lanes are being implemented at bicycle-vehicle conflict points across Sunnyvale. The treatment improves bicyclist visibility and reduces conflicts between bicyclists and vehicles.

Caltrain Grade Separations Feasibility Study: Caltrain Grade Separations at Mary and Sunnyvale Avenues will reduce existing congestion and queuing associated with crossing gate downtime, improve safety for all modes of travel, enhance pedestrian and bicycle access, and reduce noise. The project will identify a preferred alternative for each project location and complete a 15% design drawing.

GREEN INFRASTRUCTURE INITIATIVE

Sunnyvale is currently developing a citywide Green Infrastructure Plan. Green infrastructure includes trees, rain gardens, and infiltration planters that slow the course of runoff and filter it naturally before it reaches major waterways and sensitive plant and animal life. Vision Zero projects may provide an opportunity for green infrastructure improvements. For example, curb extensions or bulb outs may be constructed with planters for trees and other vegetation.

BUILDING BLOCKS OF VISION ZERO IN SUNNYVALE

The City of Sunnyvale sets a framework for Vision Zero efforts using two primary sources: **community feedback** and **collision records**. Public comments received through meetings, workshops, online surveys and walking tours, combined with a review of historic collisions within Sunnyvale, enabled the development of a robust set of recommendations that address safety concerns.

MAY 2017	JUN 2017 - AUG 2017	SEP 2017 - DEC 2017	JAN 2018 - MAY 2018	JUN 2018 - DEC 2018
Project Initiation	Existing Conditions Assessment	Priority Project Development	Implementation Strategy	Vision Zero Plan
		Public Workshop	Public Workshop	Walking Tour
		Stakeholder Focus Group	BPAC Presentation	
		BPAC Presentation		

Community Engagement

The City led a robust engagement effort to obtain input from community members on their perceptions of traffic safety in the City of Sunnyvale. All community members were invited to participate, and the community responded overwhelmingly with over 3,000 comments identifying safety concerns at specific locations and preferred safety countermeasures. The input from the community helped verify the results of the safety analysis and identify additional safety concerns not identified through the collision data. Community engagement efforts to develop the Sunnyvale Vision Zero Plan included:

Community Workshops: Community members participated in two workshops where they shared feedback on their current traffic safety concerns and their preferred approaches to improving the safety of Sunnyvale's roadways.

Online Surveys: Community members contributed to two online surveys. In the first online survey, they indicated how they travel within Sunnyvale and highlighted their safety concerns; in the second online survey, they identified their preferred safety improvements at the 10 priority project locations.

Webmap: Community members identified their location-specific safety concerns on the project webmap, sharing what feels unsafe about the locations and their ideas for improvements.

Walking Tours: Community members toured three priority project locations and provided feedback on the proposed street designs.

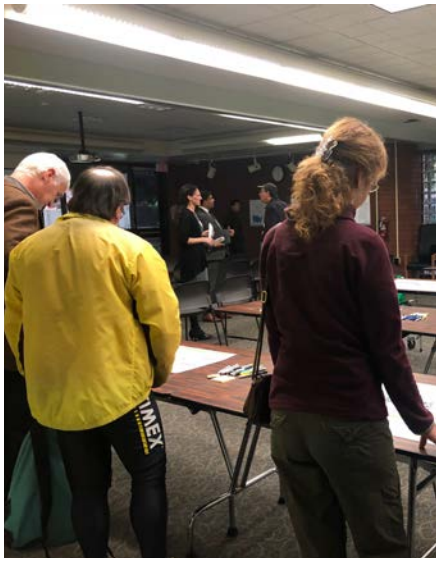
Bicycle and Pedestrian Advisory Commission (BPAC): Members of the Sunnyvale BPAC shared their feedback on the planning process during two public commission meetings.

Vision Zero Focus Group: An interdisciplinary focus group provided comments on the Sunnyvale Vision Zero planning process during one meeting. The group included the Sunnyvale Planning Department and Department of Public Safety, Santa Clara County of Public Health, Santa Clara Valley Transportation Authority, Sunnyvale School District, and the Cupertino Union and Santa Clara Unified School Districts.

"A neighborhood parallel bike path or a dedicated bike lane in the parking spaces should be a focus as Fair Oaks is currently too dangerous for cyclists."
– Online survey comment related to Fair Oaks Avenue between Balsam Avenue and East Taylor Avenue

Bicycle infrastructure and pedestrian crossing enhancements were the most requested improvements during the April 2018 workshop.

"There are a large number of pedestrians that gather at Pastoria Avenue and [El Camino Real] at school commute times. They overflow [the] intersection. A bulb out would be helpful. Also, many people whip around this intersection making right turns and risk pedestrian safety… Protecting bike commuters through here is important for the same reasons." – Online survey comment related to El Camino Real between S. Mary Avenue and S. Mathilda Avenue



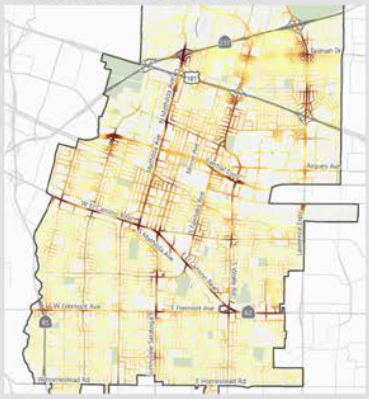
"Narrower lanes is the best way to slow down traffic and encourage drivers to pay better attention. Green and buffered bike lanes will remind drivers to look out for bikes and pedestrians and not just automobiles. Green bike lanes in conflict zones or separated bike ways may make it easier to merge into turn lanes for bikers." – Online survey comment related to Fremont Avenue between Sunnyvale-Saratoga Road and Floyd Avenue

COMMUNITY ENGAGEMENT APPROACH

Phase 1 - Fall 2017

Workshop	Webmap	Online Survey	BPAC Meeting	Focus Group
160 Comments	**1,542** Comments	**385** Participants	City Stakeholders and Community	City and County Stakeholders

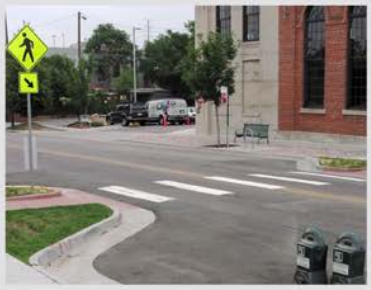
[How and where you travel] → EXISTING CONDITIONS



[Your travel safety concerns] → COLLISION PROFILES

[Where the City can help make your trip safer] → PRIORITY PROJECTS

[How the City can help make your trip safer] → SAFETY COUNTERMEASURES



58% of survey respondents **walk for transportation purposes** at least once a week

66% of survey respondents said **safety affects the mode of transportation** they choose for travel

82% of survey respondents report that **driving is their primary mode of transportation**

Phase 2 - Spring 2018

Workshop
153 Comments

Online Survey
75 Participants

BPAC Meeting
City Stakeholders and Community

Phase 3 - Fall 2018

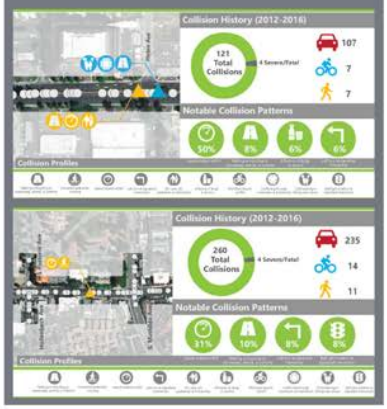
Walking Tours
3 Priority Project Locations

How the City can improve identified Priority Project locations

Policies and programs you recommend for safer streets

Street designs that meets your needs

PRIORITY PROJECTS



ACTION PLAN

11% of webmap comments and **24%** of survey responses included **speeding concerns**

7% of webmap comments related to **red light violations**

Workshop and BPAC participants highlighted **pedestrian safety concerns along** El Camino Real

Workshop participants voted for their top three safety enhancements:

- **Adding sidewalk connectivity or sidewalk widening**
- **Adding bicycle lanes**
- **Adding left-turn traffic signals and signal coordination**

Data-Driven Process

The City investigated collision records on local roadways and expressways from the five most recent years available (2012 to 2016)[7] to describe historic collision trends and identify high-risk locations. This information acts as a primary resource for the Sunnyvale Vision Zero Plan, providing the underlying data to support key analyses. The data-driven process included:

Collision Trends: Review collision statistics to evaluate when, where, and why collisions occur and who is involved.

High Injury Network: Identify corridors with the highest concentrations of fatal and serious injury collisions.

Collision Profiles: Combine different collision factors to identify 10 prevalent collision types.

Countermeasure Toolbox: Based on national research, identify effective countermeasures and pair them with applicable collision profiles.

Priority Project Locations: Select 10 priority project locations based on collision density and community verification.

COLLISION TRENDS

A review of collision records helped the City understand the "who, what, when, where, and why" of traffic incidents, particularly for collisions resulting in fatalities or serious injuries. Throughout the Plan, the acronym KSI is used to denote collisions where someone was killed (K) or seriously injured (SI).

Sunnyvale saw **6,244** collisions between 2012 and 2016, including **91** KSI collisions

72% of pedestrian KSI collisions occurred at intersections

7% of all collisions and **4%** of KSI collisions occurred on expressways

11% of KSI collisions involved drivers under the influence of alcohol or drugs

60% of KSI collisions occurred on roadways with speed limits greater than **35** miles per hour

KSI collisions were most likely to occur in the late afternoon or early evening. **51%** of collisions occur between 3 PM and 9 PM.

Only **10%** of all collisions involved bicyclists or pedestrians, yet bicyclist and pedestrian collisions comprised **56%** of KSI collisions

[7] Source: Crossroads Collision Database Software.

National research shows that children, seniors, low-income communities and people of color face a disproportionate burden when it comes to traffic fatalities and serious injuries. The City incorporated demographic information into the collision analysis to understand how some of these patterns play out locally.

Of these demographic considerations, people in Sunnyvale 60 years or older are overrepresented in fatal and serious injury pedestrian collisions. They make up **20%** of Sunnyvale residents but comprise over **40%** of KSI pedestrian collisions.

A FOCUS ON FATALITIES AND SERIOUS INJURIES

Focusing on fatal and serious injury collisions in Vision Zero acknowledges the outsized impact of these events. Improvements that target fatal and serious injury collisions help produce the greatest benefits to fulfill the City's commitments on health and safety.

The consequences of a fatality or serious injury can be measured in monetary costs, including medical bills, and in intangible costs, including physical pain and emotional suffering. According to the Highway Safety Manual (2016), the combined monetary and intangible cost of a fatal collision is estimated to be $5.8 million for victims and their families, and the cost of a collision resulting in serious injury is estimated to be $300,000.[8] This means that, between 2012 and 2016, KSI collisions in Sunnyvale cost the community **$142.8 million**, or **$28.5 million** per year.

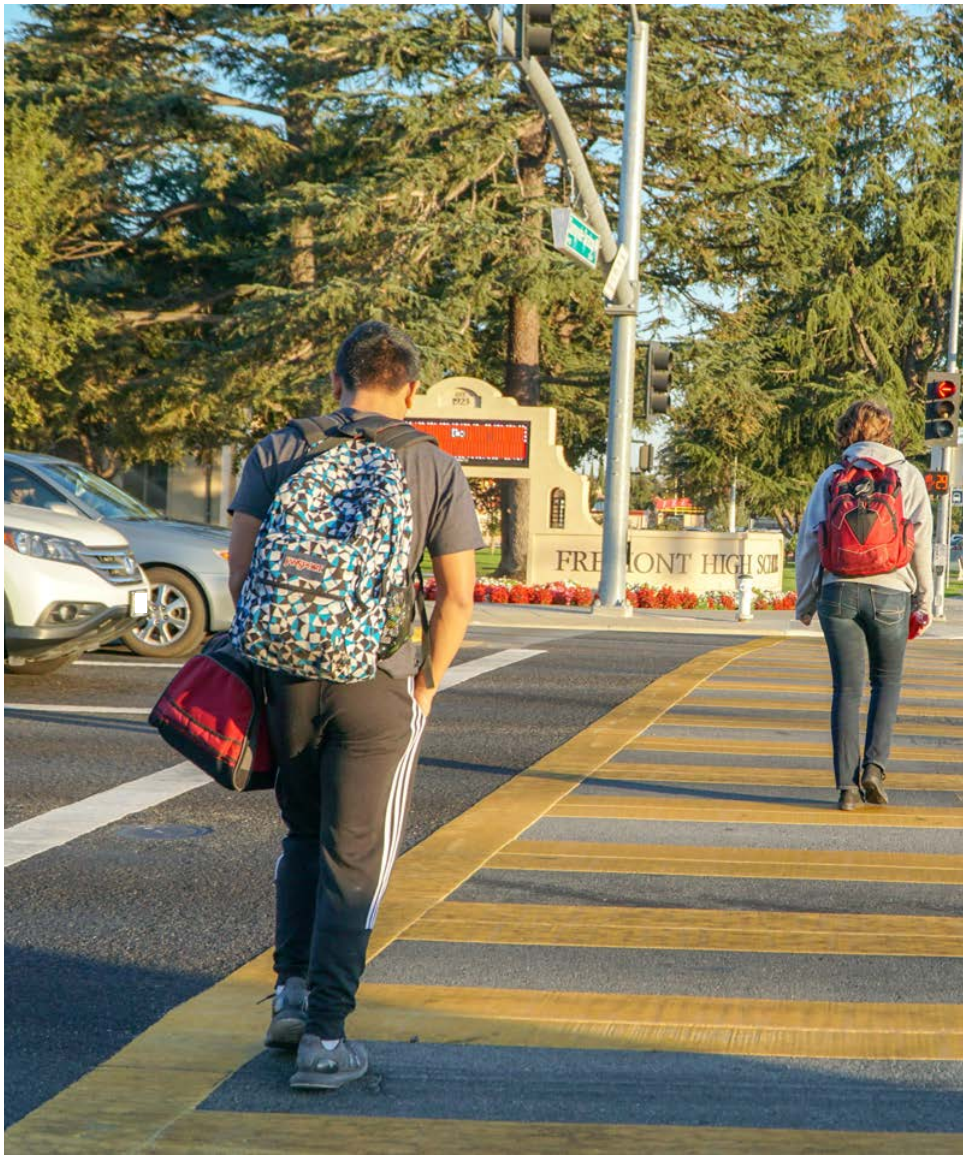
[8] Federal Highway Administration. 2018. Crash Costs for Highway Safety Analysis https://safety.fhwa.dot.gov/hsip/docs/fhwasa17071.pdf

High Injury Network (HIN)

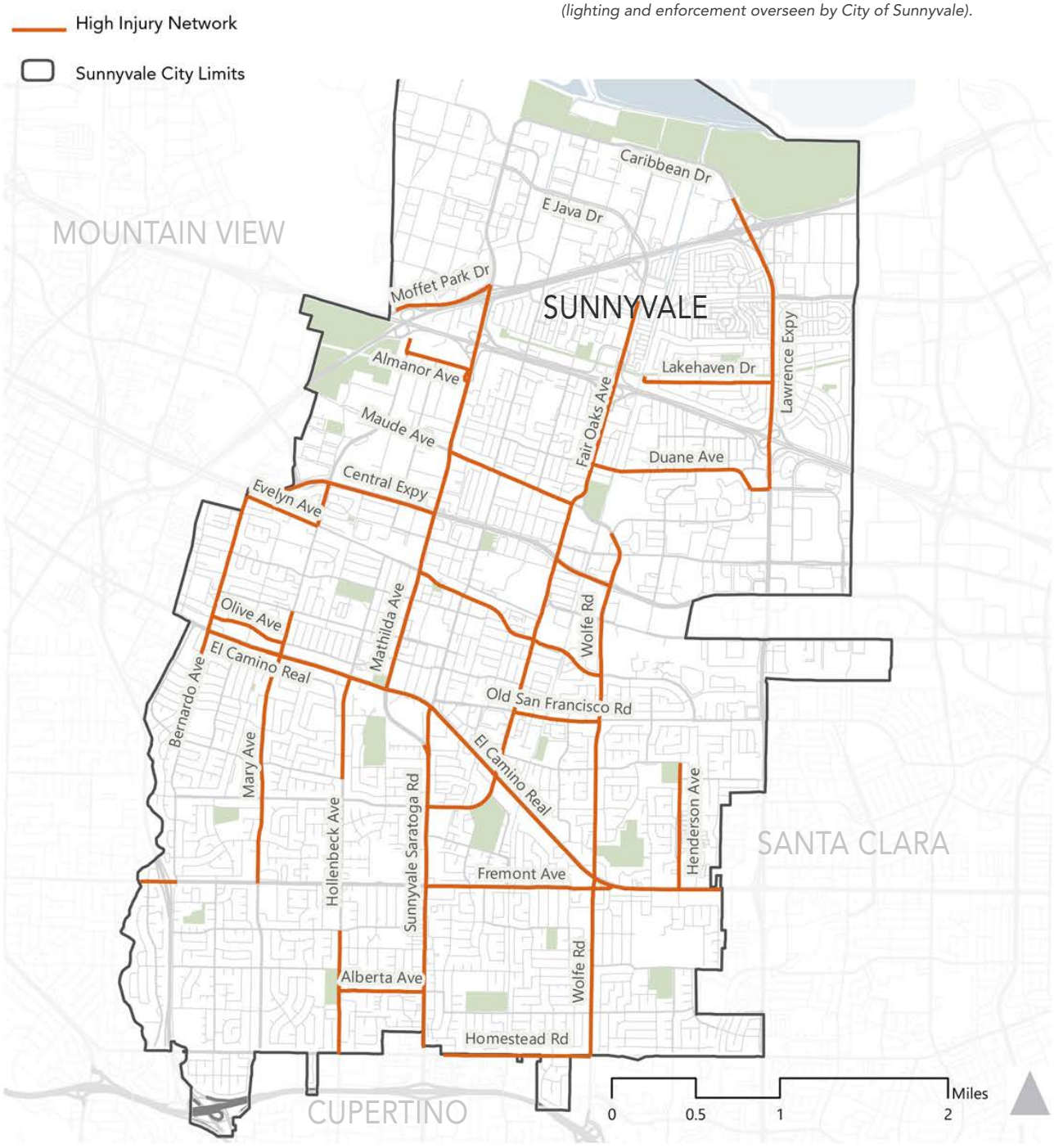
The High Injury Network (HIN) identifies the corridors with the highest levels of fatal and serious injury collisions for pedestrians, bicyclists and motorists. The majority of KSI collisions occurs on a small subset of Sunnyvale roadways. The HIN can help focus safety improvements on priority corridors where the most serious collisions happen with the highest frequency.

The High Injury Network accounts for **60%** of KSI collisions on just **7%** of Sunnyvale's roadway network.

20 of Sunnyvale's **27** public elementary, middle, and high schools fall within a quarter mile of the HIN.



Note: Central Expressway and Lawrence Expressway are managed by the County; El Camino Real is managed by Caltrans (lighting and enforcement overseen by City of Sunnyvale).



Source: City of Sunnyvale Crossroads Data, 2012-2016

HIGH INJURY NETWORK (HIN)


35

COUNTERMEASURE TOOLBOX AND COLLISION PROFILES

Countermeasure Toolbox

The City has developed a toolbox of key countermeasures that could be used to implement safety projects. These countermeasures encapsulate engineering, education and enforcement strategies. Each countermeasure is summarized based on its efficacy, cost, and complexity.

Efficacy indicates the countermeasure's ability to decrease serious and fatal collisions. High efficacy countermeasures have a measurable effect based on national research and provide overall safety benefits at the given location. Medium efficacy countermeasures may improve user experience and compliance, and they are often more effective at addressing specific crash types under specific conditions. Low efficacy countermeasures result in a possible improvement, though research on their impacts is not available yet.

Cost refers to the capital cost to implement the countermeasure. Complexity summarizes the time or level of effort to plan and design how the countermeasure would be implemented.

Where efficacy, cost or complexity varies significantly based on countermeasure installation type or roadway context, "Based on Context" has been indicated.

ROADWAY DESIGN

BULB OUTS AND CURB EXTENSIONS

Raised devices that reduce the corner radius or narrow the roadway to reduce speeds of turning vehicles, improve sight lines, and shorten crossing distances.

EFFICACY: ● ● ○
COST: ● ● ○
COMPLEXITY: ● ○ ○

LANE REDUCTION

Reduction in number of travel lanes, often paired with a center turn lane and/or bicycle lanes.

EFFICACY: ● ● ●
COST: ● ● ●
COMPLEXITY: ● ● ●

CONSOLIDATED DRIVEWAYS

Removal of redundant driveways where multiple driveways provide access to one property.

EFFICACY: ● ○ ○
COST: ● ● ○
COMPLEXITY: ● ● ●

SIDEWALK TO CLOSE GAPS

Construction of a new sidewalk that closes a gap between two existing sidewalks.

EFFICACY: ● ● ○
COST: ● ● ●
COMPLEXITY: ● ● ● **(BASED ON CONTEXT)**

ROADWAY AND INTERSECTION SAFETY LIGHTING

Roadway and intersection lighting to make other road users or hazards more visible to drivers at night, thereby improving driver perception and reaction time.

EFFICACY: ● ● ●
COST: ● ● ●
COMPLEXITY: ● ● ○

PEDESTRIAN CROSSINGS

HIGH VISIBILITY CROSSWALKS WITH ADVANCE STOP OR YIELD LINES

Distinct pavement markings, such as ladder or continental, stamped or colored concrete, or a reflective inlay or thermoplastic tape to increase visibility of pedestrians crossing.

EFFICACY: ● ● ●
COST: ● ○ ○
COMPLEXITY: ● ○ ○

MARKED CROSSING

New crosswalk at an unsignalized intersection where no marked crosswalk was previously striped, consistent with state guidance.

EFFICACY: ● ○ ○
COST: ● ○ ○
COMPLEXITY: ● ○ ○

PEDESTRIAN-ACTIVATED CROSSWALK WARNING BEACON

Pedestrian-activated flashing beacons that highlight crosswalks and pedestrian crossing signs.

EFFICACY: ● ● ○
COST: ● ● ○
COMPLEXITY: ● ○ ○

PEDESTRIAN HYBRID BEACON

Pedestrian-activated beacon that indicates to drivers that a pedestrian is in the crosswalk. An engineering study is used to determine whether installation of the beacon is warranted.

EFFICACY: ● ● ●
COST: ● ● ●
COMPLEXITY: ● ● ○

PEDESTRIAN REFUGE ISLAND AND MEDIAN

Curbed sections in the center of the roadway that are physically separated from vehicular traffic. Raised medians or refuge islands shorten crossing distances across large, multi-lane roadways.

EFFICACY: ● ● ●
COST: ● ● ○
COMPLEXITY: ● ○ ○

BIKEWAY DESIGN

BIKE INTERSECTION MARKINGS

Striping on intersection approaches that provide clear delineation between the paths of through bicyclists and through or right-turning vehicles in the adjacent lane.

EFFICACY: ● ● ○
COST: ● ○ ○
COMPLEXITY: ● ○ ○

BUFFERED BIKE LANE

Class II bike lane separated from vehicle lanes by a painted buffer, intended to reduce motor vehicle encroachment into the bike lane and increase bicyclist comfort and safety.

EFFICACY: ● ● ○
COST: ● ● ○
COMPLEXITY: ● ● ○

GREEN PAVEMENT

Green markings, created with paint, epoxy, thermoplastic, or colored asphalt, that designate bike lanes, cycle tracks, bike boxes, bicycle conflict zones or intersection crossings. Higher efficacy can be achieved when green pavement is used in combination with other treatments.

EFFICACY: ● ○ ○ **(BASED ON CONTEXT)**
COST: ● ● ○
COMPLEXITY: ● ○ ○

SHARED-USE TRAIL AND BICYCLE PATH

Off-street path, either for exclusive use by bicyclists or by bicyclists and pedestrians, usually with minimal street crossings, and designated by signs and/or pavement markings. These are considered Class I bikeways by Caltrans.

EFFICACY: ● ● ●
COST: ● ● ●
COMPLEXITY: ● ● ●

PROTECTED BIKEWAY

Exclusive bikeways that are located within or next to the roadway, but are separated from both the sidewalk and roadway by vertical barriers or elevation differences. These are considered Class IV bikeways by Caltrans.

EFFICACY: ● ● ● **(BASED ON CONTEXT)**
COST: ● ● ●
COMPLEXITY: ● ● ●

SIGNS, MARKINGS & OPERATION

MODIFIED INTERSECTION STOP-CONTROL

Modified stop-control at an intersection, such as new stop signs at an uncontrolled intersection or conversion of side-street stops to all-way stops, consistent with warrant guidance and design considerations.

EFFICACY: ● ● ●

COST: ● ● ○ **(BASED ON CONTEXT)**

COMPLEXITY: ● ● ○ **(BASED ON CONTEXT)**

PARKING RESTRICTION AT INTERSECTIONS

Parking spaces removed on near side of crossing locations to allow for improved sightlines for both pedestrians and motorists.

EFFICACY: ● ● ●

COST: ● ○ ○

COMPLEXITY: ● ○ ○

TURN RESTRICTION

Left or right turn restrictions to reduce conflicts between pedestrians and turning vehicles.

EFFICACY: ● ● ○

COST: ● ○ ○

COMPLEXITY: ● ○ ○

SIGNAL TIMING & PHASING

ADAPTIVE PEDESTRIAN SIGNAL SYSTEM

Sensors that automatically detect when pedestrians are present in a crossing and automatically increase crossing time when necessary.

EFFICACY: ● ● ○
COST: ● ● ○
COMPLEXITY: ● ● ○

LEADING PEDESTRIAN INTERVAL

Signals that allow pedestrians a short head start in crossing the intersection to minimize conflicts with turning vehicles.

EFFICACY: ● ● ○
COST: ● ○ ○
COMPLEXITY: ● ○ ○

PEDESTRIAN COUNTDOWN SIGNAL HEAD

Signal head that provides countdown to inform pedestrians about the length of time left to cross.

EFFICACY: ● ● ○
COST: ● ○ ○
COMPLEXITY: ● ○ ○

PROTECTED TURN

Signal phasing that includes an exclusive phase for left-turning vehicles to enter the intersection separate from any conflicting vehicle or pedestrian movements.

EFFICACY: ● ● ●
COST: ● ● ○
COMPLEXITY: ● ● ○

SIGNAL TIMING & PHASING (CONT.)

ADVANCED DILEMMA-ZONE DETECTION

Dynamic signal timing that adjusts the start time of the yellow phase either earlier or later, based on observed vehicle locations and speeds. The signal changes are typically used for high-speed approaches. They aim to minimize the number of drivers crossing the intersection during the yellow phase, successfully reducing the specific crash types of rear-end and angle crashes associated with traffic signal phase changes.

EFFICACY: ● ● ○

COST: ● ● ○

COMPLEXITY: ● ● ●

SIGNAL TIMING AND PHASING IMPROVEMENTS

Signal changes that address safety, such as longer walk intervals, signal coordination, signal timing optimized for bicyclist speeds, or longer all-red times to give pedestrians, bicyclists, and drivers more time to clear the intersection before drivers enter the intersection from a conflicting direction. The City of Sunnyvale currently updates its signal timing on a three-year cycle. Signal operation changes require adjustment to other intersections on signal coordinated roadways

EFFICACY: ● ● ●

COST: ● ● ●

COMPLEXITY: ● ● ●

SPEED CONTROL

VEHICLE SPEED FEEDBACK SIGN

Radar sign that displays the speed of an approaching vehicle in real-time on a changeable display. Speed feedback signs should be installed with a regulatory speed limit sign.

EFFICACY: ● ● ○

COST: ● ● ○

COMPLEXITY: ● ○ ○

REDUCED SPEED SCHOOL ZONE

Speed limit reductions to 15 or 20 mph, implemented as part of a speed reduction school zone. Reduced speed school zones are recommended based on state guidance.

EFFICACY: ● ● ○

COST: ● ○ ○

COMPLEXITY: ● ○ ○

SPEED HUMP, SPEED TABLE, AND RAISED CROSSWALK

Raised asphalt that spans the width of the roadway, varying in length depending on type. Speed tables are similar to speed humps but tend to be wider. Raised crosswalks are flat-topped speed tables, marked and signed as a pedestrian crossing.

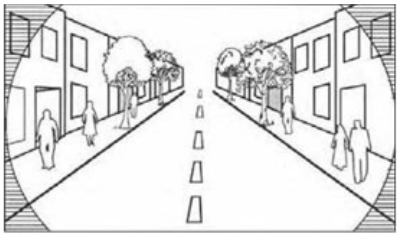
EFFICACY: ● ● ●

COST: ● ● ○

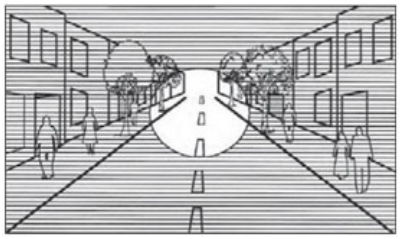
COMPLEXITY: ● ● ○

A major component of Vision Zero is the recognition of the relationship between speed and collision severity. In the City of Sunnyvale, unsafe speed (as recorded in the collision report) is a leading cause of collisions. By designing streets to better reflect the range of road users – bicyclists, pedestrians, buses, and personal vehicles – and through public education and targeted enforcement campaigns, the City can help reduce the speeds at which vehicles travel. The deployment of technologies like speed monitoring also can lower and manage speeds and reduce the likelihood and severity of collisions.

Unsafe speeds were a factor in **27.5%** of all collisions and **15.4%** of KSI collisions.



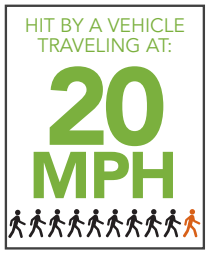
Field of vision at 15 MPH



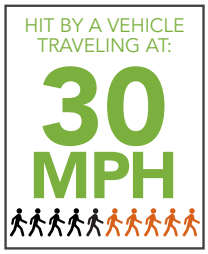
Field of vision at 30 to 40 MPH

Source: https://www.ite.org/technical-resources/topics/speed-management-for-safety/speed-as-a-safety-problem/

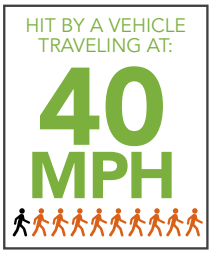
A driver's field of vision increases as speed decreases. At lower speeds, driver can see more of their surroundings and have more time to see and react to potential hazards.



9 out of 10 pedestrians survive



5 out of 10 pedestrians survive



Only 1 out of 10 pedestrians survives

Source: http://www.bikeleague.org/sites/default/files/speed.jpg

Speed is especially lethal for vulnerable users like pedestrians and people biking. The risk of injury and death increases as speed increases.

MISCELLANEOUS

EDUCATION

Public education campaigns, sometimes through public service announcements, that inform the public on roadway safety.

ENFORCEMENT

Number of officers in Department of Public Safety assigned to traffic enforcement determined based on guidance provided in the US Department of Transportation's National Highway Traffic Safety Administration Police Personnel Allocation Manual. Focus enforcement efforts on most risky behaviors and high-collision locations identified in the Sunnyvale Vision Zero Plan.

Collision Profiles

Ten collision profiles capture the top KSI collision patterns across Sunnyvale over the five most recent years of available data (2012 to 2016). The collision profiles cover collision characteristics, such as speeding vehicles or red light violations (as recorded in the collision report), as well as contextual factors including if the collision occurred on an expressway, at an intersection, or near a school. Individual collisions may fall under multiple profiles. For example, a collision may be both a speed-related conflict and involve a driver under the influence of drugs or alcohol.

The ten collision profiles are presented on the following pages with a description and relevant countermeasures. Each collision profile is paired with up to five safety countermeasures effective at addressing the collision type. Additional countermeasures may be effective at reducing collisions under a given profile, beyond the five highlighted here, and these are included in the technical appendix.

COLLISION PROFILE	% OF ALL KSI (# OF ALL KSI)	% OF AUTO KSI (# OF AUTO KSI)	% OF BICYCLE KSI (# OF BICYCLE KSI)	% OF PEDESTRIAN KSI (# OF PEDESTRIAN KSI)
1. Walking or bicycling on major roadway (expressway, arterial, or collector)	47% (43)		95% (18)	78% (25)
2. Unmarked pedestrian crossing	17% (15)			47% (15)
3. Speed-related conflict	15% (14)	15% (6)	21% (4)	13% (4)
4. Left turn at signalized intersection	12% (11)	10% (4)		23% (7)
5. 60+ year old pedestrians at intersection	12% (11)			34% (11)
6. Influence of drugs or alcohol	11% (10)	20% (8)	5% (1)	3% (1)
7. Midblock bicycle conflict	10% (9)		47% (9)	
8. Conflicting through movement at intersection	8% (7)	10% (4)	16% (3)	
9. Children walking or biking near school	8% (7)		21% (4)	9% (3)
10. Red light violation at signalized intersection	6% (5)	5% (2)	5% (1)	6% (2)

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

PROFILE 1

WALKING OR BICYCLING ON MAJOR ROADWAY (EXPRESSWAY, ARTERIAL, OR COLLECTOR)

FACTORS

» Pedestrian or bicycle collision

» Collision occurred on an expressway, arterial, or collector

STATS

43 KSI Collisions

» Accounts for **47%** of all KSI collisions

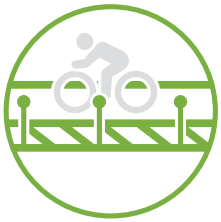
ADDITIONAL NOTES

» **14** of the **43** KSI profilecollisions **(33%)** occurred on **El Camino Real**

Key Countermeasures

Adaptive Pedestrian Signal System

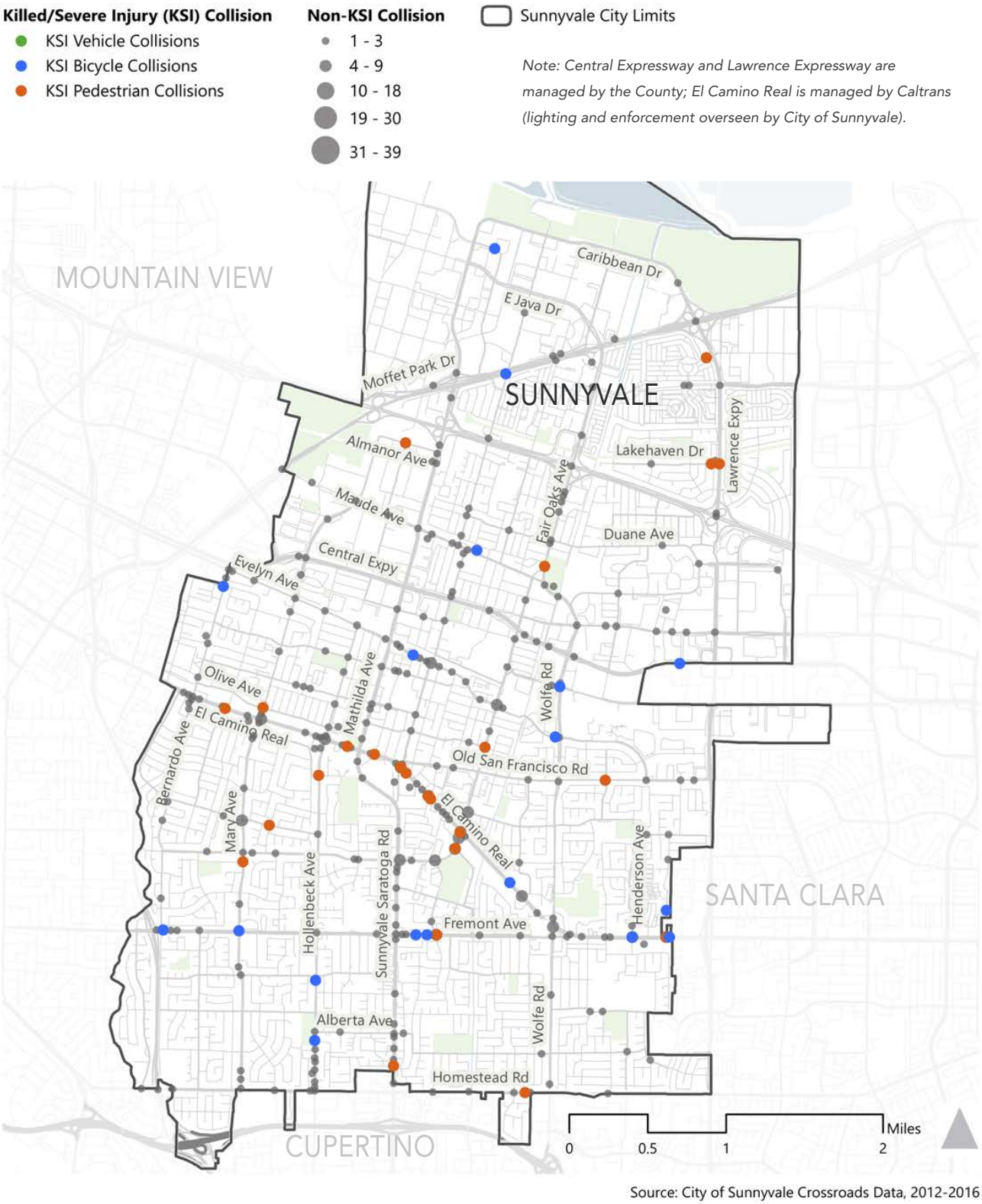
Pedestrian Refuge Island and Median



Protected Bikeway

Protected Turns

Roadway and Intersection Safety Lighting



Source: City of Sunnyvale Crossroads Data, 2012-2016

PROFILE 1: WALKING OR BICYCLING ON MAJOR ROADWAY (EXPRESSWAY, ARTERIAL, OR COLLECTOR)

PROFILE 2

UNMARKED PEDESTRIAN CROSSING

FACTORS

» Pedestrian collision

» No marked crosswalk

» Collision occurred at either mid-block or intersection location

STATS

15 KSI Collisions

» Accounts for **17%** of all KSI collisions

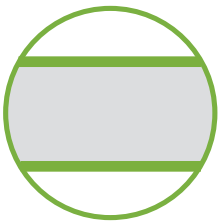
Key Countermeasures

Pedestrian Hybrid Beacon

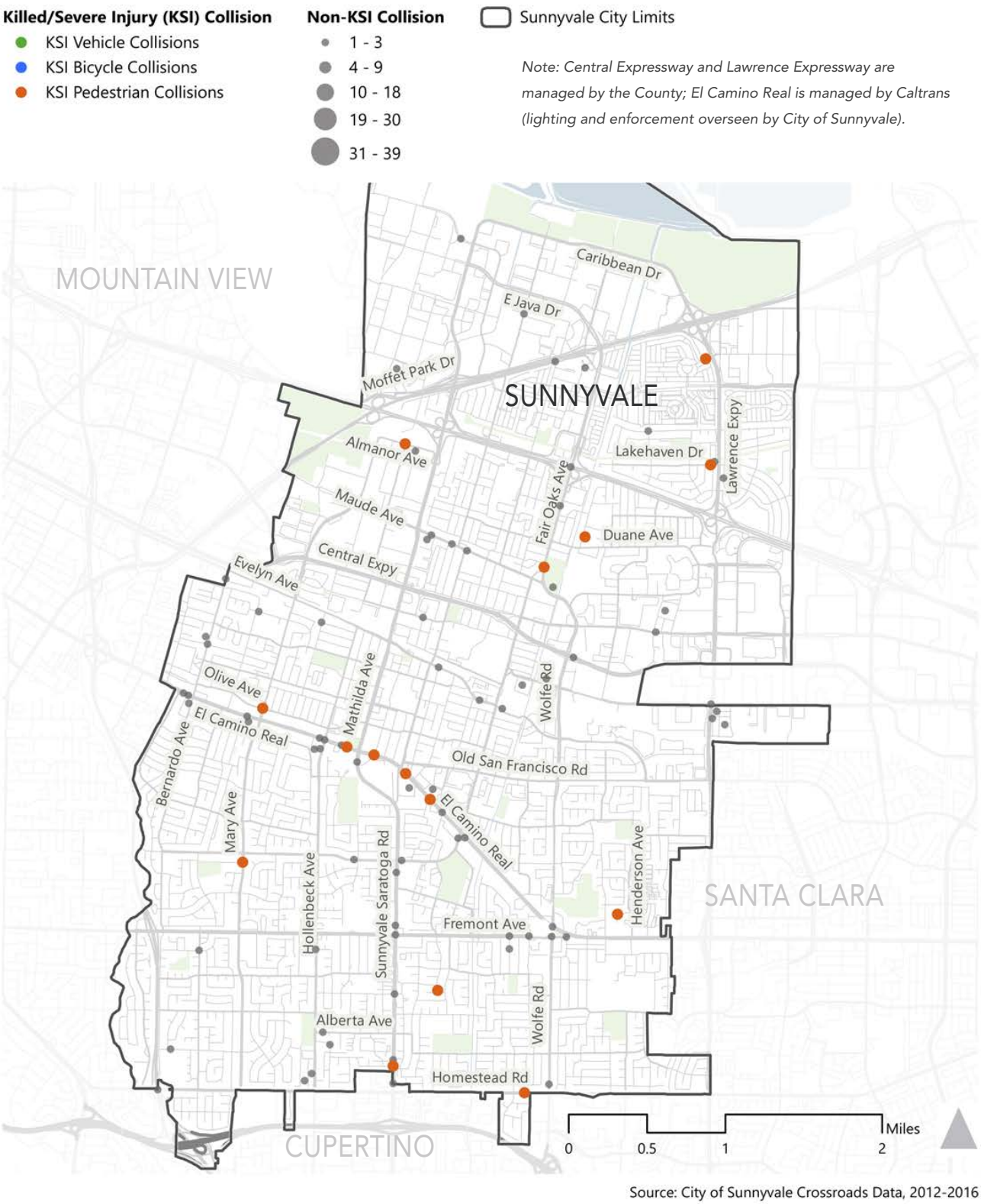
Pedestrian-Activated Crosswalk Warning Beacon

Bulb Outs and Curb Extensions

High Visibility Crosswalks with Advance Stop or Yield Line



Marked Crossings



Source: City of Sunnyvale Crossroads Data, 2012-2016

PROFILE 2: UNMARKED PEDESTRIAN CROSSING

PROFILE 3

SPEED-RELATED CONFLICT

FACTORS

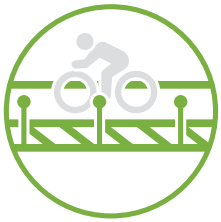
» Unsafe speed

STATS

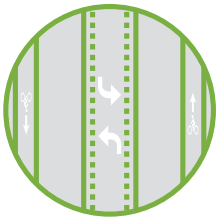
14 KSI Collisions

» Accounts for **15%** of all KSI collisions

Key Countermeasures



Protected Bikeway

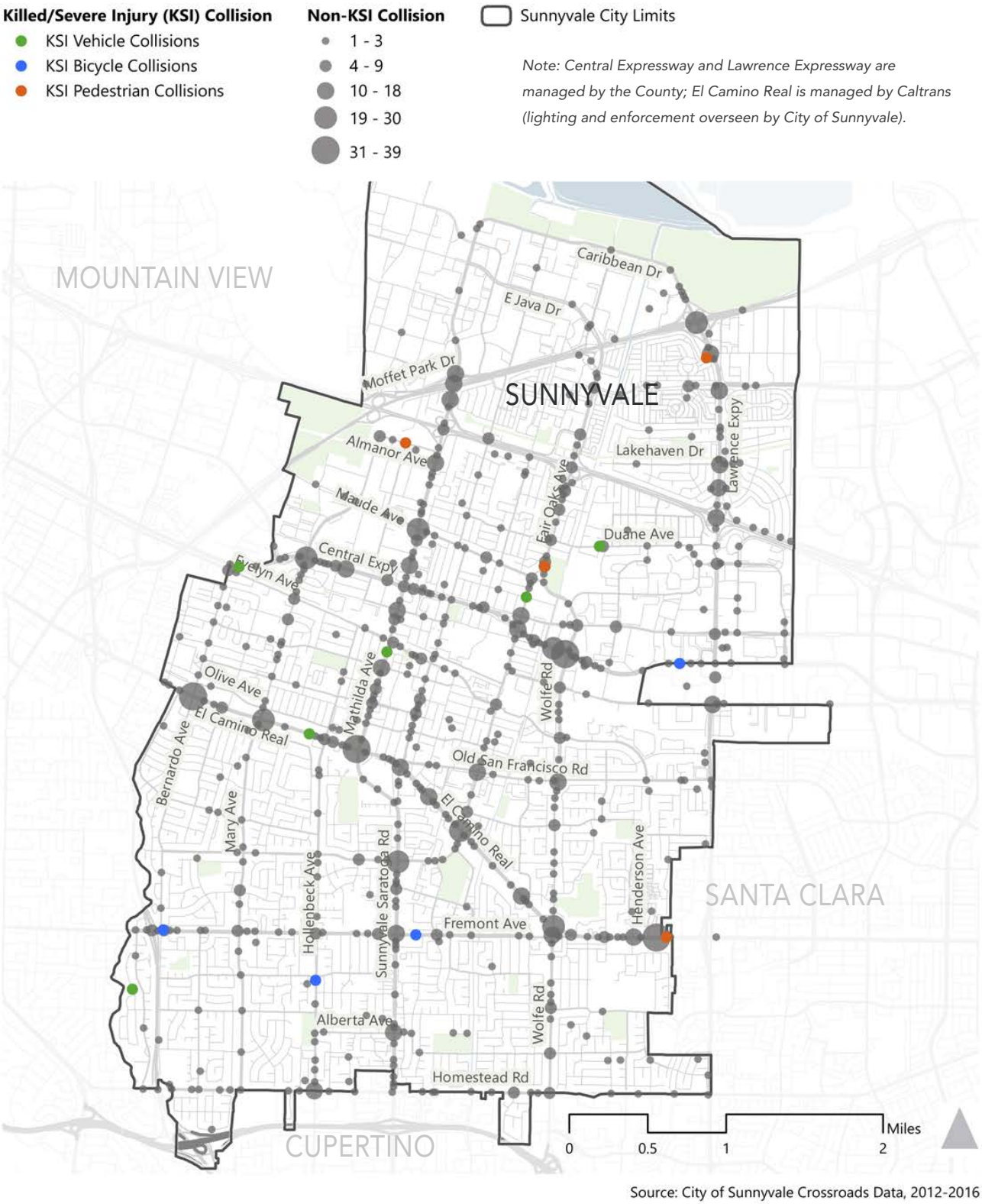


Lane Reduction

Vehicle Speed Feedback Sign

Speed Hump, Speed Table, and Raised Crosswalk

Reduced Speed School Zone



Source: City of Sunnyvale Crossroads Data, 2012-2016

PROFILE 3: SPEED-RELATED CONFLICT

PROFILE 4

LEFT TURN AT SIGNALIZED INTERSECTION

FACTORS

» Vehicle preceding movement is left turn or U-turn

» Collision occurred at a signalized intersection

STATS

11 KSI Collisions

» Accounts for **12%** of all KSI collisions

Key Countermeasures

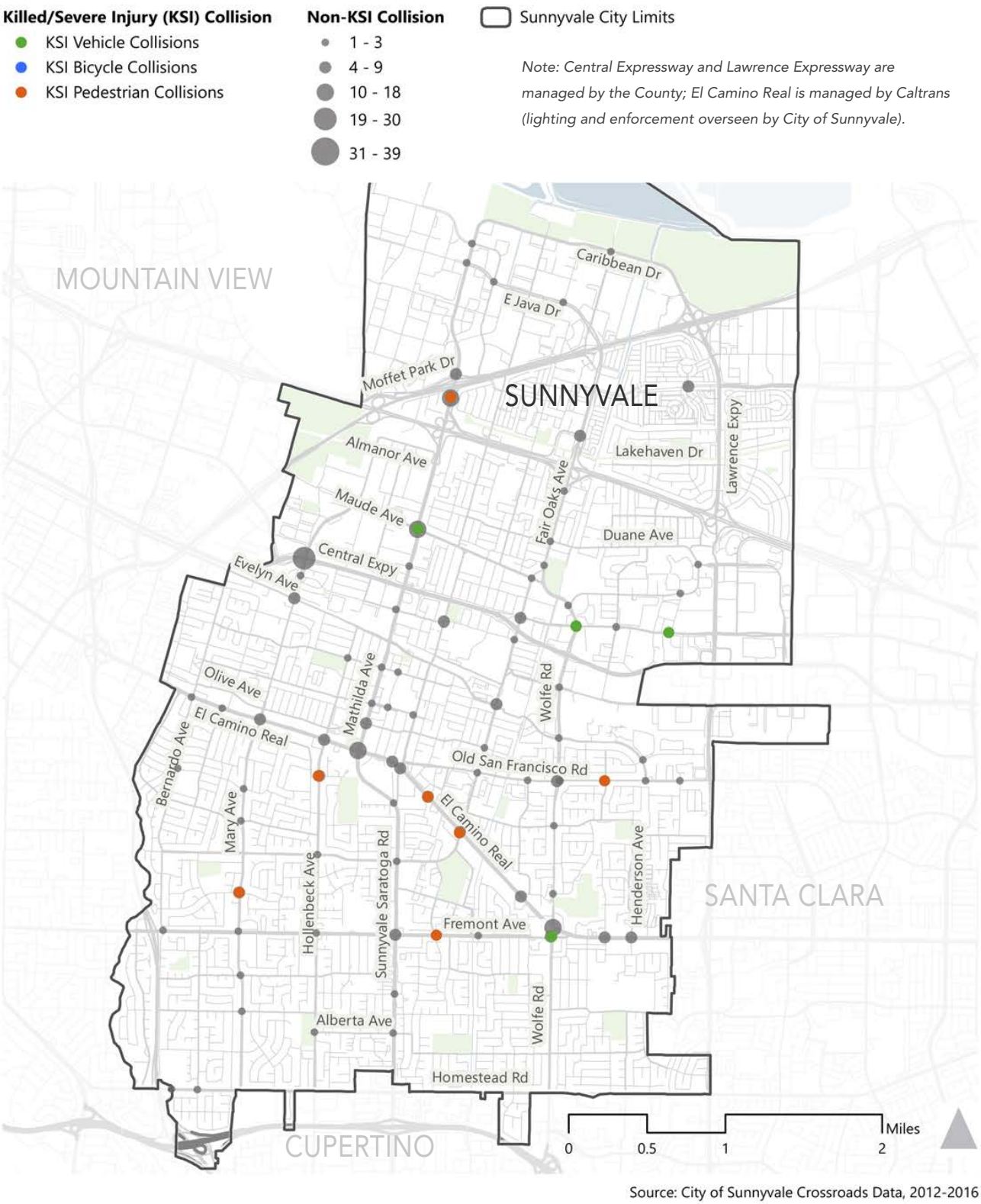
Leading Pedestrian Interval

Bulb Outs and Curb Extensions

Signal Timing and Phasing Improvements

Protected Turn

Turn Restriction



Source: City of Sunnyvale Crossroads Data, 2012-2016

PROFILE 4: LEFT TURN AT SIGNALIZED INTERSECTION

PROFILE 5

60+ YEAR OLD PEDESTRIANS AT INTERSECTION

FACTORS

» Pedestrian collision

» Pedestrian is 60 years old or older

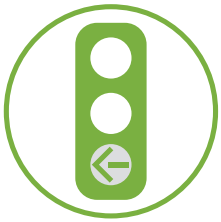
» Collision occurred at an intersection

STATS

11 KSI Collisions

» Accounts for **12%** of all KSI collisions

Key Countermeasures



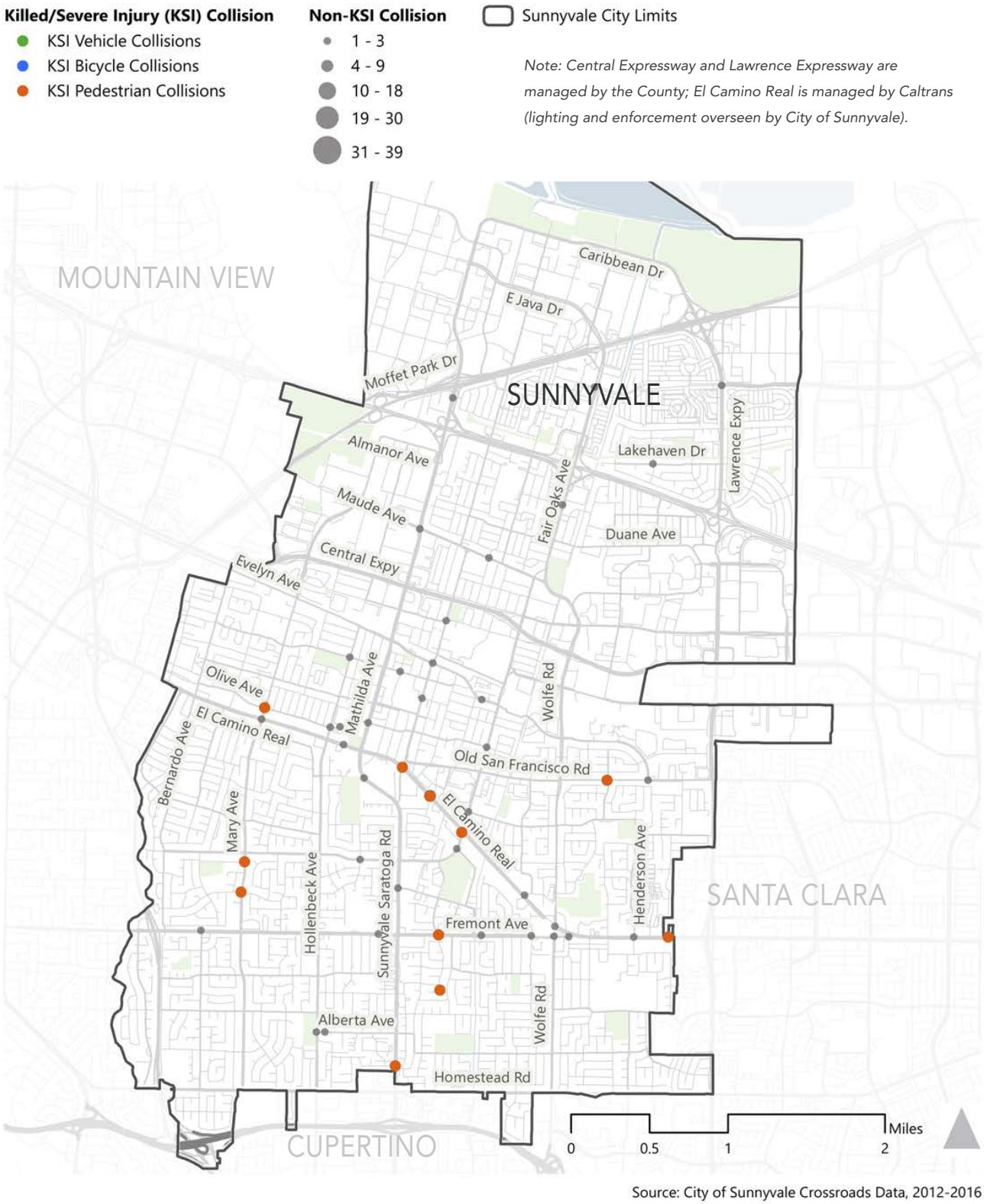
Protected Turn

Leading Pedestrian Interval

Bulb Outs and Curb Extensions

Pedestrian Refuge Island and Median

Adaptive Pedestrian Signal System



Source: City of Sunnyvale Crossroads Data, 2012-2016

PROFILE 5: 60+ YEAR OLD PEDESTRIAN AT INTERSECTION

PROFILE 6

INFLUENCE OF DRUGS OR ALCOHOL

FACTORS

» At least one party was under the influence of drugs or alcohol

STATS

10 KSI Collisions

» Accounts for **11%** of all KSI collisions

ADDITIONAL NOTES

» All **10** KSI collisions in this profile involved a driver (as opposed to a pedestrian or bicyclist) under the influence

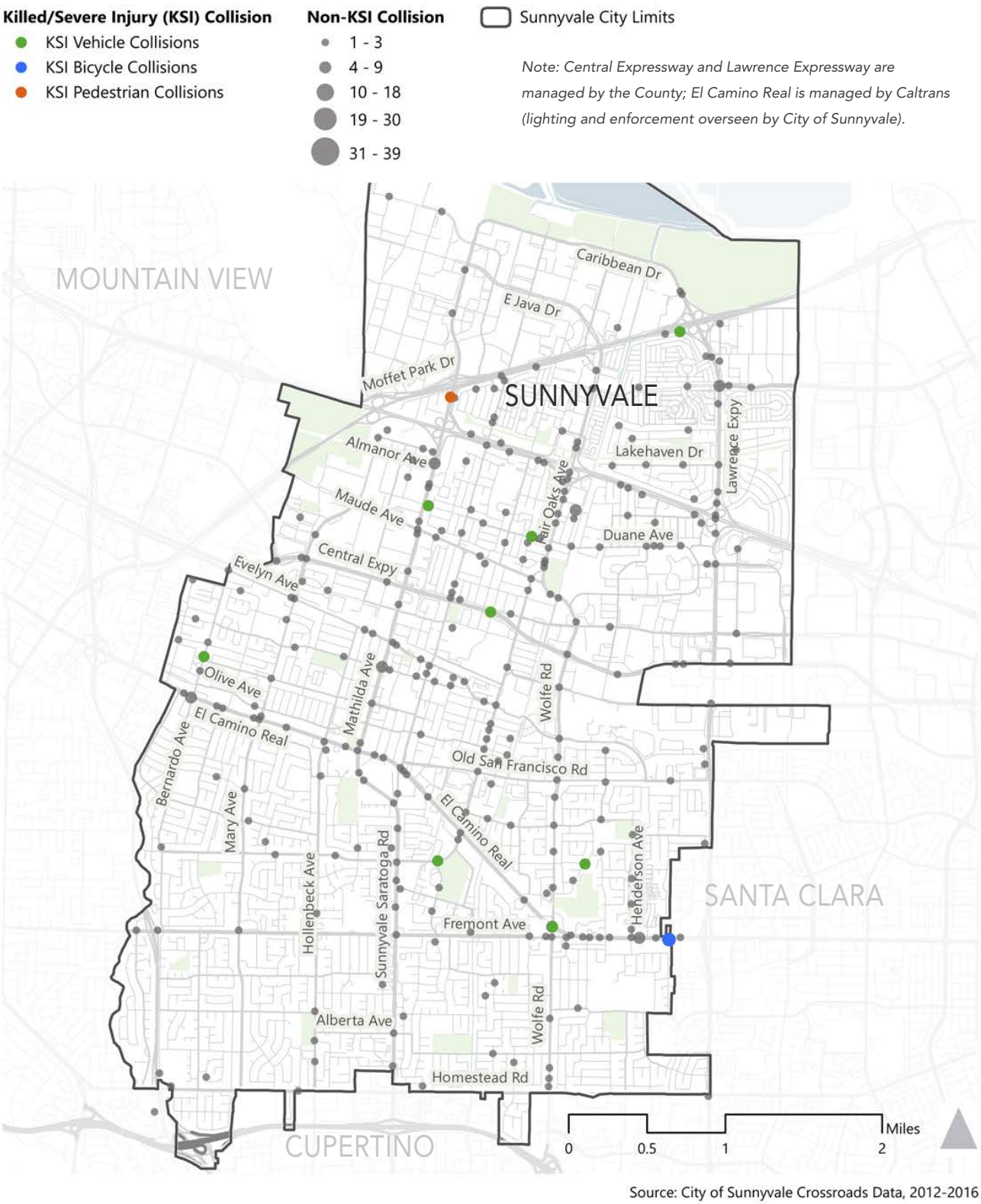
Key Countermeasures

Education

Enforcement

Vehicle Speed Feedback Sign

Speed Hump, Speed Table, and Raised Crosswalk



Source: City of Sunnyvale Crossroads Data, 2012-2016

PROFILE 6: INFLUENCE OF DRUGS OR ALCOHOL

PROFILE 7

MIDBLOCK BICYCLE CONFLICT

FACTORS

» Bicycle collision

» Collision occurred on a bicycle segment (not at an intersection)

STATS

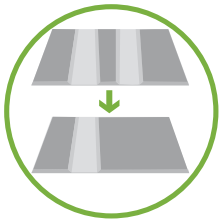
9 KSI Collisions

» Accounts for **10%** of all KSI collisions

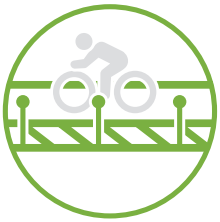
ADDITIONAL NOTES

» **2** KSI collisions involved a driver making a midblock turn (e.g. at a driveway)

Key Countermeasures



Consolidated Driveways

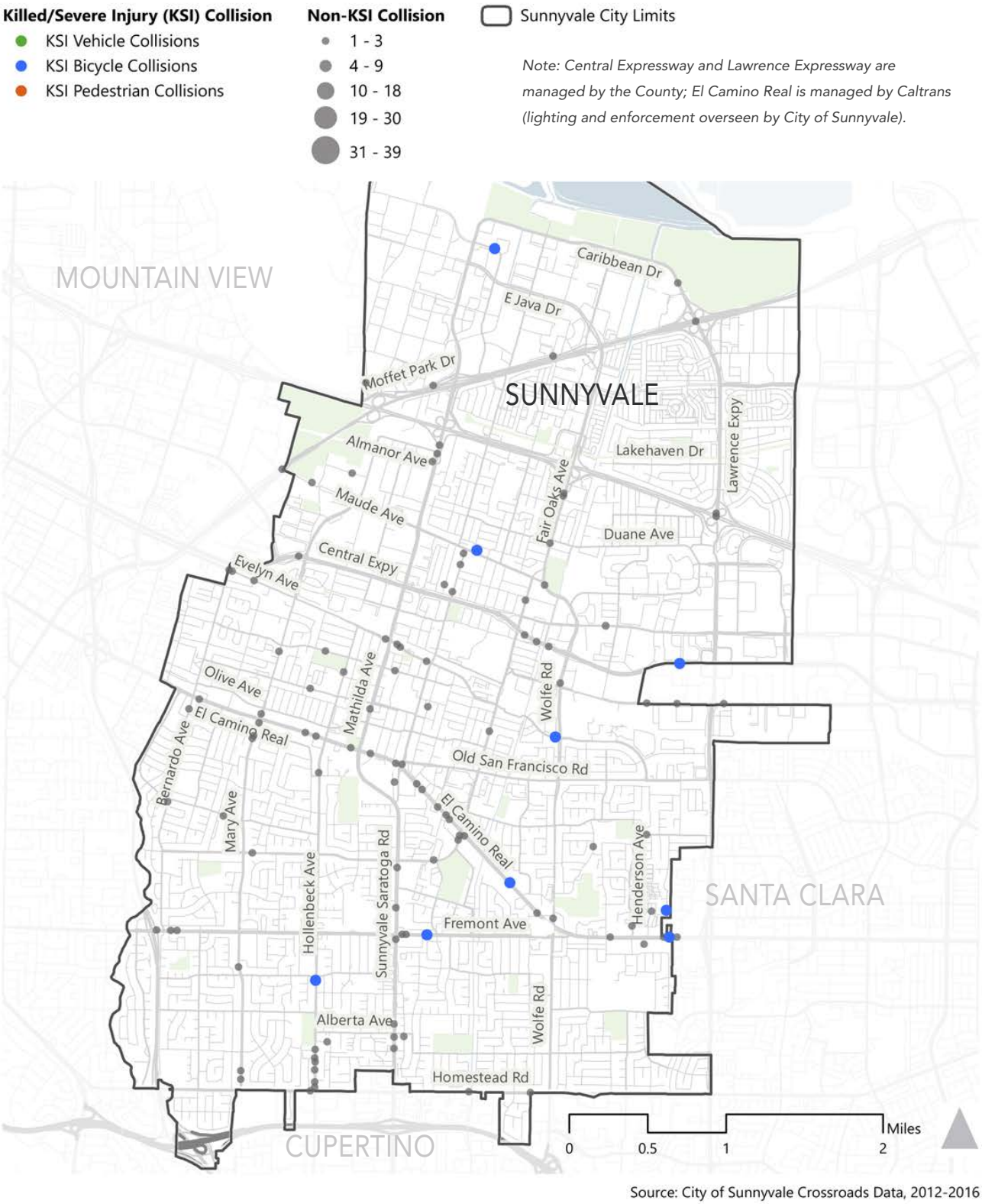


Protected Bikeway

Shared-Use Trail and Bicycle Path

Buffered Bike Lane

Green pavement



Source: City of Sunnyvale Crossroads Data, 2012-2016

PROFILE 7: MIDBLOCK BICYCLE CONFLICT

PROFILE 8

CONFLICTING THROUGH MOVEMENT AT INTERSECTION

FACTORS

» Vehicle or bicycle collision

» Collision occurred at an intersection

» At least one party was proceeding straight

» The collision type was broadside or sideswipe

STATS

7 KSI Collisions

» Accounts for **8%** of all KSI collisions

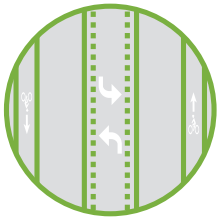
Key Countermeasures

Signal Timing and Phasing Improvements

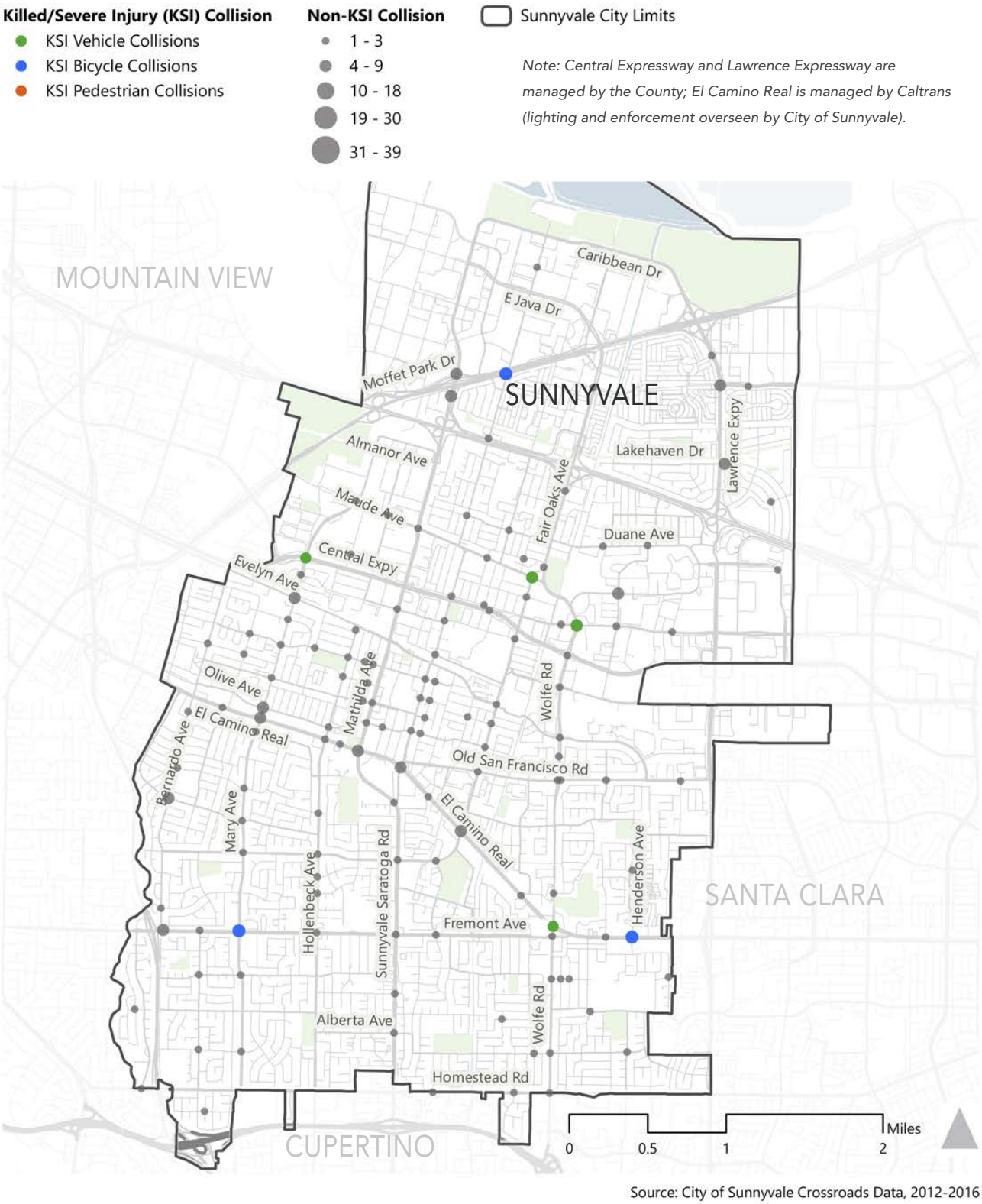
Bike Intersection Markings

Modified Intersection Stop-Control

Parking Restriction at Intersections



Lane Reduction



Source: City of Sunnyvale Crossroads Data, 2012-2016

PROFILE 8: CONFLICTING THROUGH MOVEMENT AT INTERSECTION

PROFILE 9

CHILDREN WALKING OR BIKING NEAR SCHOOL

FACTORS

» Pedestrian or bicycle collision

» The bicyclist or pedestrian was 18 years old or younger

» The collision occurred within a half mile of a school

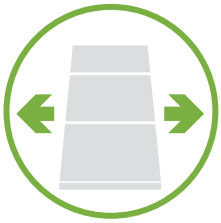
STATS

7 KSI Collisions

» Accounts for **8%** of all KSI collisions

Key Countermeasures

Pedestrian Countdown Signal Head

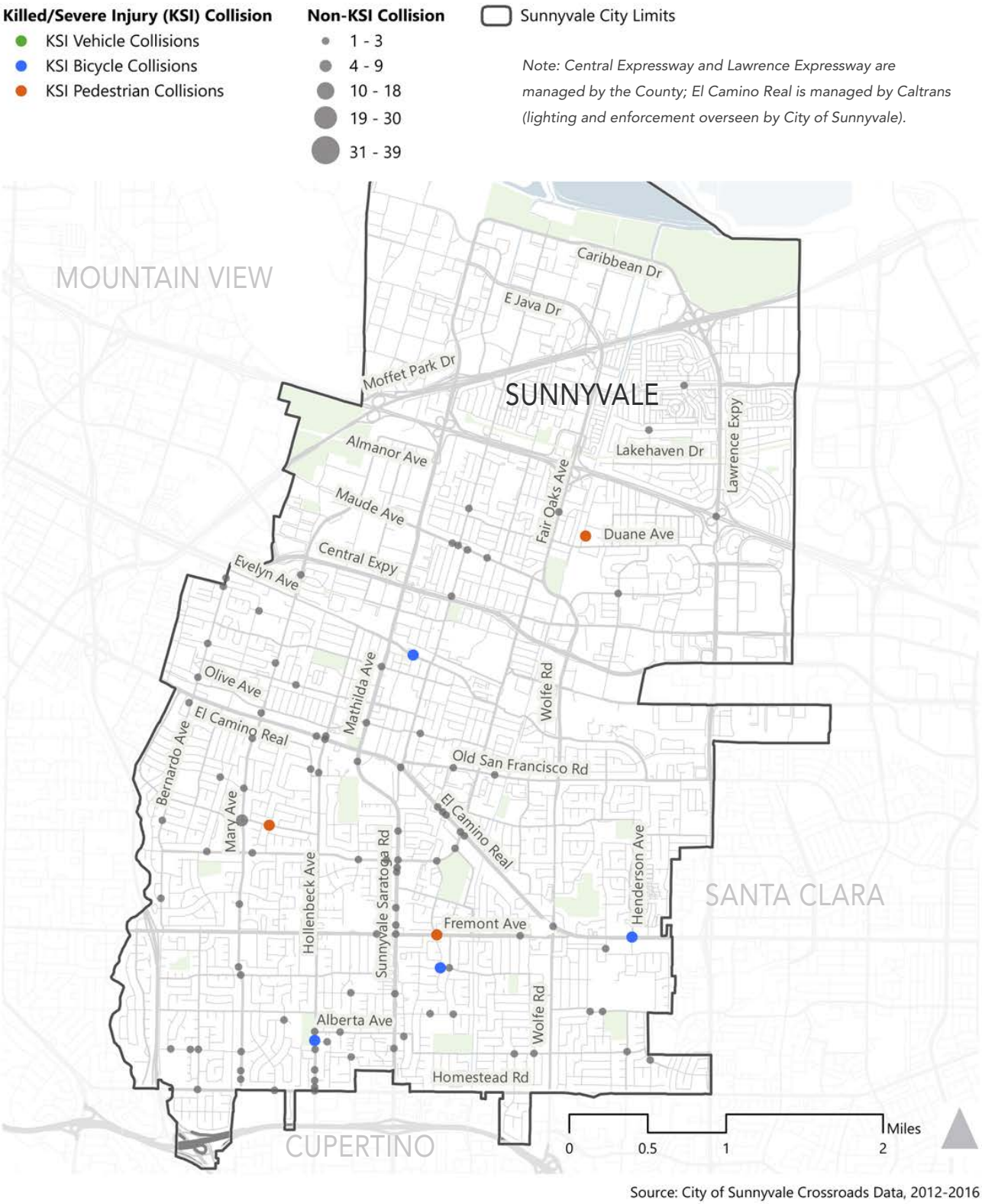


Sidewalk to Close Gaps

Shared-Use Trail and Bicycle Path

High Visibility Crosswalk with Advance Stop or Yield Sign

Reduced Speed School Zone



Source: City of Sunnyvale Crossroads Data, 2012-2016

PROFILE 9: CHILDREN WALKING OR BIKING NEAR SCHOOL

PROFILE 10

RED LIGHT VIOLATION AT SIGNALIZED INTERSECTION

FACTORS

» Contributing factor to the collision was a "traffic signals and signs violation"

» Collision occurred at a signalized intersection

STATS

5 KSI Collisions

» Accounts for **6%** of all KSI collisions

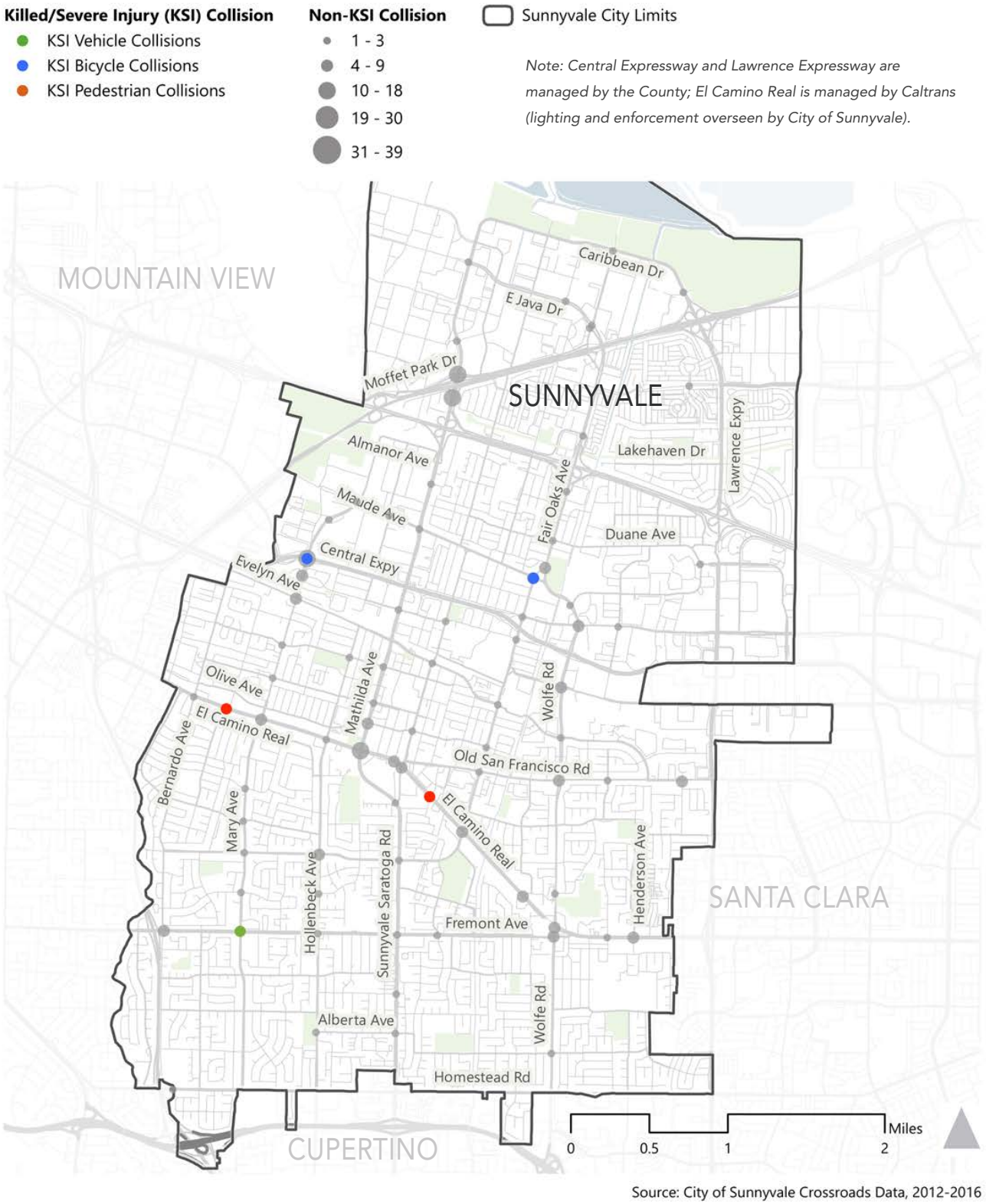
Key Countermeasures

Advanced Dilemma-Zone Detection

Signal Timing and Phasing Improvements

Education

Enforcement



Source: City of Sunnyvale Crossroads Data, 2012-2016

PROFILE 10: RED LIGHT VIOLATION AT SIGNALIZED INTERSECTION

ACTION PLAN

With the strong foundation of its Vision Zero building blocks and collision profiles, the City of Sunnyvale is ready to continue progress towards eliminating fatalities and serious injuries. The City will work to meet this goal through targeted investments at ten priority project locations and a set of actions to implement immediately and over the coming years.

Priority Project Locations

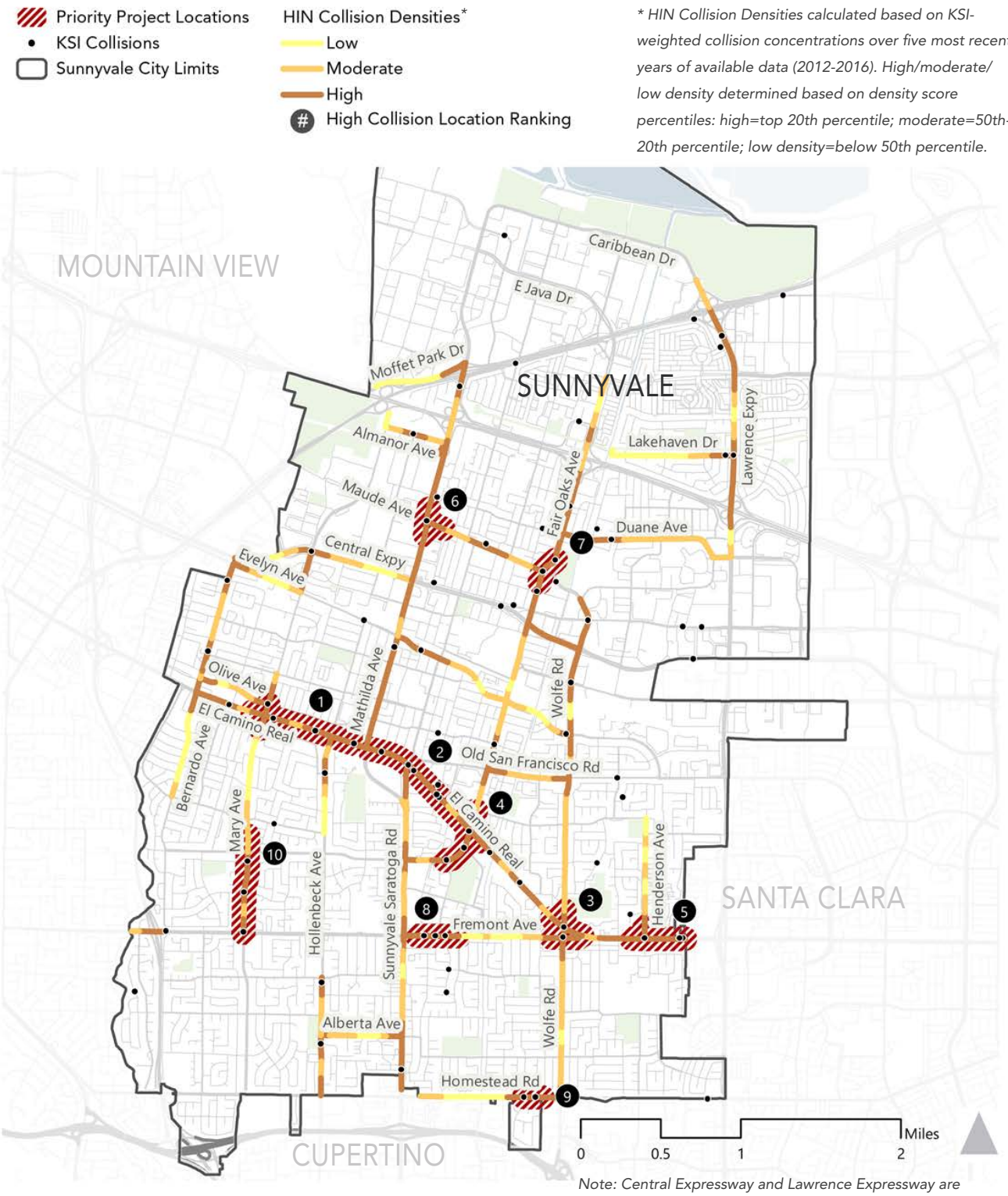
The City is focused on ten priority project locations. These are key locations on the HIN with a history of high collision densities and a high level of public feedback on perceived issues and safety concerns.

The technical appendix includes project location descriptions for the ten priority project locations and conceptual layouts for three selected projects. The three selected projects were chosen as representative examples for further development as conceptual layouts. They represent an array of discrete contexts, typologies, and challenges. The conceptual layouts do not represent proposed improvements at specific locations, but rather allow stakeholders and residents to visualize potential real-life applications of various countermeasures and treatments in familiar contexts. These were utilized to conduct walking tours along the three selected priority project corridors to collect feedback from participants about the potential improvements. Based on the comments received, the drawings were refined to produce the final conceptual layouts. The resulting conceptual layouts depict treatments that could be applied at a variety of locations throughout the City based on the outcome of further evaluation, engineering analysis, and design development.

Priority project locations cover **70%** of fatal collisions in the City of Sunnyvale and **20%** of severe injuries.

PRIORITY PROJECT LOCATIONS

El Camino Real between S. Mary Avenue and S. Mathilda Avenue
El Camino Real between S. Taaffe Street and S. Fair Oaks Avenue
El Camino Real, E. Fremont Avenue, and S. Wolfe Road (intersection)
Remington Drive/Fair Oaks Avenue between Iris Avenue and Manet Drive
El Camino Real between Henderson Avenue and Helen Avenue
N. Mathilda Avenue and W. Maude Avenue (intersection)
N. Fair Oaks Avenue between Balsam Avenue and E. Taylor Avenue
Fremont Avenue between Sunnyvale-Saratoga Road and Floyd Avenue
Homestead Road between Heron Avenue and Wolfe Road
Mary Avenue between Remington Drive and Fremont Avenue



Note: Central Expressway and Lawrence Expressway are managed by the County; El Camino Real is managed by Caltrans.

PRIORITY PROJECT LOCATIONS

Implementable Actions

Vision Zero implementation will involve a committed team of City departments, the local community, and partner organizations. The project team has identified a set of key actions to serve as a roadmap towards Vision Zero. Each action is assigned a timeframe and a metric to measure progress. Short-term actions could be implemented within 2 years; medium-term actions could be completed within 2 to 5 years; and long-term actions could be implemented within 5 to 10 years.

Meeting the City's Vision Zero goal requires immediate action, yet it allows for feasible implementation with incremental improvements over the years. The actions in this plan should be evaluated and refined on an on-going basis, and their successful implementation depends upon funding availability.

The Implementable Actions are organized into four action areas:

Vision Zero Program Initiatives and Evaluation

Street Design and Operation

Behavioral Change

Vulnerable Road Users

FUNDING AND IMPLEMENTATION – There are many ways the City can fund and implement the actions included below. For example, safety improvements may be implemented through integration into pavement management programs, other transportation capital projects, and new development projects. To fund dedicated safety projects, the City may seek state or regional funding through Caltrans and MTC Active Transportation Programs, the Caltrans Highway Safety Improvement Program, the One Bay Area Grant Program, and Transportation Development Act Article 3 (TDA3) Local Transportation Fund.

VISION ZERO PROGRAM INITIATIVES AND EVALUATION

The Sunnyvale Vision Zero program will begin by establishing a framework for the City's approach to achieve its Vision Zero goal. Program initiatives include Vision Zero promotion, integration of Vision Zero into other planning efforts, and improved Vision Zero data collection and program evaluation.

SAFETY STRATEGY			TIMELINE	PROGRESS MEASURES	KEY PARTNERS	CITY RESOURCES
Vision Zero Program Initiation						
A.1	Vision Zero Task Force	Convene an interdisciplinary Vision Zero Task Force to oversee plan implementation and coordinate projects and programs across City departments.	Short-Term	Task Force established and regular meetings held	Department of Public Works, Community Development Department, School Districts, Department of Public Safety	Low
A.2	Dedicated Funding	Identify a permanent, dedicated funding source for Vision Zero implementation and coordination.	Short-Term	Amount of funding available for Vision Zero	City Council, City Manager's Office, Department of Public Works	Medium to High
A.3	Media Workshop	Develop a workshop for Communications Department on how best to communicate traffic collisions and roadway safety concepts.	Short-Term	Number of media professionals participating	City Manager's Office	Low
Promotion and Integration						
A.4	Public Meetings	Put Vision Zero on the agenda of the City's public, community group, and stakeholder meetings in 2019.	Short-Term	Number of meetings with Vision Zero on agenda	City Council, Neighborhood Associations, Department of Public Works, City Manager's Office - Communications	Low
A.5	Online Collision Map	Launch online, interactive collision data map and website.	Medium-Term	Number of website visitors	Information Technology Department, City Manager's Office - Communications, Department of Public Works, Department of Public Safety	Medium

SAFETY STRATEGY (CONT.)			TIMELINE (CONT.)	PROGRESS MEASURES (CONT.)	KEY PARTNERS (CONT.)	CITY RESOURCES (CONT.)
A.6	Future Plans	Incorporate Vision Zero safety principles into future City plans and design documents.	Ongoing	Number of plans and policies incorporating Vision Zero	Community Development Department, Department of Public Works	Low
Data Collection & Program Evaluation						
A.7	Progress Monitoring	Publish an annual report to measure progress against the goals of the Sunnyvale Vision Zero Plan and present progress biennially to City Council during the Strategic Planning Session meeting.	Medium-Term	Annual report and biennial presentation to City Council addressing plan metrics and performance measures	Department of Public Works, Department of Public Safety	Medium
A.8	Collision Report Training	Provide training for Department of Public Safety to improve collision data reporting, and preserve collision details and site evidence.	Long-Term	Number of Department of Public Safety officers trained	Department of Public Safety	Low
A.9	Data Completeness	Improve data collection on speed, impairment, cell phone use, and distraction for KSI collisions.	Medium-Term	Proportion of collision records including this information	Department of Public Safety	Low
A.10	Bicycle and Pedestrian Count Data	Establish regular pedestrian and bicyclist counts at consistent locations.	Medium-Term	Number of counts conducted	Department of Public Works	Medium

STREET DESIGN AND OPERATION

Sunnyvale Vision Zero prioritizes high-quality improvements on the HIN as the most targeted way to reach the goal of zero traffic fatalities and serious injuries. In addition to these improvements, the City will address street design through improved signal operations and design review procedures. Street improvements will comply with compatible Citywide Design Guidelines (2013).

SAFETY STRATEGY			TIMELINE	PROGRESS MEASURES	KEY PARTNERS	CITY RESOURCES
High Injury Network Infrastructure						
B.1	Priority Locations	Develop designs and secure grant funding for ten priority project locations identified in plan, with a focus on roadway designs to improve safety.	Medium-Term	Number of projects funded	Department of Public Works	High
B.2	Prioritized Project List	Develop prioritized list of additional safety projects.	Medium-Term	Prioritized safety project list	Department of Public Works	Medium
B.3	Low-Cost Improvements	Install one low-cost safety improvement per year, including new road markings, signs, and minor signal modifications.	Medium-Term	Number of locations receiving improvements	Department of Public Works	Medium
B.4	Stakeholder Engagement	Convene local stakeholders near high-collision corridors for input on project design.	Medium-Term	Number of meetings	Department of Public Works, Department of Public Safety, School Districts	Low
Operations and Technology						
B.5	Signal Timing Updates	Update signal timing plans to improve safety for all modes (e.g. all red time, pedestrian crossing times).	Ongoing	Proportion of signals meeting updated policy	Department of Public Works	Medium

SAFETY STRATEGY (CONT.)			TIMELINE (CONT.)	PROGRESS MEASURES (CONT.)	KEY PARTNERS (CONT.)	CITY RESOURCES (CONT.)
B.6	Intelligent Transportation Systems (ITS)	Seek opportunities to deploy ITS technologies, such as speed monitoring, traffic management systems, adaptive pedestrian signal systems, and dilemma zone detection.	Long-Term	Adoption of ITS technologies to improve traffic safety	Department of Public Works	High
Policies & Design						
B.7	Design Standards	Apply established and approved design standards for design of transportation facilities, as per State guidelines and Municipal Code.	Short-Term	Proportion of projects meeting existing design standards	Department of Public Works	Low
B.8	Design Review	Establish internal process for Vision Zero countermeasures to be evaluated and implemented, where feasible, on projects on the HIN.	Medium-Term	Proportion of public and private projects incorporating Vision Zero elements	Community Development Department, Department of Public Works	Low
B.9	Complete Streets	When identifying safety improvements, consider all road users and how countermeasures follow the City's Complete Streets Policy.	Ongoing	Proportion of projects with improvements benefiting two or more modes	Department of Public Works	Low

BEHAVIORAL CHANGE

Sunnyvale Vision Zero encourages safe travel behaviors through actions related to outreach and education, enforcement, and providing alternatives to driving, particularly during holidays, special events, and late evenings. This acknowledges the shared responsibility to make safe decisions and create a culture of safety.

SAFETY STRATEGY			TIMELINE	PROGRESS MEASURES	KEY PARTNERS	CITY RESOURCES
Education and Outreach						
C.1	Education Campaign	Launch high-visibility education campaigns against speeding, distracted driving, impaired driving, and other high-risk behaviors. Campaigns will focus on HIN corridors.	Medium-Term	Number of people reached	City Manager's Office, Department of Public Safety, School Districts	High
C.2	Speed Feedback Signs	Increase the use of speed feedback signs to discourage speeding.	Medium-Term	Number of signs installed	Department of Public Works, Department of Public Safety	Medium
C.3	Targeted Outreach	Deter impaired driving by targeting education and outreach at or near alcohol-serving establishments.	Medium-Term	Number of establishments reached	City Manager's Office, Department of Public Safety	Medium
Enforcement						
C.4	Police Academy	Integrate Vision Zero policies into Police Academy curriculum and in-service Public Safety Officer training.	Long-Term	Number of officers trained on Vision Zero	Department of Public Safety	Low

SAFETY STRATEGY (CONT.)			TIMELINE (CONT.)	PROGRESS MEASURES (CONT.)	KEY PARTNERS (CONT.)	CITY RESOURCES (CONT.)
Providing Alternatives to Driving						
C.5	Subsidized Transit	Explore opportunities to expand free or subsidized transit fares during holidays and for special events.	Medium-Term	Number of people using free or subsidized fares	VTA	Medium
C.6	Late-Night Options	Develop public promotional campaign to encourage late-night transit, taxi, rideshare, and other services to provide alternatives to impaired driving.	Long-Term	Number of promotional activities	City Manager's Office, VTA, Rideshare Providers	Medium
C.7	Curbside Management	Develop curbside management policies to encourage and enable passenger loading.	Medium-Term	Adoption of City policy	Community Development Department, Department of Public Works	Medium

VULNERABLE ROAD USERS

Sunnyvale Vision Zero strategies recognize that younger and older people, people biking and people walking are more vulnerable to serious traffic injuries and fatalities by accounting for different levels of reaction time and agility.

	SAFETY STRATEGY		TIMELINE	PROGRESS MEASURES	KEY PARTNERS	CITY RESOURCES
Bicyclists and Pedestrians						
D.1	Bicycle Network	Continue building and improving the bicycle network consistent with the Sunnyvale Bicycle Plan and Santa Clara Countywide Bike Plan.	Ongoing	Lane miles of low-stress bicycle facilities installed	Department of Public Works, VTA, Silicon Valley Bicycle Coalition	High
D.2	Countdown Timers	Install pedestrian countdown timers at every signalized crossing location.	Medium-Term	Proportion of crossings with countdown timers	Department of Public Works	Medium
D.3	Pedestrian Crossings	Install or upgrade pedestrian crossing treatments on the HIN.	Medium-Term	Number of upgraded crossings	Department of Public Works	High
D.4	Turning Vehicles	Complete projects that improve bicycle and pedestrian safety related to turning vehicles at intersections.	Long-Term	Number of projects implemented	Department of Public Works, Silicon Valley Bicycle Coalition	High

SAFETY STRATEGY (CONT.)			TIMELINE (CONT.)	PROGRESS MEASURES (CONT.)	KEY PARTNERS (CONT.)	CITY RESOURCES (CONT.)
Children and Seniors						
D.5	School Safety Zones	Implement reduced speed limits (15 miles per hour) on the streets adjacent to schools	Medium-Term	Number of schools with a school safety zone	Department of Public Works, Department of Public Safety	Low
D.6	High-Visibility Crosswalks	Install high-visibility crosswalks near schools.	Medium-Term	Number of crosswalks near schools that are "high visibility"	Department of Public Works	Medium
D.7	Seniors Awareness	Develop education campaign aimed at drivers to increase safety for pedestrians age 60+.	Medium-Term	Number of people reached	City Manager's Office, AARP, Library and Community Services, Senior Center	Medium
D.8	Traffic Education for Safe Routes to School	Host traffic safety classes for students and parents.	Medium-Term	Number of people reached	School Districts, Department of Public Safety	Medium
D.9	Traffic Education for Seniors	Host traffic safety classes for pedestrians over 60.	Medium-Term	Number of people reached	AARP, Department of Public Safety, Library and Community Services, Senior Center	Medium

TRANSPORTATION TECHNOLOGY – Technology is rapidly changing the transportation industry. Advances in vehicle-to-vehicle and vehicle-to-infrastructure communication, vehicle autonomy, and crash protection features like pedestrian detection and automatic braking present a potential opportunity to reduce traffic fatalities and serious injuries by helping people operate vehicles more safely. Data analytics provides cities with real-time intelligence on roadway operations and driving behavior to take action to minimize risk. The City of Sunnyvale has already investigated opportunities to integrate smart technology into its safety efforts and will continue to do so as the industry evolves.

How to Get Involved

City officials and staff need the help of the community to carry out the actions presented in this Plan and to reduce traffic fatalities and serious injuries in the City of Sunnyvale by 50 percent by 2029. Everyone has a personal responsibility to make the right choices and to spread the word about why traffic safety matters, making the City's efforts even more effective.

Take a driver education class – e.g., classes offered by your car insurance company or AARP.

Pledge to not text while walking, bicycling, or driving, and encourage your family and friends to do the same. Examples include AT&T's It Can Wait campaign and the DecidetoDrive.org program created by the American Association of Orthopedic Surgeons.

Install anti-texting-and-driving software on your cell phone.

When driving, be aware of surroundings. Obey the rules of the road, observe speed limits, and yield to pedestrians and bicyclists when turning at intersections.

When bicycling, obey the rules of the road and use lights and reflectors at night.

As a pedestrian, stay alert, stay visible to the extent possible, and do not assume that drivers see you or will yield when turning.

Visit https://sunnyvale.ca.gov/news/topics/visionzero/ to follow the City's progress!

TECHNICAL APPENDIX

A. Summary of Input from Public Outreach Activities

B. Summary of Collision Trends

C. Collision Profiles and Countermeasure Pairings

D. Priority Project Cut Sheets (10)

E. Priority Project Conceptual Layouts (3)

Sunnyvale VISION ZERO TECHNICAL APPENDIX

Approved by City Council
July 30, 2019

Sunnyvale

Photographs provided by the City of Sunnyvale and Fehr & Peers

Design & Layout by Fehr & Peers

160 W Santa Clara Street, Suite 675,
San Jose, CA 95113

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A. SUMMARY OF INPUT FROM PUBLIC OUTREACH ACTIVITIES

FEHR PEERS

City of Sunnyvale Vision Zero Plan
Online Survey Results Summary, November 2017

The City of Sunnyvale posted an online survey for the Vision Zero Plan to solicit input from the community on traffic safety concerns in Sunnyvale. The survey was open in September and October 2017.

Multiple Choice Questions

A summary of results from the online survey multiple choice questions is as follows.

What is your primary mode of transportation for travel in Sunnyvale?

	Response Percent	Response Count
Personal Vehicle	82.0%	318
Carpool	0.5%	2
Bicycle	11.3%	44
Walking	2.3%	9
Public Transportation	0.5%	2
Other	3.4%	13

Does safety affect the mode of transportation you chose for travel in Sunnyvale?

	Response Percent	Response Count
Yes	65.9%	255
No	34.1%	132

What would be your primary mode of transportation in Sunnyvale if safety were not a consideration?

	Response Percent	Response Count
Personal Vehicle	46.7%	176
Bicycle	41.9%	158
Walking	7.7%	29
Public Transportation	1.3%	5
Other	2.4%	9

How often do you travel by walking (i.e. work, school, shopping, etc.)?

	Response Percent	Response Count
Daily	23.5%	91
Weekly	34.4%	133
Monthly	18.1%	70
Never	18.3%	71
Other	5.7%	22

How often do you travel by bicycle (i.e. work, school, shopping, etc.)?

	Response Percent	Response Count
Daily	14.9%	58
Weekly	17.3%	67
Monthly	12.6%	49
Never	48.2%	187
Other	7.0%	27

Who do you feel is most responsible for keeping roadways safe?

	Response Percent	Response Count
Department of Public Works	15.6%	60
Department of Public Safety	16.1%	62
All road users	59.7%	230
Other	8.6%	33

What is your top traffic safety concern in the City?

	Response Percent	Response Count
Speeding	24.0%	93
Red light runners	17.3%	67
Illegal turning	5.4%	21
Traffic congestion	20.1%	78
Pedestrians illegally crossing	0.8%	3
Bicyclists riding unsafely	3.6%	14
Other	28.9%	112

Source: Sunnyvale Vision Zero online survey. Accessed November 9, 2017; 388 responses. (https://www.peakdemocracy.com/portals/209/Issue_5386/survey_responses)

Map Comments

The online survey map asked participants to indicate where they have noticed transportation safety issues and to include a comment describing the concern. Participants dropped 1,542 pins on the online map. Fehr & Peers classified the survey map comments into 20 categories, listed below.

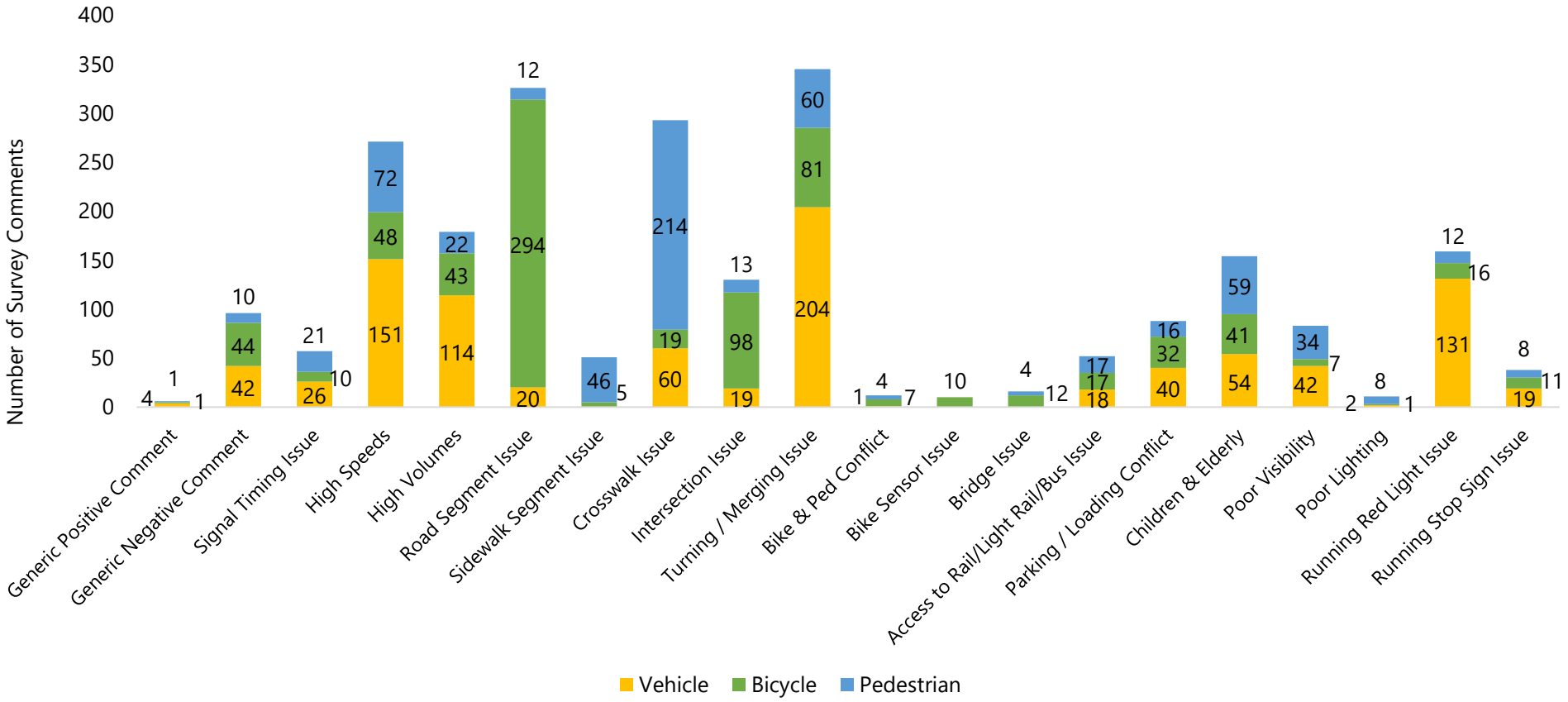
1. Signal Timing Issue
2. High Speeds
3. High Volumes
4. Road Segment Issue
5. Sidewalk Segment Issue
6. Crosswalk Issue
7. Intersection Issue
8. Turning / Merging Issue

9. Bike & Ped Conflict
10. Bike Sensor Issue
11. Bridge Issue
12. Access to Rail/Light Rail/Bus Issue
13. Parking / Loading Conflict
14. Children & Elderly
15. Poor Visibility
16. Poor Lighting
17. Running Red Light Issue
18. Running Stop Sign Issue
19. Generic Positive Comment
20. Generic Negative Comment

Two thirds of the survey comments (912) were classified under one category. One third of the survey comments (619) were classified under more than one category. Eleven comments were not categorized.

The most frequently mentioned pedestrian comments related to crosswalk issues (214, 34%), high speeds (72, 11%), turning/merging issues (60, 9%) and children/elderly (59, 9%). The most frequently mentioned bicycle comments related to road infrastructure/segment issues (294, 37%), intersection issues (98, 12%) and turning/merging issues (81, 10%). The most frequently mentioned vehicle comments related to turning/merging issues (204, 22%), high speeds (151, 16%) and running red light issues (131, 14%).

The figure on the following page shows the number of comments by mode and category.

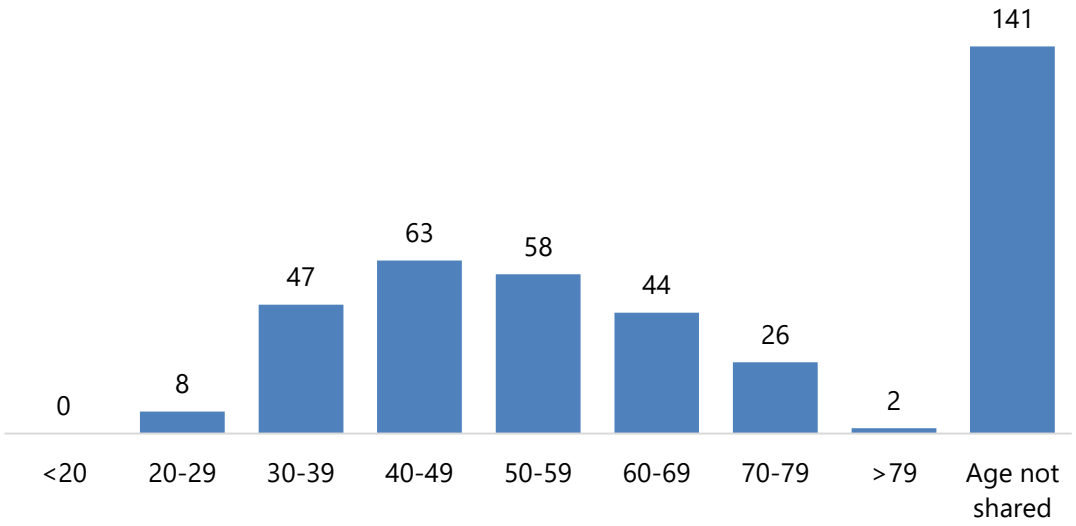


Source: Sunnyvale Vision Zero online survey. Accessed October 19, 2017; 371 responses.
(https://www.peakdemocracy.com/portals/209/Issue_5386/survey_responses)

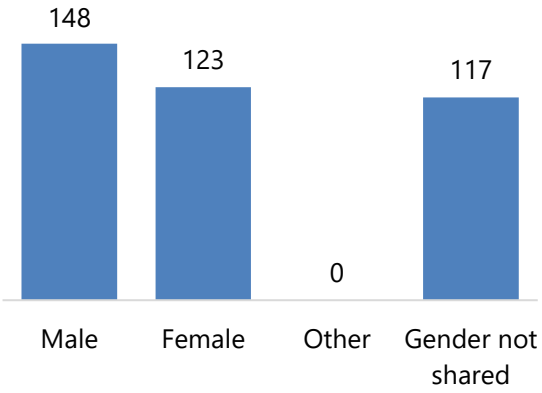
Participant Demographics

A summary of online survey participant demographics is as follows.

Age

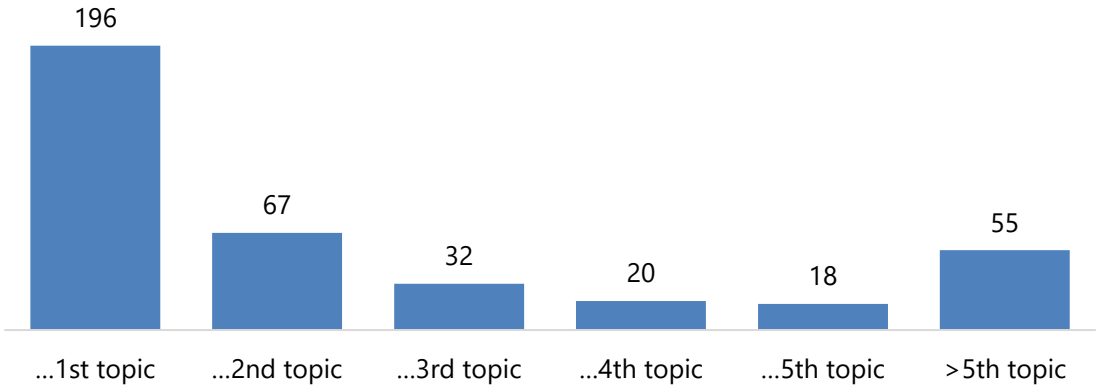


Gender



Frequency of participation

Frequency of participation reflects how many surveys a given respondent has completed through Open Town Hall. The results show that this was the first Open Town Hall survey completed for many respondents.



Source: Sunnyvale Vision Zero online survey. Accessed November 9, 2017; 388 responses. (https://www.peakdemocracy.com/portals/209/Issue_5386/survey_responses)

FEHR PEERS

City of Sunnyvale Vision Zero Plan
Community Workshop Key Takeaways, October 2017

The City of Sunnyvale hosted the first Vision Zero Plan Community Workshop October 5, 2017, to raise awareness for Vision Zero and to understand perceived issues, unreported collisions, close calls and other potentially challenging conditions. Thirteen participants used voting boards to provide citywide feedback about mode choices, safety concerns, and preferences for safety treatments. They also provided location-specific feedback about safety concerns on aerial maps.

Voting Boards Summary

Participants were asked their primary mode of travel, top safety concerns, views on responsibility for road safety, and preferred safety enhancements.

- Personal vehicle and bicycle were the top two primary modes of travel for participants, with five and four votes, respectively. Two participants chose walk and one participant chose motorcycle.
- The top safety concern among participants was red light runners (5), followed by traffic congestion (3) and bicyclists riding in an unsafe manner or violating traffic laws (2). Participants also noted speeding (1) and short crossing times (1).
- Nearly all participants stated that all road users are most responsible for keeping roads safe. One participant indicated the Department of Public Safety. The Department of Public Works received no votes, but the results may have been affected by the fact that several participants did not know that Public Works is responsible for designing roadways (based on conversations with participants).
- Participants voted on the top three safety enhancements they would like implemented in Sunnyvale. The most votes (4) were given to widening or adding connectivity of sidewalks; bicycle lanes; and turn signals for vehicles and traffic signal coordination and timing. Midblock pedestrian crossings and separated bike lanes received three votes each.

Tables summarizing the voting boards are included in **Attachment 1**.

Map Summary

Participants reported transportation safety feedback at specific locations in Sunnyvale by mode, placing 105 pins for bicycles, 38 pins for pedestrians, and 18 pins for vehicles. Common themes included support for:

- Filling gaps in bicycle network with high-quality facilities that are comfortable and convenient for cross-city travel – including on expressways (participants expressed appreciation for Evelyn Avenue and Duane Avenue bicycle facilities)

- Filling gaps in pedestrian network with improved crossings – including using HAWKs or other high visibility crossing treatments
- Enhancing crossings of major roadways near schools (for example, the crossing of ECR at the middle school on Poplar)
- Improving pedestrian and bicycle access through ramp intersections at highways and arterials
- Improving pedestrian and bicycle accommodations on overpasses
- Addressing conflict areas with high pedestrian and bicycle activity near
    - Transit (e.g., Caltrain, LRT)
    - Schools, particularly during pick-up and drop-off periods
    - Shopping centers
    - Restaurants near office parks

Locations with high concentrations of pins largely aligned with the corridors on the City's High Injury Network, including:

- 237 ramps/overpasses at N Mathilda Ave and Lawrence Expy
- 101 ramps/overpasses at N Mathilda Ave, Fair Oaks Ave, and Lawrence Expy
- Tasman Dr, in particular at Fair Oaks Ave intersection
- Maude Ave
- Central Expy
- Evelyn Ave between Mathilda and Sunnyvale
- El Camino Real
- Reed Ave near Lawrence Expy
- Fremont Ave
- Homestead Rd
- Bernardo Ave
- Mary Ave
- Mathilda Ave
- Sunnyvale Ave between Maude and Evelyn
- Fair Oaks Ave
- Wolfe Rd
- Lawrence Expy

ATTACHMENT 1. VOTING BOARDS RESULTS

Table 1. Primary Mode of Transportation

Primary Mode	Count
Personal Vehicle	5
Bike	4
Walk	2
Motorcycle	1
Taxi/Ridesharing App	0
Public Transit	0
Carpool	0
Other	0

Table 2. Top Safety Concerns

Traffic Safety Concern	Count
Red light runners	5
Traffic congestion	3
Bicyclists riding in an unsafe manner or violating traffic laws	2
Speeding	1
Pedestrians illegally crossing streets	0
Illegal turning	0
Other: Crossing times too short	1

Table 3. Responsibility for Road Safety

Party or Agency	Count
All road users	6
Department of Public Safety	1
Department of Public Works	0
Other	0

Table 4. Preferred Safety Enhancements

Safety Enhancement	Count
Sidewalks (widen or add connectivity)	4
Bike lanes	4
Turn signals for vehicles and traffic signal coordination and timing	4
Separated bike lanes	3
Mid-block pedestrian crossings	3
Narrower travel lanes	2
Crosswalks and pedestrian signals at intersections (including ADA accessibility)	2
Greater separation between sidewalks and vehicle traffic	1
Traffic calming (roundabouts, traffic circles, speed bumps)	1
Improve sight distances at corners	1
Bicycle sharrows	0
Bicycle detection at traffic signals	0
Add streetlighting for improved visibility	0

FEHR PEERS

City of Sunnyvale Vision Zero Plan
Community Workshop and Online Survey Key Takeaways, April 2018

The City of Sunnyvale hosted the second Vision Zero Plan Community Workshop on April 5, 2018. The workshop goals were to provide an update on the plan progress and to gather feedback from local residents and employees on preferred citywide safety strategies and infrastructure improvements to address safety concerns at ten priority project locations in Sunnyvale. Twenty-one participants provided 153 comments on priority project location posters that contained proposed safety treatments and crash data by mode, severity, location, and cause. Participants also voted on draft citywide safety strategies that the City could focus on as part of the Vision Zero Plan.

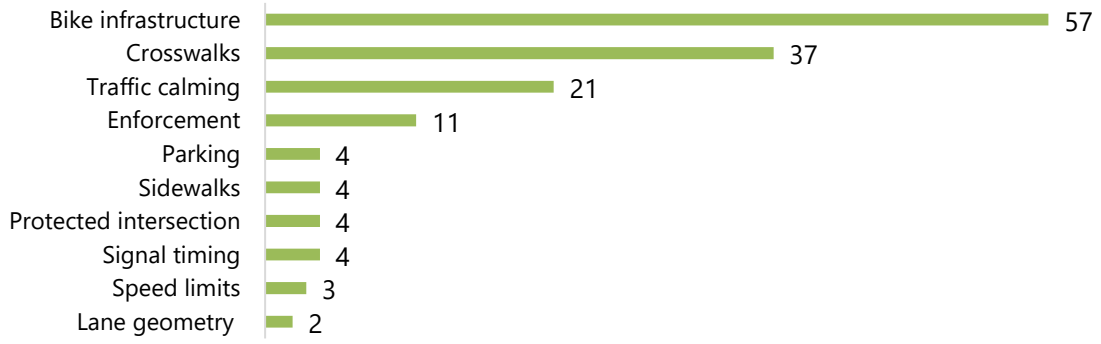
To complement the workshop, the City requested public input through an online survey. The survey was available on the Sunnyvale Vision Zero webpage from mid- to late-April 2018. It received 230 visitors and 75 responses. Respondents were asked to vote on countermeasures and provide comments on how to improve safety at each priority location.

PRIORITY LOCATION COUNTERMEASURES

Workshop Overview

Participants provided their input on preferred transportation safety countermeasures at the ten priority project locations in Sunnyvale. Common themes across the locations are summarized in **Figure 1**. Bicycle infrastructure was the most requested countermeasure at the priority project locations, followed by crosswalks and traffic calming.

Figure 1. Preferred Countermeasures at Priority Locations, by Category (Workshop)

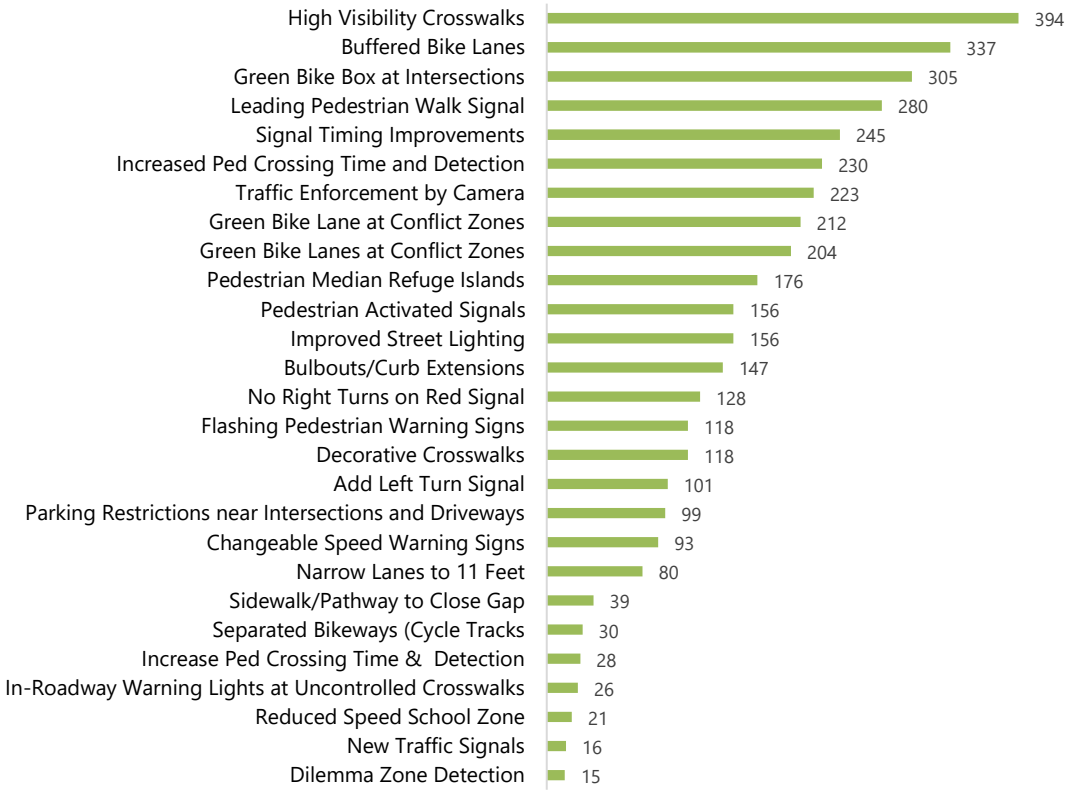


Survey Overview

The Sunnyvale Vision Zero online survey was available to the public from mid- to late April 2018. Seventy-five respondents provided their preferences for specific countermeasures at the ten priority project locations. Responses by priority location are described in greater detail in subsequent sections. **Figure 2** shows the preferred countermeasures across all priority locations. High visibility crosswalks, buffered bike lanes, and green bike boxes at intersections were most preferred overall.

Online survey respondents also provided text comments. Overall, many commenters recommended reducing vehicular speeds through lower speed limits and roadway redesign, providing green paint or buffered bicycle lanes, modifying crosswalks to be more visible to vehicles, and adding pedestrian and bicycle bridges or tunnels. Narrowing driving lanes to slow drivers and adding protected left turns were also suggested at multiple locations.

Figure 2. Preferred Countermeasures at Priority Locations (Online Survey)



Priority Location #1: El Camino Real between S. Mary Avenue and S. Mathilda Avenue

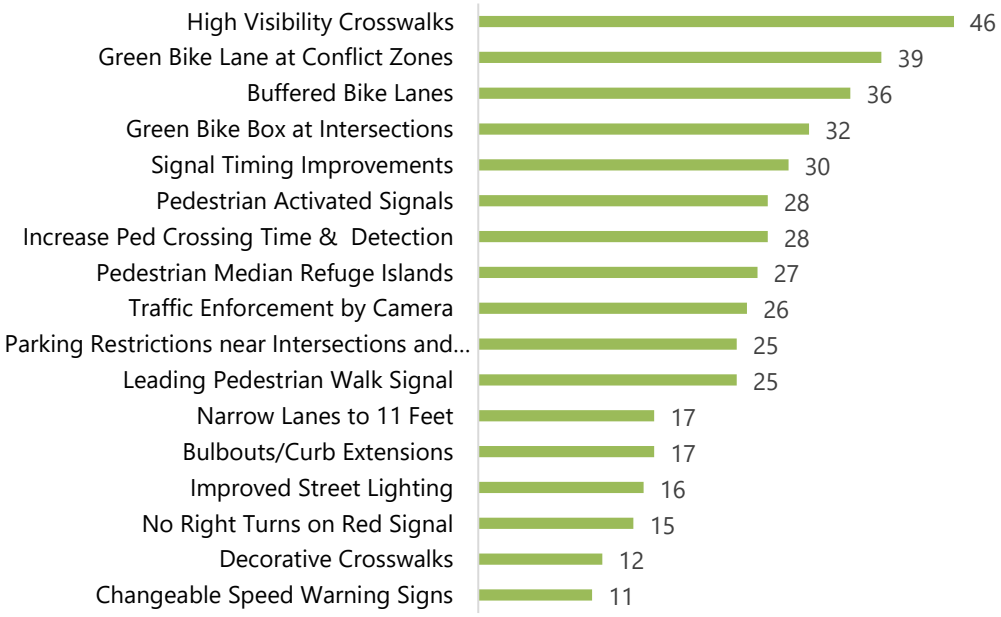
Workshop Comments

Responses for Priority Location #1 requested improved pedestrian crossings through leading pedestrian intervals (LPI), curb extensions, or varying crosswalk materials, traffic calming of vehicles to slow speeds, and bicycle lanes. One respondent recommended eliminating on-street parking on El Camino Real to provide space for bike lanes and improve visibility. Another respondent suggested increasing traffic enforcement.

Survey Results

Survey responses for Priority Location #1 are summarized in **Figure 3**. The top three requested treatments at this location were high visibility crosswalks, green bike lanes at conflict zones, and buffered bike lanes.

Figure 3. Online Survey Responses, Priority Location #1



Survey Comments

Additional survey comments for Priority Location #1 noted that this corridor is along a major school commute route, and therefore it is important to protect bike commuters on this roadway from vehicles traveling at high speeds and to consider adding crossing guards near schools. One respondent noted:

> *"There are a large number of pedestrians that gather at Pastoria and ECR at school commute times. They overflow [the] intersection. A bulbout would be helpful. Also many people whip around this intersection making right turns and risk pedestrian safety… Protecting bike commuters through here is important for the same reasons."*

Lower speeds were also requested – a commenter noted that 40 MPH is too high for a corridor where pedestrians are prevalent.

Priority Location #2: El Camino Real between S. Taaffe Street and S. Fair Oaks Avenue

Workshop Comments

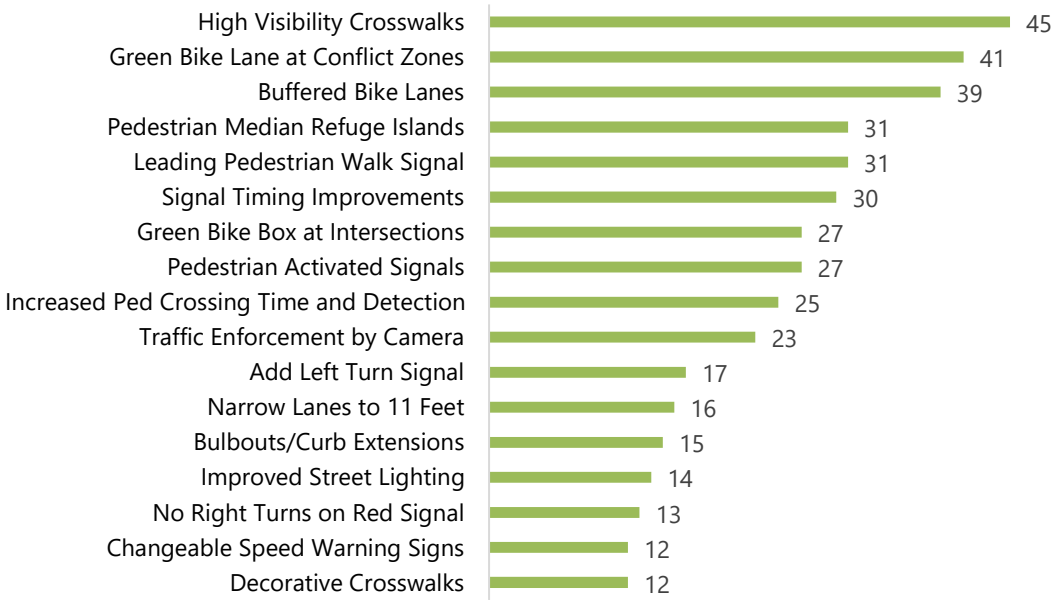
At Priority Location #2, participants noted the need for pedestrian infrastructure, including pedestrian refuge islands, pedestrian detection, HAWK or RRFBs for mid-block crossings, and measures that remove conflicts between pedestrians and left-turning vehicles. Neighborhood cut-

through, speeding on neighborhood streets, and the lack of safe bicycle infrastructure were also noted. Implementing protected intersections as a means to improve bicycle and pedestrian safety was recommended.

Survey Results

Figure 4 shows survey results for Priority Location #2. The most requested countermeasures at this location were high visibility crosswalks, green bike lanes at conflict zones, and buffered bike lanes.

Figure 4. Online Survey Responses, Priority Location #2



Survey Comments

Many survey comments reflect and echo the votes shown in **Figure 4** for Priority Location #2. Additional comments suggest narrowing traffic lanes to slow traffic and encourage drivers to pay attention, using more reflective roadway paint, and providing a bicycle detection button within reach of the bike lanes instead of at the crosswalks. Several commenters suggested a pedestrian/bicycle bridge or tunnel to serve the volume of people crossing between shopping centers far from intersections, as quoted below:

> *"A more comprehensive fix for this location could be to build pedestrian bridge to connect the two shopping areas on both sides of El Camino Real."*

Priority Location #3: El Camino Real between E. Fremont Avenue and S. Wolfe Road

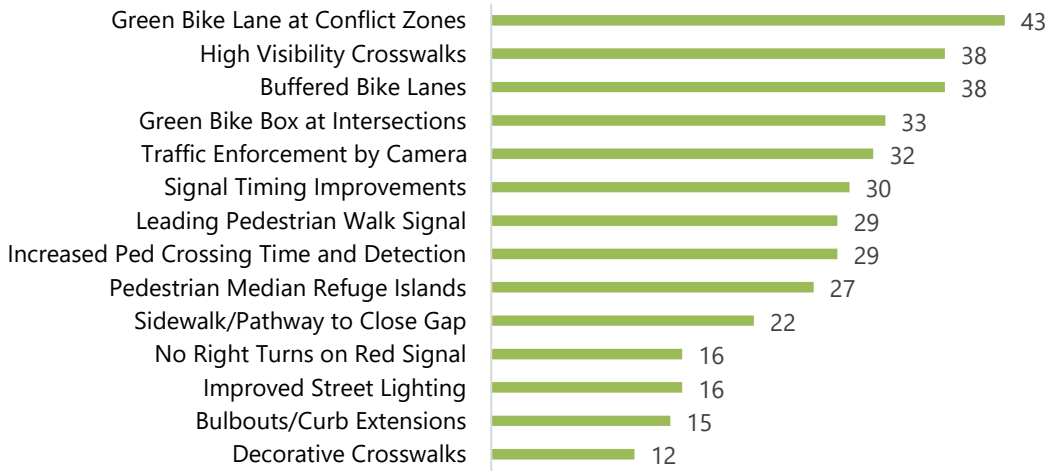
Workshop Comments

Recommendations for Priority Location #3 included implementing traffic calming infrastructure – such as speed tables, chicanes, and rotaries – as well as providing an off-street path for pedestrians and bicyclists. Other comments echoed recommendations for Location #1 and #2, also on El Camino Real, and included providing bicycle lanes with physical barriers, pedestrian refuge islands, pedestrian detection and countdown timers at traffic signals, and reconfiguring intersections to protect bicyclists and pedestrians.

Survey Results

Figure 5 shows online survey results for Priority Location #3. Similar to the previous priority locations, the top three requested countermeasures at this location were green bike lanes at conflict zones, high visibility crosswalks, and buffered bike lanes.

Figure 5. Online Survey Responses, Priority Location #3



Survey Comments

Several respondents' comments for Priority Location #3 included improving wayfinding and signage to lessen confusion on this section of El Camino Real, as quoted below:

> *"This 'triangle' seems to confuse a lot of drivers. Some drive impossibly slowly on a green light while others think they can gun it to make it through both intersections (Fremont Ave & El Camino Real)."*

One commenter recommended rerouting southbound left vehicles on Wolfe to El Camino Real to use Fremont Avenue instead and to reroute vehicles westbound to use Fremont Avenue instead of El Camino Real.

Priority Location #4: Remington Drive / Fair Oaks Avenue between Iris Avenue and Manet Drive

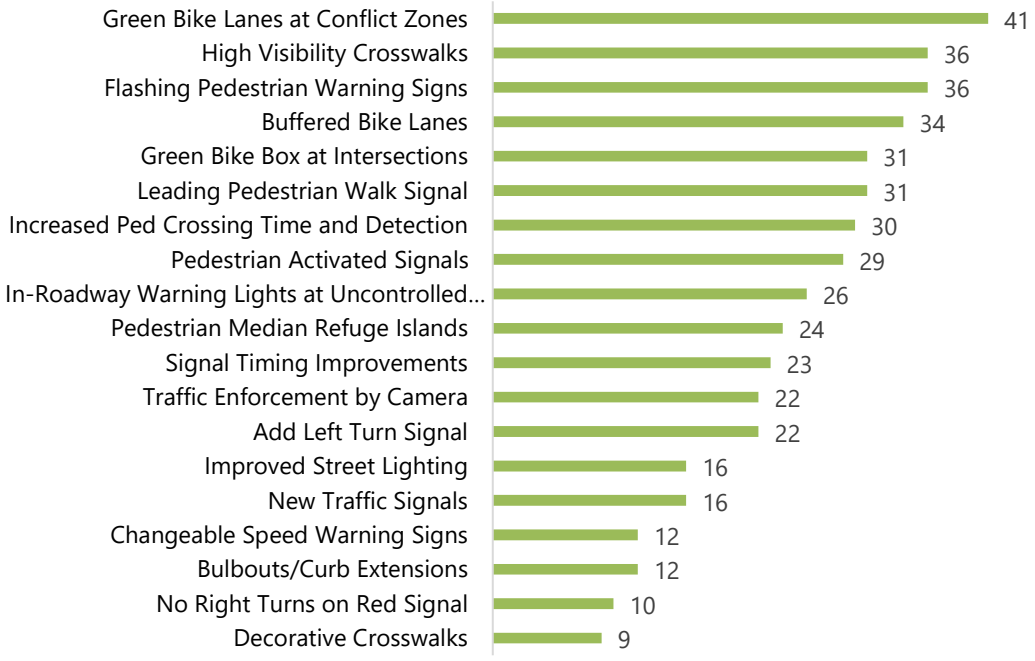
Workshop Comments

Participants' recommendations at this location focused on bicycle infrastructure, such as bike boxes, buffered bike lanes, and green paint at conflict points. Increased enforcement and added speed tables were suggested as a means to slow traffic. One participant noted that the senior center and senior housing are located on either side of Remington Drive, and that person suggested providing a better connection mid-block for seniors to safely access the recreational facilities.

Survey Results

Survey responses of countermeasure preferences at Priority Location #4 are shown in **Figure 6.** The top three requested countermeasures at this location were green bike lanes at conflict zones, high visibility crosswalks, and flashing pedestrian warning signs.

Figure 6. Online Survey Responses, Priority Location #4



Survey Comments

Respondents provided comments to supplement their responses in **Figure 6.** One commenter requested advance limit lines:

> *"Perhaps the traffic lights and stop line for cars could be 10 feet earlier (i.e. further away from the actual intersection). That way, there would be a little more space to detect pedestrians and to react."*

Other respondents noted that many pedestrians in this area are going to the community center and that green and buffered bike lanes remind drivers to anticipate pedestrians and bicyclists. One respondent recommended that the bike lanes on Remington and Fair Oaks be extended all the way to the intersection with El Camino Real and stated that buses often block the bike lanes on Remington and Fair Oaks.

Priority Location #5: El Camino Real between Henderson Avenue and Helen Avenue

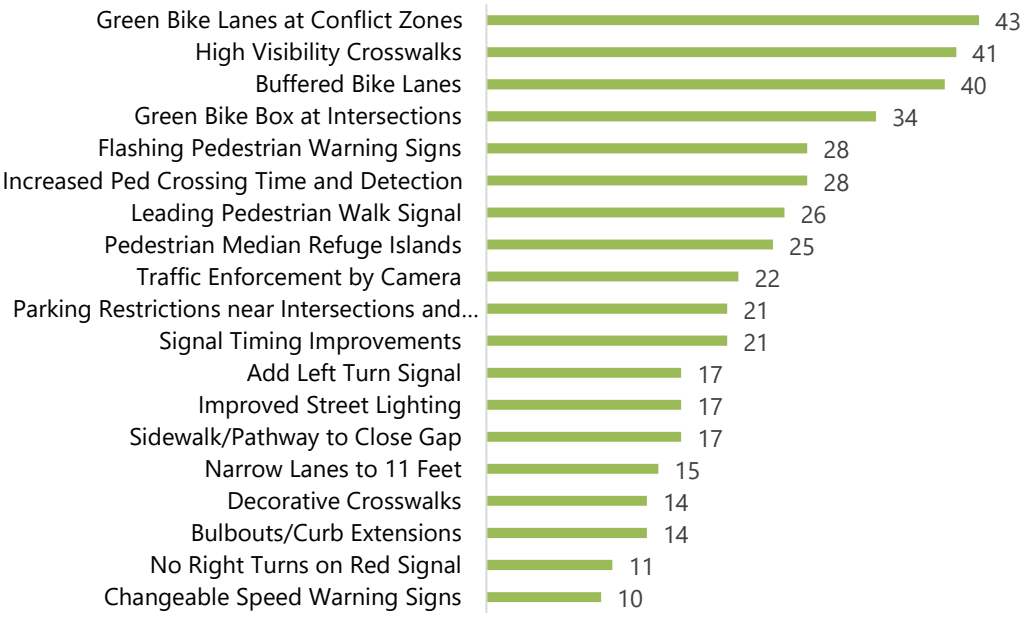
Workshop Comments

Recommendations for Priority Location #5 for pedestrian infrastructure included pedestrian refuge islands, high visibility crosswalks with advance limit lines, and wider sidewalks. Eight of the 19 comments on this segment noted the need for some type of separated bicycle lanes. Additional suggestions included adjusting signal timing to shorten the wait times, increasing enforcement, and reducing the speed limit to match adjacent jurisdictions.

Survey Results

Survey results for Priority Location #5 are summarized in **Figure 7**. The top four requested countermeasures at this location were green bike lanes at conflict zones, high visibility crosswalks, buffered bike lanes, and green bike boxes at intersections.

Figure 7. Online Survey Responses, Priority Location #5



Survey Comments

Online survey respondents provided additional comments. One respondent noted that to cross El Camino Real from Henderson, there is no clear path for bikes to follow. Another stated:

> *"This corridor, along with the intersection of El Camino Real and Poplar, are direct entry points for Peterson Middle School. It is ludicrous that there are no crossing guards, no light-up crosswalks, no bike lanes…to keep our kids safe…At least provide crossing guards as an interim measure until the City can (hopefully) install light-up crosswalks with longer lead time, buffered bike lanes, or changes to signal timing."*

It was also recommended that a protected left turn be added at El Camino Real and Henderson, because respondents observe that vehicles making a left turn from Henderson onto El Camino Real often do not yield to student pedestrians, bicyclists, or on-coming traffic.

Priority Location #6: N. Mathilda Avenue and W. Maude Avenue

Workshop Comments

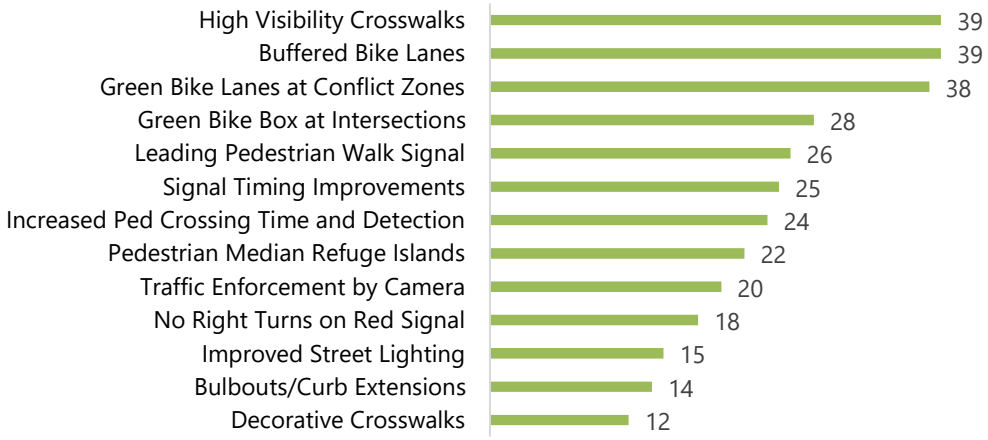
Comments at Priority Location #6 echoed those at other locations. They focused on improving pedestrian and bicycle infrastructure and traffic calming. Participants noted the need to physically alert drivers to pedestrian and bicyclists in this area. A pedestrian scramble, speed tables, LPI,

pedestrian refuge islands, and rumble strips were suggested for this intersection. Three participants noted that there are many pedestrians in this area, and multiple participants stated that they are not comfortable bicycling on the sharrows and bike lanes currently in place.

Survey Results

Figure 8 summarizes the online survey responses at Priority Location #6. The top three selected countermeasures at this location were high visibility crosswalks, buffered bike lanes, and green bike lanes at conflict zones.

Figure 8. Online Survey Responses, Priority Location #6



Survey Comments

One respondent noted that bicycle lanes end on Maude before the intersection and continue after the intersection, requesting a clearly marked path for bicyclists through the intersection. Other requested treatments included lower speed limits, adding a diagonal (scramble) crosswalk from Mathilda to the Sunnyvale Square shopping center, and removing parking near the Lucky shopping center to provide room for bicycle facilities. Modifying driveways to only certain movements was also suggested, as quoted below:

> *"[On] W Maude between N Mathilda and N Mary Ave… Drivers emerge from office buildings in Peery Park onto W Maude and attempt to cross all lanes of traffic to turn right onto N Mathilda Ave (headed south) or to cross lanes of traffic to turn left at N Mathilda Ave (headed north). Drivers sometimes stop, perpendicular to the flow of traffic while attempting a left turn onto W Maude from office building driveways. The simplest, cheapest, and safest solution to this dangerous situation is to route all office building traffic to Pastoria and Potrero Aves with traffic control at the exit points*

from the office campuses. Then, drivers can safely turn left or right onto W Maude without injury to bikers, pedestrians, or motorists."

Priority Location #7: N. Fair Oaks Avenue between Balsam Avenue and E. Taylor Avenue

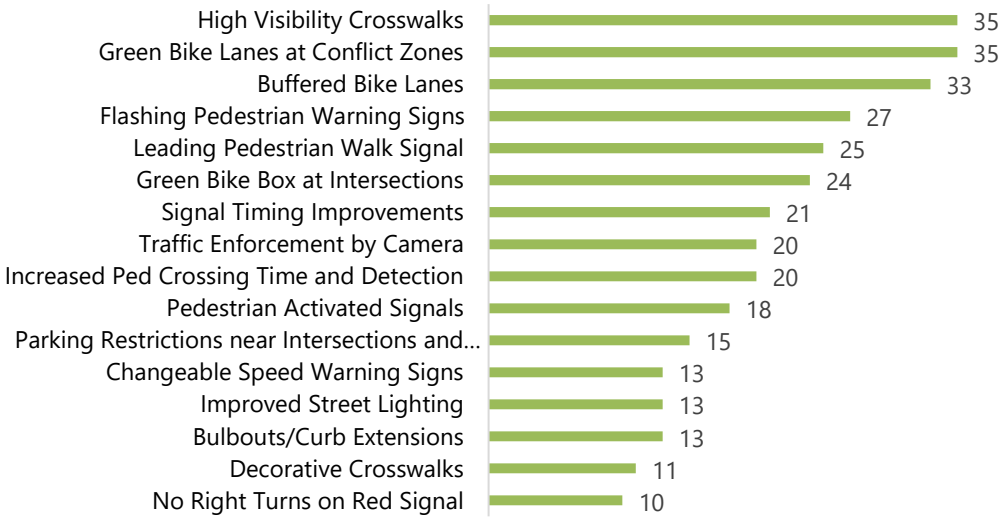
Workshop Comments

Participants requested buffered or protected bicycle lanes and a pedestrian crossing table or HAWK crossing near Fair Oaks Park at Priority Location #7. With plans in place to upgrade the park, responses noted that additional park users and children will likely cross Fair Oaks in this area. Traffic calming measures and speed enforcement were also recommended to slow speeds.

Survey Results

Survey results for Priority Location #7 are shown in **Figure 9**. The top three requested countermeasures at this location were high visibility crosswalks, green bike lanes at conflict zones, and buffered bike lanes.

Figure 9. Online Survey Responses, Priority Location #7



Survey Comments

Multiple survey comments for Priority Location #7 requested providing a pedestrian and/or bicycle bridge over Fair Oaks. Other comments included suggestions to not allow left turns out of the Chavez Supermarket and shopping area and to close Maude Avenue to through traffic between Fair Oaks and Wolfe.

One respondent suggested providing bicycle infrastructure, quoted below:

> *"Shortcut traffic through Duane should be eliminated. A neighborhood parallel bike path or a dedicated bike lane in the parking spaces should be a focus as Fair Oaks is currently too dangerous for cyclists."*

Priority Location #8: Fremont Avenue between Sunnyvale Saratoga Road and Floyd Avenue

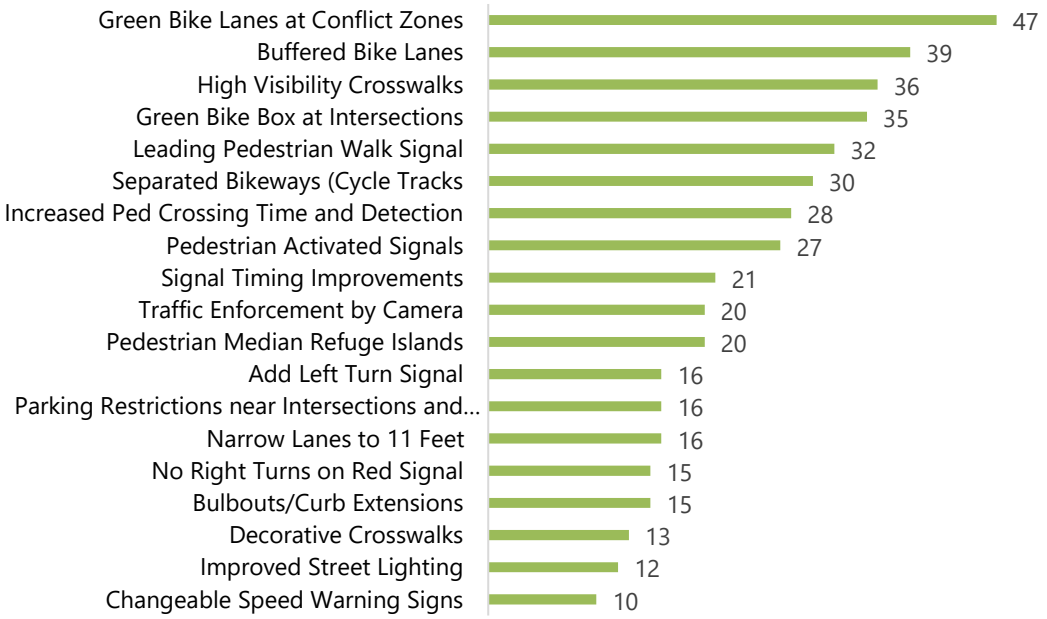
Workshop Comments

Recommendations for Priority Location #8 focused on traffic calming and bicycle infrastructure. Several participants noted that curb extensions pose a safety risk for bicyclists, stating that they cause bicyclists to swerve towards traffic. It was suggested that curb extensions be designed with cut-throughs for bicyclists. A pedestrian scramble, narrower traffic lanes, and increased enforcement were also recommended.

Survey Results

Figure 10 shows the online survey responses for preferred countermeasures at Priority Location #8. Results indicate that the preferred countermeasure at this location were green bike lanes at conflict zones, buffered bike lanes, and high visibility crosswalks.

Figure 10. Online Survey Responses, Priority Location #8



Survey Comments

Comments for Priority Location #8 suggested adding protection for bicyclists and pedestrians at intersections via physical protection for bicyclists near the shopping area parking lot entrances and exits and adding leading pedestrian intervals (LPIs) so that pedestrians have priority to cross before right turning vehicles.

One commenter stated:

> *"The intersection at E. Fremont Ave and Bobwhite / Manet Avenues should be designated as a school crossing. The intersection is used by students to get to/from Fremont High School and Stocklmeir Elementary, it gets more student pedestrian traffic than the Cascade Ave and Hollenbeck Ave intersection which is already designated as a school crossing. The existing School Zone signage on East Fremont does not conform to the standards/guidelines in CA MUTCD, [so] the signage should be updated."*

Priority Location #9: Homestead Road between Heron Avenue and Wolfe Road

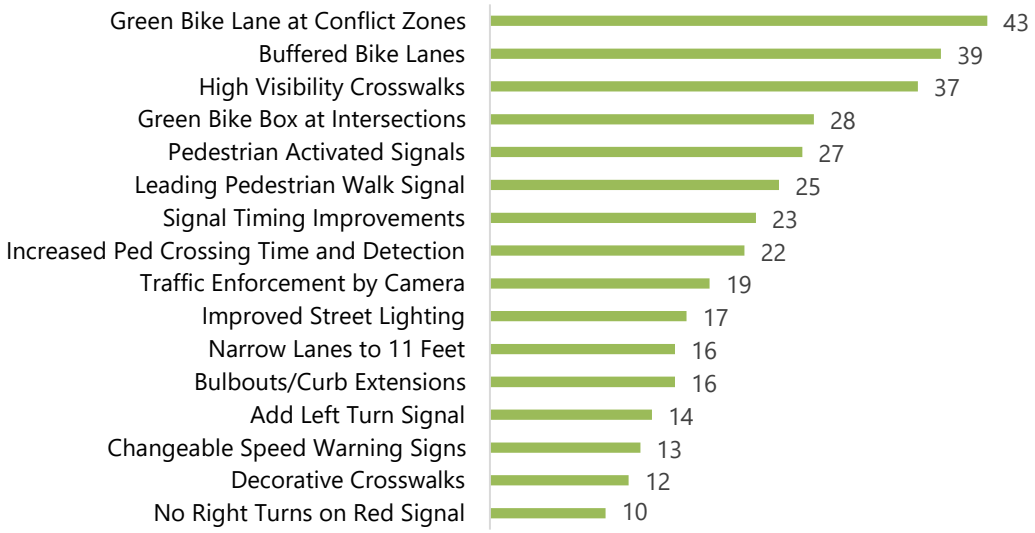
Workshop Comments

Six out of 13 comments at Priority Location #9 were recommendations to add buffered bike lanes or protected bike lanes, and two comments recommended a "road diet" or traffic calming. Participants also noted the need for crossing enhancements such as a HAWK signal at Linnet Lane, pedestrian scramble, and curb extensions to improve pedestrian safety.

Survey Results

Online survey responses for Priority Location #9 are shown in **Figure 11**. The top three recommended countermeasures at this location were green bike lanes at conflict zones, buffered bike lanes, and high visibility crosswalks.

Figure 11. Online Survey Responses, Priority Location #9



Survey Comments

Respondents recommended adding protected left turns from Homestead onto Heron, increasing signage and lane geometry paint in advance of intersections, and restricting driveways in and out of the shopping center for Priority Location #9.

In regards to part-time bike lanes and pedestrian crossings, one commenter noted:

> *"[Add] full-time bike lanes. The part-time bike lanes are confusing and discouraging for bikers. We also need a pedestrian crossing at Linnet Lane."*

Priority Location #10: Mary Avenue between Remington Drive and Fremont Avenue

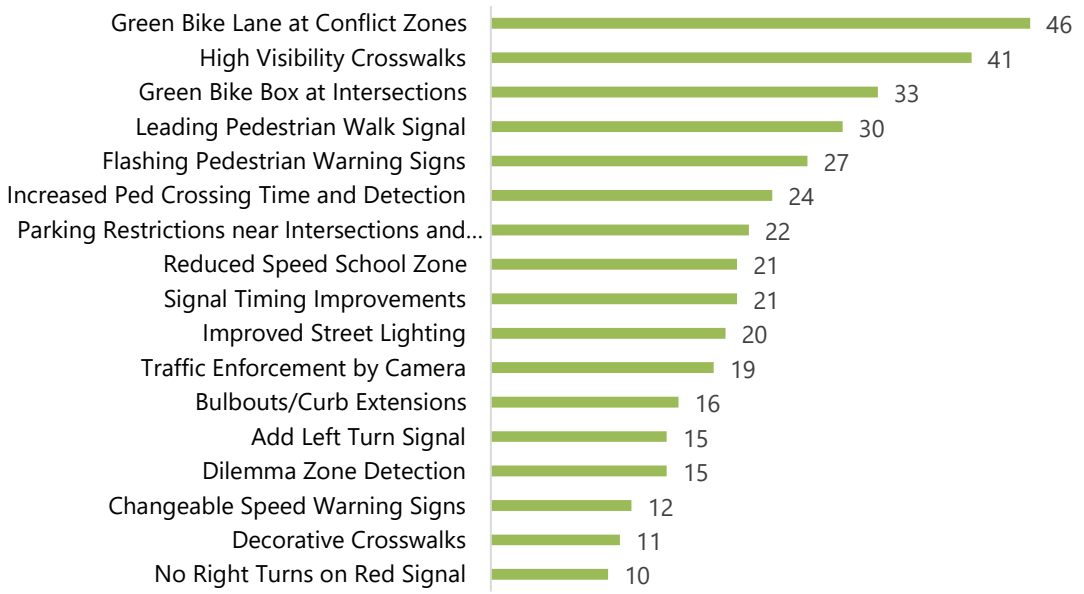
Workshop Comments

Comments at Priority Location #10 focused on bicycle safety improvements, such as buffered bike lanes, protected bike lanes, bike boxes, and consistent bicycle lanes along the corridor. Additional suggestions included LPIs, pedestrian scrambles, rumble strips or Botts' dots to separate motorists from pedestrians and bicyclists, parking restrictions, and speed enforcement.

Survey Results

Figure 12 shows that green bike lanes at conflict zones, high visibility crosswalks, and green bike boxes at intersections were the preferred countermeasure treatments at Priority Location #10.

Figure 12. Online Survey Responses, Priority Location #10



Survey Comments

Survey comments for Priority Location #10 included the suggestion to add school zoning infrastructure such as signage and roadway paint along Mary Avenue in addition to the segment of Mary near Knickerbocker Drive currently designated as a school zone.

Regarding bicycle infrastructure, one commenter noted that:

> *"It can be dark and hard to be seen when biking here. More visible bike lanes would help at intersections."*

DRAFT SAFETY STRATEGIES

Workshop participants were asked to vote on draft citywide safety strategies that the City of Sunnyvale could incorporate into the Vision Zero Plan. Strategies that received one or more vote are shown in **Table 1**. A table showing all of the potential safety strategies presented at the workshop, including those that received no votes, are included in **Attachment 1**.

Table 1. Draft Safety Strategies Feedback

A. Vision Zero Program	***Votes***
Incorporate Vision Zero safety principles into future City plans and design documents.	1
Identify a permanent, dedicated funding source for Vision Zero implementation and coordination	1
Improve data collection on speed, impairment, cell phone use, and distraction for KSI collisions.	1
B. Street Design and Operation	
Install one low-cost safety improvement per year, such as new road markings, signs, and minor signal modification.	1
C. Dangerous Behaviors	
Launch high-visibility education PSA campaigns against speeding, distracted driving, impaired driving, and other high-risk behaviors. Campaigns will focus on HIN corridors	1
Support state Automated Speed Enforcement legislation	1
Integrate Vision Zero curriculum into Police Academy curriculum and in-service Public Safety Officer training	1
Explore opportunities to expand free or subsidized transit fares during holidays and for special events	1
Develop public promotional campaign to encourage late-night transit, taxi, rideshare, and other services to provide alternatives to impaired driving.	1
D. Vulnerable Road Users	
Continue building and improving the bicycle network consistent with the Sunnyvale Bicycle Plan and Santa Clara Countywide Bike Plan	1
Host traffic safety classes for pedestrians over 60 and children.	1
Implement reduced speed limits (15 MPH) on the streets adjacent to City schools	2

ATTACHMENT 1. VOTING BOARDS RESULTS

Table 2. Potential Safety Strategies Votes by Category

	A. Vision Zero Program	Votes
External Initiatives	Put Vision Zero on the agenda of the City's public, community group, and stakeholder meetings in 2018.	
	Launch online, interactive crash data map and website.	
	Incorporate Vision Zero safety principles into future City plans and design documents.	1
	Develop a workshop for Communications Department on how to best communicate about traffic crashes and roadway safety.	
	Identify a permanent, dedicated funding source for Vision Zero implementation and coordination.	1
Data Collection & Program Evaluation	Publish an annual report to measure progress against the goals of the Action Plan.	
	Provide training for Department of Public Safety to improve collision data reporting, and preserve crash details and site evidence.	
	Improve data collection on speed, impairment, cell phone use, and distraction for KSI collisions.	1
	Establish regular pedestrian and bicyclist counts at consistent locations.	
	B. Street Design and Operation	
High Injury Network Infrastructure	Develop designs and secure grant funding for ten priority project locations identified in plan, with a focus on roadway designs to improve safety.	
	Develop prioritized list of additional safety projects.	
	Install one low-cost safety improvement per year, such as new road markings, signs, and minor signal modification.	1
Operations	Convene local stakeholders near high-crash corridors for input on project development.	
	Update City signal timing plans to improve safety for all modes (e.g. all red time, pedestrian crossing times).	
Policies & Design	Establish internal process for Vision Zero countermeasures to be evaluated and implemented, where feasible, on projects on the HIN.	
	C. Dangerous Behaviors	
Education and Outreach	Launch high-visibility education PSA campaigns against speeding, distracted driving, impaired driving, and other high-risk behaviors. Campaigns will focus on HIN corridors.	1
	Increase the use of speed feedback signs to discourage speeding.	
	Deter impaired driving by targeting education and outreach at alcohol-serving establishments.	
Enforcement	Support state Automated Speed Enforcement legislation.	1
	Integrate Vision Zero curriculum into Police Academy curriculum and in-service Public Safety Officer training.	1

Providing Alternatives to Driving	Explore opportunities to expand free or subsidized transit fares during holidays and for special events.	1
	Develop public promotional campaign to encourage late-night transit, taxi, rideshare, and other services to provide alternatives to impaired driving.	1
	D. Vulnerable Road Users	
Bicycles and Pedestrians	Continue building and improving the bicycle network consistent with the Sunnyvale Bicycle Plan and Santa Clara Countywide Bike Plan.	1
	Install pedestrian countdown timers at every signalized crossing location in the City.	
	Install or upgrade pedestrian crossing treatments on the HIN.	
	Complete projects that improve bicycle pedestrian safety related to turning vehicles at intersections.	
Children and Seniors	Implement reduced speed limits (15 MPH) on the streets adjacent to City schools.	2
	Install high-visibility crosswalks near City schools.	
	Develop public service announcement campaign aimed at drivers to increase safety for pedestrians age 60+.	
	Host traffic safety classes for pedestrians over 60 and children.	1

B. SUMMARY OF COLLISION TRENDS

SunnyvaleVisionZero

SUNNYVALE VISION ZERO

Project Introduction & Existing Collision Trends

Community Workshop
October 5, 2017

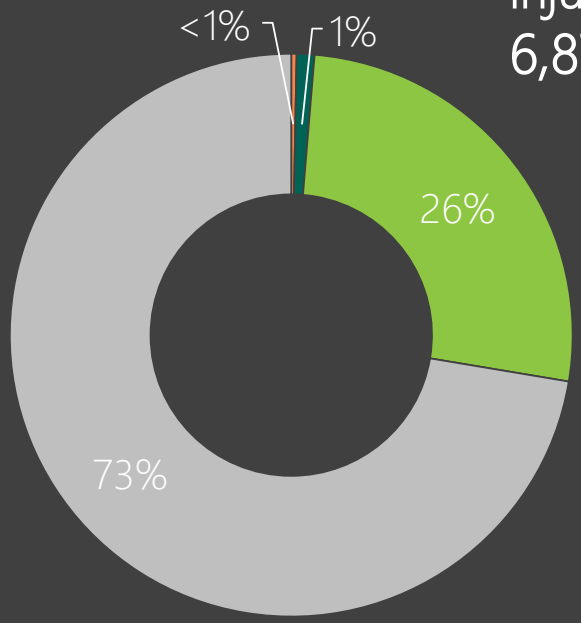
COLLISION TRENDS

SunnyvaleVisionZero

ALL COLLISIONS

City of Sunnyvale, 2012 - 2016

91 collisions with a fatality (21) or severe injury (70) between 2012 and 2016, out of 6,875 total collisions.



fatality severe injury non-severe injury non-injury

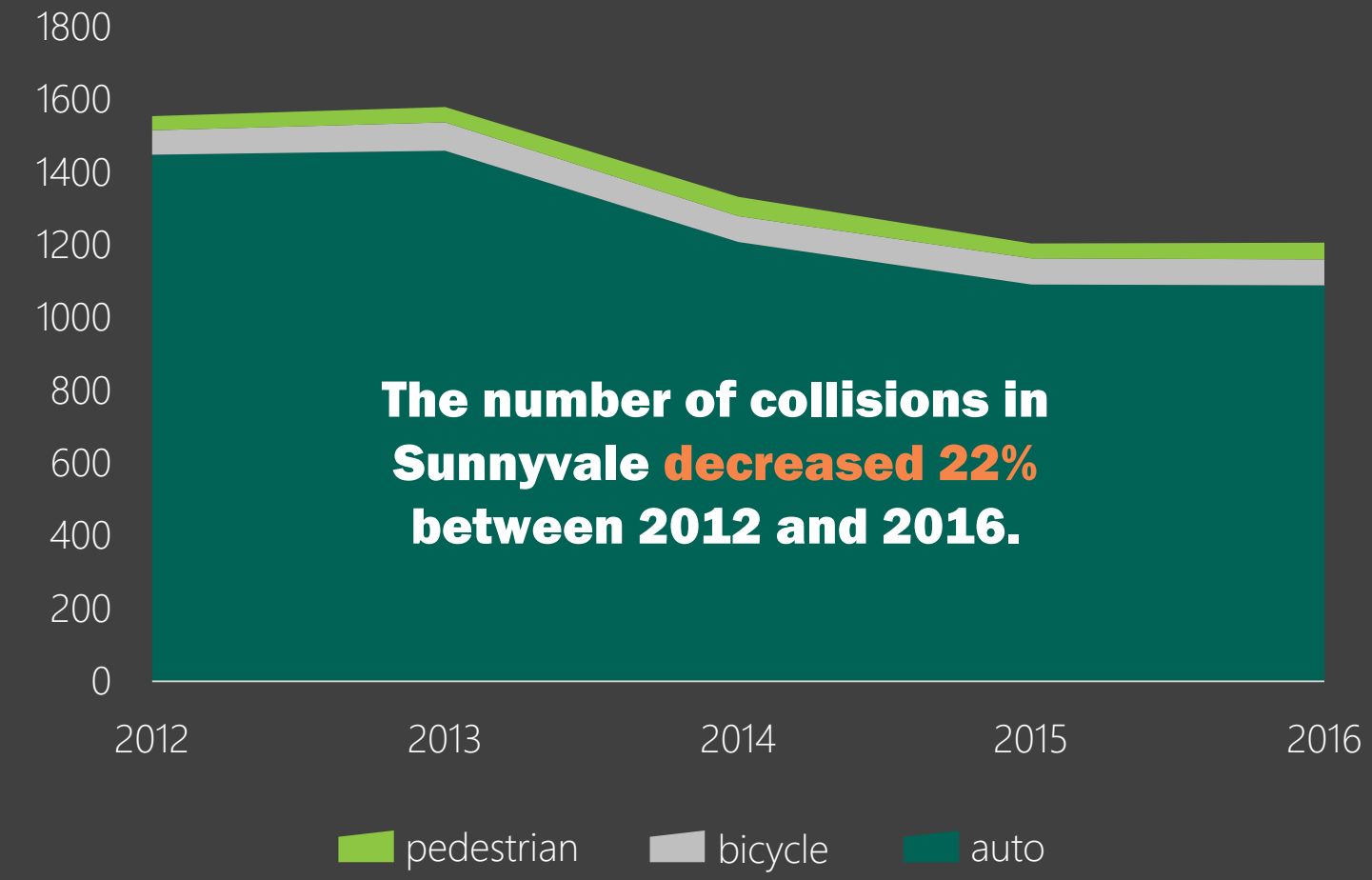
Sunnyvale has fewer collisions than 80% of cities of comparable size (120,000 to 160,000 population).

Source: California Office of Traffic Safety (OTS) Injury and Fatal Rankings (2014)

SunnyvaleVisionZero

ALL COLLISIONS

City of Sunnyvale, 2012 - 2016



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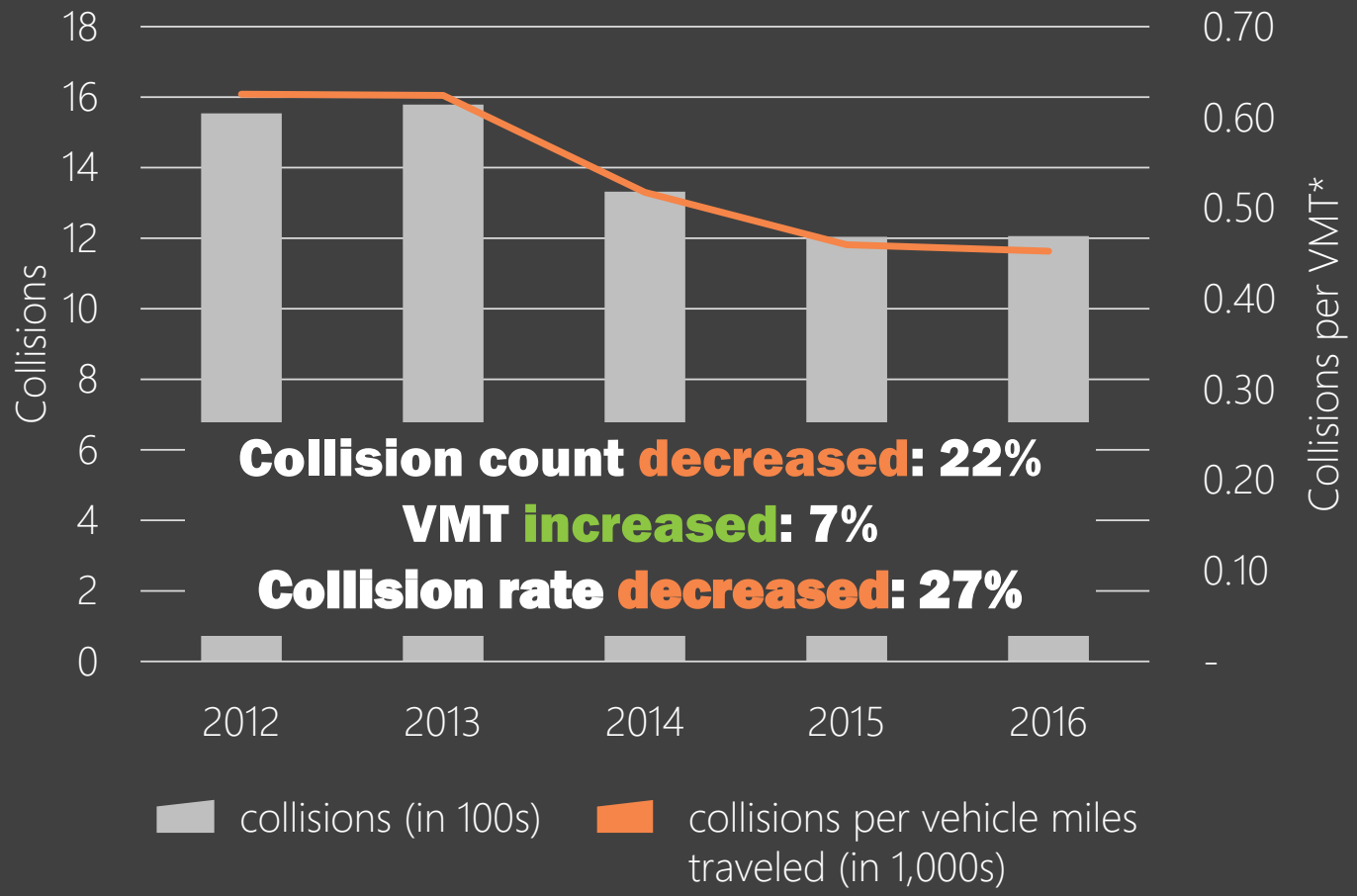
ALL COLLISIONS & DAILY VMT

City of Sunnyvale, 2012 - 2016

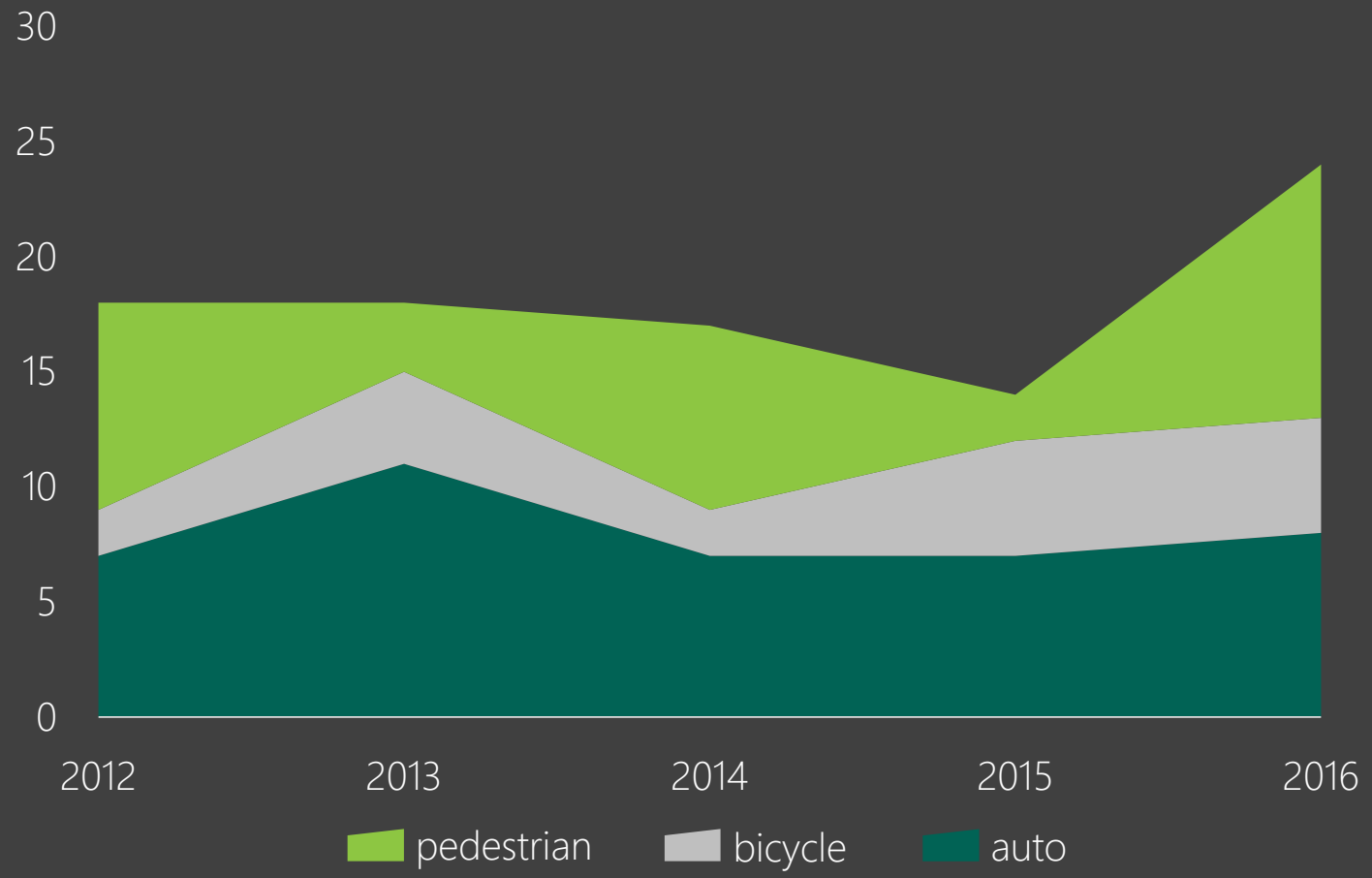


*Source: City of Sunnyvale Travel Model

SunnyvaleVisionZero

KSI COLLISIONS

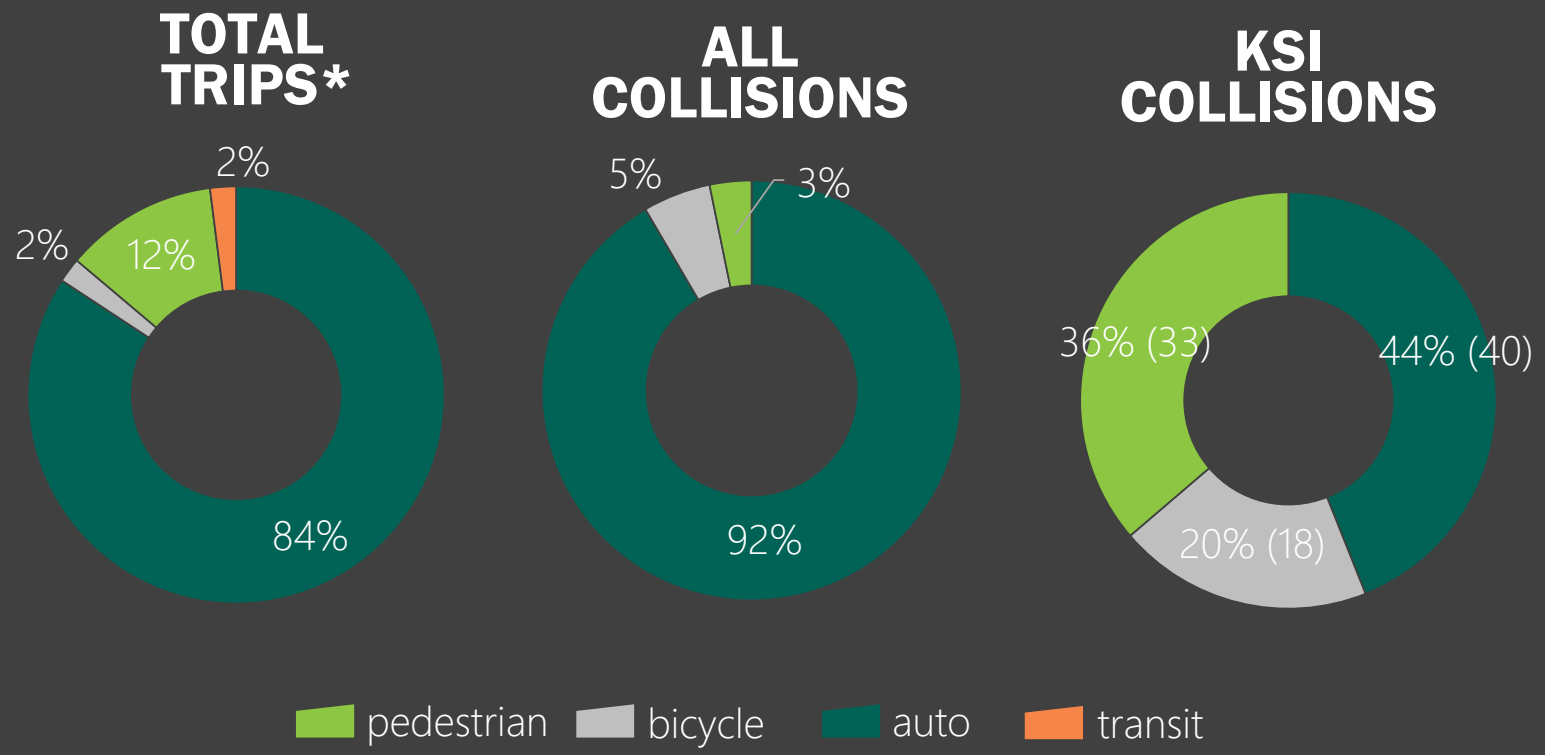
City of Sunnyvale, 2012 - 2016



SunnyvaleVisionZero

MODE SPLIT

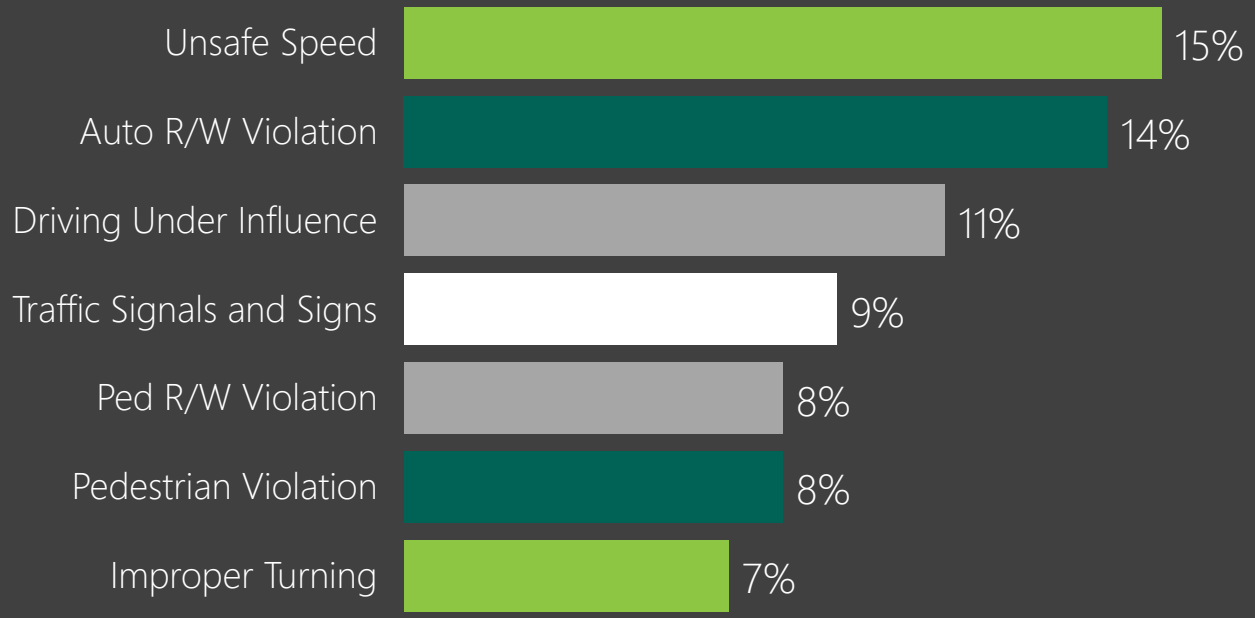
City of Sunnyvale, 2012 - 2016



*Source: California Household Travel Survey, 2012

SunnyvaleVisionZero

Top Factors Leading to KSI Collisions (All Modes)



In Sunnyvale...

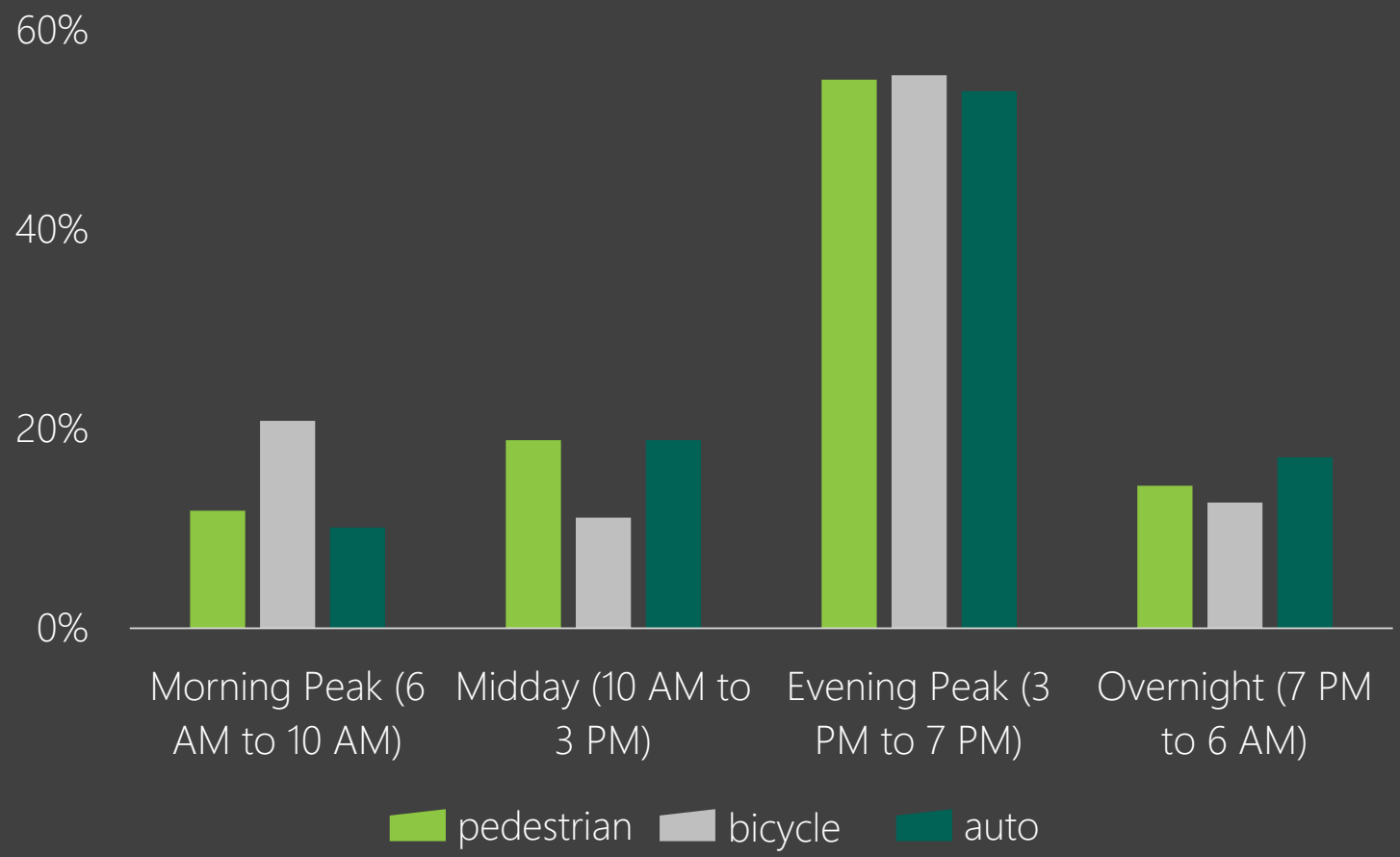
In **one third** of pedestrian KSI collisions, the pedestrian is recorded **at fault**

In **half** of bicycle KSI collisions, the bicyclist is recorded **at fault**

SunnyvaleVisionZero

TIME OF DAY

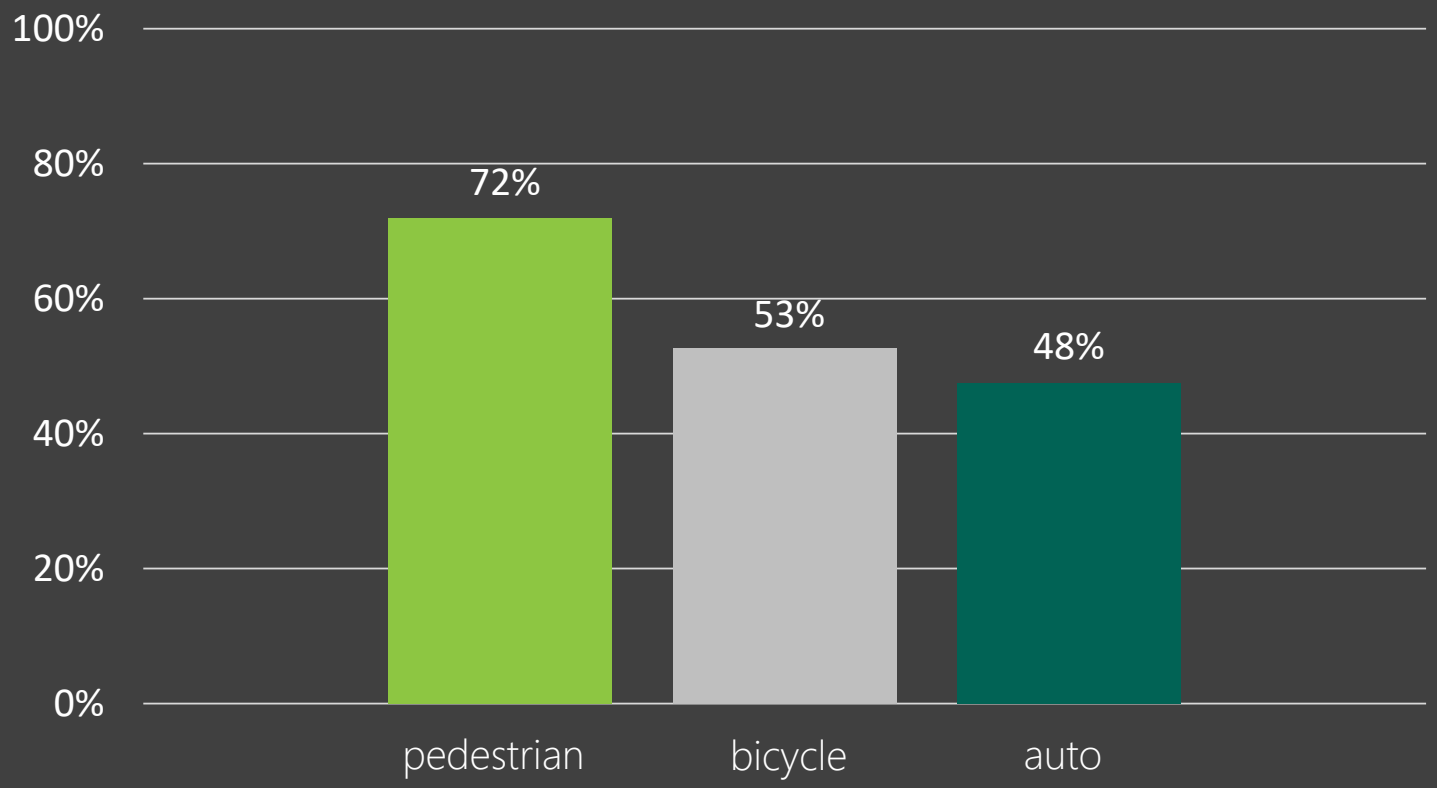
City of Sunnyvale, 2012 - 2016, KSI Collisions



SunnyvaleVisionZero

AT INTERSECTION

City of Sunnyvale, 2012 - 2016, KSI Collisions



HIGH INJURY NETWORK

The HIN accounts for nearly 60% of all fatal and severe injury collisions, on 10% of the roadway network in Sunnyvale

C. COLLISION PROFILES AND COUNTERMEASURE PAIRINGS

Collision Profile Countermeasure Matrix

Countermeasure Categories	Countermeasures	Collision Profiles									
		1	2	3	4	5	6	7	8	9	10
		Bicycle & Pedestrian	Pedestrian	All Modes	All modes	Pedestrian	All Modes	Bicycle	All Modes	All Modes	Bicycle & Pedestrian
		Walking or bicycling on expressway, arterial or collector	Unmarked pedestrian crossing	Speed-related conflict	Left turn at signalized intersection	60+ year old pedestrian at intersection	Influence of drugs or alcohol	Midblock bicycle conflict	Conflicting through movement at intersection	Child walking or biking near school	Red light violation at signalized intersection
Signalization	Dilemma Zone Detection			x							x
	Pedestrian Countdown Signal Head	x				x				x	
	Increase Pedestrian Crossing Time, Pedestrian Detection	x			x	x				x	
	Leading Pedestrian Interval	x			x	x				x	
	New Traffic Signals	x		x		x				x	
	Pedestrian Hybrid Beacon	x	x			x				x	
	Pedestrian-Activated Crosswalk Sign		x			x				x	
	Pedestrian-Activated Crosswalk Beacon		x			x				x	
	Signal Timing Improvements (including extend all-red time)	x		x	x	x			x		x
Geometric	Bulbouts/ Curb Extensions	x	x	x	x	x				x	
	Sidewalk/Pathway to Close Gap	x								x	
	Consolidate Driveways	x						x		x	
	Narrow Lanes (11' minimum per Sunnyvale standards)	x		x				x			
	Pedestrian Refuge Islands/ Medians	x		x		x				x	
	Separated Bikeways (Cycle tracks)	x		x				x		x	
	Road Diets	x		x	x	x		x		x	
	Shared-Use/ Bicycle Path	x						x		x	

Collision Profile Countermeasure Matrix

Countermeasure Categories	Countermeasures	Collision Profiles									
		1	2	3	4	5	6	7	8	9	10
		Bicycle & Pedestrian	Pedestrian	All Modes	All modes	Pedestrian	All Modes	Bicycle	All Modes	All Modes	Bicycle & Pedestrian
		Walking or bicycling on expressway, arterial or collector	Unmarked pedestrian crossing	Speed-related conflict	Left turn at signalized intersection	60+ year old pedestrian at intersection	Influence of drugs or alcohol	Midblock bicycle conflict	Conflicting through movement at intersection	Child walking or biking near school	Red light violation at signalized intersection
Signs, Markings, Operational	Bike Box				x						
	Bike Intersection Markings				x				x		
	Bike Lane							x		x	
	Buffered Bike Lanes	x						x		x	
	Controlled Intersections/ New Stop Signs/ Convert 2-Way to 4-Way Stops		x	x					x	x	
	Green Paint/ Conflict Zones	x			x						
	High Visibility Crosswalks with Advance Stop or Yield Lines	x	x			x				x	
	Intersection, Street-Scale Lighting	x	x		x					x	
	Marked Crossings (unsignalized intersections)	x	x			x				x	
	Parking restrictions near intersections (nearside locations)	x	x			x			x	x	
	Protected Turns (turn pockets and protected or split signal phasing)	x		x	x	x					
	Restrict or Prohibit Turns (including Right Turn on Red Restriction)	x			x	x					
Speed Control Measures, Miscellaneous	Dynamic/Variable Speed Warning Signs	x		x						x	
	Speed Humps			x				x			
	Reduced Speed School Zone	x		x						x	
Education	Education, PSAs	x	x	x			x	x		x	x
Enforcement	Video enforcement for red light running and speeding	x		x							x
	Enforcement, More Officers	x	x	x			x	x		x	x

D. PRIORITY PROJECT CUT SHEETS (10)

El Camino Real between S. Mary Avenue and S. Mathilda Avenue

SunnyvaleVisionZero
Priority Project Location 1

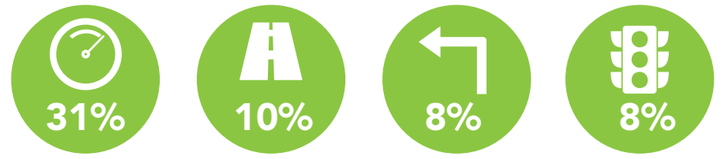
This study area extends 0.7 miles along El Camino Real between S. Mary Avenue and S. Mathilda Avenue. The project area is served by VTA Bus Routes 22 and Rapid 522, and major destinations in the vicinity of the corridor include Sunnyvale City Hall, Holiday Inn, Grand Hotel, and food services. El Camino Real in this section is generally 6 lanes with a speed limit of 40 miles per hour. There were 260 collisions on the project corridor between 2012 and 2016, including four severe/fatal collisions. Collisions on the corridor often involved speed. Other notable collision patterns were people walking or bicycling on the arterials, left turns at signalized intersections and red light violations at signalized intersections.

Note: Collision locations are shown diagrammatically based upon distance from the reported intersection. The exact travel lane or location in the roadway for each collision is not reflected.

KSI Vehicle Collision ▲ KSI Bicycle Collision ▲ KSI Pedestrian Collision ▲ Non-KSI Collision ○

Collision History (2012-2016)

Notable Collision Patterns



Potential Improvements

Mary Avenue Pedestrian Crossing

Data indicate one pedestrian-involved KSI collision occurred on Mary Avenue at an unmarked crossing in the project area. There are currently no marked crossings on Mary Avenue between El Camino Real and Iowa Avenue, a segment over 1,300' in length with fronting uses including Sunnyvale Christian School and Skywalk Bible Church. A new marked pedestrian crossing north of Olive Avenue would improve connectivity and safety. If provided, a new crossing should include a high-visibility crosswalk, advance limits lines, median refuge island, and pedestrian hybrid beacon (PHB), or pedestrian signal. Alternately, crosswalks could be installed at the intersection of Mary Avenue and Olive Avenue with all-way stop or traffic signal control. Any modifications would require evaluation and completion of appropriate engineering studies

El Camino Real Corridor Improvements

Collision analysis and community feedback indicated that a number of corridor-wide improvements would help improve user comfort and safety along El Camino Real, including:

- Elimination of on-street parking
- Lane width reductions to 11' where feasible
- Buffered bike lanes
- Green pavement markings in conflict zones
- Directional curb ramps to assist pedestrians with visual impairment
- Speed feedback signs and enforcement
- Median fencing where feasible

Signalized Intersection Improvements

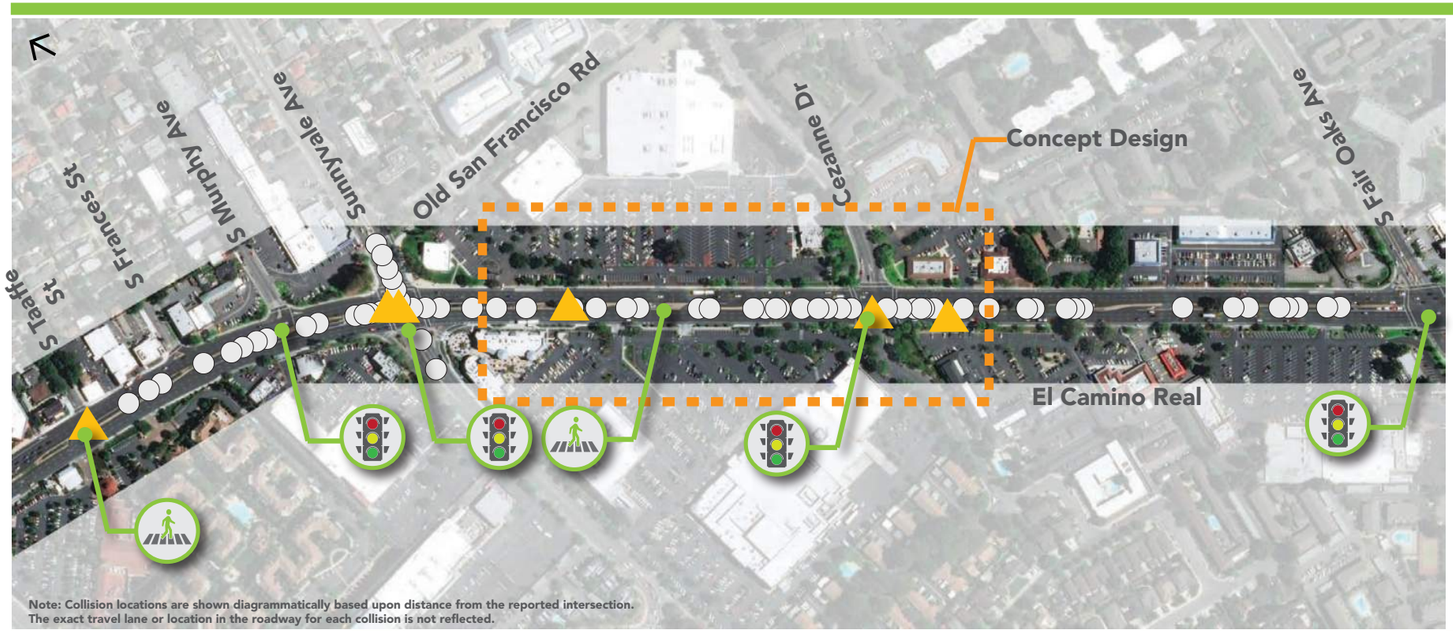
A majority of collisions for all modes in this segment occurred at or near the existing signalized intersections. Providing the following features would help to improve safety at those locations:

- High-visibility crosswalks
- Accessible pedestrian signals (APS) with countdown timers
- Adaptive pedestrian signal systems
- Bicycle detection improvements
- Leading pedestrian intervals (LPI)
- 12" vehicle signal heads
- Median pedestrian refuge islands on El Camino Real
- Curb extensions to reduce turning radii
- Green two-stage bicycle queue boxes where feasible

El Camino Real between S. Taaffe Street and S. Fair Oaks Avenue

SunnyvaleVisionZero
Priority Project Location 2

This study area extends 0.7 miles along El Camino Real between S. Taaffe Street and S. Fair Oaks Avenue. The project area is served by VTA Bus Routes 22 and Rapid 522, and major destinations in the vicinity of the corridor include Allario Shopping Center, Helios School, Sprouts Farmers Market, Safeway, CVS, Pediatrics Sunnyvale Center, and food services. El Camino Real in this section is generally 6 lanes with a speed limit of 40 miles per hour. There were 173 collisions on the project corridor between 2012 and 2016, including six severe/fatal collisions. Collisions on the corridor often involved speed. Other notable collision patterns were people walking or bicycling on the arterials, left turns at signalized intersections and red light violations at signalized intersections.

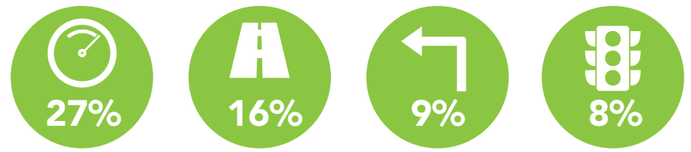


Note: Collision locations are shown diagrammatically based upon distance from the reported intersection. The exact travel lane or location in the roadway for each collision is not reflected.

KSI Vehicle Collision
KSI Bicycle Collision
KSI Pedestrian Collision
Non-KSI Collision

Collision History (2012-2016)

Notable Collision Patterns



Speed-related conflict

Walking or bicycling on expressway, arterial, or collector

Left turn at signalized intersection

Red light violation at signalized intersection

Potential Improvements

El Camino Real Corridor Improvements

Collision analysis and community feedback indicated that a number of corridor-wide improvements would help improve user comfort and safety along El Camino Real including:

- Lane width reduction to 11' where feasible
- Buffered bike lane where feasible
- Green pavement marking in conflict zone
- Speed feedback signs and traffic enforcement
- Improved street lighting
- Directional curb ramps to assist pedestrians with visual/physical impairment where feasible
- Faded sign replacement/extraneous sign removal
- Planting strip to separate sidewalk from roadway
- Bus/bike conflicts to be reduced where possible
- Transit amenity improvements
- High-visibility crosswalks
- Curb extensions to reduce curb radii
- Median fencing where feasible

Signalized Intersection Improvements

A majority of collisions for all modes in this segment occurred at or near the existing signalized intersections. Providing the following features would help to improve safety at those locations:

- Straighten crosswalks
- Accessible pedestrian signals (APS) with countdown timers
- Adaptive pedestrian signal systems
- Bicycle detection
- Leading Pedestrian Intervals (LPI)
- Median pedestrian refuge island
- More vehicle signal heads to improve visibility
- Possible elimination of right-turn pork chop island on south-east corner of the El Camino Real and S. Fair Oaks Avenue intersection
- Protected left turns and turn lanes on Cezanne Drive
- Bike box on southbound Cezanne Drive

Midblock crossing on El Camino Real

Data indicate pedestrian-involved KSI collisions occurred on this segment of El Camino Real. Midblock crosswalks along with enhanced crossing treatments, if warranted, should be considered to improve crossing safety for pedestrians at these locations. Treatments may include:

- Midblock high-visibility crosswalks with traffic signal or pedestrian hybrid beacon
- Median pedestrian refuge island
- Advance limit lines

Note: See Appendix E for corresponding conceptual layout.

El Camino Real, E. Fremont Avenue, and S. Wolfe Road

SunnyvaleVisionZero
Priority Project Location 3

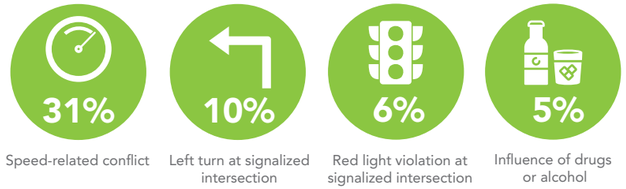
This study location includes the area immediately surrounding the intersection complex at El Camino Real, E. Fremont Avenue, and S. Wolfe Road. The project location is served by VTA Bus Route 22, 26, and Rapid 522, and major destinations in the vicinity of the corridor include Golfland USA, Sunken Gardens Golf Course, food services, and Wild Palms Hotel. Each major roadway in the study area is 4 to 6 lanes wide with auxiliary turn lanes. There were 175 collisions in the study area between 2012 and 2016, including two severe/fatal collisions. Other notable collision patterns were left turns at signalized intersections, influence of drugs or alcohol, and red light violations at signalized intersections.

Note: Collision locations are shown diagrammatically based upon distance from the reported intersection. The exact travel lane or location in the roadway for each collision is not reflected.

KSI Vehicle Collision | KSI Bicycle Collision | KSI Pedestrian Collision | Non-KSI Collision

Collision History (2012-2016)

Notable Collision Patterns



Potential Improvements

Area-wide Improvements

Collision analysis and community feedback indicated that a number of corridor-wide improvements would help improve user comfort and safety along El Camino Real, Fremont Avenue and Wolfe Road, including:

- Lane width reduction to 11' where feasible
- Buffered bike lanes where feasible
- Green pavement marking in conflict zones
- Directional curb ramps to assist pedestrians with visual impairment
- Speed feedback signs and enforcement
- Improved street lighting

Signalized Intersection Improvements

A majority of collisions for all modes in this segment occurred at or near the existing signalized intersections. Providing the following features would help to improve safety at those locations:

- Curb extensions to reduce curb radii
- High visibility crosswalks
- Pedestrain refuge island
- Leading Pedestrain Interval (LPI)
- Restrict or prohibit permissive left turns
- Accessible Pedestrian Signal (APS) with countdown timers
- Passive in-crosswalk pedestrian detection
- Bicycle detection
- Green two-stage queue boxes where feasible

Remington Drive/Fair Oaks Avenue between Iris Avenue and Manet Drive

SunnyvaleVisionZero
Priority Project Location 4

This study area extends 0.4 miles along Remington Drive between Iris Avenue and Manet Drive. The project area is served by VTA Bus Routes 22, 55 and Rapid 522, and major destinations in the vicinity of the corridor include Sunnyvale Community Center Park, food services, and offices. Remington Drive is generally 5 lanes wide in this section with a speed limit of 35 miles per hour. There were 140 collisions on the project corridor between 2012 and 2016, including three severe/fatal collisions. Collisions on the corridor often involved speed. Other notable collision patterns were people walking or bicycling on the arterial, left turns at signalized intersections and conflicting through movements at intersections.

KSI Vehicle Collision | KSI Bicycle Collision | KSI Pedestrian Collision | Non-KSI Collision

Collision History (2012-2016)

Notable Collision Patterns

Potential Improvements

Remington Drive Pedestrian Crossing

Data indicate one pedestrian-involved KSI collision occurred on Remington Drive at the Michelangelo Drive uncontrolled crossing. Enhanced crossing treatments, if warranted, should be considered to improve crossing safety for pedestrians. These treatments may include:

- Median pedestrian refuge island
- Advance limit or yield lines
- Flashing beacons, pedestrian hybrid beacon (PHB), or traffic signal

S. Fair Oaks Avenue and Remington Drive Corridor Improvements

Collision analysis and community feedback indicated that a number of corridor-wide improvements would help improve user comfort and safety along the corridor, including:

- Elimination of on-street parking
- Lane width reductions to 11' where feasible
- Buffered bike lanes where feasible
- Green pavement markings in conflict zones
- Directional curb ramps to assist pedestrians with visual impairment
- Speed feedback signs and enforcement

Signalized Intersection Improvements

A majority of collisions for all modes in this segment occurred at or near the existing signalized intersections. Providing the following features would help to improve safety at those locations:

- High-visibility crosswalks
- Accessible pedestrian signals (APS) with countdown timers
- Increased pedestrian crossing time
- Adaptive pedestrian signal systems
- Bicycle detection improvements
- Leading pedestrian intervals (LPI)
- 12" vehicle signal heads
- Median pedestrian refuge islands
- Curb extensions to reduce turning radii
- Green two-stage queue boxes where feasible

El Camino Real between Henderson Avenue and Helen Avenue

SunnyvaleVisionZero
Priority Project Location 5

This study area extends 0.3 miles along El Camino Real between Henderson Avenue and Helen Avenue. The corridor is served by VTA Bus Routes 22 and Rapid 522, and major destinations in the vicinity of the corridor include Peterson Middle School and food and shopping services. El Camino Real is 6 lanes wide in this section with a speed limit of 35 miles per hour. There were 121 collisions on the project corridor between 2012 and 2016, including four severe/fatal collisions. Collisions on the corridor often involved speed. Other notable collision patterns were people walking or bicycling on the arterial, influence of drugs or alcohol and left turns at signalized intersections.

Note: Collision locations are shown diagrammatically based upon distance from the reported intersection. The exact travel lane or location in the roadway for each collision is not reflected.

KSI Vehicle Collision
KSI Bicycle Collision
KSI Pedestrian Collision
Non-KSI Collision

Collision History (2012-2016)

Notable Collision Patterns

Potential Improvements

El Camino Real Corridor Improvements

Collision analysis and community feedback indicated that a number of corridor-wide improvements would help improve user comfort and safety along El Camino Real, including:

- Buffered bike lanes where feasible
- Elimination of on-street parking
- Lane width reductions to 11' where feasible
- Green pavement markings in conflict zones
- Directional curb ramps to assist pedestrians with visual impairment
- Speed feedback signs and enforcement
- Wider sidewalk
- Median fencing to discourage jaywalking where feasible
- Crossing supervision, if warranted.

Signalized Intersection Improvements

A majority of collisions for all modes in this segment occurred at or near the existing signalized intersections. Providing the following features would help to improve safety at the intersection of El Camino Real and Henderson Avenue:

- Curb extensions to reduce curb radii
- High visibility crosswalk with advance limit line
- Bike boxes where feasible
- Leading Pedestrian Interval (LPI)
- Side-street left-turn lanes with protected phasing
- Accessible Pedestrian Signal (APS) with countdown timers
- Adaptive pedestrian signal systems
- Bicycle detection
- 12″ vehicle signal heads
- Parking restrictions near intersection
- Increased pedestrian crossing time

Uncontrolled Crossing at Helen Avenue

Data indicate two KSI collisions occurred on El Camino Real at or near the Helen Avenue uncontrolled crossing. Enhanced crossing treatments, if warranted, should be considered to improve crossing safety for pedestrians. These treatments may include:

- High visibility crosswalks
- Median pedestrian refuge island
- Flashing beacons, pedestrian hybrid beacon (PHB), or traffic signal

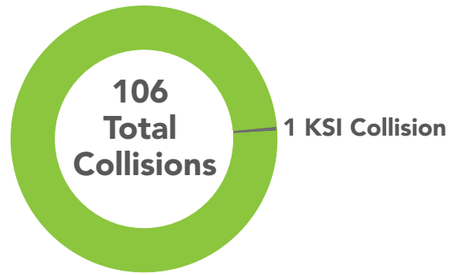
N. Mathilda Avenue and W. Maude Avenue

SunnyvaleVisionZero
Priority Project Location 6

This study area extends 0.3 miles along N. Mathilda Avenue between Del Rey Avenue and Indio Avenue and 0.2 miles along W. Maude Avenue between Mathilda Avenue and San Angelo Avenue . The corridor is served by VTA Bus Route 54, and major destinations in the vicinity of the corridor include offices such as Apple and LinkedIn buildings, food services, and Trinity Church of Sunnyvale. N. Mathilda Avenue width in this section varies between 6 to 11 lanes with a speed limit of 45 miles per hour. There were 106 collisions in this study area between 2012 and 2016, including one severe/fatal collision. Collisions on the corridor often involved speed. Other notable collision patterns were left turns at signalized intersections, people walking or bicycling on arterials, and influence of drugs or alcohol.

KSI Vehicle Collision | KSI Bicycle Collision | KSI Pedestrian Collision | Non-KSI Collision

Collision History (2012-2016)



103
1
2

Notable Collision Patterns

33% Speed-related conflict

12% Left turn at signalized intersection

6% Influence of drugs or alcohol

3% Walking or bicycling on expressway, arterial, or collector

Potential Improvements

N. Mathilda Avenue Corridor Improvements

Collision analysis and community feedback indicated that a number of corridor-wide improvements would help improve user comfort and safety along N. Mathilda Avenue including:

- Lane width reduction to 11' where feasible
- Buffered bike lane where feasible
- Green pavement marking in conflict zone
- Speed feedback signs and traffic enforcement
- Improved street lighting

Signalized Intersection Improvements

A majority of collisions for all modes in this segment occurred at or near the existing signalized intersections. Providing the following features would help to improve safety at those locations:

- High-visibility crosswalks
- Accessible pedestrian signals (APS) with countdown timers
- Increased pedestrian crossing time
- Bicycle detection
- Leading Pedestrian Intervals (LPI)
- 12" vehicle signal heads
- Curb extensions to reduce turning radii and eliminate pork chop islands where feasible
- Improved traffic signal timing
- Dilemma zone detection
- Side-street left-turn lanes with protected phasing
- Green two-stage queue boxes where feasible

Marked Crosswalk at Del Rey Avenue

Del Rey Avenue may be a candidate for a marked pedestrian crossing due to the long distance between crosswalks and connection between key destinations. This location is adjacent to a bus stop serving VTA Bus Route 54, Apple and LinkedIn buildings, motels and a residential neighborhood. The next signalized intersections to the north and south are located more than 700 feet from this crossing location. A new marked crossing south of Del Rey Avenue would improve connectivity and eliminate the need for transit riders to jaywalk across Mathilda Avenue . If provided, a new crossing should include a high-visibility crosswalk, advance limits lines, median refuge island, and pedestrian or full traffic signal.

N. Fair Oaks Avenue between Balsam Avenue and E. Taylor Avenue

SunnyvaleVisionZero
Priority Project Location 7

This study area extends 0.3 miles along N. Fair Oaks Avenue between Balsam Avenue and E. Taylor Avenue. The corridor is served by VTA Bus Routes 26 and 55, and major destinations in the vicinity of the corridor include Fair Oaks Park and The King's Academy. N. Fair Oaks Avenue in this section is 4 lanes with turn lanes at major intersections and a speed limit of 30 miles per hour. There were 80 collisions on the project corridor between 2012 and 2016, including three severe/fatal collisions. Collisions on the corridor often involved speed. Other notable collision patterns were red light violations at signalized intersections, influence of drugs or alcohol, and conflicting through movements at intersections.

Note: Collision locations are shown diagrammatically based upon distance from the reported intersection. The exact travel lane or location in the roadway for each collision is not reflected.

KSI Vehicle Collision ▲ KSI Bicycle Collision ▲ KSI Pedestrian Collision ▲ Non-KSI Collision ○

Collision History (2012-2016)

77
1
2

Notable Collision Patterns

- 28% Speed-related conflict
- 14% Red light violation at signalized intersection
- 9% Influence of drugs or alcohol
- 9% Conflicting through movement at intersection

Potential Improvements

N. Fair Oaks Avenue Corridor Improvements

Collision analysis and community feedback indicated that a number of corridor-wide improvements would help improve user comfort and safety along N. Fair Oaks Avenue including:

- Lane width reduction to 11' where feasible
- Green pavement marking in conflict zones
- Speed feedback signs and enforcement
- Improved street lighting

Signalized Intersection Improvements

A majority of collisions for all modes in this segment occurred at or near the existing signalized intersections. Providing the following features would help to improve safety at those locations:

- High-visibility crosswalks
- Accessible pedestrian signals (APS) with countdown timers
- Adaptive pedestrian signal systems
- Bicycle detection
- Leading pedestrian intervals (LPI)
- 12" vehicle signal heads
- Curb extensions to reduce turning radii
- Parking restrictions near intersections
- Improved traffic signal timing
- Improved dilemma zone detection

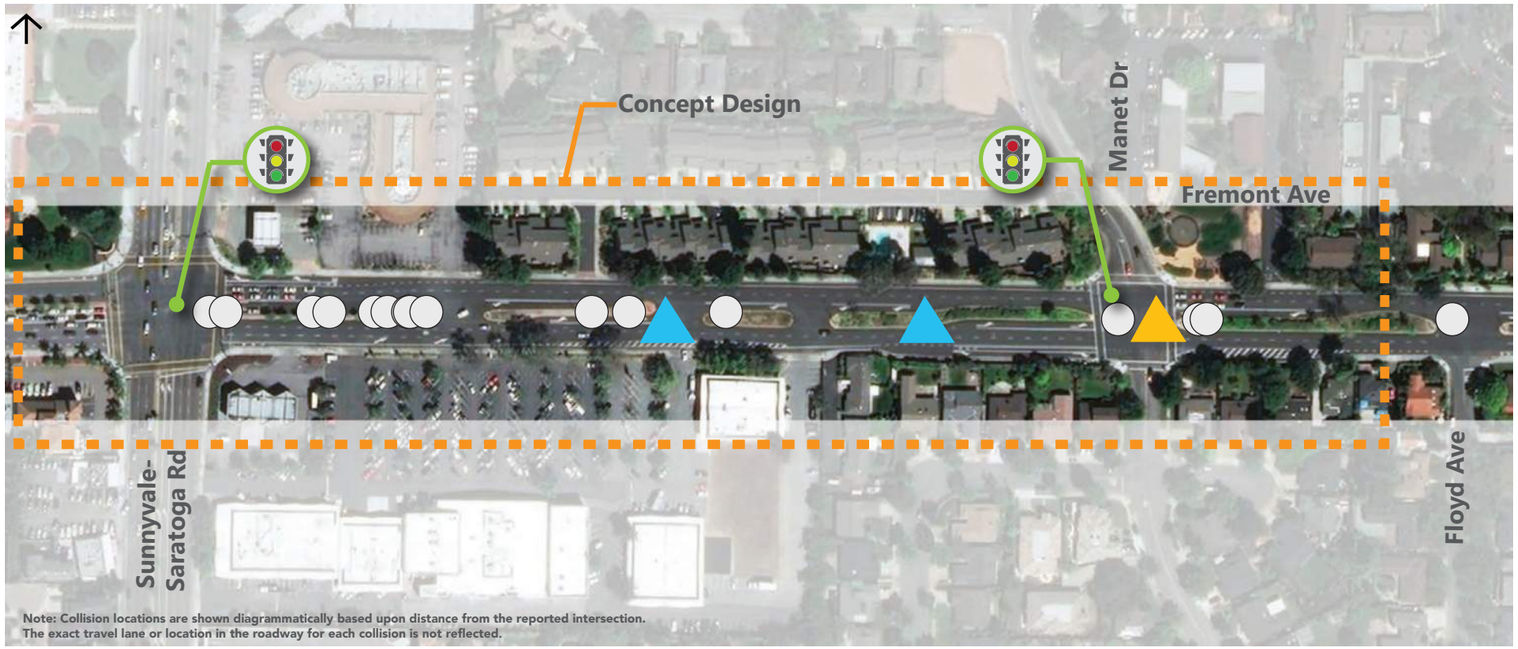
Marked Crosswalks at Balsam Avenue

Balsam Avenue may be a candidate for a marked pedestrian crossing due to the long distance between crosswalks and connection between key destinations. Community workshop participants requested safety countermeasures across N. Fair Oaks Avenue to provide safe access to the Fair Oaks Park located northeast of Maude Avenue. Per their comments, there are many park users and children crossing N. Fair Oaks Avenue to access the park. If provided, a new crossing should include a high-visibility crosswalk, advance limits lines, median refuge island, and pedestrian hybrid beacon (PHB) or pedestrian signal. Any modifications would require evaluation and completion of appropriate engineering studies.

Fremont Avenue between Sunnyvale-Saratoga Road and Floyd Avenue

SunnyvaleVisionZero
Priority Project Location 8

This study area extends 0.3 miles along Fremont Avenue between Sunnyvale-Saratoga Road and Floyd Avenue. Major destinations in the vicinity of the corridor include Fremont Corners Shopping Center, St John's Lutheran Church, Fremont High School, and 24 Hour Fitness. Fremont Avenue in this section is 4 to 6 lanes with auxiliary turn lanes at major intersections and a speed limit of 40 miles per hour. There were 35 collisions on the project corridor between 2012 and 2016, including three severe/fatal collisions. Collisions on the corridor often involved speed. Other notable collision patterns were people walking or bicycling on the arterial, left turns at signalized intersections, and mid-block bicycle conflicts.



Note: Collision locations are shown diagrammatically based upon distance from the reported intersection. The exact travel lane or location in the roadway for each collision is not reflected.

KSI Vehicle Collision ▲ KSI Bicycle Collision ▲ KSI Pedestrian Collision ▲ Non-KSI Collision ○

Collision History (2012-2016)

Notable Collision Patterns

Potential Improvements

Fremont Avenue Corridor Improvements

Collision analysis and community feedback indicated that a number of corridor-wide improvements would help improve user comfort and safety along Fremont Avenue including:

- Lane width reduction to 11' where feasible
- Buffered bike lane where feasible
- Green pavement marking in conflict zone
- Speed feedback signs and traffic enforcement
- Improved street lighting
- Directional curb ramps to assist pedestrians with visual impairment
- High-visibility crosswalks
- Reduction in median cuts to reduce turn conflicts where feasible
- Pedestrian crossing across Fremont Avenue at Floyd Avenue
- Reduction in number of lanes, where feasible

Signalized Intersection Improvements

A majority of collisions for all modes in this segment occurred at or near the existing signalized intersections. Providing the following features would help to improve safety at those locations:

- High-visibility crosswalks
- Accessible pedestrian signals (APS) with countdown timers
- Increased pedestrian crossing time
- Adaptive pedestrian signal systems
- Bicycle detection
- Leading Pedestrian Intervals (LPI)
- 12" vehicle signal heads to improve visibility
- Curb extensions to reduce turning radii
- Protected left turns and turn lanes on Manet Drive/Bobwhite Avenue
- Median pedestrian refuge island on Fremont Avenue where feasible
- Advance limit line at the intersection of Fremont Avenue and Sunnyvale-Saratoga Road

Note: See Appendix E for corresponding conceptual layout.

Homestead Road between Heron Avenue and Wolfe Road

SunnyvaleVisionZero
Priority Project Location 9

This study area extends 0.2 miles along Homestead Road between Heron Avenue and Wolfe Road. Major destinations in the vicinity of the corridor include Jesus Love Korean Church, Good Samaritan Preschool, Cupertino Village Mall, Apple Park, and food services. Homestead Road is 4 lanes wide in this section with a speed limit of 35 miles per hour. There were 28 collisions on the project corridor between 2012 and 2016, including two severe/fatal collisions. Collisions on the corridor often involved speed. Other notable collision patterns were people walking or bicycling on the arterial, mid-block bicycle conflicts, and pedestrians in unmarked pedestrian crossings.

Note: Collision locations are shown diagrammatically based upon distance from the reported intersection. The exact travel lane or location in the roadway for each collision is not reflected.

KSI Vehicle Collision | KSI Bicycle Collision | KSI Pedestrian Collision | Non-KSI Collision

Collision History (2012-2016)

Notable Collision Patterns

Potential Improvements

Homestead Road Corridor Improvements

Collision analysis and community feedback indicated that a number of corridor-wide improvements would help improve user comfort and safety along Homestead Road including:

- Lane width reduction to 11’ where feasible
- Buffered bike lane where feasible
- Green pavement marking in conflict zones
- Speed feedback signs and enforcement
- Improved street lighting
- Directional curb ramps to assist pedestrians with visual impairment
- Painted or thermoplastic pavement markings in place of existing markers

Signalized Intersection Improvements

A majority of collisions for all modes in this segment occurred at or near the existing signalized intersections. Providing the following features would help to improve safety at those locations:

- High-visibility crosswalks
- Accessible pedestrian signals (APS) with count down timers
- Passive in-crosswalk pedestrian detection
- Bicycle detection
- Leading pedestrian intervals (LPI)
- 12" vehicle signal heads
- Improved traffic signal timing
- Pedestrian refuge islands where feasible
- Protected left-turn signals on Homestead Road at Heron Avenue

Mary Avenue between Remington Drive and Fremont Avenue

SunnyvaleVisionZero
Priority Project Location 10

This study area extends 0.5 miles along Mary Avenue between Remington Drive and Fremont Avenue. The corridor is served by VTA Bus Route 53, and major destinations in the vicinity of the corridor include Westmoor Village Shopping Center, Sunnyvale Middle School, Walgreens, banks, and offices. Mary Avenue varies between 3 and 5 lanes with a speed limit of 35 miles per hour. There were 57 collisions on the project corridor between 2012 and 2016, including three severe/fatal collisions. Collisions on the corridor often involved speed. Other notable collision patterns were people walking or bicycling on the arterial, left turns at signalized intersections, and conflicting through movements at intersections.

Note: Collision locations are shown diagrammatically based upon distance from the reported intersection. The exact travel lane or location in the roadway for each collision is not reflected.

KSI Vehicle Collision ▲ KSI Bicycle Collision ▲ KSI Pedestrian Collision ▲ Non-KSI Collision ○

Collision History (2012-2016)

Notable Collision Patterns

Potential Improvements

Mary Avenue Corridor Improvements

Collision analysis and community feedback indicated that a number of corridor-wide improvements would help improve user comfort and safety along Mary Avenue including:

- Lane width reduction to 11′ where feasible
- Green pavement marking in conflict zones
- Speed feedback signs and traffic enforcement
- Improved street lighting
- Directional curb ramps to assist pedestrians with visual impairment
- ADA upgrades to meet current standards at all locations
- Southbound speed feedback sign near Sherwood Drive

Signalized Intersection Improvements

A majority of collisions for all modes in this segment occurred at or near the existing signalized intersections. Providing the following features would help to improve safety at those locations:

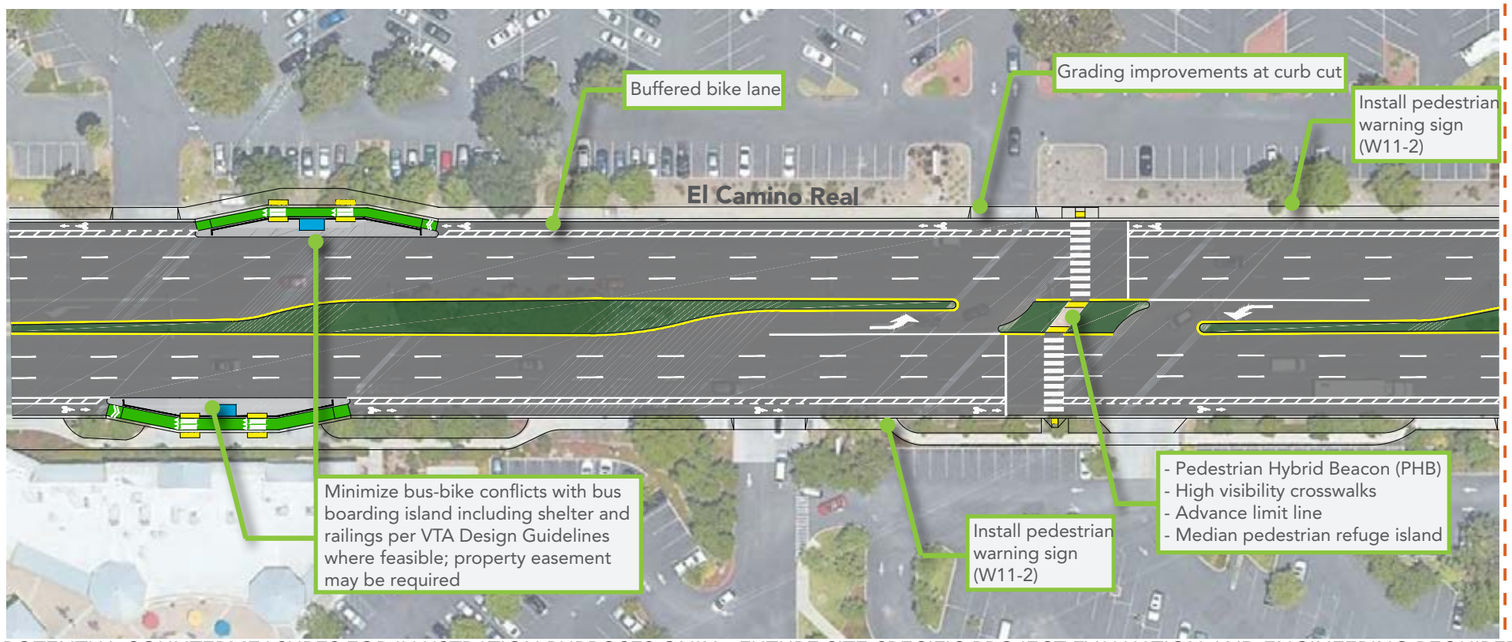
- High-visibility crosswalks
- Accessible pedestrian signals (APS) with countdown timers
- Increased pedestrian crossing time
- Adaptive pedestrian signal systems
- Bicycle detection
- Leading Pedestrian Intervals (LPI)
- Curb extensions to reduce turning radii
- Green marking in conflict zones and through intersections
- Potential protected intersection designs at Mary Avenue/Remington Drive and Mary Avenue/Fremont Avenue
- Median pedestrian refuge island
- Modify buffered bicycle lane striping on eastbound Fremont Avenue

Note: See Appendix E for corresponding conceptual layout.

E. PRIORITY PROJECT CONCEPTUAL LAYOUTS (3)

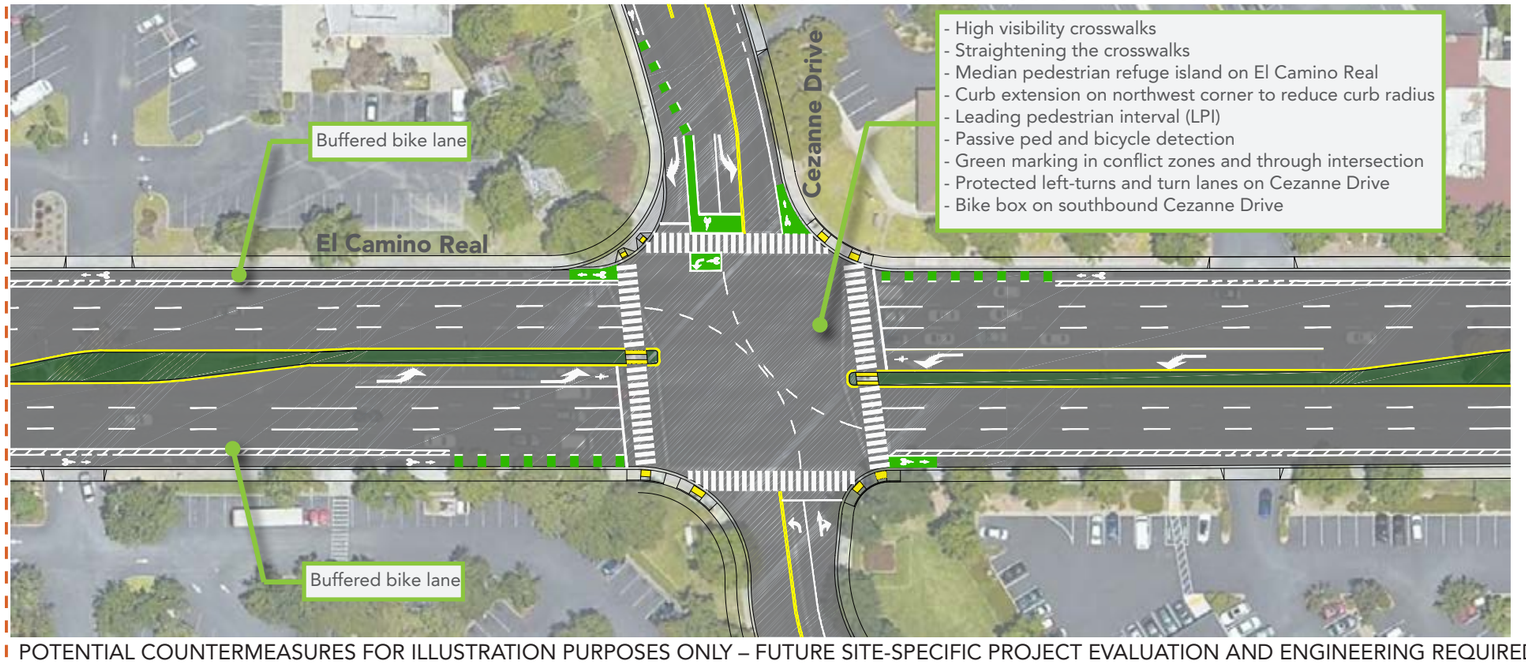
El Camino Real between S. Taaffe Street and S. Fair Oaks Avenue

SunnyvaleVisionZero
Conceptual Layout* - Priority Project Location 2



Match Line - See Below Left

POTENTIAL COUNTERMEASURES FOR ILLUSTRATION PURPOSES ONLY – FUTURE SITE-SPECIFIC PROJECT EVALUATION AND ENGINEERING REQUIRED.



Match Line - See Above Right

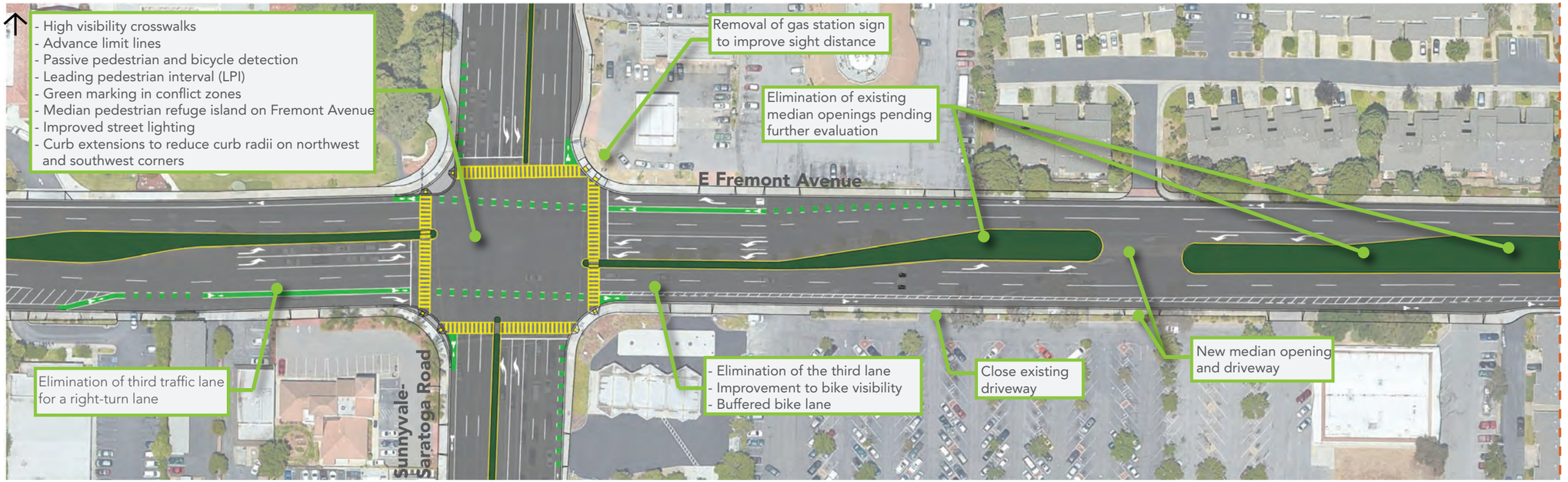
POTENTIAL COUNTERMEASURES FOR ILLUSTRATION PURPOSES ONLY – FUTURE SITE-SPECIFIC PROJECT EVALUATION AND ENGINEERING REQUIRED.

** Three priority projects were chosen as representative examples for further development as conceptual layouts. They represent an array of discrete contexts, typologies, and challenges. The conceptual layouts do not represent proposed improvements at specific locations, but rather allow stakeholders and residents to visualize potential real-life applications of various countermeasures and treatments in familiar contexts.*

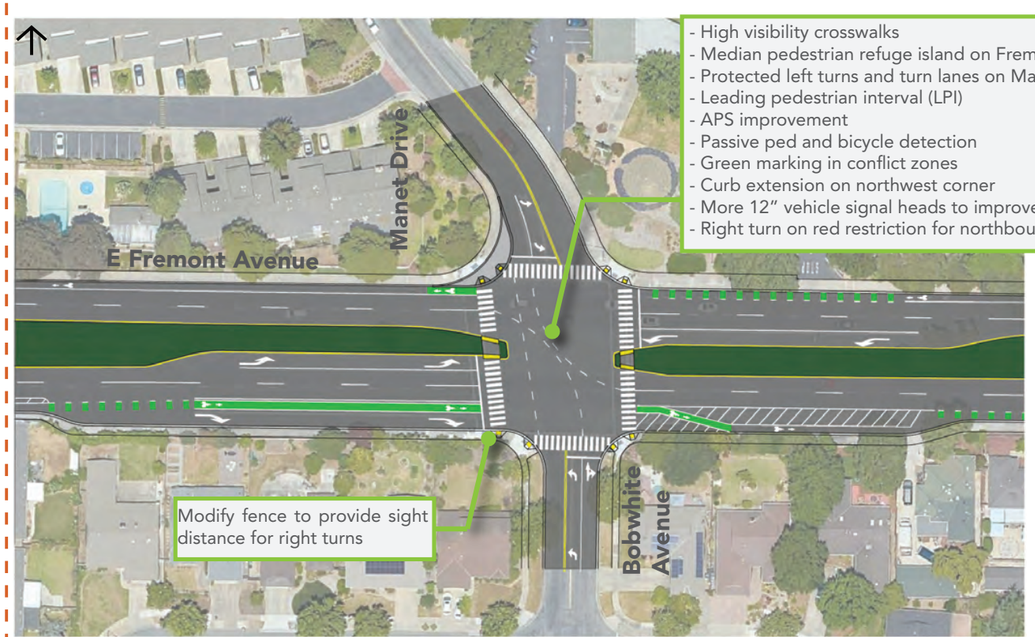
These were utilized to conduct walking tours along the three selected priority project corridors to collect feedback from participants about the potential improvements. Based on the comments received, the drawings were refined to produce the final conceptual layouts. The resulting conceptual layouts depict treatments that could be applied at a variety of locations throughout the City based on the outcome of further evaluation, engineering analysis, and design development.

Fremont Avenue between Sunnyvale-Saratoga Road and Floyd Avenue

SunnyvaleVisionZero
Conceptual Layout*
Priority Project Location 8



POTENTIAL COUNTERMEASURES FOR ILLUSTRATION PURPOSES ONLY – FUTURE SITE-SPECIFIC PROJECT EVALUATION AND ENGINEERING REQUIRED.



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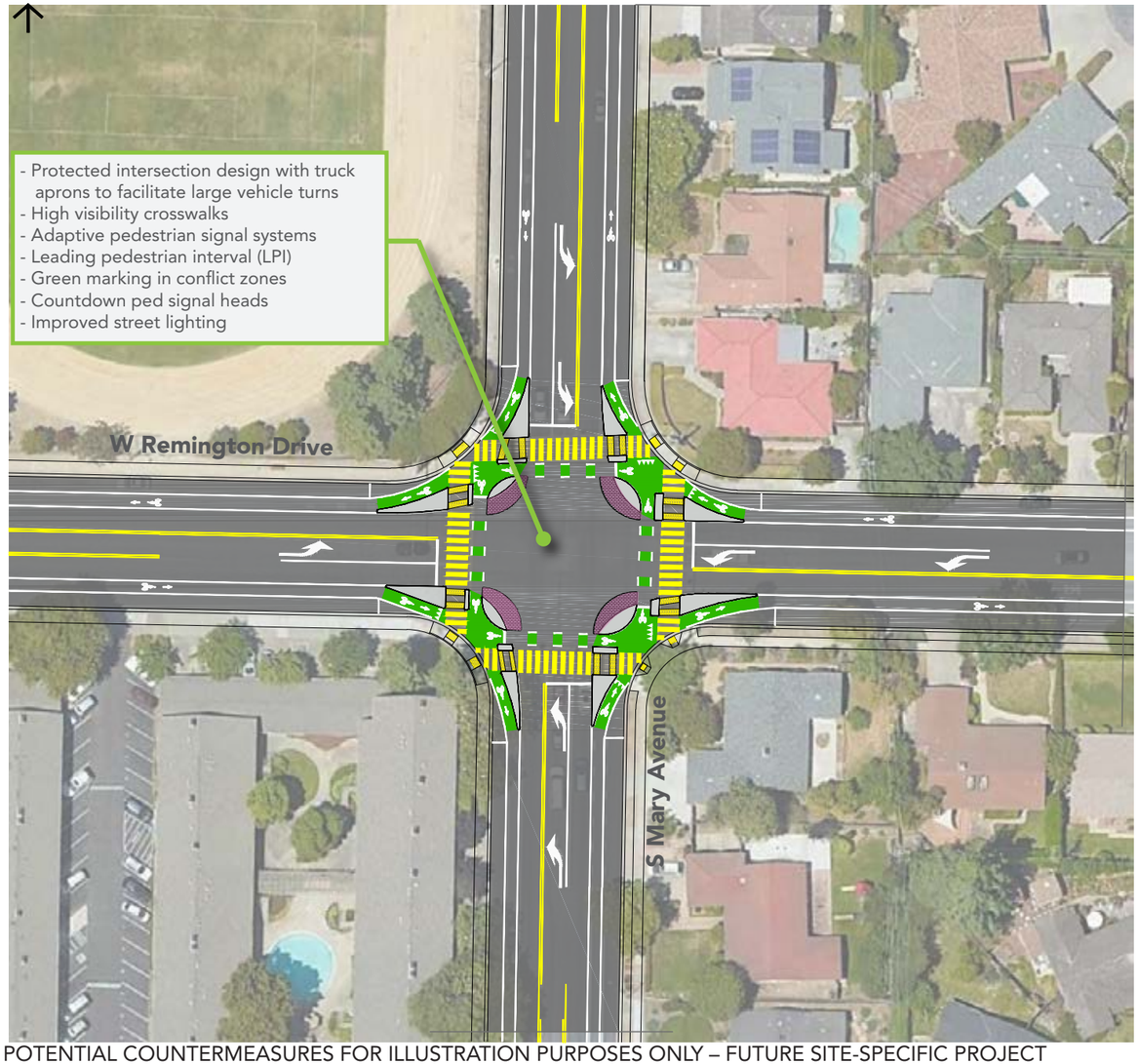
Mary Avenue between Remington Drive and Fremont Avenue

SunnyvaleVisionZero
Conceptual Layout* - Priority Project Location 10



POTENTIAL COUNTERMEASURES FOR ILLUSTRATION PURPOSES ONLY – FUTURE SITE-SPECIFIC PROJECT EVALUATION AND ENGINEERING REQUIRED.

S Mary Avenue/W Remington Drive

POTENTIAL COUNTERMEASURES FOR ILLUSTRATION PURPOSES ONLY – FUTURE SITE-SPECIFIC PROJECT EVALUATION AND ENGINEERING REQUIRED.

S Mary Avenue/Ticonderoga Drive

** Three priority projects were chosen as representative examples for further development as conceptual layouts. They represent an array of discrete contexts, typologies, and challenges. The conceptual layouts do not represent proposed improvements at specific locations, but rather allow stakeholders and residents to visualize potential real-life applications of various countermeasures and treatments in familiar contexts.*

These were utilized to conduct walking tours along the three selected priority project corridors to collect feedback from participants about the potential improvements. Based on the comments received, the drawings were refined to produce the final conceptual layouts. The resulting conceptual layouts depict treatments that could be applied at a variety of locations throughout the City based on the outcome of further evaluation, engineering analysis, and design development.