

# Unincorporated San Mateo County Local Road Safety Plan

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DECEMBER 2022



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# 1. EXECUTIVE SUMMARY

## Background/Need

As part of California's Strategic Highway Safety Plan, the State of California announced a Call for Local Roadway Safety Plans (LRSP) Applications in 2020. A LRSP creates a framework to systematically identify and analyze safety concerns and recommend safety enhancements on local streets.

In 2020, the Department of Public Works was awarded a LRSP grant from the California Department of Transportation (Caltrans), in the amount of \$72,000 to develop the County's first Local Road Safety Plan for its unincorporated local roads. On April 21, 2020, the San Mateo County Board of Supervisors approved Resolution No. 077376 to accept funding from Caltrans. Since then, the Department has been in development of said plan.

Beginning in 2022, the State of California Highway Safety Improvement Program (HSIP) Calls-for-Projects will require local agencies to have a completed and adopted LRSP or an equivalent plan, to be eligible for federal HSIP funds. Other federal, state, or local aid programs may also require an adopted LRSP in order to be eligible for funding.

## Process

The LRSP was developed based on guidance from the California Department of Transportation's (Caltrans's) *Local Road Safety Manual* (<https://dot.ca.gov/-/media/dot-media/programs/local-assistance/documents/hsip/2020/lrsm2020.pdf>) and FHWA's Local Road Safety Plans website (<https://highways.dot.gov/safety/local-rural/local-road-safety-plans>) with input from these safety partners: California Department of Transportation, California Highway Patrol, San Mateo County Board of Supervisors, San Mateo County Office of Education, San Mateo County Office of Sustainability, San Mateo County Planning and Building, San Mateo County Unincorporated Bicycle and Pedestrian Advisory Committee. Three workshops were held with the safety partners, and they were instrumental in developing the methodology of analyzing past collision data and prioritizing roadways for improvements.

The LRSP analyzed collision data from the University of California Berkeley Transportation Injury Mapping System (TIMS) from 2014 through 2020, which collects injury data from the California Statewide Integrated Traffic Records System (SWITRS). SWITRS is a database that collects, and processes data gathered by law enforcement from a collision scene.

## Goals and Outcomes

The LRSP is targeting a goal of zero fatal collisions by 2035. To reach the goal of zero fatalities by 2035, this plan prioritizes roads and intersections would benefit most from safety improvements. The LRSP then identifies Caltrans approved countermeasures that would enhance safety of the County's roads. A list of priority roads and intersections, and possible countermeasures are shown in Tables 1-3.

The LRSP will be updated within 5 years as new data becomes available. The update will evaluate efforts made since the approval of the plan and will re-evaluate the priority roads and countermeasures list.

Table 1: Selected Countermeasures for Priority Road Segments

Street Name	Install Bike Lanes	Install Separated Bike Lanes	Install Chevrons	Install Curve Warning Signs	Install Delineators and Reflectors on Median	Install Edgelines	Install Edgelines and Centerlines	Install Rapid Rectangular Flashing Beacons	Install/Upgrade Crossing with Enhanced Safety	Restrict Parking	Road Diet	Install Rumble Strips
4th Ave								X	X			
5th Ave	X <sup>1</sup>						X <sup>1</sup>	X	X			
Alameda de las Pulgas	X <sup>2</sup>										X <sup>2</sup>	
Alpine Rd				X <sup>3</sup>								
Avy Ave							X					
Bay Rd	X						X	X	X		X	
Canada Rd		X	X	X								X
Cloverdale Rd							X <sup>4</sup>					X
Country Club Dr							X					
Edgewood Rd				X			X					
Golf Course Dr	X										X	
Guadalupe Canyon Pkwy		X									X <sup>5</sup>	X
Harbor Blvd	X							X	X		X	
Higgins Canyon Rd				X			X					
Hillside Blvd	X							X	X		X	
Middlefield Rd	X							X	X		X <sup>6</sup>	
Old La Honda Rd				X								
Pescadero Creek Rd		X	X	X								
Ringwood Ave							X					
Sand Hill Rd	X <sup>7</sup>							X	X		X	
Santa Cruz Ave	X							X	X		X <sup>8</sup>	
Skyline Blvd							X					
Tunitas Creek Rd		X	X	X		X						
Verde Rd							X					
Westborough Blvd					X							
Winding Wy						X				X		
Wurr Rd						X						

<sup>1</sup> Buffered green bike lanes and edgelines installed in 2021

<sup>2</sup> Under final design

<sup>3</sup> Conceptual study completed

<sup>4</sup> For portion south of Butano State Park

<sup>5</sup> Under conceptual design

<sup>6</sup> In construction under Middlefield Road Improvement Project

<sup>7</sup> Bike lane gap at I-280 interchange under conceptual plan

<sup>8</sup> Under final design



Table 2: Selected Countermeasures for Priority Unsignalized Intersections

Primary Street	Secondary Street	Install intersection lighting	Convert to all-way stop control	Install signals	Convert Intersection to roundabout	Install/upgrade larger or additional warning/regulatory signs	Upgrade intersection pavement markings	Install flashing beacons at stop-controlled Intersections	Install flashing beacons as advance warning	Create directional median openings to allow/restrict left/U-turns	Install raised medians/refuge island	Install pedestrian crossings at uncontrolled locations with enhanced safety features	Install rectangular rapid flashing beacon	Install pedestrian signal (HAWK)
Alpine Rd	Interstate 280			X <sup>9</sup>	X	X		X	X					
State Route 82	Selby Lane	X		X	X					X	X	X	X	X <sup>10</sup>
State Route 1	Cypress Ave		X	X	X	X	X		X		X			
Spring St	Warrington Ave		X									X	X	
Montgomery Ave	San Carlos Ave		X <sup>11</sup>											
State Route 1	Medio Ave										X	X	X	X
State Route 1	Virginia Rd										X	X	X	X
Edgewood Rd	Canada Rd				X	X								
Edgewood Rd	Crestview Dr				X	X								
Middlefield Rd	6 <sup>th</sup> Ave											X	X	X
Middlefield Rd	2 <sup>nd</sup> Ave			X								X	X <sup>12</sup>	X

<sup>9</sup> Conceptual study completed, pending funding for design development

<sup>10</sup> Town of Atherton completed conceptual design, pending further funding

<sup>11</sup> All-way stops control completed

<sup>12</sup> Rectangular Rapid Flashing Beacons under construction under Middlefield Road Improvement Project

Table 3: Selected Countermeasures for Priority Signalized Intersections

Primary Street	Secondary Street	Install/upgrade larger or additional warning/regulatory	Upgrade intersection pavement markings	Install flashing beacons as advance warning	Create directional median openings to allow/restrict left/U-	Install raised medians/refuge Island	Improve signal hardware	Improve signal timing	Install raised pavement markers and striping through intersection	Modify signal phasing to implement a Leading Pedestrian Interval
State Route 1	Capistrano Ave		X			X	X	X	X	X
Alameda de las Pulgas	Valparaiso Ave		X							X
Middlefield Road	5 <sup>th</sup> Ave		X				X	X	X	X
Ralston Ave	State Route 92	X		X						

## 2. INTRODUCTION

### Background

The Unincorporated San Mateo County Local Road Safety Plan is a living document that aims to reduce fatal and severe injury collisions on its roadways. The plan will:

- Provide a systemic safety and collision analysis of the road network in unincorporated San Mateo County, excluding state highways except at intersections with County-maintained roads;
- Identify high risk locations and collision patterns;
- Develop a list of systemic low-cost and longer-term countermeasures;
- Develop a plan to help secure funding to implement countermeasures.

The Local Road Safety Plan is consistent with the State of California’s Strategic Highway Safety Program (SHSP). An SHSP is a statewide data-driven traffic safety plan that coordinates a wide range of organizations to reduce traffic-related fatalities and serious injuries on all public roads. The LRSP will contribute to the success of the SHSP, while giving the County an opportunity to address their unique safety needs.

The California Highway Safety Improvement Program (HSIP) is a statewide program that aims to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned public roads and roads on tribal land. The program provides funding for roadway safety improvement projects to agencies with an approved LRSP. California’s HSIP funds are split between the State HSIP for state highways and the Local HSIP for local roads maintained and operated by local jurisdictions. This LRSP was developed based on the guidance from the *Caltrans Local Road Safety Manual*.

### Vision & Goals

The County of San Mateo’s vision is to ensure all users of our roadways can get to their destinations safely. The County will use a data-driven approach along with consultation with our partners to achieve the following goals:

- Reduce the number of fatal crashes to Zero by 2035.
- Implement proven safety solutions systemically to reduce severe crashes by 50% by 2035.

### Safety Partners

Three workshops were held with Safety Partners. These meetings were instrumental in guiding the process of acquiring and analyzing data, selecting emphasis areas, developing safety strategies, and implementing the final plan. The partners are listed below.

#### **Safety Partner**

*California Department of Transportation*

*California Highway Patrol*

*San Mateo County Board of Supervisors*

*San Mateo County Office of Education*

*San Mateo County Office of Sustainability*

*San Mateo County Health*

*San Mateo County Planning and Building*

*San Mateo County Unincorporated Bicycle and Pedestrian Advisory Committee*

#### **Representative**

*Elliot Goodrich*

*Demian Warner*

*Michael Barber*

*Vanessa Castro*

*Joel Slavitt*

*Belen Seara*

*Sonali Suratkar*

*Chanda Singh*

*Elaine Salinger*



## Definitions

- **Active-Mode** – Bicycling or Walking
- **Automobile Right of Way** – Improper yielding to a vehicle with the right of way
- **Bulbout** – Widening of sidewalks at crosswalks to reduce road crossing distance
- **Caltrans** – California Department of Transportation
- **FHWA** – Federal Highway Administration
- **Primary Collision Factors Violation Category** – The primary factor and violation that led to the collision
  - **Driving or Bicycling Under the Influence of Alcohol or Drug**
  - **Unsafe Speed** – Vehicles traveling at speeds greater than is reasonable or prudent
  - **Improper Passing** – Overtaking another vehicle improperly
  - **Improper Turning** – Turning improperly at intersections and roadway curves
  - **Automobile Right of Way** - Vehicles observing vehicle right-of-way improperly
  - **Pedestrian Right of Way** – Vehicles observing the pedestrian right-of-way improperly
  - **Pedestrian Violation** – Pedestrian observing a vehicle right-of-way improperly
  - **Traffic Signals and Signs** - Not observing the rules of a particular signal or sign
  - **Unsafe Starting or Backing** – Entering the travel way unsafely
- **Road Diet** – Removing one (1) or more lanes of a roadway with four (4) or more total lanes to build infrastructure for other modes such as walking and bicycling

*Figure 1: New Buffered Bicycle Lane and Reduced Lane Widths on Guadalupe Canyon Parkway*



### 3. PROCESS

#### Analyze Collision Data

San Mateo County collects traffic collision data from the UC Berkeley Transportation Injury Mapping System (TIMS), which draws from the California Statewide Integrated Traffic Records System (SWITRS). SWITRS is a database that collects, and processes data gathered by law enforcement from a collision scene. The data will determine the Emphasis Areas that have the greatest potential to reduce fatal and severe injury collisions with interventions.

#### Determine Emphasis Areas

The County will determine its Emphasis Areas based on areas with the most fatal and severe injury collisions. The County will also pick areas with significant pedestrian and bicycle collisions, as people walking and bicycling are more vulnerable users of the road.

#### Identify Strategies

The County will apply the most appropriate proven FHWA countermeasures based on types of collision, primary collision factor, and roadway characteristics to determine the right strategies.

#### Prioritize and Implement Strategies

The projects identified in the Emphasis Areas are all priority projects. They will be implemented as funding is secured.

#### Evaluation and Update Plan

Data will be collected and analyzed every 5 years to understand efficacy and update the plan as needed. The bicycling community has also expressed an interest in evaluating informal data such as “near-misses”, “perceived risks”, etc. into the LRSP. Future updates of the LRSP will evaluate the appropriateness of using informal data



## 4. EXISTING EFFORTS

The County is actively working to improve its roadways' safety and efficiency. The County routinely reviews collision data and requests from the public to determine improvements. These improvements range from signage to pavement marking refreshes to road diets that improve safety for all users of the roadway.

### **Signage and Pavement Maintenance**

The County has an ongoing effort to monitor all its traffic signs, including their condition and retroreflectivity. Existing signs will be replaced on a regular schedule to maintain the County's standard for visibility. The County also reviews and maintains its traffic markings and pavement condition to ensure safe use of the roadway.

### **Pedestrian and Bicycle Infrastructure Enhancements**

The County meets regularly with community groups and stakeholders, such as the San Mateo County Bicycle and Pedestrian Advocacy Committee, San Mateo County Office of Sustainability, local schools, and Silicon Valley Bicycle Coalition. From those groups, the County receives feedback on potential roadway enhancements that are important to them. Examples of recent enhancements include installation of Rapid Rectangular Flashing Beacons for pedestrian crosswalks at Palo Alto Way and Santa Cruz Ave and enhanced green pavement markings for bicycle lanes along 5<sup>th</sup> Avenue in North Fair Oaks.

### **Unincorporated San Mateo County Active Transportation Plan (ATP)**

Active transportation refers to any type of human-powered transportation including walking, rolling, and biking. Active transportation plans, or bicycle and pedestrian plans, are intended to give planners, engineers, advocates, and policymakers the tools they need to build safe, comfortable, and convenient facilities for walking and biking in communities. The County of San Mateo Office of Sustainability led the development of this plan, which was adopted in 2021 by the Board of Supervisors.

As part of the planning process, thousands of community members and stakeholders were engaged through in-person workshops and pop-up events, surveys, interactive online tools, and presentations to community councils and other community partners. Throughout this engagement, community members shared their input for recommendations improving pedestrian crossings and dedicated bikeways as well as a desire to rethink how space is allocated on roadways, considering current needs and future demand.

The ATP serves as a starting point and a guide for future decisions about active transportation improvements throughout unincorporated county communities. The ATP is available for review here:

<https://www.smcsustainability.org/livable-communities/active-transportation/unincorporated-smc-active-transportation-plan/>.

### **Middlefield Road Improvement Project**

Middlefield Road is the main thoroughfare of the North Fair Oaks Core Retail Sector. There are four (4) lanes of traffic with street parking and sidewalks. The area has significant pedestrian and bicycle activity yet lacks some of the infrastructure consistent with contemporary core urban retail corridors, such as wide sidewalks and dedicated bike lanes. It has also been one location where data show a large number of fatal and severe injury collisions.

In the past few years, the County has made some improvements to make the corridor more pedestrian-friendly, including installation of Rectangular Rapid Flashing Beacons at many of the uncontrolled intersections and concrete bulbouts to increase pedestrian visibility and reduce crossing distance. However, there are larger

changes planned for the corridor.

The corridor is under construction to reconfigure Middlefield Road between Pacific Avenue and Fifth Avenue to a three-lane (one lane in each direction with a center two-way left turn lane) roadway with parallel parking, bike lanes, and wider sidewalks. Expanded sidewalk would be constructed to accommodate street amenities, such as benches, landscaping, streetlights, trash receptacles, street art, public spaces, wayfinding signage, and low-impact development for stormwater management. To learn more about the Middlefield Road Improvement Project, visit <https://www.smcgov.org/publicworks/middlefield-road-improvement-project>.

### **Santa Cruz Avenue Corridor Project**

Santa Cruz Avenue (From Sand Hill Road to Alameda de las Pulgas) and Alameda de las Pulgas (From Santa Cruz Ave to Avy Ave) is a minor four to five (4 to 5) lane corridor road in West Menlo Park. It was primarily constructed for vehicle travel, as there are no dedicated bike facilities and very narrow paths under five (5) feet wide. There is significant bike usage and an interest from the community for better pedestrian facilities. The County worked with a community task force for nearly three years to determine potential improvements. Ultimately, the task force, with feedback from the larger community, supported a road diet on Alameda de las Pulgas and Santa Cruz Avenue to provide improved bike and pedestrian facilities. The road diet consists of removing one travel lane in the southbound direction to provide wider pedestrian paths and dedicated bike lanes in the corridor.

The County recently completed an interim improvement by providing bulbouts and a Rapid Rectangular Flashing Beacon at Palo Alto Way and Santa Cruz Ave. The County has begun design and environmental review for the full corridor which is scheduled to be complete in 2023.

### **Ringwood Avenue and Coleman Avenue Study**

Over the last two decades, the City of Menlo Park and County of San Mateo have conducted a series of studies that described walking, biking, and safety needs on Coleman Avenue and Ringwood Avenue. These included the 2021 Unincorporated San Mateo Active Transportation Plan, the Menlo Park Transportation Master Plan, and the Menlo Atherton High School Expansion Study. The County Office of Sustainability and the City of Menlo Park secured the services of a consultant to engage the public in discussion for street improvements on these corridors to improve the safety and comfort of all roadway users. Study updates can be found at <https://www.smcsustainability.org/colemanringwoodwalkbike>.

### **Safe Routes to School San Mateo County**

There are 15 schools that have completed Safe Routes to School evaluation in unincorporated San Mateo County. The County also participates in the evaluation of schools in near proximity of County maintained roads. The Public Works Department partners with the San Mateo County Office of Education, which leads the Safe Routes to School program. The intent of the program is to enable and encourage children to safely walk or bike to school. The program is modeled after the National Safe Routes to School Program, which focuses activities around a “6 E” framework: education, encouragement, engineering, enforcement, evaluation, and equity. Together, the County and Safe Routes to School Program actively partner to delivery projects that provide safer walking and bicycling routes to school.



*Table 4: Schools in Unincorporated San Mateo County*

<b>School Name</b>	<b>Address</b>
El Granada Elementary	400 Santiago Street, Half Moon Bay
Fair Oaks Elementary	2950 Fair Oaks Avenue, Redwood City
Farallone View Elementary	1100 Le Conte Ave, Montara, CA 94037
Garden Village Elementary	208 Garden Lane, Daly City, CA
Garfield Elementary	3600 Middlefield Road, Menlo Park,
Highlands Elementary	2320 Newport St, San Mateo
Hillside Elementary	1400 Hillside Blvd. South San Francisco
Holy Angels Elementary	20 Reiner Street, Colma
Kings Mountain Elementary	211 Swett Road, Woodside
La Honda Elementary	450 Sears Ranch Road, La Honda
Los Lomitas Elementary	299 Alameda de las Pulgas, Atherton
Pescadero Elementary	P.O. Box 189, 620 North Street, Pescadero
Pescadero Middle/High	P.O. Box 730, 350 Butano Cutoff, Pescadero
Ponderosa Elementary	295 Ponderosa Road, South San Francisco
Woodland Elementary	360 LaCuesta Drive, Portola Valley

**Enforcement**

The California Highway Patrol is responsible for enforcement of traffic laws in the unincorporated roads of San Mateo County. The County’s Sheriff’s office is responsible for all other law enforcement functions in unincorporated County of San Mato. As the Public Works Department identifies potential road safety issues due to driver behavior, the County notifies the Highway Patrol for targeted enforcement. The California Highway Patrol is also notified when operational changes are made to County-maintained roads.

**Education**

The Public Works Department routinely provides roadway safety education to community groups and committees upon request. This includes participation in Safe Routes to School audits, walking audits for green street improvements, and community-based workshops for specific projects.

**Emergency Services**

Any roadway changes will need to consider emergency response time and Fire Department requirements. For projects with significant changes to existing traffic patterns, Fire, Highway Patrol, and other emergency responders are part of the discussion regarding changes to the roadway network.

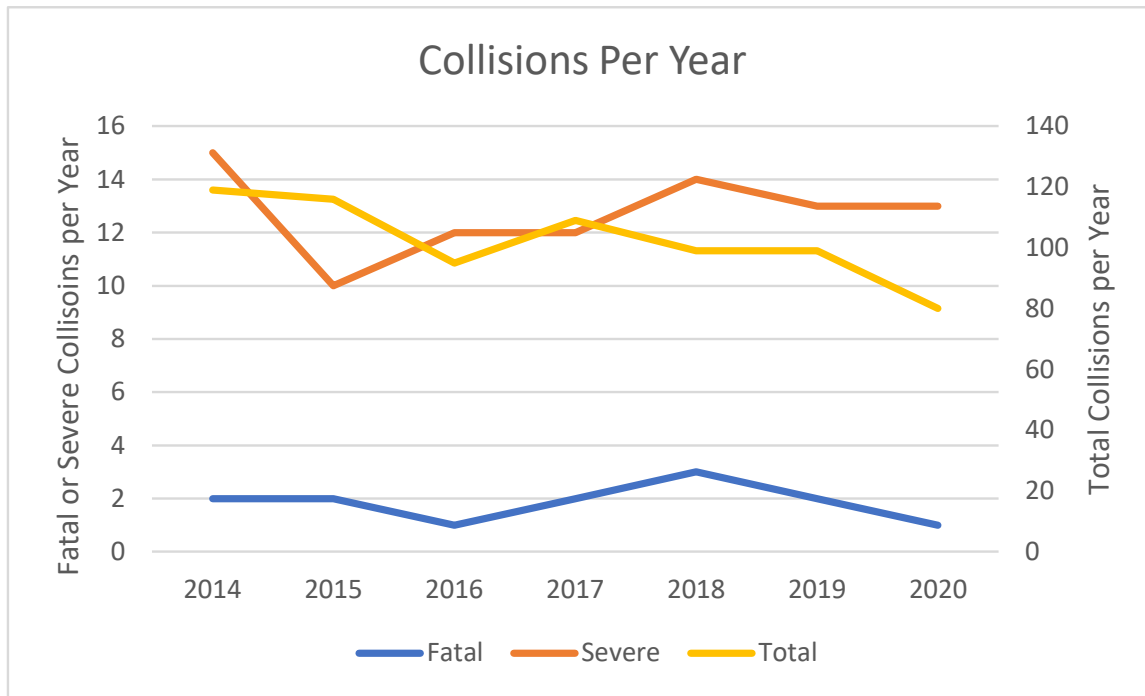
## 5. DATA SUMMARY

### Unincorporated San Mateo County Local Roads<sup>13</sup>

This section presents a summary of the Unincorporated San Mateo County’s collision data. The County analyzed traffic collision data from the University of California Transportation Injury Mapping System (TIMS). The database is compiled from California Highway Patrol and local police-reported collisions from the Statewide Integrated Traffic Records System (SWITRS). This dataset has been identified by Caltrans’ Local Road Safety Manual as a good formal source of data for planning purposes. Here are key metrics for Unincorporated San Mateo County:

Miles of Road:	316
Study Period:	2014 – 2020 <sup>14</sup>
Total Severe Injury Collisions:	76
Total Fatal Collisions:	13
Total Injury Collisions:	717

Figure 2: Collision Trends in Unincorporated County of San Mateo



Between 2014 and 2020, the number of total collisions has trended downward. However, the number of fatal and severe collisions have stayed relatively the same every year.

The top violations cited for fatal and severe collisions are speeding, improper turning, driving/biking under the influence and improper yielding of right-of-way.

<sup>13</sup> State Routes were not part of this analysis except at intersections with unincorporated County maintained roads.

<sup>14</sup> 2020 is the latest data available at the time this report was written.

A comprehensive evaluation of these records provides a descriptive analysis of collision data at the countywide level, which is the basis for identifying study intersection and corridors. More detailed collision data was extracted for key study intersections and corridors, including by mode, collision type, forming the basis for collision-based countermeasures listed in this plan.

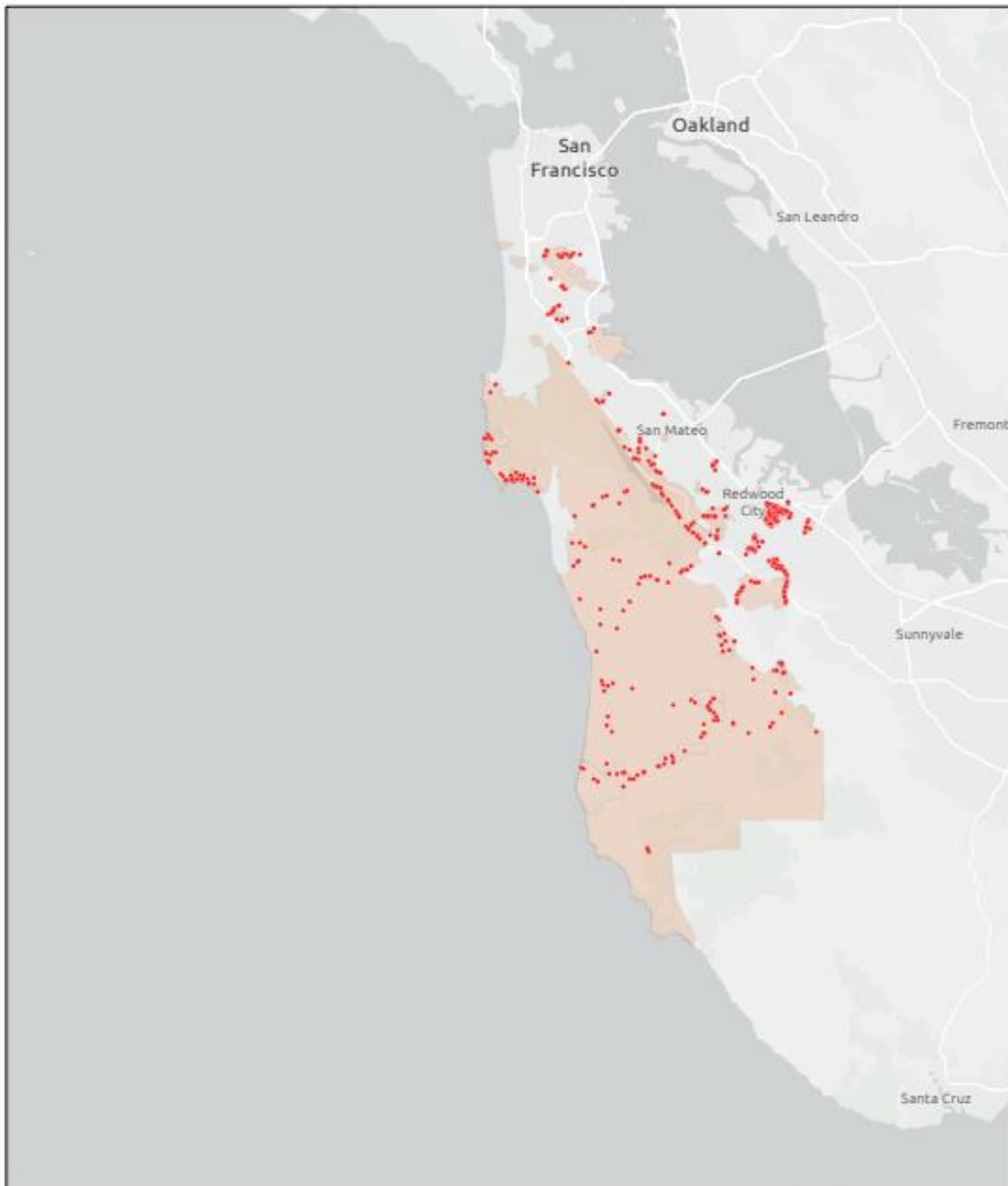
Figure 3: Top Violations of Severe and Fatal Collisions 2014-2020



The top correlated violations with severe and fatal collisions are unsafe speeds, improper turning, driving/biking under the influence, and automobile right of way.

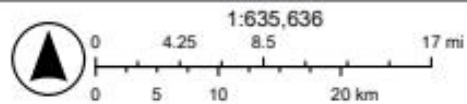


Figure 4: All Injury Collisions in the Unincorporated County of San Mateo (2014-2020)



7/14/2022

- All Collisions
- Unincorporated County of San Mateo



## 6. Future Priority Road Improvements and Emphasis Area Analysis

To determine and prioritize future improvements to the County’s roads, an analysis was done on the Road Segments and Intersections.

### Road Segments

For segments, two lists were adapted from C/CAG’s Youth-Based High Injury Network. The Youth-Based High Injury Network takes a composite of:

- Severe Collisions - 10x weight given to collisions where any victim is killed or severely injured
- Youth-Involved Collisions – 10x weight for any victim under the age of 18
- Active Mode-Involved Collisions – 10x weight for any victim that is a bicyclist or pedestrian

More information about Youth-Based High Injury Network can be found in C/CAG’s report in Appendix A and on C/CAG’s website at <https://ccag.ca.gov/programs/transportation-programs/safe-routes-to-school/>.

For the purpose of this plan, the twenty roads with the highest severe collision densities and twenty roads with the highest active mode involved collision density were prioritized for future improvements. An analysis of the primary collision factors<sup>15</sup> common on these roads determine the Emphasis Areas they belong to and possible countermeasures that would reduce the likelihood of future collisions. These roads can be found in Table 6. Full maps of the collisions and roadway segments can be found in Appendix B.

### Intersections

For intersections, a list of the top 15 intersections with the most collisions (weighted) were identified in Table 5 below. Intersections will be their own Emphasis Area and with a set of countermeasures.

*Table 5: Intersections with Most Collisions (Equity Priority Communities Highlighted)*

Rank	Street1	Street2	Collisions	Top Violations	Signal?
1	State Route 1	Capistrano Ave	8	Unsafe Speed, Pedestrian Right-of-Way	Yes
2	Alpine Rd	Interstate 280	7	Traffic Signals and Signs, Unsafe Speed	No
3	State Route 82	Selby Lane	6	Automobile Right of Way <sup>16</sup>	No
4	Alameda de las Pulgas	Valparaiso Ave	5	Automobile Right of Way	Yes
5	State Route 1	Cypress Ave	5	Automobile Right of Way	No
6	Middlefield Road	5 <sup>th</sup> Ave	4	Traffic Signals and Signs	Yes
7	Spring St	Warrington Ave	4	Traffic Signals and Signs, Automobile Right of Way	No
8	Montgomery Ave	San Carlos Ave	4	Traffic Signals and Signs, Automobile Right of Way	No
9	State Route 1	Medio Ave	4	Automobile Right of Way	No
10	State Route 1	Virginia Rd	4	Automobile Right of Way	No
11	Edgewood Rd	Canada Rd	4	Automobile Right of Way	No
12	Edgewood Rd	Crestview Dr	4	Automobile Right of Way	No
13	Ralston Ave	State Route 92	3	Traffic Signals	Yes
14	Middlefield Rd	6 <sup>th</sup> Ave	3	Automobile Right of Way	No
15	Middlefield Rd	2 <sup>nd</sup> Ave	3	Automobile Right of Way	No

<sup>15</sup> Primary Collision Factor is the category of violation as indicated the reporting officer as the likely cause of the collision.

<sup>16</sup> Automobile Right of Way means improper yielding to a vehicle with the right of way.

Table 6: Priority Road Segments by Severity and Active Mode Involved Collisions, and Emphasis Area (Equity Priority Communities Highlighted)

Street Name	Primary Collision Factor							Ped Bike	Emphasis Area				
	Automobile Right of Way	Unsafe Speed	Improper Turning	Driving Under the Influence	Hazardous Parking	Pedestrian Violation	Pedestrian Right of Way		Wrong Side of Road	High Active Mode Collisions	1) Unsafe Speeds and Turning on Urban/Suburban Roads	2) Roads with Pedestrian/Bicycle Collisions	3) Roadway Departure on Mountainous/Rural Roads
<b>High Severity Collision Roads</b>													
Middlefield Rd	X	X							X	X	X		
Sand Hill Rd	X	X	X						X	X	X		
Alpine Rd	X	X							X		X	X	
Pescadero Creek Rd		X	X	X								X	X
State Route 1	X	X	X										
Wurr Rd		X											
State Route 82		X	X	X					X	X	X		X
Skyline Blvd		X	X	X									X
Westborough Blvd			X						X	X	X		
Old La Honda Rd		X	X									X	
Bay Rd	X	X							X	X	X		
Avy Ave			X						X	X	X		
Higgins Canyon Rd			X						X			X	
Guadalupe Canyon Parkway		X	X	X					X				X
Santa Cruz Ave	X								X	X	X		
Tunitas Creek Rd		X									X	X	
Edgewood Rd	X	X								X	X		
State Route 84		X										X	
Winding Wy					X							X	
Harbor Blvd			X			X	X		X	X	X		
Kings Mountain Road		X	X									X	
<b>High Active Mode Involved Collision Roads Not Listed Above</b>													
Ringwood Ave		X							X	X	X		
Alameda de las Pulgas	X		X						X	X	X		
Country Club Dr									X	X	X		
Canada Rd	X	X							X	X	X		
5th Ave	X		X	X					X	X	X		X
4th Ave	X								X	X	X		
Cloverdale Rd		X	X					X	X		X	X	
Golf Course Dr	X								X	X	X		
Verde Rd		X							X	X			
Hillside Blvd		X							X	X	X		

Equity Priority Community

After reviewing the data, the County found these Emphasis Areas:

1. Unsafe speeds and improper turning on suburban roads.
2. Pedestrian, bicycle, and intersectional conflicts on urban/suburban roads.
3. Unsafe speeds and roadway departures on winding, mountainous roads.
4. Driving Under the Influence

The locations range in land use type, from urban, suburban, to rural. Each area has its unique challenges and will require different countermeasures, as will be discussed in the following sections. The countermeasures and their associated IDs are selected from Caltrans’s Local Roadway Safety – A Manual for California’s Local Road Owners.

**Emphasis Area 1: Unsafe Speeds and Turning on Suburban Roads**

The County has many roads that are very wide but with very low traffic volumes, leading to high speeds and improper turning. Data shows that many collisions were caused by unsafe speeds or improper turning. This is seen in particular on Guadalupe Canyon Parkway in the San Bruno Mountains, Canada Road near San Mateo, Alpine Road near Stanford, and Edgewood Road near Redwood City.

**Strategies for Emphasis Area 1:**

Caltrans Countermeasure ID	Engineering Countermeasures from Caltrans Local Roadway Safety - A Manual for California's Local Road Owners
NS04/NS05	<ul style="list-style-type: none"> <li>• Convert intersection to roundabout</li> </ul>
R14	<ul style="list-style-type: none"> <li>• Road Diet</li> </ul>
R15	<ul style="list-style-type: none"> <li>• Widen Shoulder</li> </ul>
R21	<ul style="list-style-type: none"> <li>• Enhanced pavement friction for horizontal curves</li> </ul>
R24	<ul style="list-style-type: none"> <li>• Install additional curve warning signs</li> </ul>
R26	<ul style="list-style-type: none"> <li>• Install speed radar feedback signs for use on Curves</li> </ul>
R28	<ul style="list-style-type: none"> <li>• Enhanced delineation for horizontal curves</li> </ul>
R30/R31	<ul style="list-style-type: none"> <li>• Longitudinal rumble strips</li> </ul>

**Emphasis Area 2: Roads with Pedestrian/Bicycle Collisions**

The roads in unincorporated areas of the county were originally developed for vehicles. As a result, many roads do not have good pedestrian and bicycle facilities. Over the past few years, the County has begun reconstructing roads to better serve all types of road users. For pedestrians, the data shows high incidences of drivers failing to yield to pedestrians at intersections, as well as pedestrians who cross on the road without yielding to vehicles. For bicycle collisions, the data show high incidences of unsafe speeds and improper turning, both for automobiles and bicyclists.

**Strategies for Emphasis Area 2:**

Caltrans Countermeasure ID	Engineering Countermeasures from Caltrans Local Roadway Safety - A Manual for California's Local Road Owners
R14	<ul style="list-style-type: none"> <li>• Road Diet</li> </ul>
S20PB	<ul style="list-style-type: none"> <li>• Install advance stop bar before crosswalk (Bike Box)</li> </ul>
S21PB	<ul style="list-style-type: none"> <li>• Modify signals with leading pedestrian intervals</li> </ul>
NS4/NS5	<ul style="list-style-type: none"> <li>• Convert intersection to roundabout</li> </ul>

NS07	<ul style="list-style-type: none"> <li>• Upgrade intersection pavement markings</li> </ul>
NS19PB	<ul style="list-style-type: none"> <li>• Install raised medians</li> </ul>
NS21PB	<ul style="list-style-type: none"> <li>• Install pedestrian crossings at uncontrolled locations with enhanced safety features</li> </ul>
NS23PB	<ul style="list-style-type: none"> <li>• Install Pedestrian Signal (HAWK)</li> </ul>
R32PB, R33PB	<ul style="list-style-type: none"> <li>• Install bike lanes/separated bike lanes</li> </ul>
R34PB	<ul style="list-style-type: none"> <li>• Install sidewalk/pathway if none exist</li> </ul>
R35PB	<ul style="list-style-type: none"> <li>• Install/upgrade pedestrian crossing (with enhanced safety features)</li> </ul>
R36PB	<ul style="list-style-type: none"> <li>• Install raised pedestrian crossing</li> </ul>
R37PB/NS22PB	<ul style="list-style-type: none"> <li>• Install Rapid Rectangular Flashing Beacons</li> </ul>

**Emphasis Area 3: Roadway Departure on Mountainous Roads**

The unincorporated County has many mountainous areas with winding roads with narrow lanes and little to no shoulder width for recovery. In these areas, the data shows many of crashes are either overturned vehicles or hitting objects on the side of the road.

**Strategies for Emphasis Area 3:**

Caltrans Countermeasure ID	Engineering Countermeasures from Caltrans Local Roadway Safety - A Manual for California's Local Road Owners
R04	Install guardrail
R15	Widen shoulder
R16	Curve shoulder widening
R19	Improve curve superelevation
R22	Install/upgrade signs with new fluorescent sheeting
R23	Install chevron signs on horizontal curves
R24/R25	Install curve advance warning signs with/without flashing beacon
R27	Install delineators, reflectors, and/or object markers
R28	Install edgelines and centerlines
R30/R31	Install centerline/edgeline rumble strips/stripes

**Emphasis Area 4: Driving Under the Influence**

(DUI) makes up a considerable (16%) portion of all fatal and severe-injury collisions. As this is a mainly a behavioral issue, the County will identify roads with significant DUI-related collisions, work with California Highway Patrol to enforce, and offer education to drivers on the dangers and consequences of a DUI.

**Strategies for Emphasis Area 4:**

Targeted education and enforcement of known DUI locations.

**Emphasis Area 5: Intersections**

The majority of unincorporated County intersections are non-signalized, meaning there is no traffic signal where two streets meet. They also have a wide variety of land-uses around them, including urban, suburban, and rural. Data show most collisions are caused by vehicles unable to yield to the proper right of way. Countermeasures for this Emphasis Area aim to reduce conflicts between vehicles.

**Strategies for Emphasis Area 5 (Unsignalized):**

<b>Engineering Countermeasures from Caltrans Local Road Safety Manual</b>	<b>Caltrans Countermeasure ID</b>
• Install intersection lighting	NS01
• Convert to all-way STOP control	NS02
• Install signals	NS03
• Convert Intersection to Roundabout	NS04/NS05
• Install/upgrade larger or additional warning/regulatory signs	NS06
• Upgrade intersection pavement markings	NS07
• Install flashing beacons at Stop-controlled Intersections	NS08
• Install flashing beacons as advance warning	NS09
• Improve sight distance to intersection	NS11
• Install splitter-islands on minor road approaches	NS13
• Install raised median on approaches	NS14
• Create directional median openings to allow/restrict left/U-turns	NS15
• Install left/right-turn lanes	NS17/NS18
• Install raised medians	NS19PB
• Install pedestrian crossings at uncontrolled locations with enhanced safety features	NS21PB
• Install Rectangular Rapid Flashing Beacon	NS23PB
• Install Pedestrian Signal (HAWK)	NS23PB

**Strategies for Emphasis Area 5 (Signalized):**

<b>Engineering Countermeasures from Caltrans Local Road Safety Manual</b>	<b>Caltrans Countermeasure ID</b>
• Install intersection lighting	S01
• Improve signal hardware	S02
• Improve Signal Timing	S03
• Install left-turn lane and add turn phase if not exists	S06
• Install raised pavement markers and striping through intersection	S09
• Install flashing beacons as advance warning	S10
• Install raised median on approaches	S12
• Convert intersection to roundabout	S16
• Install pedestrian countdown signal heads	S17PB
• Install pedestrian crossings	S18PB
• Pedestrian Scramble	S19PB
• Install advance stop bar before crosswalk	S20PB
• Modify signal phasing to implement a Leading Pedestrian Interval	S21PB

## **7. IMPLEMENTATION**

To implement the possible countermeasures identified in the previous section, the strategies are paired with road corridors and intersections. These are displayed in Table 7, Table 8, and Table 9. The Public Works Department will track, develop, and schedule these improvements in conjunction with its road maintenance schedule. Additionally, the County will also identify the most competitive projects for outside funding opportunities.

One major hurdle to implementation is funding as there are limited funds available to complete these improvements. However, the Public Works Department will coordinate, and incorporate these improvements in conjunction with its Capital Improvements Program as funding permits and will also seek outside funding opportunities. In addition, improvements identified the LRSP will need to be further evaluated during the planning and design phases for constructability and feasibility based on the existing roadway geometry and physical constraints of each site.



Table 7: Selected Countermeasures for Priority Road Segments

Street Name	Install Bike Lanes	Install Separated Bike Lanes	Install Chevrons	Install Curve Warning Signs	Install Delineators and Reflectors on Median	Install Edgelines	Install Edgelines and Centerlines	Install Rapid Rectangular Flashing Beacons	Install/Upgrade Crossing with Enhanced Safety	Restrict Parking	Road Diet
4th Ave								X	X		
5th Ave	X <sup>17</sup>						X	X	X		
Alameda de las Pulgas	X										X <sup>18</sup>
Alpine Rd				X <sup>19</sup>							
Avy Ave							X				
Bay Rd	X						X	X	X		X
Canada Rd		X	X	X							
Cloverdale Rd							X				
Country Club Dr							X				
Edgewood Rd							X				
Golf Course Dr	X										X
Guadalupe Canyon Pkwy		X									X <sup>20</sup>
Harbor Blvd	X							X	X		X
Higgins Canyon Rd				X			X				
Hillside Blvd	X							X	X		X
Middlefield Rd	X							X	X		X
Old La Honda Rd				X							
Pescadero Creek Rd		X	X	X							
Ringwood Ave				X			X				
Sand Hill Rd	X <sup>21</sup>							X	X		X
Santa Cruz Ave	X							X	X		X <sup>22</sup>
Skyline Blvd							X				
Tunitas Creek Rd		X	X	X		X					
Verde Rd							X				
Westborough Blvd					X						
Winding Wy						X				X	
Wurr Rd						X					

<sup>17</sup> Buffered green bike lanes installed in 2021

<sup>18</sup> Under final design

<sup>19</sup> Conceptual study completed

<sup>20</sup> Under conceptual design

<sup>21</sup> Bike lane gap at I-280 interchange under conceptual plan

<sup>22</sup> Under final design

Table 8: Selected Countermeasures for Priority Unsignalized Intersections

Primary Street	Secondary Street	Install intersection lighting	Convert to all-way stop control	Install signals	Convert Intersection to roundabout	Install/upgrade larger or additional warning/regulatory signs	Upgrade intersection pavement markings	Install flashing beacons at stop-controlled intersections	Install flashing beacons as advance warning	Create directional median openings to allow/restrict left/U-turns	Install raised medians/refuge Island	Install pedestrian crossings at uncontrolled locations with enhanced safety features	Install rectangular rapid flashing beacon	Install pedestrian signal (HAWK)
Alpine Rd	Interstate 280			X <sup>23</sup>	X	X		X	X					
State Route 82	Selby Lane	X		X	X					X	X	X	X	X <sup>24</sup>
State Route 1	Cypress Ave		X	X	X	X	X		X		X			
Spring St	Warrington Ave		X									X	X	
Montgomery Ave	San Carlos Ave		X <sup>25</sup>											
State Route 1	Medio Ave										X	X	X	X
State Route 1	Virginia Rd										X	X	X	X
Edgewood Rd	Canada Rd				X	X								
Edgewood Rd	Crestview Dr				X	X								
Middlefield Rd	6 <sup>th</sup> Ave											X	X	X
Middlefield Rd	2 <sup>nd</sup> Ave			X								X	X <sup>26</sup>	X

<sup>23</sup> Conceptual study completed, pending funding for design development

<sup>24</sup> City of Atherton completed conceptual design, pending further funding

<sup>25</sup> All-way stops control completed

<sup>26</sup> Rectangular Rapid Flashing Beacons under construction under Middlefield Road Improvement Project

Table 9: Selected Countermeasures for Priority Signalized Intersections

Primary Street	Secondary Street	Install/upgrade larger or additional warning/regulatory	Upgrade intersection pavement markings	Install flashing beacons as advance warning	Create directional median openings to allow/restrict left/U-	Install raised medians/refuge Island	Improve signal hardware	Improve signal timing	Install raised pavement markers and striping through intersection	Modify signal phasing to implement a Leading Pedestrian Interval
State Route 1	Capistrano Ave					X	X	X	X	X
Alameda de las Pulgas	Valparaiso Ave									X
Middlefield Road	5 <sup>th</sup> Ave						X	X	X	X
Ralston Ave	State Route 92	X		X						

## **8. EVALUATION AND FUTURE UPDATES**

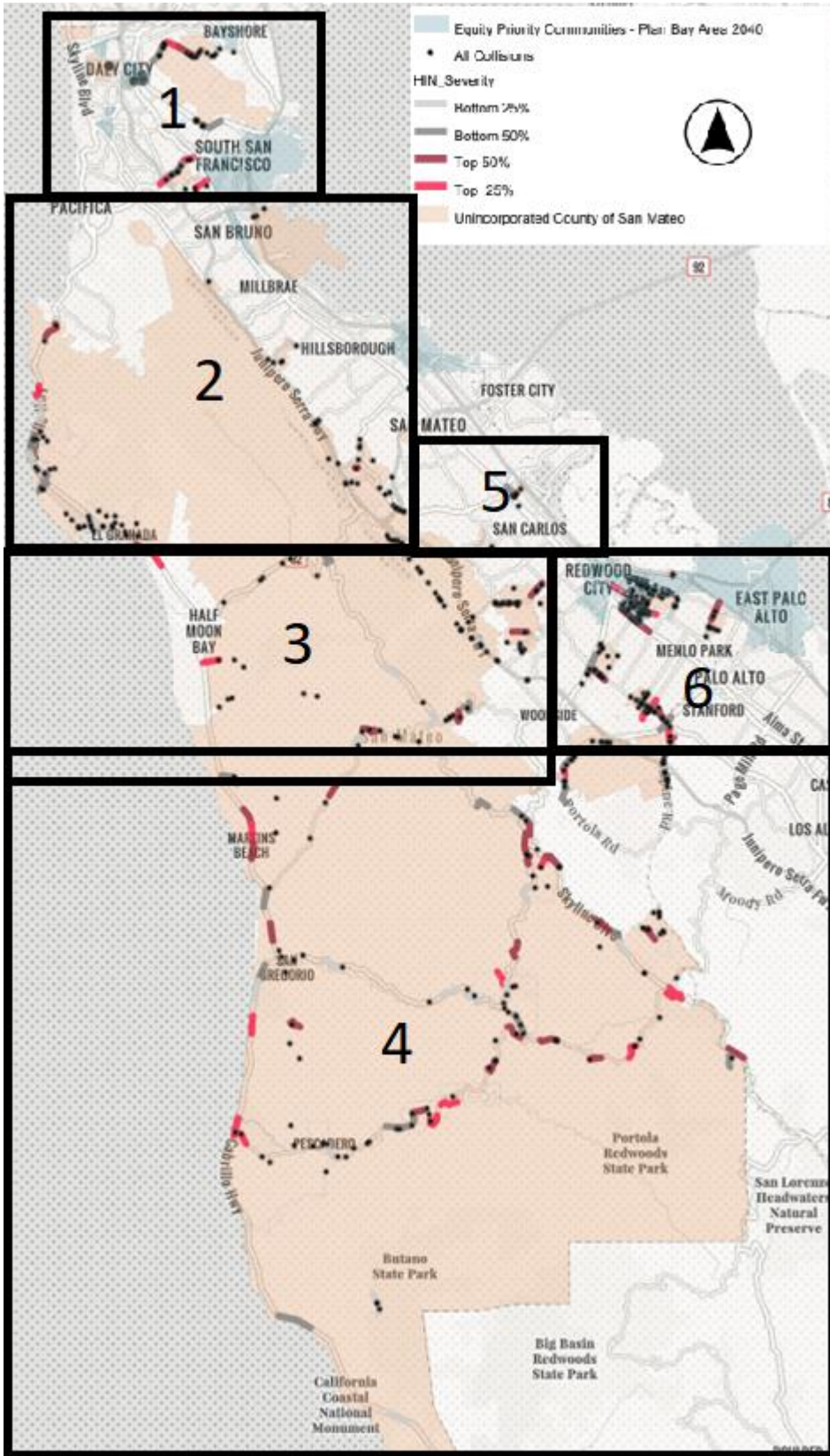
The County will continue to host meetings with stakeholders to discuss implementation of the plan and strategies for each emphasis area. The LRSP is a living document and will be re-evaluated with the stakeholder group and updated within 5 years with new data as it is made available. At that time, new collision data and other data would be evaluated over the new period.

## **9. APPENDICES**

### **APPENDIX A: C/CAG San Mateo County Safe Routes to School High Injury Network**

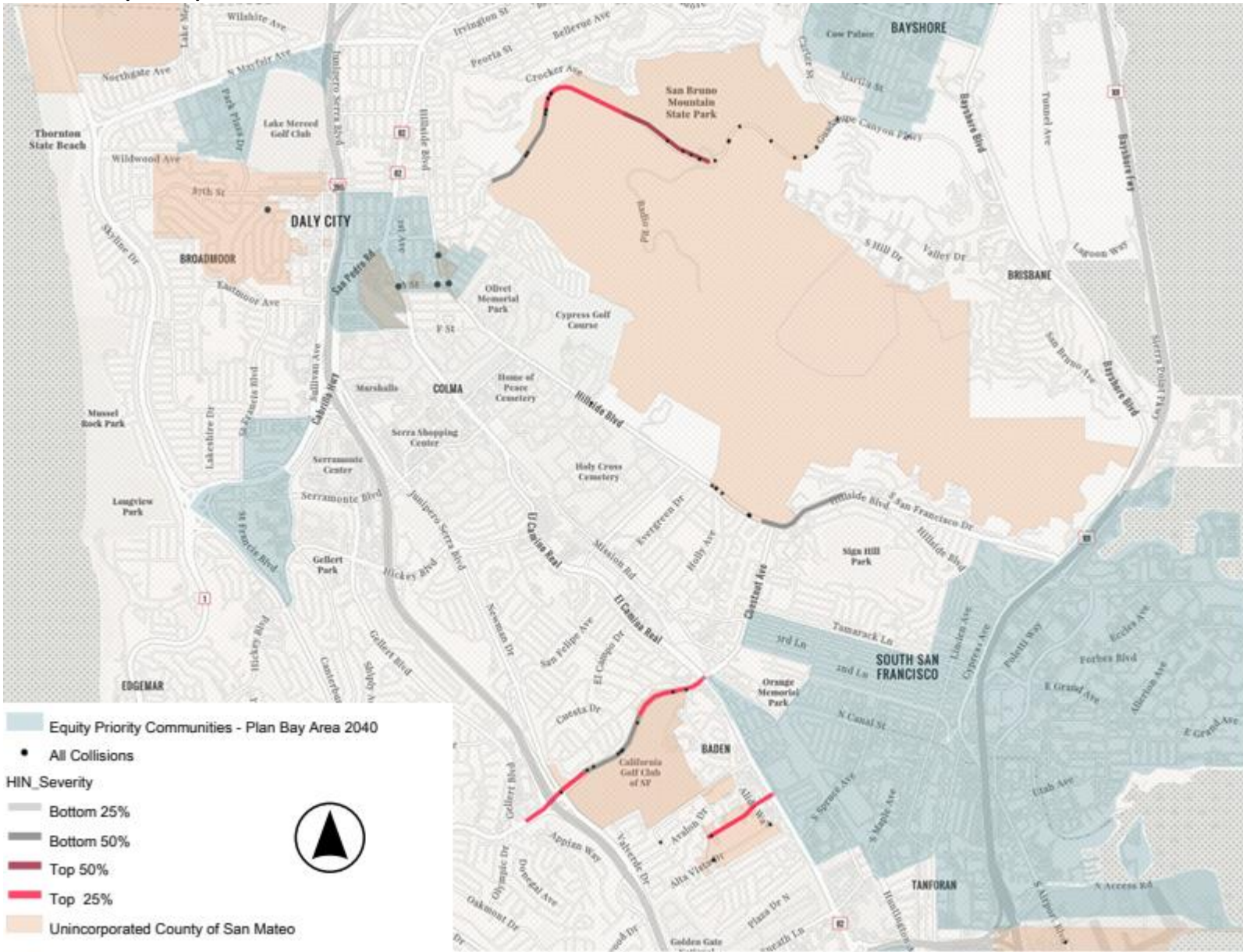
## **APPENDIX B: COLLISION MAPS**

# B1 – High Severity Weighted Collision Maps





1 - Broadmoor/Colma/San Bruno Mountains and South San Francisco



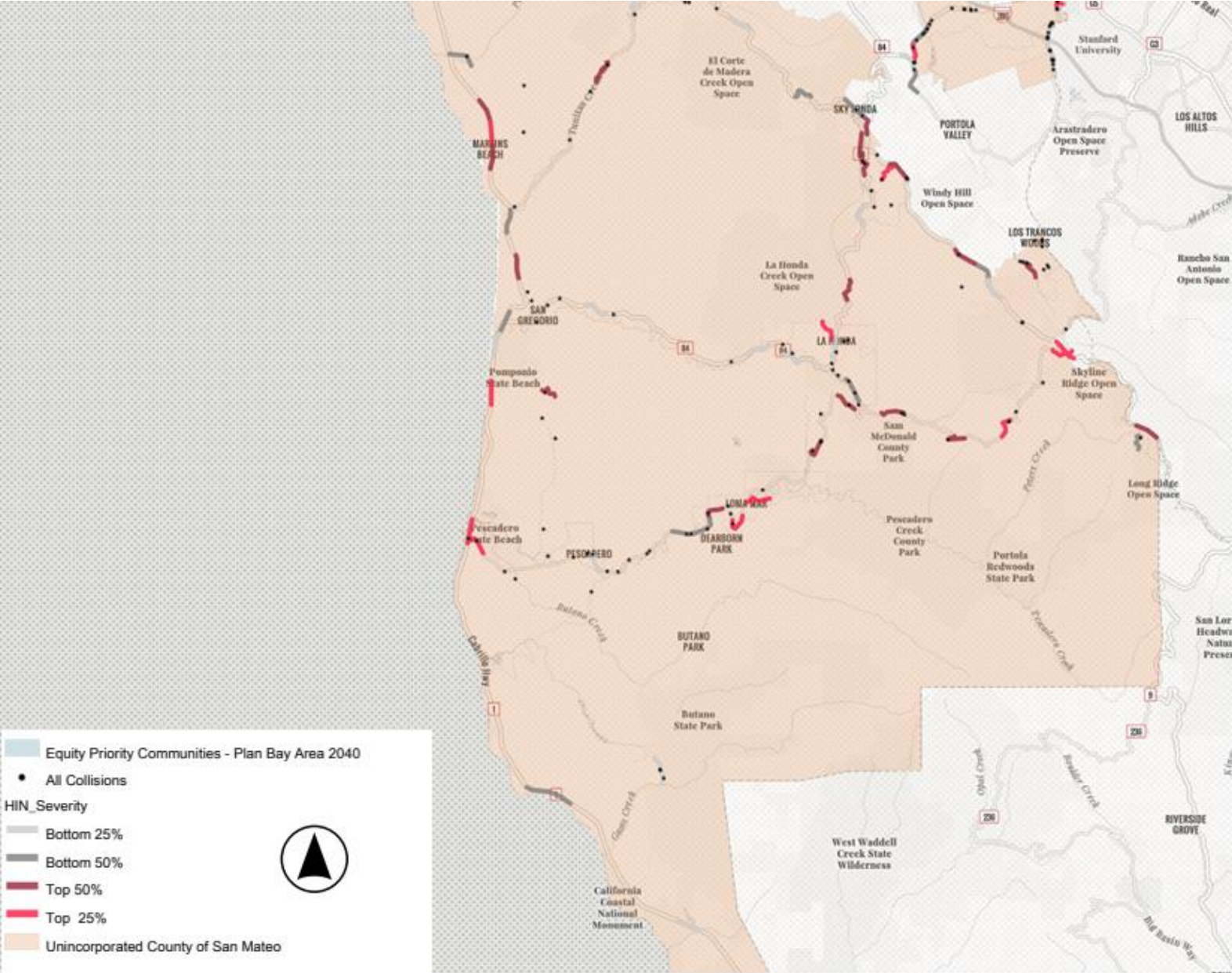
2 - Pacifica, Montara, Moss Beach, Princeton, El Granada, Burlingame, San Mateo Highlands





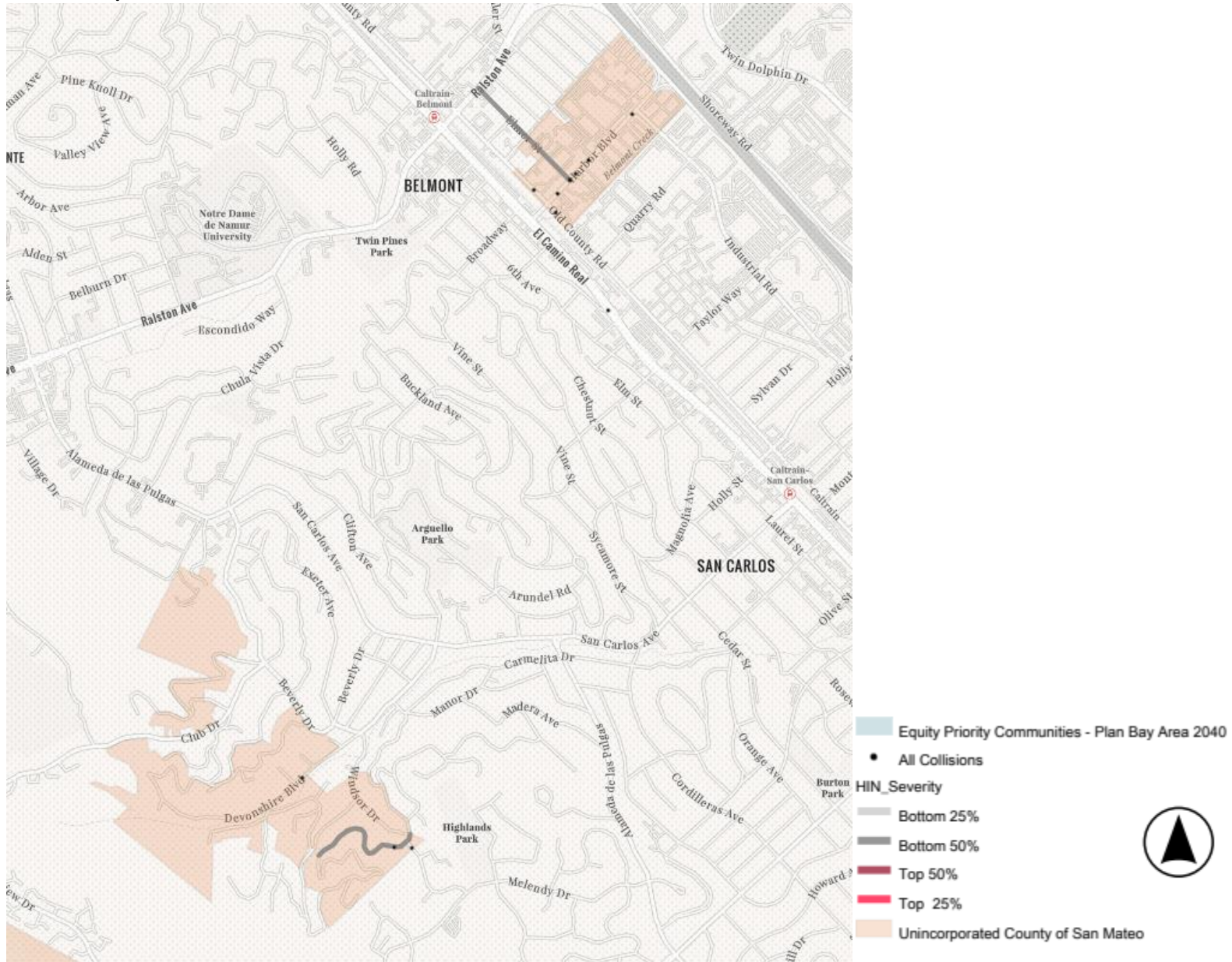


4 - South Coast/Pescadero/Los Trancos/Stanford Lands

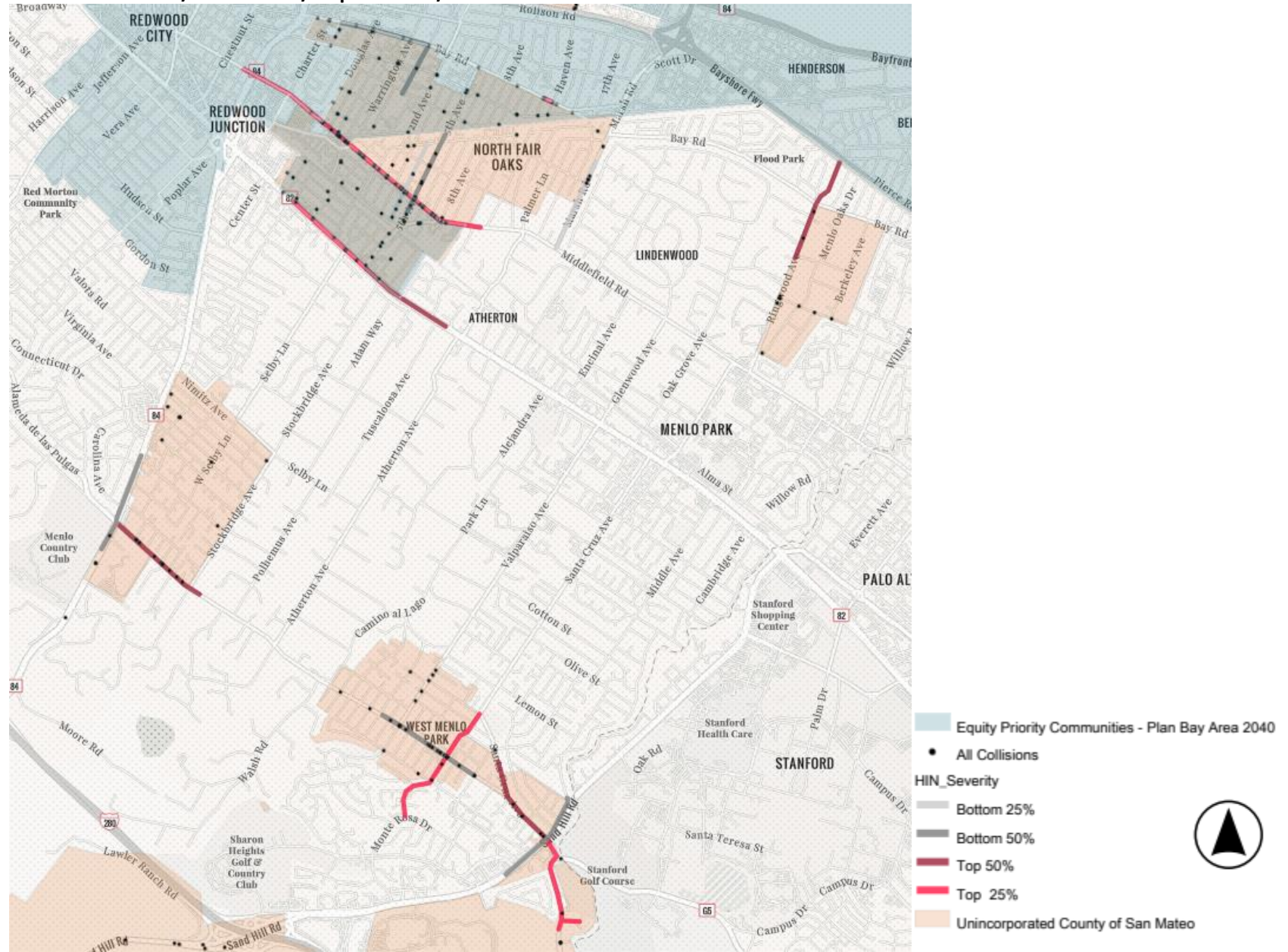




5 - Belmont/Devonshire



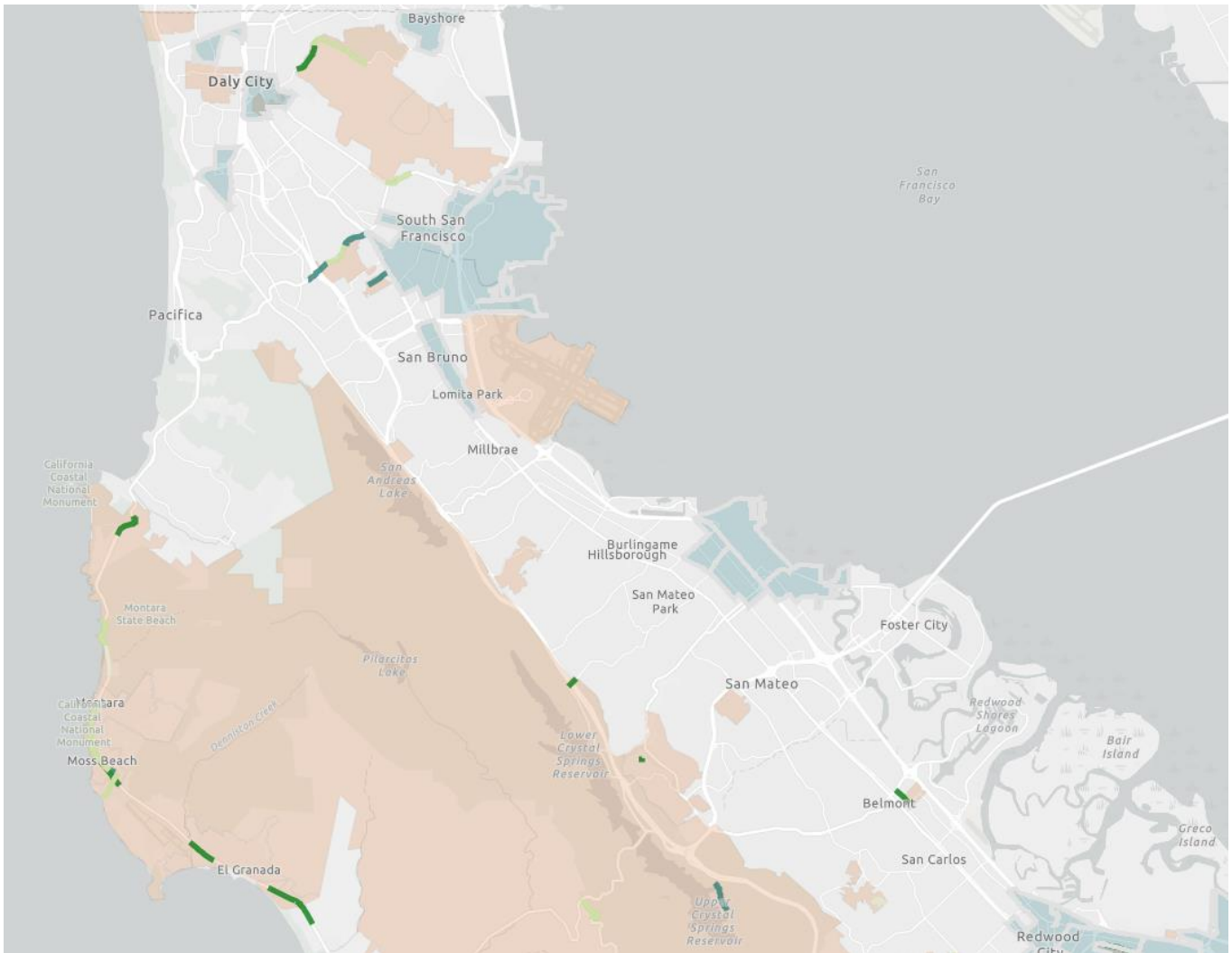
6 - North Fair Oaks/Menlo Oaks/Sequoia Tract/West Menlo





# B2 – High Active Mode Involved Collision Roads

## 1 - North County



### Legend

Equity Priority Communities - Plan Bay Area 2040



Priority Roads by Active Mode Involved Collision Density

Active Mode-Weighted Collision Density

Top 25%

Top 50%

Bottom 50%

Bottom 25%

Unincorporated County of San Mateo



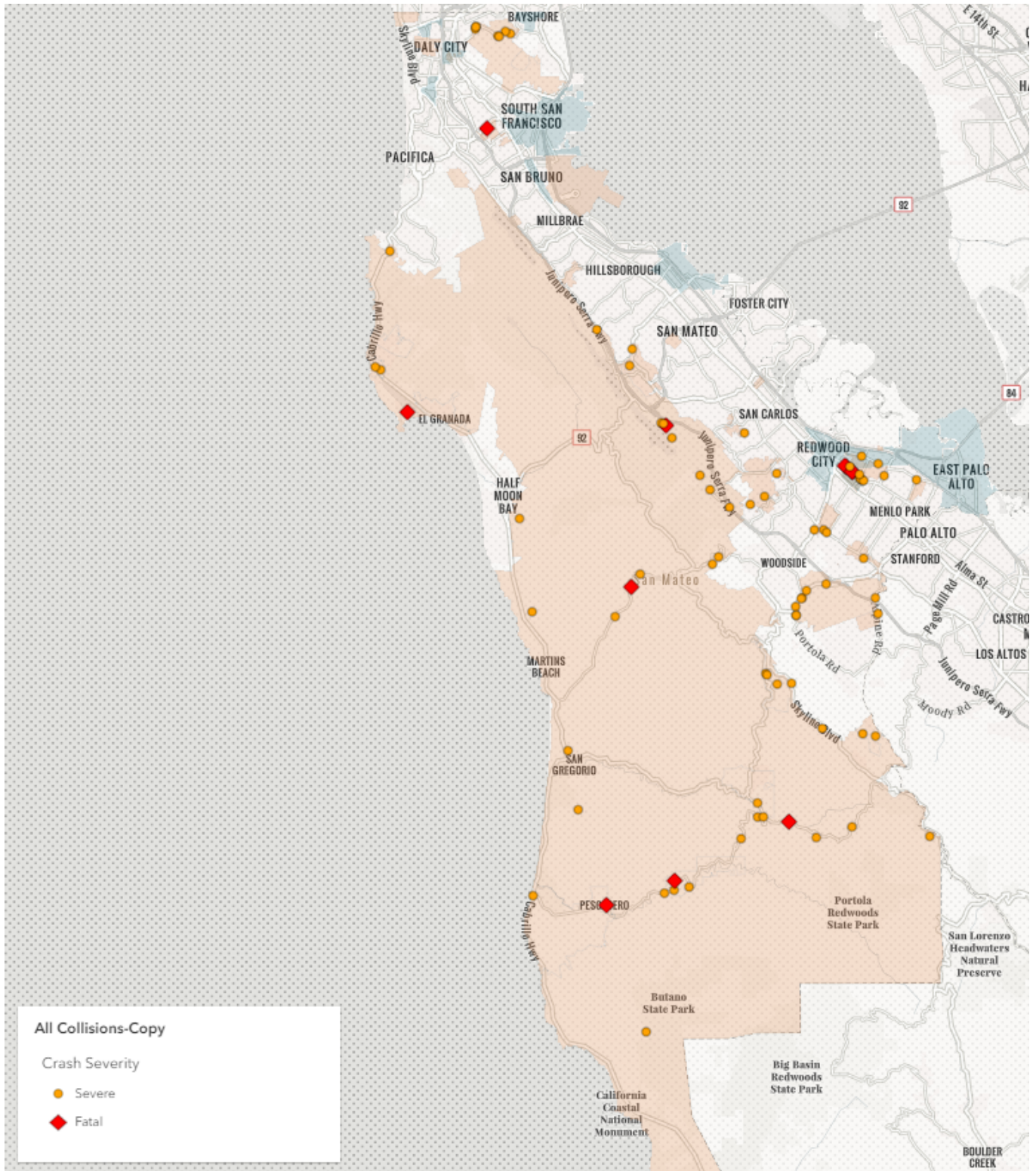




### 3 – North Fair Oaks/Sequoia Tract/Menlo Oaks/West Menlo



# B3 – Severe and Fatal Collisions



## APPENDIX C: COLLISION DATA

### Pedestrian-Involved Collisions

Of the 52 pedestrian-involved collisions identified in the TIMS data, the County found that the majority occurred in the roadway/shoulder (13, 33%), crossing in crosswalks at intersection (11, 28%) and crossing in crosswalk not in at intersection (11, 28%). The remaining (17, 11%) occur at midblock crosswalks or not in the road.

As for the causes of those collisions, the top reason was driver failure to yield to pedestrians at crosswalks (16), followed by pedestrians' failure to yield to vehicles at crosswalks (12), and driver speeding (5).

*Table 10: Primary Collision Factors for Pedestrian-Involved Collisions*

Primary Collision Factor Pedestrian Location	Collision Type					Grand Total
	Sideswipe	Rear End	Broadside	Hit Object	Vehicle Pedestrian	
<b>Unknown</b>					<b>3</b>	<b>3</b>
In Road, Including Shoulder					2	2
Not in Road					1	1
<b>Driving/Biking Under the Influence</b>					<b>2</b>	<b>2</b>
Crossing in Crosswalk at Intersection					1	1
In Road, Including Shoulder					1	1
<b>Unsafe Speed</b>		<b>2</b>		<b>1</b>	<b>5</b>	<b>8</b>
Crossing Not in Crosswalk					3	3
In Road, Including Shoulder		2		1	2	5
<b>Improper Passing</b>					<b>1</b>	<b>1</b>
Crossing Not in Crosswalk					1	1
<b>Improper Turning</b>	<b>2</b>				<b>1</b>	<b>3</b>
In Road, Including Shoulder	1				1	2
Not in Road	1					1
<b>Automobile Right of Way</b>			<b>2</b>			<b>2</b>
Crossing Not in Crosswalk			1			1
Not in Road			1			1
<b>Pedestrian Right of Way</b>					<b>16</b>	<b>16</b>
Crossing in Crosswalk at Intersection					12	12
Crossing in Crosswalk Not at Intersection					1	1
Crossing Not in Crosswalk					3	3
<b>Pedestrian Violation</b>			<b>1</b>		<b>11</b>	<b>12</b>
Crossing in Crosswalk at Intersection					2	2
Crossing Not in Crosswalk			1		6	7
In Road, Including Shoulder					3	3
<b>Unsafe Starting or Backing</b>	<b>1</b>				<b>4</b>	<b>5</b>
Crossing Not in Crosswalk					1	1
In Road, Including Shoulder	1				3	4
<b>Grand Total</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>43</b>	<b>52</b>

Table 11: Primary Collision Factors for Bicycle-Involved Collision (Bicyclist At Fault)

Primary Collision Factor	Collision Type (Bike At Fault)									
	Not Stated	Head-on	Sideswipe	Rear End	Broadside	Hit Object	Overtaken	Vehicle Pedestrian	Other	Grand Total
Unsafe Speed	1			4	1	8	17	2	2	35
Wrong Side of the Road		1	1		4			1		7
Improper Turning			4		1	7	15			27
Automobile Right of Way					11				2	13
Traffic Signal and Signs		1	1		4					6
Other Hazardous Violation		1								1
Unsafe Starting or Backing						1				1
Other Improper Driving							1			1
<b>Grand Total</b>	<b>1</b>	<b>3</b>	<b>6</b>	<b>4</b>	<b>21</b>	<b>16</b>	<b>33</b>	<b>3</b>	<b>4</b>	<b>91</b>

The data shows that most collisions are caused by unsafe speeds, improper turning, and not yielding properly to the right of way. This typically resulted in overturning, hitting objects, or vehicles.

Table 12 below shows the collision types and primary collision factor for bicycle-involved collisions where the driver is at fault.

Table 12: Primary Collision Factors for Bicycle-Involved Collisions (Driver At Fault)

Primary Collision Factor	Collision Type (Vehicle At Fault)							Grand Total
	Head-on	Sideswipe	Rear End	Broadside	Overtaken	Other		
Unknown						1	1	
Driving/Biking Under the Influence				1		1	2	
Unsafe Speed				1	3	1	5	
Wrong Side of the Road	2						2	
Improper Passing			1			1	2	
Improper Turning		5	1	6	1	2	15	
Automobile Right of Way	1			13	1	1	16	
Other Hazardous Violation			1				1	
<b>Grand Total</b>	<b>3</b>	<b>6</b>	<b>4</b>	<b>22</b>	<b>3</b>	<b>6</b>	<b>44</b>	

The leading primary collision factors are improper turning, and automobile right-of-way. Improper turning and automobile right-of-way suggest there are conflicts between vehicles with bicyclist resulting in broadside collisions.

*Table 13: Fatal and Severe Injury Collisions*

The County had 91 fatal and severe injury collisions. Table 13 below shows that unsafe speeds, improper turning, and driving/biking under the influence are the leading collision factors, leading to hit object, overturning, and broadside crashes.

Type of Collision	Collision Type							Grand Total
	Head-on	Rear End	Broadside	Hit Object	Overturned	Vehicle Pedestrian	Other	
Unknown						1		1
Driving/Biking Under the Influence		1		11	2		2	16
Unsafe Speed		1	1	7	13		1	24
Wrong Side of the Road	2		3		1			6
Improper Passing							1	1
Improper Turning			1	11	6			18
Automobile Right of Way			9	1	1			11
Pedestrian Right of Way						2		2
Pedestrian Violation						3		3
Traffic Signal and Signs	1							1
Hazardous Parking				1			1	2
Other Hazardous Violation	1							1
Other than Driver			1		1			2
Unsafe Starting or Backing						1		1
<b>Grand Total</b>	<b>4</b>	<b>2</b>	<b>15</b>	<b>31</b>	<b>24</b>	<b>9</b>	<b>4</b>	<b>89</b>