

**DATE:** February 22, 2023

**TO:** Bicycle/Pedestrian Advisory Committee

**FROM:** Priyoti Ahmed, Transportation Planner  
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**SUBJECT:** **Vision Zero Action Plan/Local Road Safety Plan**

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**RECOMMENDATION**

Receive information on the progress of the integrated Vision Zero Action Plan and Local Road Safety Plan and provide feedback on the proposed list of Local Road Safety Plan locations and projects.

**BACKGROUND**

On [December 10, 2019](#), the City Council adopted a Vision Zero Policy, which established a goal of reaching zero fatal traffic collisions by 2030. Policy deliberation was supported by Vision Zero analysis, which examined crash data to identify the City's High Injury Network (HIN), key crash contributing factors (including speed, DUIs, and encroaching on pedestrian rights-of-way), and other issues related to fatal and severe injury crashes (such as disproportionate effects on pedestrians, cyclists, males, young adults, and seniors). Council also received information on draft actions that might be included in a Vision Zero Action Plan (VZAP). These actions cover the 7Es: Engineering, Education, Encouragement, Engagement, Emergency response, Evaluation, and Enforcement.

In 2020, the City hired a consultant (Nelson\Nygaard) to prepare an integrated VZAP and Local Road Safety Plan (LRSP). This integrated plan will be a living document that provides a framework for identifying, analyzing, and prioritizing roadway safety improvements in Mountain View. The integrated plan will encompass interdepartmental collaboration and the 7Es approach associated with Vision Zero, a systemic safety analysis and roadway improvements.

On [January 27, 2021](#), the Bicycle/Pedestrian Advisory Committee (BPAC) received information on LRSP development and bicycle collision data. The BPAC provided feedback on fatal and severe injury crash data analysis that identified primary collision factors, vulnerable users, and roadway characteristics associated with fatal and severe injury crashes. On [March 30, 2022](#), the BPAC received an update on the status of initial Vision Zero actions and provided feedback on the proposed LRSP countermeasures toolbox and prioritization framework. The proposed

countermeasures and prioritization framework is applied to develop a list of locations and propose safety improvements at those locations. The BPAC also received information on Vision Zero approaches in Mountain View and San Jose on [August 22, 2022](#).

## **ANALYSIS**

### **Key Findings from Crash History Analysis**

The crash analysis from 2014 to 2019 resulted in about 1,200 total crashes, including 64 severe injuries and 13 fatalities. Based on the crash analysis, roadway and land use factors associated with a higher-than-average incidence of fatal and severe injury collisions in Mountain View include:

- Streets with a posted speed of 35 mph or above (20% of streets in Mountain View, 73% of fatal and severe injury crashes);
- Intersections of 35 mph streets with 25 mph streets (50% of fatal and severe injury crashes);
- Signalized intersections (30% of fatal and severe injury crashes);
- Two-way, stop-controlled intersections (18% of all fatal and severe injury crashes, 45% of fatal and severe injury crashes involving people walking); and
- Commercial areas and Precise Plan areas, including downtown Mountain View (60% of crashes, about 40% of land area).

### **Identification of Emphasis Area**

The crash and systemic analysis along with BPAC and public feedback determined the eight emphasis areas of the VZAP and LRSP. These emphasis areas reflect the topics that need to be addressed to achieve the goals of the Vision Zero Policy. Each emphasis area includes specific goals, strategies, and potential funding opportunities (Attachment 1) and could inform potential capital projects.

The eight emphasis areas are:

1. High Injury Network (HIN)
2. Equity Priority Locations
3. Safe Routes for Schools and Older Adults
4. Pedestrian Crossings
5. Bicycle Safety
6. Driver Behavior

7. Speed Management
8. Data and Technology

**Identification of Key Segments and Intersections**

In addition to identifying emphasis areas, the systemic safety analysis identified key locations for safety countermeasures. These locations are primarily along the HIN and intersections with a high rate of fatal and severe injury crashes from 2014 to 2019. Street segments are listed in Table 1, intersections with high pedestrian and bicycle collisions are shown in Table 2 and Figure 1, and intersections with high motor vehicle collisions are shown in Table 3.

**Table 1: Key Street Segments, 2014 to 2019**

<b>Corridor</b>	<b>Segment</b>	<b>High Injury Network</b>	<b>Fatal and Severe Injury Crash Location</b>	<b>Systemic Analysis*</b>
Amphitheatre Parkway	Full extent		Yes	
California Street	Rengstorff Avenue to Shoreline Boulevard	Yes		
California Street	West of Rengstorff Avenue	Yes		
Castro Street	Full extent	Yes		
Central Expressway	Shoreline Boulevard to Bernardo Avenue	Yes		
Charleston Road	Full extent		Yes	
Cuesta Drive	Miramonte Avenue to Grant Road			Yes
Dana Street	Calderon Avenue to Moorpark Road			Yes
Middlefield Road	East of State Route 85	Yes		
El Camino Real	East of Grant Road	Yes		
El Camino Real	Rengstorff Avenue to Castro Street	Yes		
El Monte Avenue	Full extent		Yes	
Ellis Street	Full extent	Yes		
Evelyn Avenue	Full extent		Yes	
Fairchild Drive	Leong Drive to Ellis Street			Yes
Garcia Avenue	Bayshore Boulevard to Amphitheatre Parkway			Yes
Grant Road	City limit to El Camino Real		Yes	

Corridor	Segment	High Injury Network	Fatal and Severe Injury Crash Location	Systemic Analysis*
Latham Street	West of Shoreline Boulevard		Yes	
Miramonte Avenue	El Camino Real to City limits			Yes
Moffett Boulevard	Full extent		Yes	
North Whisman Road	Central Expressway to Fairchild Drive		Yes	
Old Middlefield Way	Full extent	Yes		
Rengstorff Avenue	Central Expressway to Middlefield Road	Yes		
Rengstorff Avenue	El Camino Real to Central Expressway	Yes		
Rengstorff Avenue	North of Middlefield Road	Yes		
San Antonio Road	Full extent (CMV)	Yes		
Shoreline Boulevard	Central Expressway to Middlefield Road	Yes		
Shoreline Boulevard	El Camino Real to Central Expressway	Yes		Yes
Shoreline Boulevard	North of Middlefield Road	Yes		
Sierra Vista Avenue	Full extent		Yes	
Villa Street	Full extent		Yes	

\*Posted speed 35 mph or above.

**Table 2: Key Intersections for Pedestrians and Bicyclists, 2014 to 2019**

Location	Ped/Bike Crashes	Severe Injury Crashes	Fatal Crashes
Shoreline Boulevard and Villa Street	9	0	0
Showers Drive and Latham Street	6	1	0
Rengstorff Avenue and Latham Street	5	1	0
Charleston Road and Huff Avenue	5	0	1
El Monte Avenue and Marich Way	4	0	1
El Camino Real and Dale Avenue	3	1	0
Sylvan Avenue/The Americana and El Camino Real	3	2	0
San Antonio Road and Fayette Drive	3	1	0
Ortega Avenue and Latham Street	3	1	0



Figure 1: Key Intersections for Pedestrians and Bicycle Safety Countermeasures, 2014 to 2019

**Table 3: Key Intersections for Motor Vehicles, 2014 to 2019**

Location	Total Motor Vehicle Crashes	Severe Injury Crashes	Fatal Crashes
Middlefield Road and State Route 237 on-/off-ramps	43	2	0
Franklin Street and California Street	10	0	0
El Camino Real and Shoreline Boulevard	10	0	0
Plymouth Street and Joaquin Road	8	0	0
West El Camino Real and Phyllis Avenue	8	0	0
Moffett Boulevard and Central Avenue	6	1	0
Rengstorff Avenue and Old Middlefield Way	5	1	0
Moffett Boulevard and State Route 85 ramp	3	0	1
Chiquita Avenue and California Street	2	1	0
Castro Street and El Camino Real	1	1	0
Ellis Street and Fairchild Drive	1	1	0

**Prioritization Criteria**

Prioritization criteria were developed to prioritize key street segments and intersections for the installation of countermeasures. These criteria include the history and severity of crashes, proven effectiveness, equity, proximity to key destinations, and implementation. Proven effectiveness and implementation criteria will be considered during the capital improvement program (CIP) process. The other three criteria are described below as applied to the key street segments and intersections listed in Tables 1, 2, and 3.

The applied prioritization criteria include:

1. **Severity of Crashes**: This criterion is consistent with City’s Vision Zero policy and Caltrans LRSP goals and metrics. The criterion weighs crash severity based on crash cost estimates from [Caltrans’ Local Roadway Safety Manual](#). Total weighted crash cost is based on the number of crashes at each severity level in the project location.

**Table 4: Scoring for Severity of Crashes**

Crash Type	Weight
Fatal and Severe Injury	20
Other Visible Injury	2
Complaint of Pain	1

Total Crash Weight per Corridor	Quintile-Based Score
< 51	1
52 - 75	2
76 - 115	3
116 - 135	4
136 - 290	5

2. **Equity:** This criterion is consistent with General Plan Policies related to equitable distribution of amenities. The metrics associated with equity are household income and vulnerable road users (i.e., bicyclists, pedestrians, seniors, youth, and people with disabilities).

**Table 5: Scoring for Equity**

Element	Data Source	Weight/Score	
The low-income population within 1/4 mile (percent of the total population)	U.S. Census American Community Survey 2020 five-year estimates	Above Citywide rate (23.7%)	1
		Below the Citywide rate (23.7% and below)	0
Limited English-speaking households within 1/4 mile (percent of the total population)	U.S. Census American Community Survey 2020 five-year estimates	Above Citywide rate (9.6%)	1
		Below the Citywide rate (9.6% and below)	0
Vulnerable parties	Crash history and level of stress	Both things are true: - High-stress location for biking or walking - Higher than average number of bicycle and pedestrian crashes or fatalities	2
		One of these things is true: - High-stress location for biking or walking - Higher than average number of bicycle and pedestrian injury crashes	1
		Neither of these things is true: - High-stress location for biking or walking - Higher than average number of bicycle and pedestrian injury crashes	0

3. **Proximity to Key Destinations:** This criterion improves accessibility to destinations that are pedestrian and bicyclist attractors and locations that should be accessible for all modes of transportation. Key destinations include schools, parks/open spaces, commercial centers, senior centers, senior living communities, health-care facilities, and libraries.

**Table 6: Scoring for Proximity to Key Destination**

Element	Data Source	Weight/Score	
Proximity to school (suggested route to school)	City GIS	Within 1/4-mile of a school or on a designated school route	2
		Within 1/2-mile of a school but not on a designated school route	1
		More than 1/2-mile and not on a designated school route	0

**Prioritized Key Segments and Intersections**

The above criteria were applied to all key segments and intersections to develop a prioritized list of key segments and intersections. As shown in Tables 7 and 8, the Rengstorff Avenue corridor was rated as the highest LRSP priority in the City followed by El Camino Real, Shoreline Boulevard, California Street, and El Monte Avenue. The City is already addressing safety concerns on many of the identified street segments and intersections through City CIP projects and private development projects.

**Table 7: Scored Key Segments and Existing Projects**

Full Corridor	Segment	Total Score	Existing Projects	Scheduled? (Y/N)
South Rengstorff Avenue	El Camino Real to Central Expressway	11	N/A	N
West El Camino Real	Rengstorff Avenue to Castro Street	10	El Camino Real Pedestrian and Bicycle Improvements	Y
North Shoreline Boulevard	Central Expressway to Middlefield Road	10	Stierlin Road Bike and Ped (Montecito Avenue to Middlefield Road)	Y/N
North Rengstorff Avenue	Central Expressway to Middlefield Road	10	N/A	N



Full Corridor	Segment	Total Score	Existing Projects	Scheduled? (Y/N)
California Street	Rengstorff Avenue to Shoreline Boulevard	10	California Street Pilot Project California Complete Street Improvements	Y
South Shoreline Boulevard	El Camino Real to Central Expressway	9	Bicycle/Pedestrian Improvements, (Shoreline Boulevard from Wright Avenue to Villa Street)	N
East El Camino Real	East of Grant Road	9	El Camino Real Pedestrian and Bicycle Improvements	Y
El Monte Avenue	Full extent	8	El Monte Corridor Improvements	Y
Ellis Street	Full extent	8	East Whisman Area Transit-Oriented Development Improvements, Phase II: Ellis Street Improvements	Y
San Antonio Road	Full extent (CMV)	8	N/A	N
East Middlefield Road	East of State Route 85	7	State Route 237/ Middlefield Road Interchange Improvements Middlefield Bikeway and Repaving	Y
Latham Street	West of Shoreline Boulevard	7	Shoreline/Church-Latham Intersection Signal Improvements	Y
Grant Road	City Limits to El Camino Real	7	Grant Road and Sleeper Avenue Intersection Improvements	Y
Villa Street	Full extent	7	Speed humps with development, Escuela Avenue to Shoreline Boulevard	Y / N

<b>Full Corridor</b>	<b>Segment</b>	<b>Total Score</b>	<b>Existing Projects</b>	<b>Scheduled? (Y/N)</b>
California Street	West of Rengstorff Avenue	7	California Complete Street Improvements	Y
North Rengstorff Avenue	North of Middlefield Road	7	N/A	N
Central Expressway	Shoreline Boulevard to Bernardo Avenue (Santa Clara County)	7	N/A	N
East Evelyn Avenue	Full extent	6	Evelyn Avenue Bikeway, 24-xx	Y
Amphitheatre Parkway	Full Extent	6	N/A	N
Old Middlefield Way	Full extent	7	N/A	N
North Whisman Road	Central Expressway to Fairchild Drive	6	N/A	N
Miramonte Avenue	El Camino Real to City Limits	6	Miramonte Avenue Pavement Improvements, El Camino Real to Cuesta Drive	Y/N
Sierra Vista Avenue	Full extent	6	N/A	Y
Cuesta Drive	Miramonte Avenue to Grant Road	6	N/A	N
East Dana Street	Calderon Avenue to Moorpark Way	5	N/A	N
West Dana Street	Pettis Avenue to Calderon Avenue	5	N/A	N
Garcia Avenue	Bayshore Parkway to Amphitheatre Parkway	4	Google Charleston Phase 2/3	Y



Figure 2: Scored Key Segments

**Table 8: Scored Key Intersections and Existing Projects**

Intersection	Total Score	Existing Projects	Scheduled ? (Y/N)
Castro Street and El Camino Real	9	El Camino Real Ped/Bike Improvements + Castro Bikeway Feasibility	Y
Showers Drive and Latham Street	8	NTMP Upgrades	Y
Independence Avenue and Middlefield Road	8	N/A	N
Charleston Road and Amphitheatre Parkway	8	Google Charleston Corridor Improvements Phase 2 and 3	N
Ortega Avenue and Latham Street	8	N/A	N
San Antonio Road and Fayette Drive	8	N/A	N
Charleston Road and Huff Avenue	7	Transit Corridor and bikeway class I	Y
Moffett Boulevard and State Route 85	7	N/A	N
Rengstorff Avenue and Old Middlefield Way	7	N/A	N
California Street and Pacchetti Way	7	Bike improvements (NW corner)	Y/N
Whisman Road and Middlefield Road	6	N/A	N
Flynn Avenue and Whisman Road	6	N/A	N
Shoreline Boulevard and Amphitheatre Parkway	6	N/A	N
East El Camino Real and Grant Road	5	El Camino Real Pedestrian and Bicycle Improvements	Y
Sierra Vista Avenue and Hackett Avenue	5	N/A	N
Mountain Shadows Drive and Shoreline Boulevard	5	N/A	N
Rengstorff Avenue and San Ramon Avenue	5	N/A	N
Charleston Road and Independence Avenue	5	N/A	N
Bryant Avenue and Shady Spring Lane	4.5	N/A	N
Madison Drive and Van Buren Circle	4	N/A	N
Evelyn Avenue and Bernardo Avenue	4	Bernardo Avenue Undercrossing	N (Planning)
Rengstorff Avenue and Plymouth Street	4	N/A	N



Figure 3: Scored Key Intersections

Based on the ongoing projects below are the top-scored corridors and intersections where there are no scheduled improvements planned:

1. Prioritized Key Segments:
  - a. Rengstorff Avenue, El Camino Real to U.S. 101.
  - b. Shoreline Boulevard from El Camino Real to Montecito Avenue
  - c. San Antonio Road (City of Mountain View)
  - d. Villa Street from Shoreline Boulevard to Calderon Avenue
  - e. Old Middlefield Way
  - f. North Whisman Road
  - g. Miramonte Avenue (Castro Street to El Camino Real and Cuesta Drive to City border)
  - h. Sierra Avenue
  - i. Cuesta Drive
  - j. East Dana Street
  - k. West Dana Street
  
2. Prioritized Key Intersections:
  - a. Independence Avenue and Middlefield Road
  - b. Ortega Avenue and Latham Street
  - c. San Antonio Road and Fayette Drive
  - d. California Street and Pacchetti Way
  - e. Whisman Road and Middlefield Road
  - f. Flynn Avenue and Whisman Road
  - g. Shoreline Boulevard and Amphitheatre Parkway
  - h. Sierra Vista Avenue and Hackett Avenue
  - i. Mountain Shadows Drive and Shoreline Boulevard
  - j. Rengstorff Avenue and San Ramon Avenue
  - k. Charleston Road and Independence Avenue
  - l. Bryant Avenue and Shady Spring Lane
  - m. Madison Drive and Van Buren Circle

### **Project Description**

Based on the prioritized key segments and intersections, LRSP proposes seven safety projects that include multiple Federal Highway Administration (FHWA) proven countermeasures to address specific crash types and reduce severe and fatal injuries. Proposed projects are:

1. Rengstorff Streetscape Plan: Rengstorff Avenue is a 2.7-mile long arterial run from El Camino Real to Charleston Road that includes diverse land uses, including affordable housing, commercial districts, parks, schools, community center, and senior center. In

2019, [AccessMV](#) identified this corridor as a priority corridor. The road is also part of the suggested routes to school for Castro and Crittenden Middle School. The Rengstorff Streetscape Plan will develop corridorwide multi-modal improvement concepts through an analytical and public engagement process. Improvements to be considered include Class IV protected bikeways, speed management strategies, a road diet, improved intersection (lighting, extension lines), signage, crosswalk improvements, bike intersection treatments, such as bike box or bicycle crossing line, protected left turn, and Rectangular Rapid Flash Beacons (RRFB).

2. [Shoreline Boulevard Complete Street \(El Camino Real to Montecito Avenue\)](#): The California/Escuela/Shoreline Complete Streets Feasibility Study recommended multi-modal improvements along this corridor. The improvements include a Class IV bike lane (Villa Street to Wright Avenue), Class II bike lane (Wright Avenue to Montecito Avenue), on-/off-ramp intersection improvements, protected intersections, bulb-outs, and pedestrians leading intervals.



Figure 4: Shoreline Boulevard Concept Design

3. San Antonio Complete Streets Improvements: In the City of Mountain View, San Antonio Road runs from El Camino Real to Central Expressway. This 0.6-mile road generates a high multi-modal demand due to nearby residential housing and a robust commercial area. The San Antonio Complete Streets Feasibility Study will determine additional countermeasures that will improve safety in this corridor. The countermeasures to be considered may include pedestrian signal modifications, Class IV protected bike lanes, a road diet, curb radius reduction, bike intersection treatment, such as bike box or bicycle crossing line, high-visibility crosswalks, median crossing islands, improved intersection lighting, extension lines, and signage, and access management.
4. San Antonio Road and Fayette Drive Intersection Improvements: The proposed improvements may include bike and pedestrian signal modification (north and south leg), high-visibility crosswalks, median crossing island, bike box, and bicycle crossing marks. The next steps will require further traffic analysis, design, and construction.
5. California Street and Pacchetti Way Intersection Improvement: The proposed improvements at this intersection would include pedestrian signal modification, high-visibility crosswalk, median crossing, curb radius reduction, bike signal phasing, bike treatment, such as bike box and bicycle crossing markings, and improved intersection (lighting, extension lines, and signage). The next steps will require further traffic analysis, design, and construction.
6. Ortega Avenue and Latham Street Intersection Improvements: The proposed improvements at this intersection would include traffic-calming measures, such as a traffic circle, high-visibility crossing, and curb radius reduction. The next steps will require further traffic analysis, design, and construction.
7. Independence Avenue and Middlefield Road Intersection Improvements: The proposed improvements at this intersection would include bulb-outs, a median crossing island, and an improved intersection (lighting, extension lines, and signage). The next steps will require traffic analysis, design, and construction.

The consultant will provide support materials, such as cost estimates and project descriptions, to support grant applications for the projects addressing a limited number of the prioritized key segments and intersections.



## **DISCUSSION**

Staff seeks BPAC input on the following key questions:

1. Does the BPAC concur with prioritized key segments and intersections in Tables 7 and 8?
2. Does the BPAC have input on proposed project descriptions?

## **NEXT STEPS**

City staff will gather and incorporate community feedback through an in-person open house and online comment box. BPAC feedback on the prioritized locations, emphasis areas, and proposed projects will also be incorporated. In the upcoming months, staff will develop cost estimates and project descriptions for the projects and prepare the draft and final report for the integrated VZAP/LRSP.

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