

# STATE ROUTE 84 / NILES CANYON

## *An Integrated Value Analysis/ Road Safety Review Process*

### *Quantitative Road Safety Analysis*



# Background

- Caltrans requested the Federal Highways Administration (FHWA) to conduct a Road Safety Assessment (RSA) to provide an independent safety analysis of Route 84 in Niles Canyon.
- Caltrans also formed a Value Analysis (VA) team to take any recommendations from the RSA and:
  1. Also establish a safety need
  2. Prioritize any RSA safety recommendations
  3. Incorporate the safety recommendations into project strategies
  4. Incorporate trade-off analysis to account for stakeholder concerns – environmental impacts, construction impacts, maintainability, highway operations, etc.

# Background

- In May 2012, the kickoff meeting was held for the RSA and VA studies.
- In July 2012, the results of the draft RSA and VA studies were presented at a public meeting. The presentations were posted on the project website.
- In September 2012, the final RSA and VA studies were posted on the project website to allow the public an opportunity to review the documents.
- Tonight we are here to obtain feedback from the public on the two studies.

# RSA Study Team

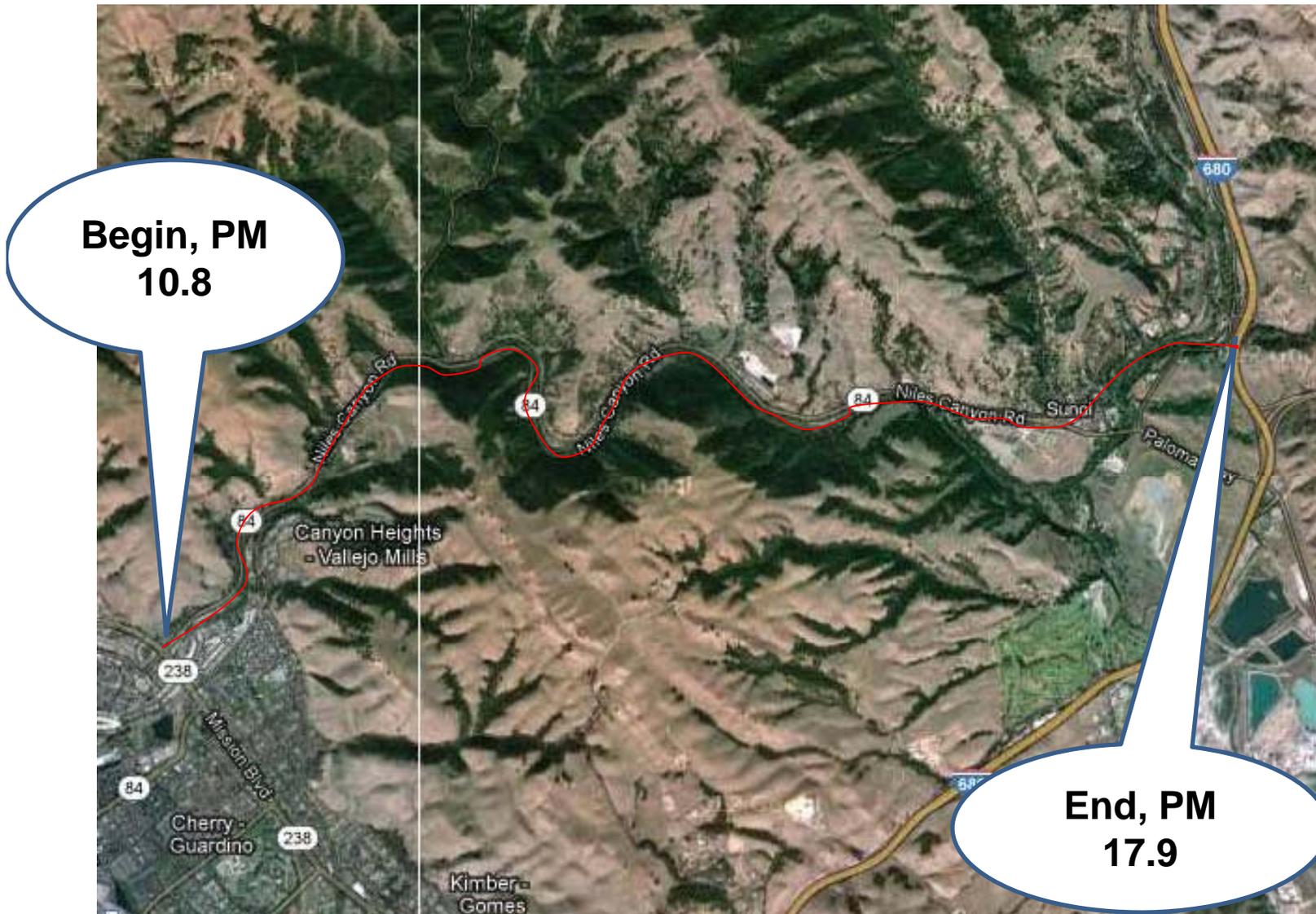
- **Craig Allred** Federal Highway Administration
- **Keith Harrison** Federal Highway Administration
- **David Cohen** Federal Highway Administration
- **Lt. Jim Libby** California Highway Patrol – Dublin Area



# VA Study Team

- Jeff Holm
  - Frank Guros
  - Valerie Shearer
  - Oliver Iberien
  - Keith Suzuki
  - Mike Thomas
  - Jana Weldon
  - Cris Pena (Part-time)
  - Jayson Imai
  - Michael Renk
  - Geoff Millen
  - George Hunter
  - Mark Watson
- FHWA  
Caltrans Construction  
Caltrans Env. Planning  
Caltrans Env. Planning  
Caltrans Landscape Arch.  
Caltrans HQ Design  
Alameda County  
Alameda Co. Water District  
City of Fremont  
City of Union City  
Delphi MRC  
VMS  
VMS

# State Route 84 / Niles Canyon Study Area



# Study Approach

**Road Safety  
Assessment  
(RSA)  
Workshop**

- Identify Safety Issues
- Identify Countermeasures

**Value Analysis  
(VA)/ Quantitative  
Road Safety  
Analysis (QRSRA)  
Workshop**

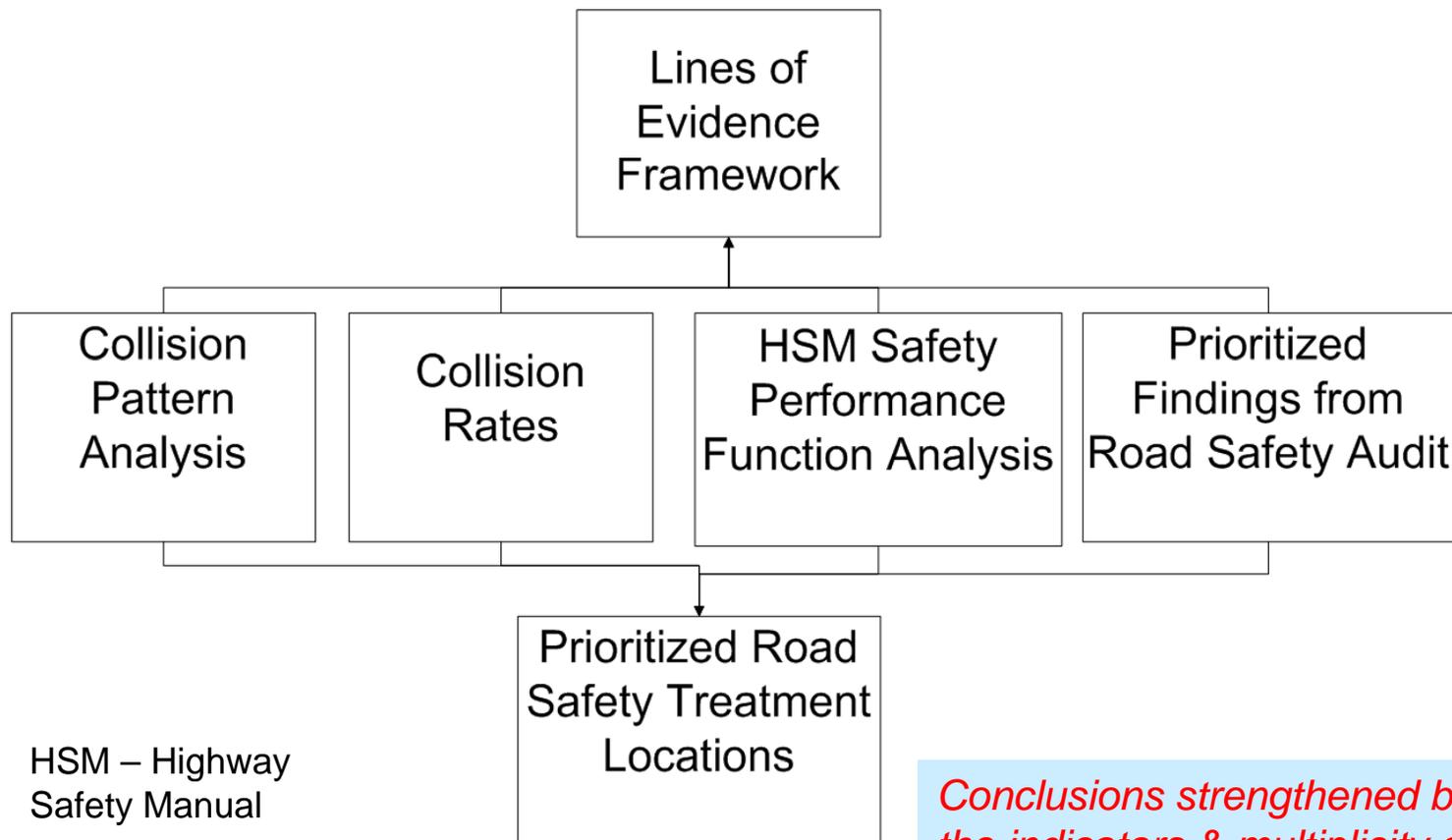
- Establish Safety Need
- Prioritize Safety Issues
- Develop Countermeasures
- Evaluate Countermeasures
- Develop & Evaluate Countermeasure Strategies

*Identification of  
Safety Need  
drives VA/QSRA  
process*

**Quantitative Road Safety Analysis  
(QRSRA) Outcomes**

# Identification of Safety Need

- Assessment of the existing road safety performance
- A “lines of evidence” approach.



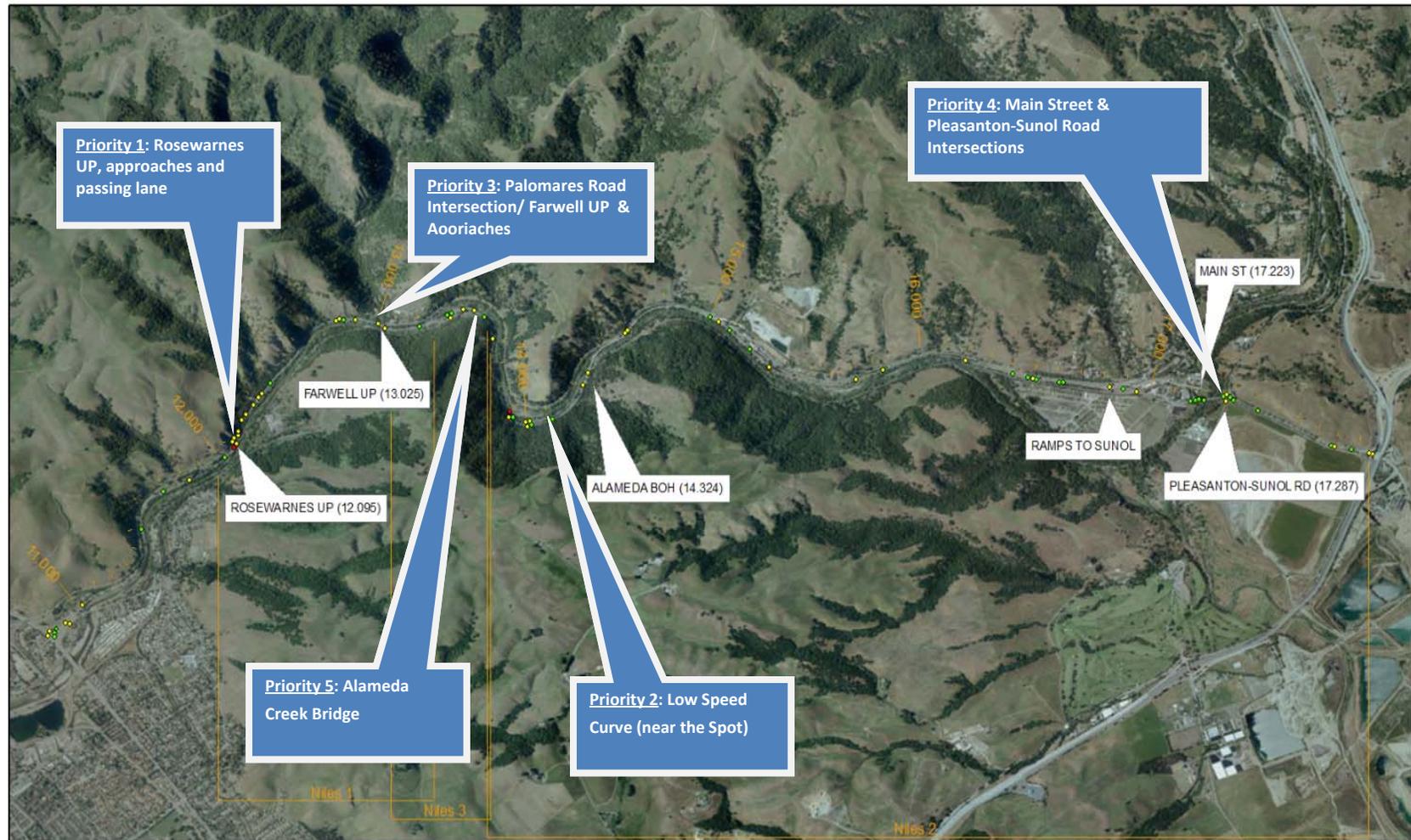
*Conclusions strengthened by independence of the indicators & multiplicity of their occurrence*

# Safety Need Summary

## Lines of Evidence

Location	Lines of Evidence			
	Prioritized RSA Findings	Collision Pattern	Collision Rates	Safety Performance Function
<b>Specific Locations</b>				
Mission Boulevard		X		
Rosewornes Underpass & Approaches (includes passing zone to east)	X	X	X	X
Station 11+350 (approx. mile post 12.8)				X
Palomares Intersection/Farwell Underpass	X	X	X	X
Alameda Creek Bridge	X	X		X
Low-Speed Curve Near "The Spot"	X	X	X	X
Alameda BOH	X		X	
Station 7+800 (approx. mile post 14.6)				X
Kaiser Quarry Intersection	X			X
Station 11+800 (approx. mile post 15.3)				X
Station 13+800 (approx. mile post 15.7)				X
Sunol Interchange on/off ramps				X
Main Street and Pleasanton/Sunol Intersections -queues that extend to Silver Spring UP	X	X	X	X
<b>Corridor Wide Issues</b>				
Roadside Barrier Inconsistencies	X			
Clear Zone Provisions	X	X		
Accommodating Bicycles	X	X		
Shoulder discontinuities	X			
Vegetation limits sightlines	X			

# Safety Need Priorities- Spot Locations\*



\*As indicated and supported on all **Lines of Evidence**

# Safety Need- Corridor Wide

- **Accommodation of Bicycles**
  - 2% of collision
  - High Severity
  - Growing Usage
- **Roadside Design Issues**
  - Roadside Hazards
  - Barrier Deficiencies
  - 57% of collisions
- **Shoulder Discontinuities**
  - Vehicle Roadside Departure
  - Disabled Vehicles, Bicycles and Police Enforcement
- **Vegetation**
  - Obstruction signing
  - Restricting lateral sight lines

# Safety Improvement Countermeasures

- 51 Countermeasures identified during RSA and VA brainstorming exercises
- 32 Countermeasures Conceptually Developed:
  - (17) – Short-term implementation
  - (12) – Medium-term implementation
  - (3) – Long-term implementation after monitoring

# Short Term Countermeasures

1. Install active warning system to alert motorists to bikes on roadway
2. Install sharrows on shoulders or lane edges at select locations to demonstrate potential bicycle usage
3. Install friction treatment to pavements at low-speed curves and in icy areas
4. Modify flashing beacon at Palomares Road to indicate intersection further to the east
5. Install mirrors at Palomares Road to view westbound traffic
6. Install ITS elements at Palomares Road to signal drivers of approaching vehicles
7. Lighting of key areas (Rosewarnes Undercrossing, Palomares Intersection/ Farwell UP)
8. Eliminate passing zone adjacent to low-speed curves
9. Address guard rail and k-rail end treatments/Upgrade roadside protection appurtenances
10. Relocate select fixed objects immediately adjacent to roadway
11. Install steel mesh netting on slopes in rockfall areas
12. Install reflective material on underpass abutments
13. Install reflective material on curbs and rock walls adjacent to roadway
14. Install dynamic active warning device for queuing conditions
15. Install speed feedback sign and optical bars at low-speed curves
16. Narrow lane widths to 11 feet and reapportion to shoulder
17. Reduce sign clutter at Old Canyon Road and Palomares Road

# Medium Term Countermeasures

- **FACILITATE CORRIDOR ENFORCEMENT (CORRIDOR WIDE)**
  - Widen locations at strategic spacing to accommodate enforcement and pull-overs
- **PALOMARES ROAD/ FARWEL UP SPOT IMPROVEMENTS**
  - Strategy 1 - Realign Palomares Rd to join church driveway
  - Strategy 2 - Relocate the railroad abutment at Farwell UP to improve sight distance
- **ALAMEDA CREEK BRIDGE SPOT IMPROVEMENTS**
  - Replace Alameda Creek Bridge to upgrade the approach curves
- **LOW SPEED CURVE BETWEEN BRIDGES SPOT IMPROVEMENT**
  - Correct superelevation at roadway curve east of Alameda Creek Bridge
  - Widen roadway curve east of Alameda Creek Bridge to accommodate off-tracking
- **ALAMEDA CREEK BOH SPOT IMPROVEMENT**
  - Remove Curb on Alameda Creek Bridge BOH
- **PLEASANTON-SUNOL ROAD/ ALA-84 INTERSECTION SPOT IMPROVEMENT**
  - Strategy 1 - Construct a Signalized Intersection
  - Strategy 2 - Construct a Roundabout
- **ROSEWARNES UNDERPASS SPOT IMPROVEMENTS**
  - Strategy 1 - Relocate the west abutment at Rosewarnes UP
  - Strategy 2 - Realign Road and Construct Tunnel into Slope at Rosewarnes UP
  - Strategy 3 - Bifurcate around the Pier on the North Side of Alameda Creek at the Rosewarnes UP

# Countermeasures' Safety Benefit

Location	Mileage	Collision Rate Reduction	
		Short-Term	Medium-Term
Rosewarnes UP & Approaches	0.055	27%	62%
Between Rosewarnes UP & Palomares Road	0.300	20%	5%
Palomares Rd & Farwell UP	0.132	28%	24%
Between Farwell UP & Alameda Creek Br.	0.273	9%	-
Alameda Creek Bridge	0.300	-	24%
Alameda Creek Bridge to Alameda Creek Bridge BOH	0.956	8%	23%
East of Alameda Creek Bridge (0.2 miles)	0.209	9%	-
Alameda Creek Bridge BOH	0.193		20%
Between Silver Springs UP & Pleasanton-Sunol Intersection	0.318	10%	25%
<b>Aggregating the impact at the Spot Locations</b>	<b>2.74</b>	<b>12%</b>	<b>22%</b>
<b>Corridor collision reduction (applied to 7.1 mile corridor): 10%</b>			

*Collision rate reduction measurements based on accidents per million-vehicle miles*

# Long Term Countermeasures

- Widen roadway to provide roadway cross-section of 12-foot lanes, 8-foot shoulders, and spot widening for clear recovery zone
- Correct superelevation and vertical sight distance at Quarry Road intersection
- Extend the eastbound left-turn pocket at the Quarry intersection
- Caltrans would monitor accident data after project implementation of short and medium term countermeasure and would consider long term countermeasures if monitoring revealed a continuing problem

# *Summary of Study Findings*

- Safety improvements are warranted at specific locations
  - Collision rates are above state-wide average in select locations after installation of median rumble strips
  - Select corridor-wide improvements warranted:
    - Accommodation of Bicycles
    - Roadside Design Issues
    - Shoulder Discontinuities
    - Vegetation
- Consider implementing short and medium-term countermeasures
- Monitor roadway safety performance after project implementation of short & medium-term countermeasures
- Based on monitoring results, consider implementation of long-term countermeasures

# Project Development- Next Steps

- Caltrans to evaluate community feedback
- Comments may be submitted by comment card or by email at: [nilescanyonprojects@dot.ca.gov](mailto:nilescanyonprojects@dot.ca.gov)
- Continued dialog with local agencies and organizations at stakeholder meetings in January/February 2013
- Start scoping process for potential projects

# Route 84 Stakeholders

- **Senator Corbett**
- **Assembly member Wieckowski**
- **Alameda County Supervisors Haggerty & Valle**
- **Alameda County**
- **City of Fremont**
- **City of Union City**
- **Alameda County Water District**
- **California Highway Patrol**
- **East Bay Bicycle Coalition**
- **Alameda Creek Alliance**
- **Save our Sunol**
- **Sunol Citizen's Advisory Committee**
- **Save Niles Canyon**

# Questions & Comments

