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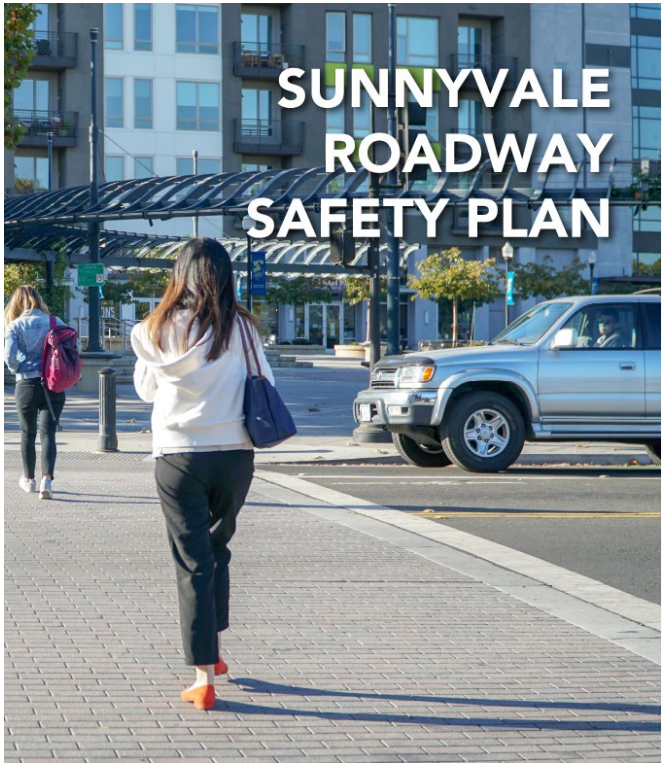
# Sunnyvale Roadway Safety Plan Draft Final Report

City Council, September 29, 2020

# Agenda

- What is the Roadway Safety Plan?
- Project Background
- Data Analysis Techniques and Results
- Safety Countermeasures Toolbox
- Project Recommendations
- Next Steps
- City Council Considerations and Recommendations



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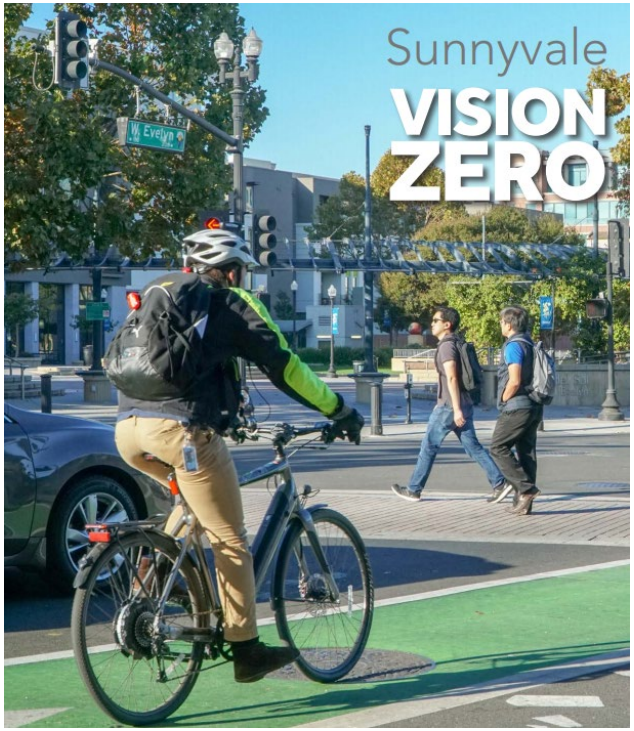
# What is the Roadway Safety Plan?

# What is the Roadway Safety Plan?

- Funded through Caltrans Systemic Safety Analysis Report (SSAR) Program grant
  - Grant amount $250,000
  - Local match $30,000
- Builds on Vision Zero and other safety efforts in City
- Provides resources for Highway Safety Improvement Program (HSIP) and other grant funding applications



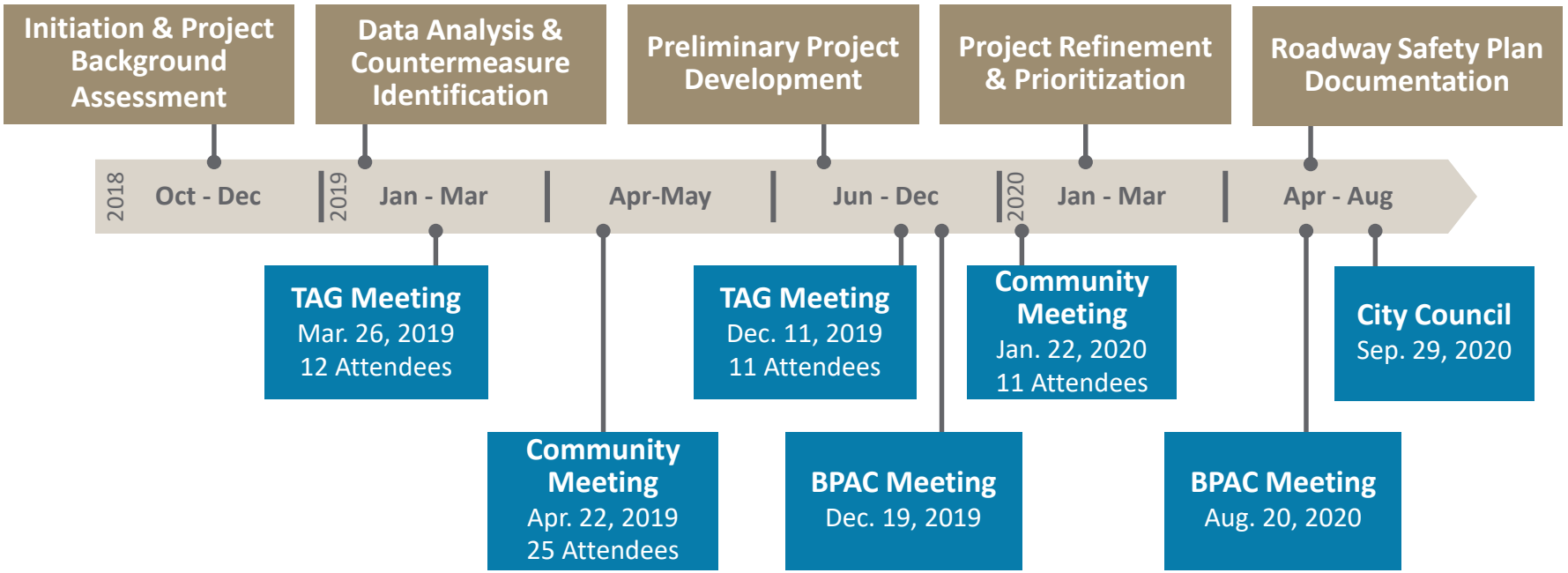
# What is the Roadway Safety Plan?

- Systemic analysis acknowledges:
  - the number of crashes alone is not always sufficient to prioritize countermeasures across a system

- Systemic evaluation considers:
  - High-risk roadway characteristics
  - Crash density on low-volume roadways
  - Crash severity

# What is the Roadway Safety Plan?

## Project Development Timeline



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# Project Background

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- Overview of Plans and Policies
- Recent Related Efforts
  - Sunnyvale Vision Zero Plan
  - Sunnyvale Active Transportation Plan

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# Data Analysis Techniques and Results

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## Data Inputs

- 5-Year Collision History Data (July 1, 2013 – June 30, 2018)
  - Collision Type
  - Cited Cause
  - Collision Outcome Severity
- Roadway Characteristics
  - Location Type (Signalized, Unsignalized, Roadway Segment)
  - Existing Infrastructure
- Vehicular Traffic Volumes
  - Facilitates Crash Rate Analysis

# Data Analysis Techniques and Results

## Data Inputs

### Collision Type Indicates

- Bike- or Ped-involved
- Lighting conditions
- Weather (wet or dry)
- Broadside
- Head on
- Rear end
- Sideswipe
- Driver impairment

### Cited Cause Indicates

- What action was cited
- Which party was cited

### Outcome Severity Indicates

- Property damage only
- Complaint of pain
- Other visible injury
- Severe injury
- Fatality (killed)

> KSI Collisions

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# Safety Countermeasures Toolbox

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## Categories

- Signal Timing & Phasing
- Intersection & Roadway Design
- Signs & Markings
- Bikeway Design
- Pedestrian Crossings
- Other (i.e. lighting, visual obstructions, bus stop locations, etc.)
- Low-cost and Quick-build



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# Project Recommendations

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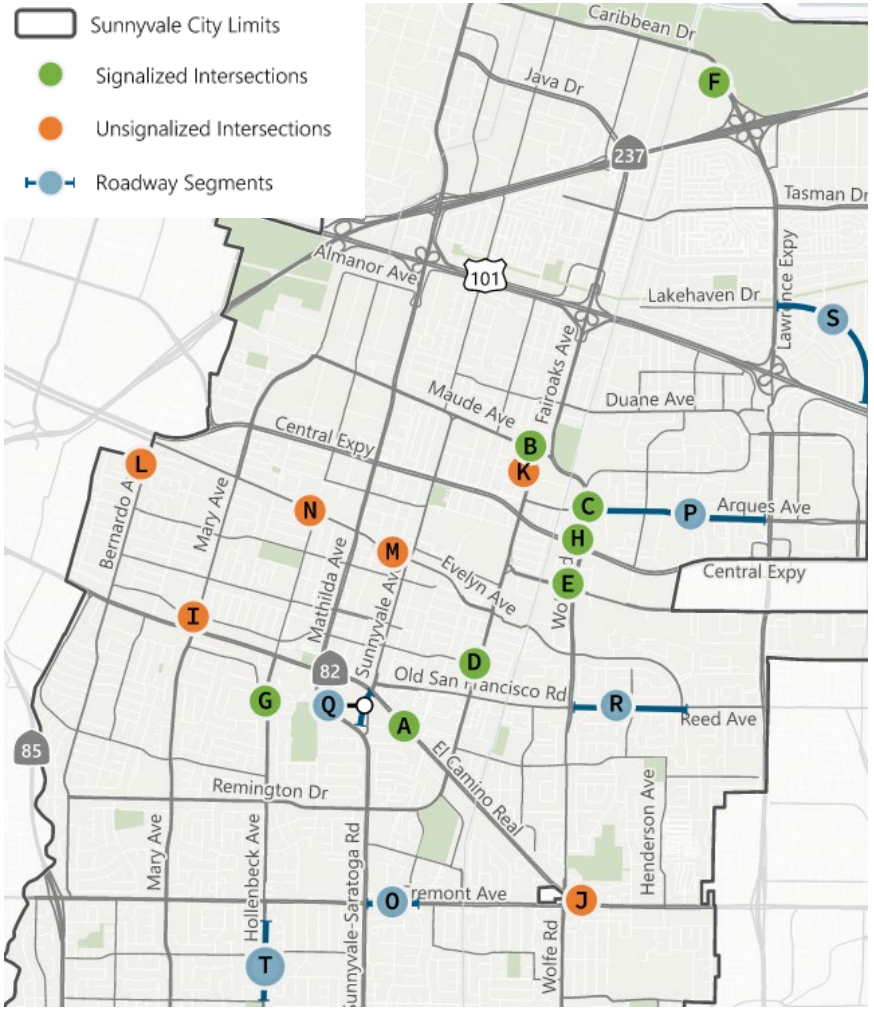
## Highway Safety Improvement Program (HSIP)

- Most projects evaluated competitively on Benefit Cost Ratio (BCR) from actual collision history
  - Benefit = Proven Efficacy
  - Cost = Expense of Improvements
  - Higher BCR = More Competitive
- HSIP favors low-cost and high-efficacy treatments
- Minimum Funding of $100,000 per project
- Systemic approach allows project grouping

# Project Recommendations

## Representative Projects

- Geographic Diversity
- Context Diversity
  - Surrounding Land Uses
  - Collision Types and Causes
  - Roadway Characteristics and Functions
- Different Location Types (20 Total)
  - 8 Signalized Intersections
  - 6 Unsignalized Intersections
  - 6 Roadway Segments



# Project Recommendations

## Representative Projects

- Location Description
- Collision History
- Notable Collision Types
- Project Description
- Estimated Costs
- Benefit Cost Ratio

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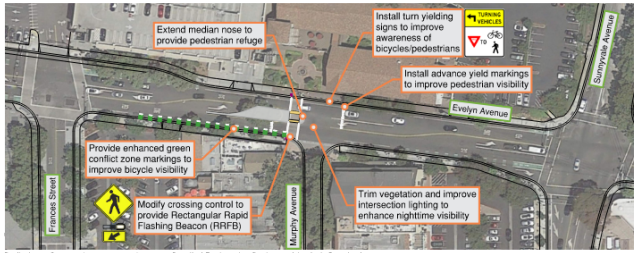
### M Evelyn Avenue & Murphy Avenue

This intersection is located at the terminus of Historic Murphy Avenue in downtown Sunnyvale, which is a brick-paved two-lane with on-street parking and a high level of activation to the adjacent public spaces. Evelyn Avenue provides one through travel lane and a bicycle lane in each direction with a westbound left-turn lane at Murphy Avenue. A decorative crosswalk with a flashing beacon is provided across the west leg of the intersection. There were 14 collisions in the area near the intersection during the study period, none of which involved a severe injury or fatality. Notable collision patterns were collisions occurring at dark and bicycle- and pedestrian-involved collisions, with speed was often cited as a contributing factor. Many major destinations are near this location in downtown Sunnyvale, including retail shops, food services, Sunnyvale Caltrain Station, and the weekend Sunnyvale Farmers' Market. Given its proximity to Caltrain and these major destinations, the immediate area is served by many transit services, including VTA Bus Routes 20, 21, 53, 55, and Rapid 523.




Preliminary Concept Improvement Layouts - Detailed Engineering Design and Analysis Required.

**Collision History** (July 1, 2013 to June 30, 2018)


**Notable Collision Types**


**Project Description**

- Extend median on Evelyn Avenue to provide pedestrian refuge
- Upgrade pedestrian crossing with installation of RRFB and advance yield markings
- Provide green conflict zone markings and turn yielding signs
- Trim vegetation and improve intersection lighting

**Estimated Project Costs** (2020 Dollars)

| | |
|---|---|
| RRFB & Lighting Improvements | $85,000 |
| Civil Improvements | $12,320 |
| Contingency | $19,460 |
| Total Construction Cost (rounded) | $116,800 |
| Environmental | $11,700 |
| PS&E | $17,600 |
| Construction Engineering | $11,700 |
| **Total Project Cost** | **$157,800** |

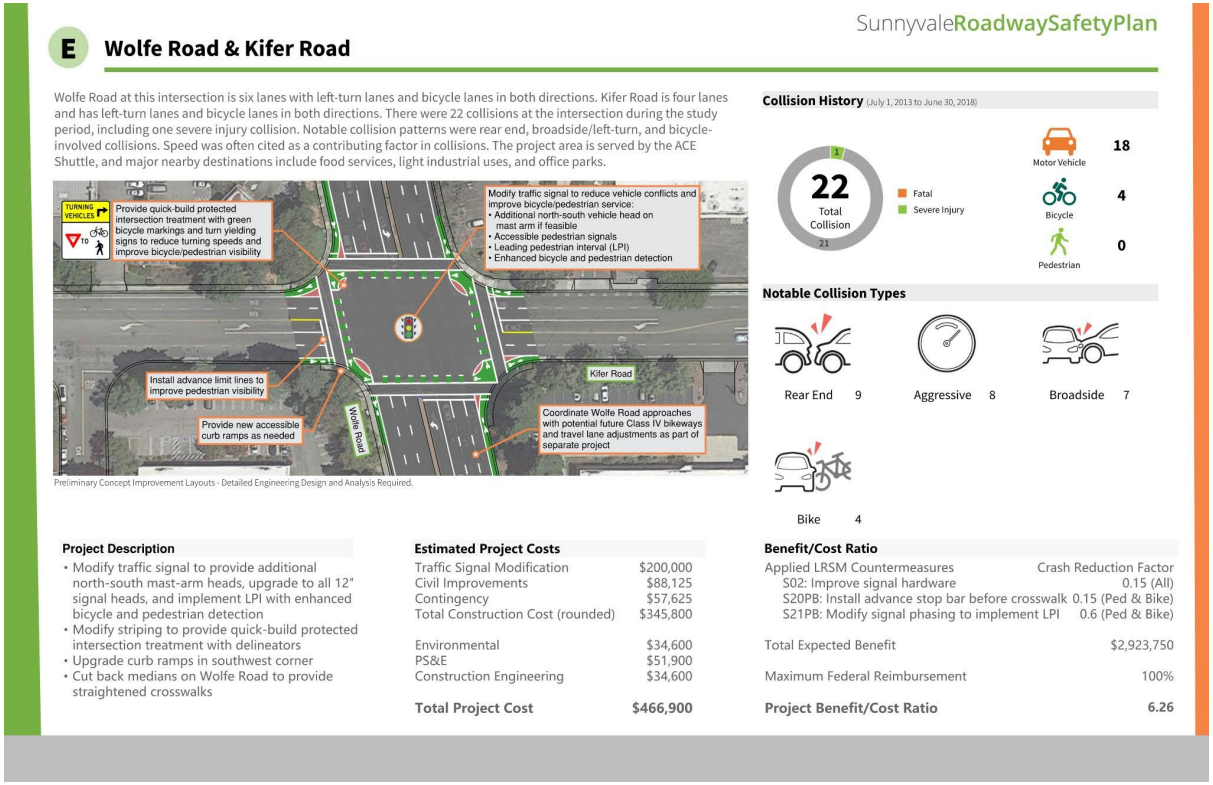
**Benefit/Cost Ratio**

| Applied LRSM Countermeasures | Crash Reduction Factor |
|---|---|
| NS07: Upgrade intersection pavement markings | 0.25 (All) |
| NS19PB: Install raised median/refuge island | 0.45 (Ped & Bike) |
| NS22PB: Install RRFB | 0.35 (Ped & Bike) |
| Total Expected Benefit | $1,358,040 |
| Maximum Federal Reimbursement | 90% |
| **Project Benefit/Cost Ratio** | **8.61** |

# Project Recommendations

## Representative Projects

- Quick-build projects
- Short-term improvements



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**E** **Wolfe Road & Kifer Road**

Wolfe Road at this intersection is six lanes with left-turn lanes and bicycle lanes in both directions. Kifer Road is four lanes and has left-turn lanes and bicycle lanes in both directions. There were 22 collisions at the intersection during the study period, including one severe injury collision. Notable collision patterns were rear end, broadside/left-turn, and bicycle-involved collisions. Speed was often cited as a contributing factor in collisions. The project area is served by the ACE Shuttle, and major nearby destinations include food services, light industrial uses, and office parks.



Preliminary Concept Improvement Layouts - Detailed Engineering Design and Analysis Required.

**Collision History** (July 1, 2013 to June 30, 2018)

22 Total Collision (1 Fatal, 21 Severe Injury)

| | |
|---|---|
| Motor Vehicle | 18 |
| Bicycle | 4 |
| Pedestrian | 0 |

**Notable Collision Types**

| | | | | | |
|---|---|---|---|---|---|
| Rear End | 9 | Aggressive | 8 | Broadside | 7 |
| Bike | 4 | | | | |

**Project Description**

- Modify traffic signal to provide additional north-south mast-arm heads, upgrade to all 12" signal heads, and implement LPI with enhanced bicycle and pedestrian detection
- Modify striping to provide quick-build protected intersection treatment with delineators
- Upgrade curb ramps in southwest corner
- Cut back medians on Wolfe Road to provide straightened crosswalks

**Estimated Project Costs**

| | |
|---|---|
| Traffic Signal Modification | $200,000 |
| Civil Improvements | $88,125 |
| Contingency | $57,625 |
| Total Construction Cost (rounded) | $345,800 |
| Environmental | $34,600 |
| PS&E | $51,900 |
| Construction Engineering | $34,600 |
| **Total Project Cost** | **$466,900** |

**Benefit/Cost Ratio**

| Applied LRSM Countermeasures | Crash Reduction Factor |
|---|---|
| S02: Improve signal hardware | 0.15 (All) |
| S20PB: Install advance stop bar before crosswalk | 0.15 (Ped & Bike) |
| S21PB: Modify signal phasing to implement LPI | 0.6 (Ped & Bike) |
| Total Expected Benefit | $2,923,750 |
| Maximum Federal Reimbursement | 100% |
| **Project Benefit/Cost Ratio** | **6.26** |

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# Next Steps

# Next Steps

## Using the Roadway Safety Plan

- Satisfies Caltrans requirements for HSIP Cycle 11 (approximately 2022)
- Identifies project opportunities by location
- Streamlines countermeasure selection
- Identifies funding opportunities

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# City Council Considerations and Recommendations

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## Considerations

Alternative 1: Adopt the Roadway Safety Plan

Alternative 2: Adopt the Roadway Safety Plan with Modifications

Alternative 3: Other Direction as Provided by the Council

### Staff

- Recommend Alternative 1: Adopt the Roadway Safety Plan

### BPAC

- Recommend Alternative 1: Adopt the Roadway Safety Plan

# Questions?