



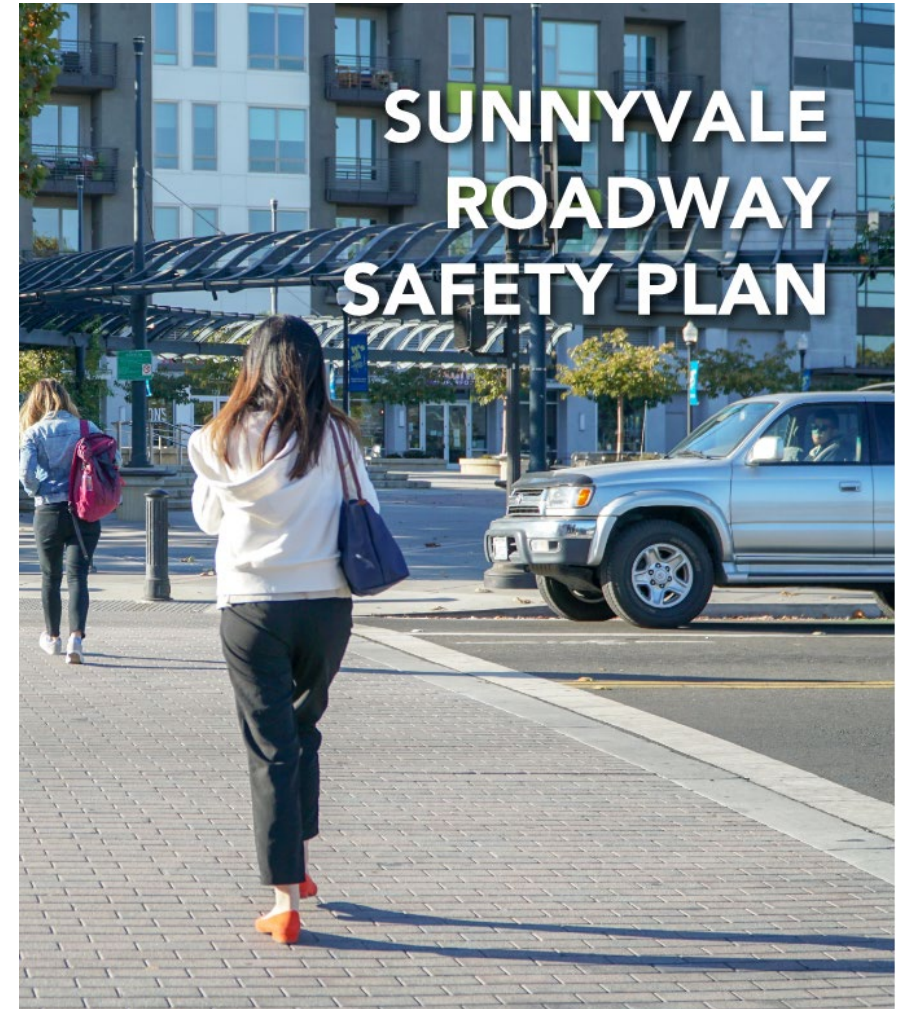
Sunnyvale Roadway Safety Plan Draft Final Report

Steve Davis
Presented to Sunnyvale BPAC
August 20, 2020



Agenda

- What is the Roadway Safety Plan?
- Project Background
- Data Analysis Techniques and Results
- Safety Countermeasures Toolbox
- Project Recommendations
- Next Steps
- Bicycle and Pedestrian Advisory Commission Recommendation to City Council



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



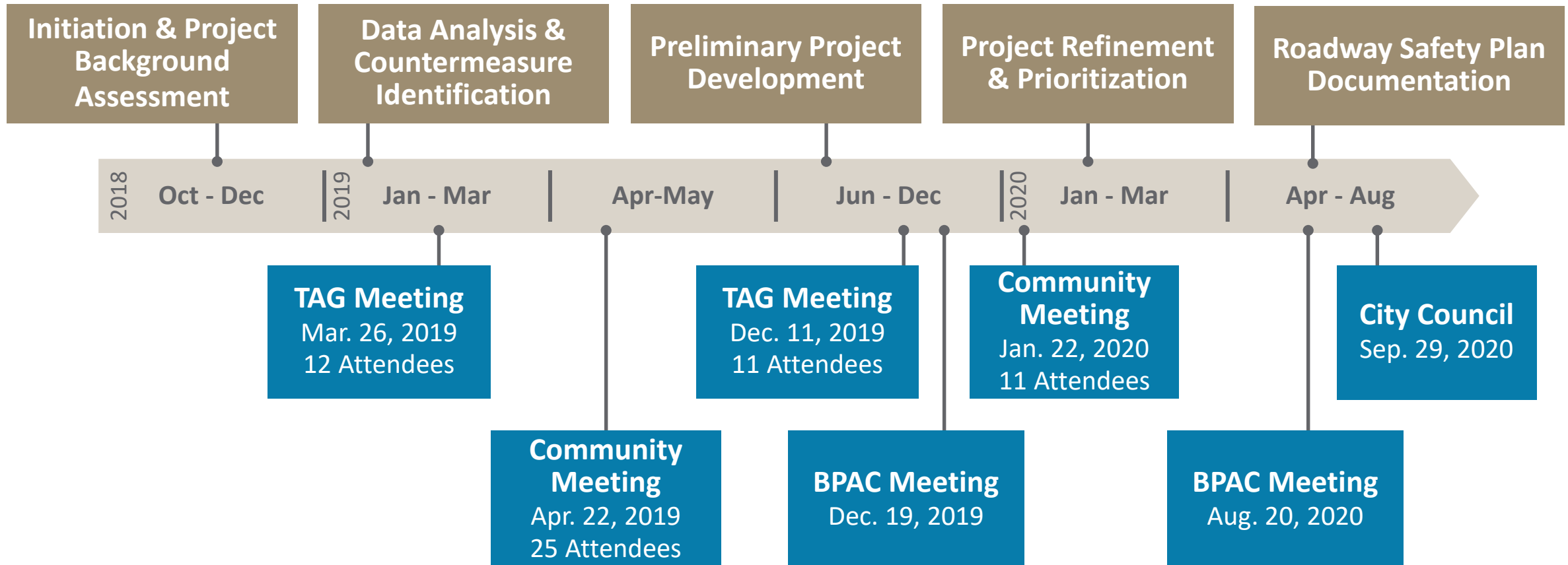
What is the Roadway Safety Plan?

- 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



Project Background

Project Background

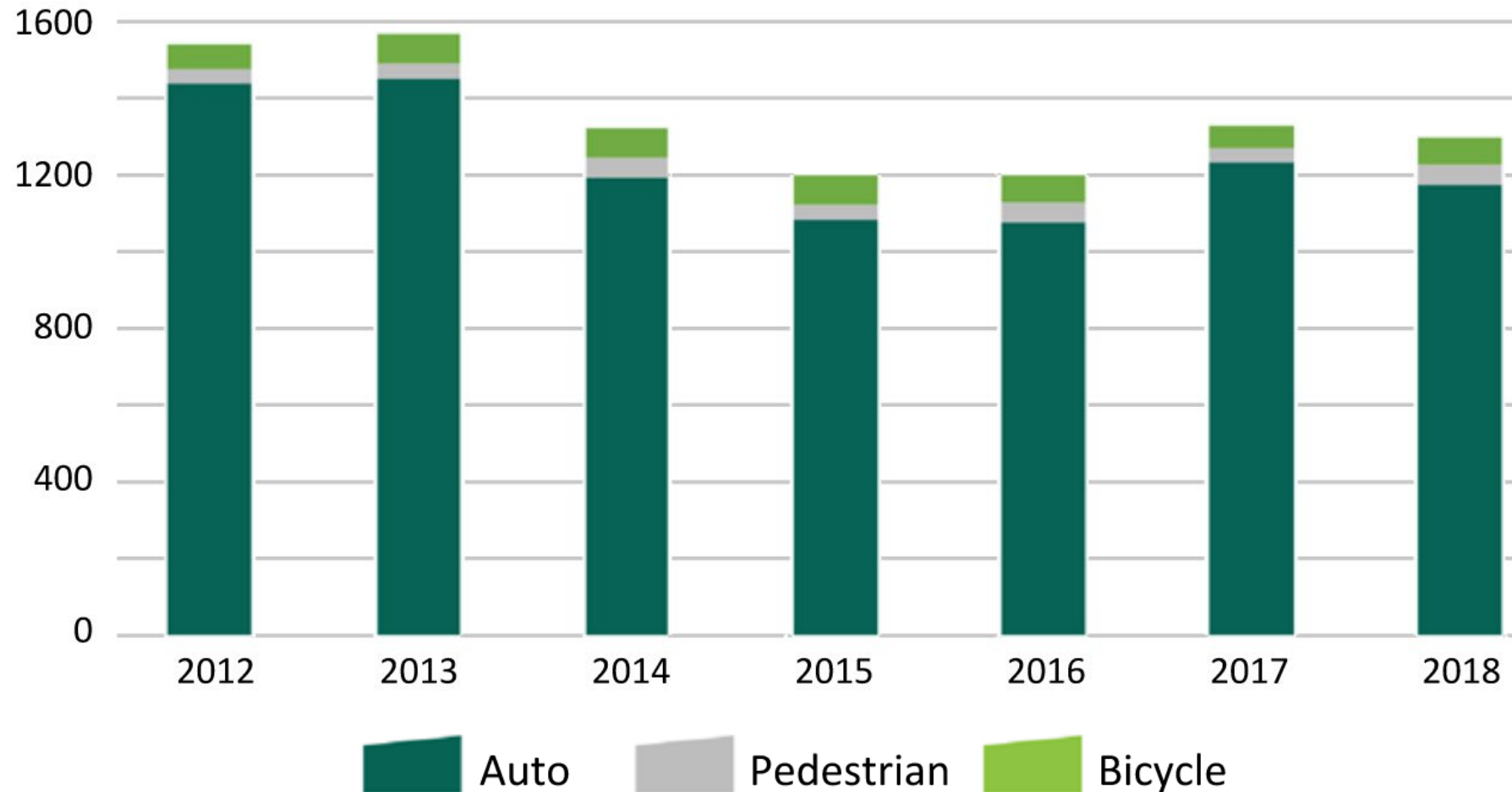
- Overview of Plans and Policies
- Recent Related Efforts
 - ◆ Sunnyvale Vision Zero Plan
 - ◆ Sunnyvale Active Transportation Plan



Data Analysis Techniques and Results

Data Analysis Techniques and Results

Collision Trend



Data Analysis Techniques and Results

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

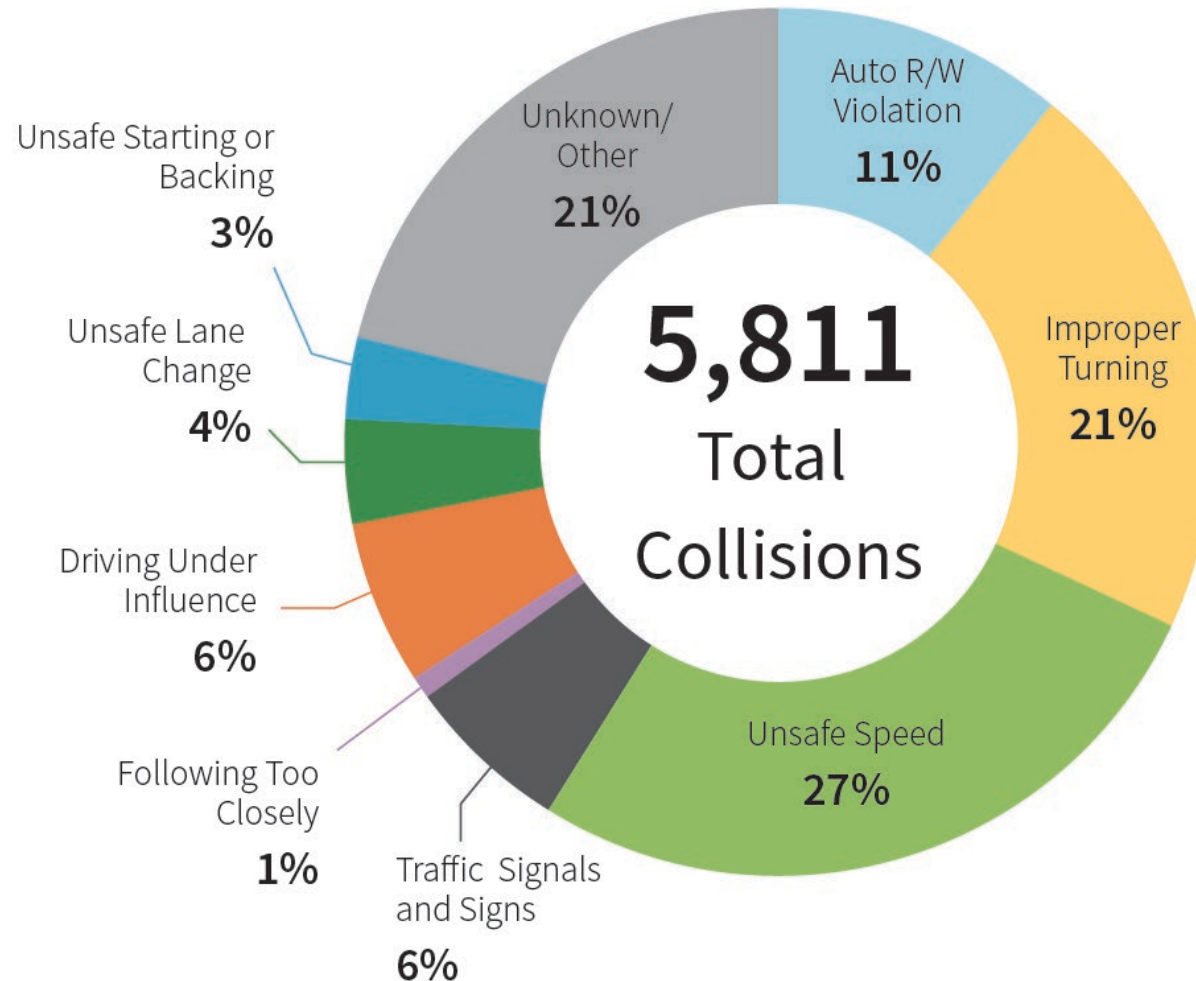
- What action was cited
- Which party was cited

Outcome Severity Indicates

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

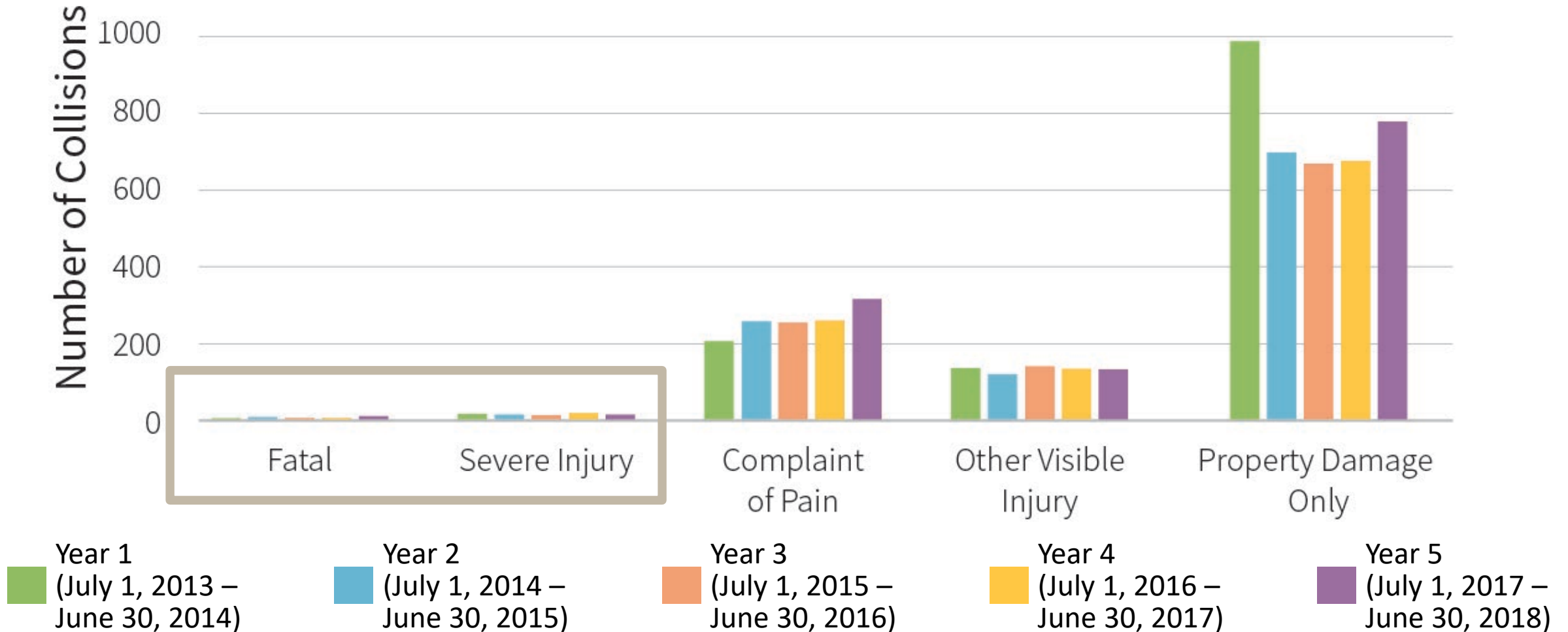
Data Analysis Techniques and Results

Collision Causes (July 1, 2013 – June 30, 2018)



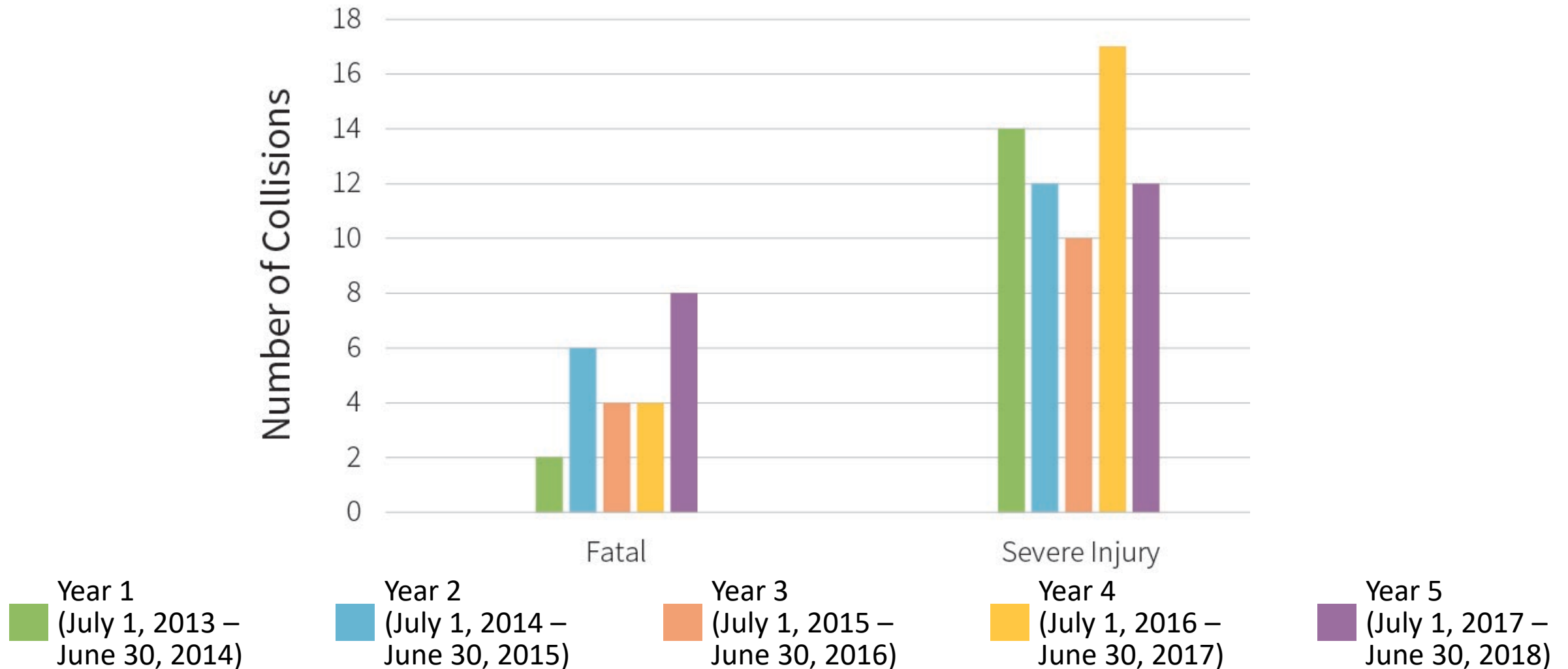
Data Analysis Techniques and Results

Collision Outcomes (July 1, 2013 – June 30, 2018)



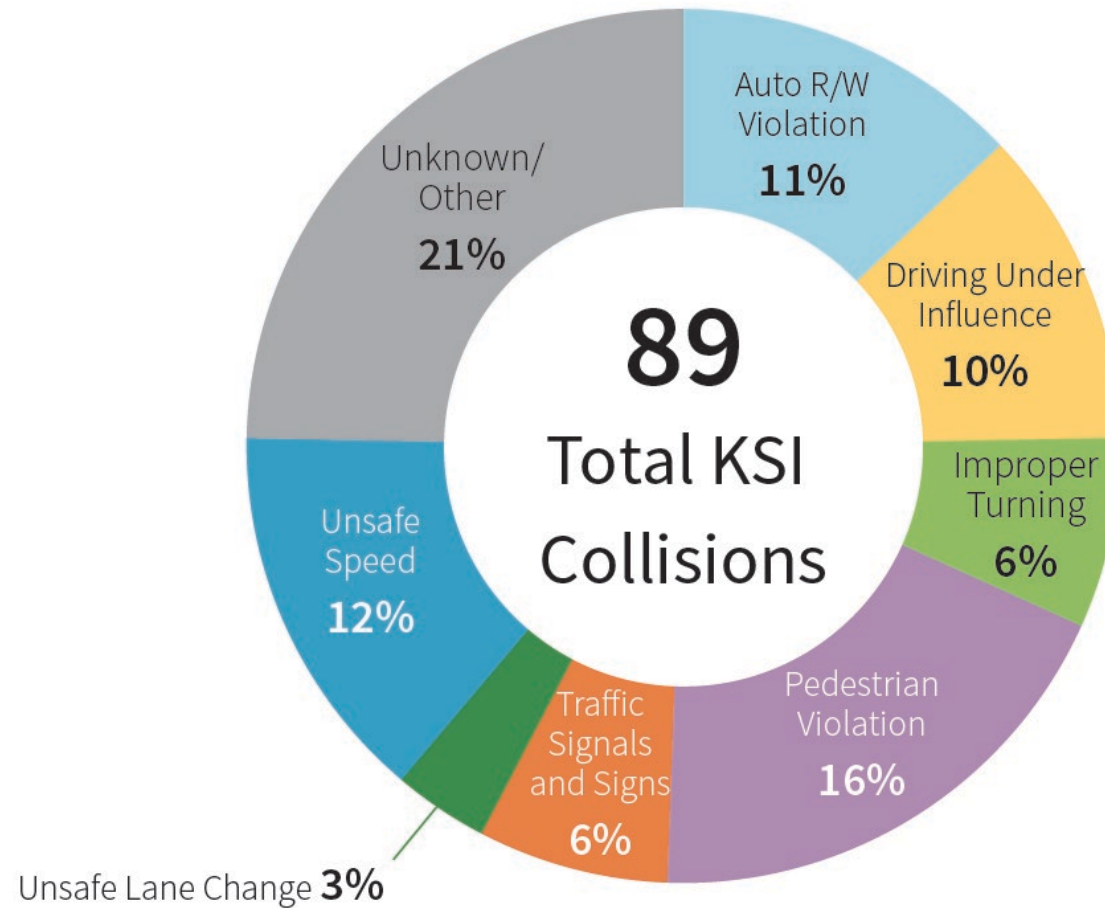
Data Analysis Techniques and Results

KSI Collision Outcomes (July 1, 2013 – June 30, 2018)



Data Analysis Techniques and Results

KSI Collision Causes (July 1, 2013 – June 30, 2018)

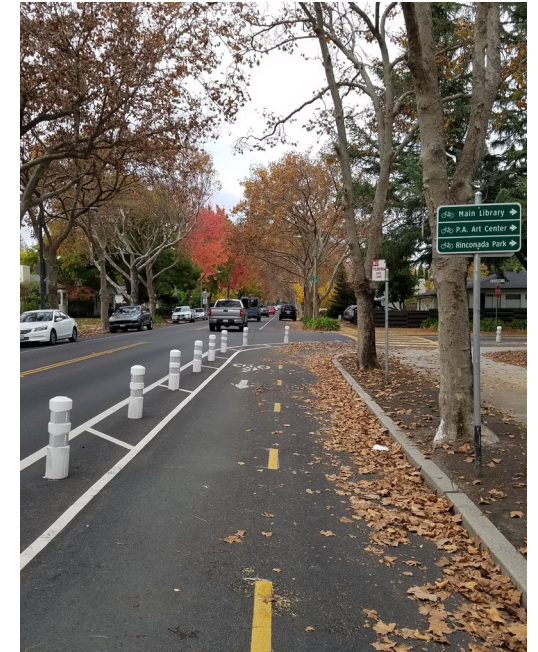


Safety Countermeasures Toolbox

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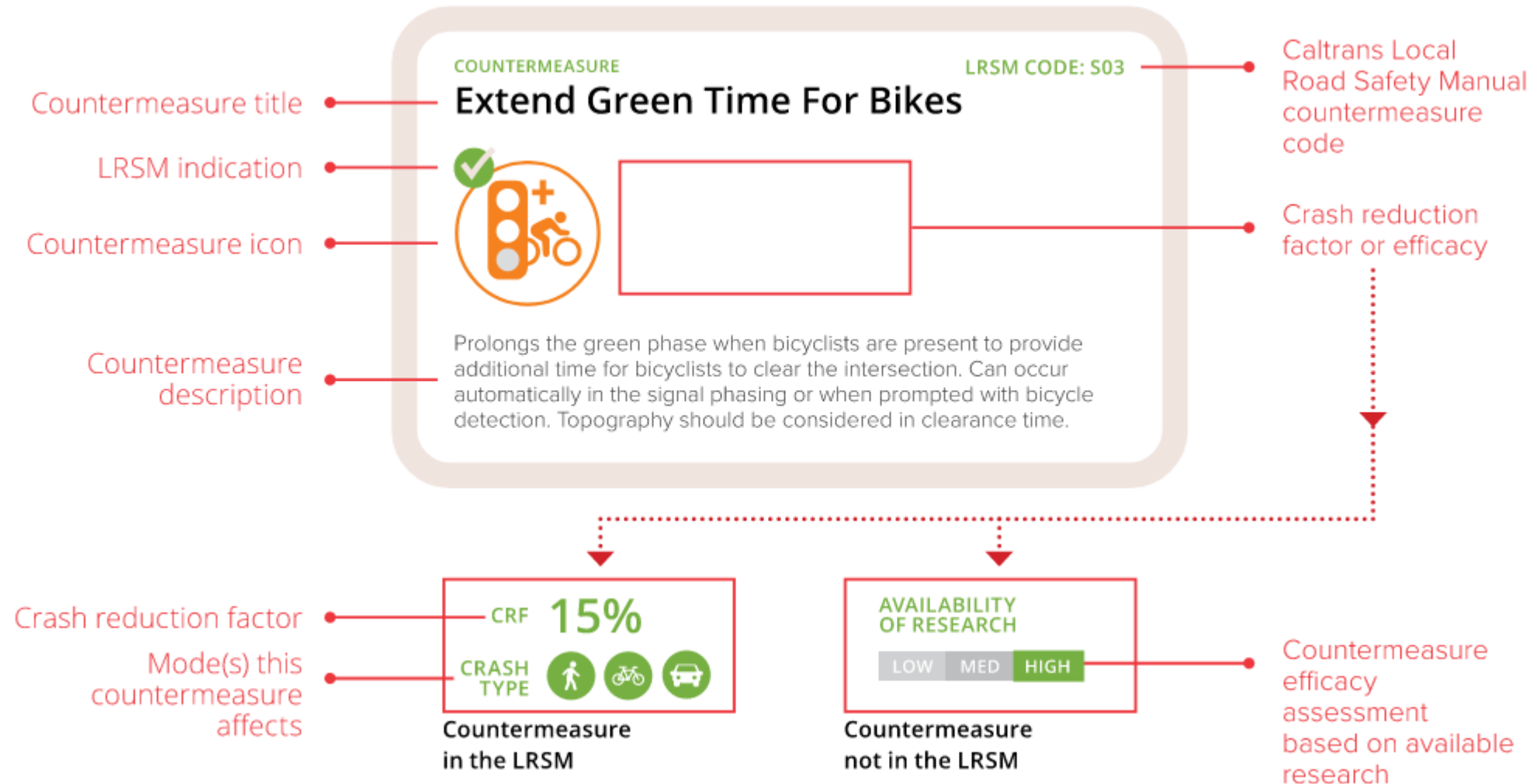
Categories

- Signal Timing & Phasing
- Intersection & Roadway Design
- Signs & Markings
- Bikeway Design
- Pedestrian Crossings
- Other
- Low-cost and Quick-build



Safety Countermeasures Toolbox

Countermeasure Information



Project Recommendations

Project Recommendations

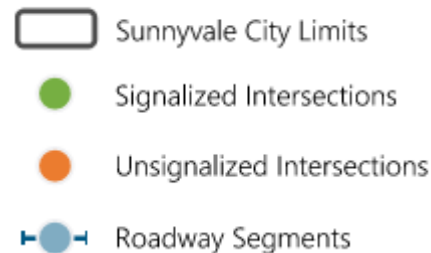
Highway Safety Improvement Program (HSIP)

- 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



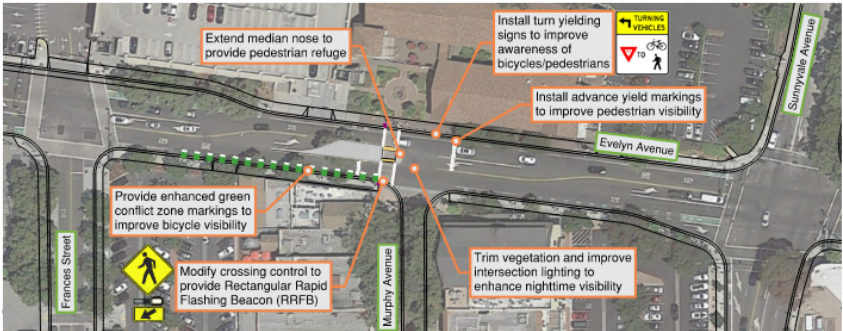
Project Recommendations

Representative Projects

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

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.



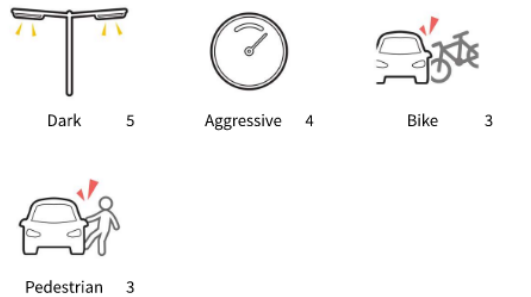
Preliminary Concept Improvement Layouts - Detailed Engineering Design and Analysis Required.

Project Description		Estimated Project Costs (2020 Dollars)	
<ul style="list-style-type: none">• 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	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

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



Notable Collision Types



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

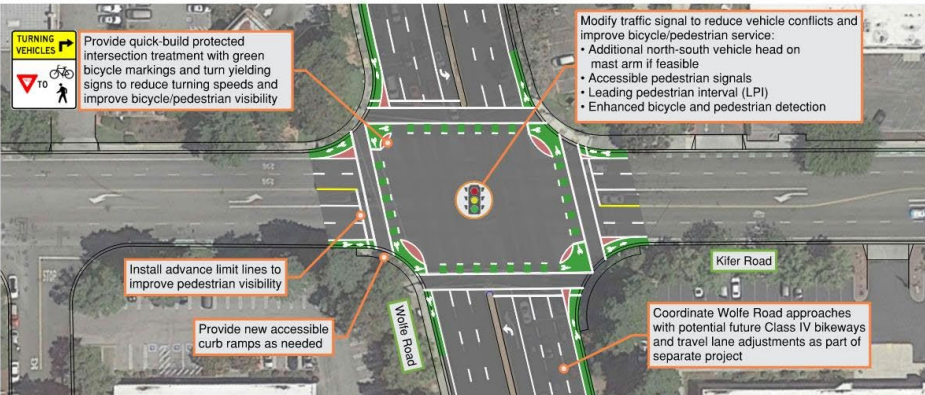
Project Recommendations

Representative Projects

- Quick-build projects
- Short-term improvements

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.

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

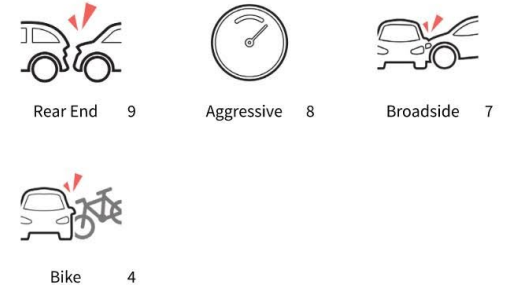
Estimated Project Costs

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

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



Notable Collision Types



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

Next Steps

Next Steps

Using the Roadway Safety Plan

- Satisfies Caltrans requirements for HSIP Cycle 11
- Identifies locations with high collision rates
- Streamlines countermeasure selection
- Identifies funding opportunities



Project Recommendations

Additional Funding Opportunities

Funding Source	Opportunities
Congestion Mitigation and Air Quality (CMAQ) Improvement Program	Improvements targeting congestion/air quality goals
Active Transportation Program (ATP)	Bicycle/pedestrian projects
SB-1 Transportation Funding	Road maintenance/rehab projects
Santa Clara County Measure B	Transportation improvements in categories identified by VTA
MTC One Bay Area Grant (OBAG) Program	Transportation projects advancing regional housing goals
Caltrans Sustainable Transportation Planning Grant Program	Multimodal transportation and land-use planning
California Office of Traffic Safety (OTS)	Safety projects
Affordable Housing and Sustainable Communities (AHSC)	Increasing access to affordable housing or employment centers

Bicycle and Pedestrian Advisory Commission Recommendation to City Council

Bicycle and Pedestrian Advisory Commission

Recommendation to City Council

Considerations

Alternative 1: Recommend to City Council to Adopt the Roadway Safety Plan

Alternative 2: Recommend to City Council to Adopt the Roadway Safety Plan
with Modifications

Alternative 3: Other Direction as Provided by the Commission

Staff Recommendation

Alternative 1: Recommend to City Council to Adopt the Roadway Safety Plan

Thank you for
your contributions!

