Tools for Active Transportation Safety Measures

Slido 1033

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Meghan Mitman, AICP

Principal, Fehr & Peers

Rod Brown, AICP, PTP

Associate, Fehr & Peers

Strategies for Reducing Pedestrian Injury on State Roads

Acknowledgements:

Rachel Carpenter
Caltrans Pedestrian and Bicycle Safety Branch Chief

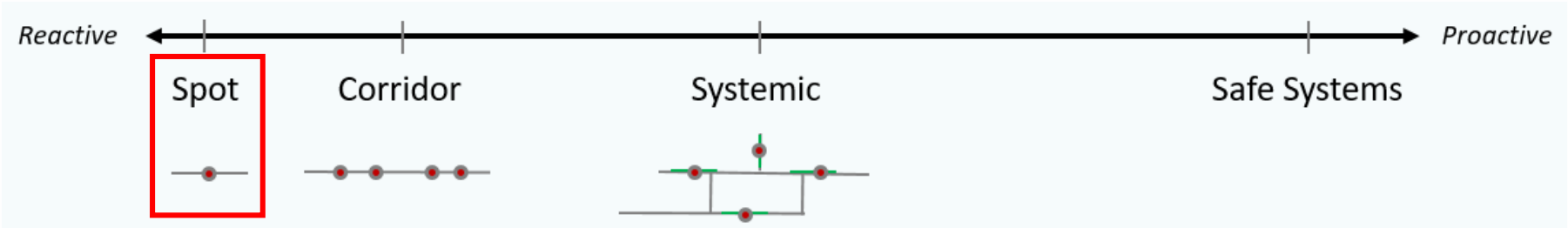
Anika Jesi
Senior Transportation Planner, Caltrans Sustainability Program

Offer Grembek
Co-Director, Safe Transportation Research and Education Center, UC Berkeley

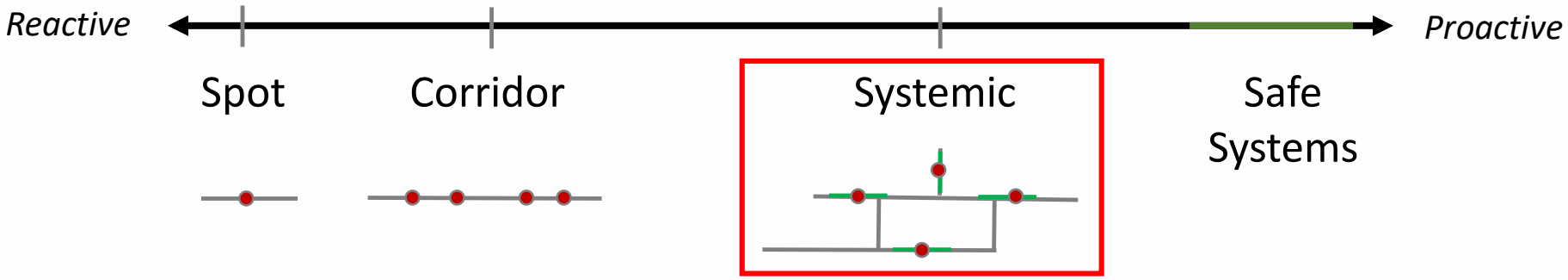
Pedestrian Safety Improvement Monitoring Program

Round 1, 2016-2017

- 129 Investigations
- 147 Improvement Actions



Where does Systemic Safety fit in?



Systemic approach

- Reactive: uses historical crash data to identify priorities
- Proactive: makes improvements also at low or non-crash sites

FHWA's Systemic Safety Program

Systemic Analysis: Collision Rates

Facility	Factor	Values
Intersection	Control	• Two-way stop • Four-way stop • Yield • Signalized • Uncontrolled
	Approach lanes	Number on major street and number on minor street
	Average Annual Daily Traffic (AADT)	• 0-7,000 • 7,000-15,000 • 15,000-25,000 • 25,000 or greater

Lanes (maj+min)	0-7,000 AADT	7,000-15,000 AADT	15,000-25,000 AADT	25,000+ AADT
All-way stops	0.03	0.28	0.38	0.43
2+2	0.02	0.20	*0.13*	*0.50*
3+2			*2.00*	
4+2	*0.13*	*0.83*	*0.50*	*0.40*
4+4		*0.50*		
6+2				*0.50*
Signal	0.35	0.53	0.87	1.11
2+1			*0.60*	
2+2	0.33	0.22	0.62	0.23
3+2	0.36	0.89	1.87	*0.20*
3+3	*0.67*	*3.33*	*3.43*	*4.00*
4+1			*0.22*	0.08
4+2	0.29	0.55	0.78	0.83
4+3	*0.50*	1.07	0.70	0.73
4+4		1.11	1.09	1.16
5+2		*0.33*	0.26	0.73
5+3			*1.00*	*0.25*
5+4			0.82	0.88
6+2		*1.20*	*1.40*	1.28
6+3				2.40
6+4			1.08	1.48
6+5				*1.20*
6+6			*0.50*	1.57
7+2				*1.50*
8+2				1.44
8+3				*1.50*
8+4				2.43

Systemic Analysis: Prioritization

Category	Source Data	Metric	Max Pts Available
Collision Rate	SafeTREC systemic analysis results	Statewide total collisions divided by total intersections for each facility type	55
Exposure	Exposure/Pedestrian Volumes Study 2013-2017 American Community Survey data by block group	Total pedestrian volumes	25
Disadvantaged Communities	CalEnviroScreen 3.0 GIS Data	If a tract with a score <25% occurs within a half mile of the facility	10
Senior Population Density	2013-2017 American Community Survey data by Block Group	Total senior population (65 and over) per square mile within a 1/2 mile of the facility	2.5
Youth Population Density	2013-2017 American Community Survey data by block group	Total youth population (under 15) per square mile within a 1/2 mile of the facility	2.5
School Proximity	California School Campus Database	If a school is within 1/4 or 1/2 mile of the facility	5

Applying Appropriate Countermeasures

COUNTERMEASURE

Paint and Plastic Curb Extension

Widens the sidewalk at intersections or midblock crossings to shorten the pedestrian crossing distance, to make pedestrians more visible to motorists, and to reduce the speed of turning vehicles.

Locations: Signalized Intersections, Unsignalized Street Crossings

Note: not in CMF Clearinghouse. See Countermeasure References.

COUNTERMEASURE

High-Visibility Crosswalk

A crosswalk that is designed to be more visible to approaching drivers. Crosswalks should be designed with continental markings and use high-visibility material, such as inlay tape or thermoplastic tape instead of paint.

Locations: Signalized Intersections, Unsignalized Street Crossings

Next Steps

- Gather additional infrastructure data to refine analysis
- Expand systemic analysis to bicyclists
- Develop strategic plan for pedestrian and bicycle safety
- Approach and tools can be applied for local agency analysis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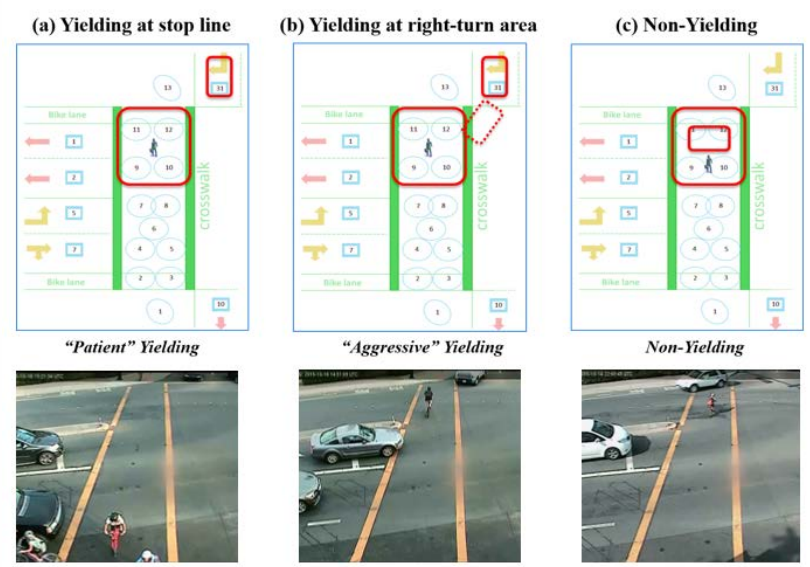
Safe System, Vulnerable Users, and Intelligent Intersections



Presented by:

Dr. Offer Grembek

Berkeley SafeTREC

Presented at:

CA ATP Symposium

October 30, 2019

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Safe System: safer roads, vehicles, speeds

Mooren et al., 2011

Figure 3 – The Safe System model reproduced from Howard, 2004 [25]

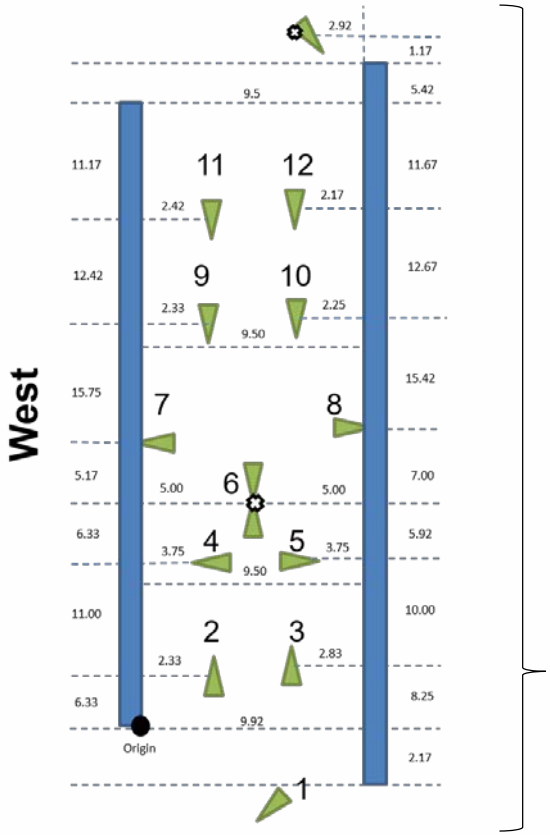
Cyclist Safety Considerations

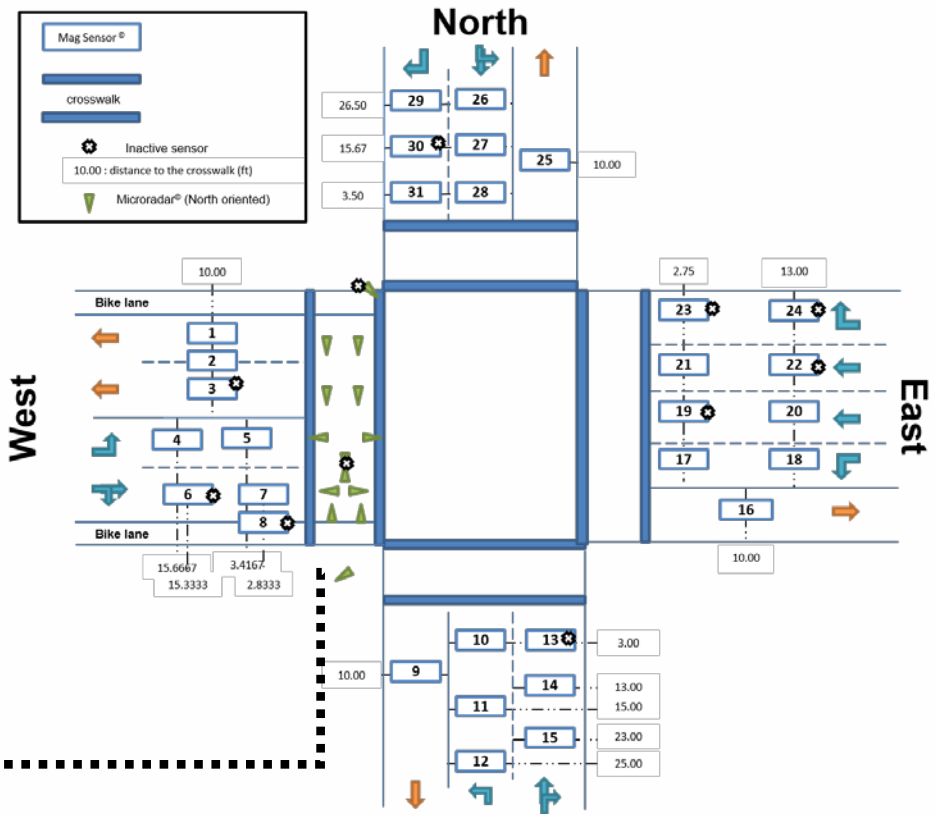
We would want alert and compliant riders, to make trips using safe bicycles, on safe street design with adequate separation from safe motorized traffic driven by alert and compliant drivers, all of which are governed by safe speeds, and supported by effective cyclist protection, and the medical emergency system, when needed.

Safety Buffers

1. street design
2. street operations
3. street-user behavior
4. street-user warning
5. street-user protection
6. emergency medical services

Intelligent Intersection





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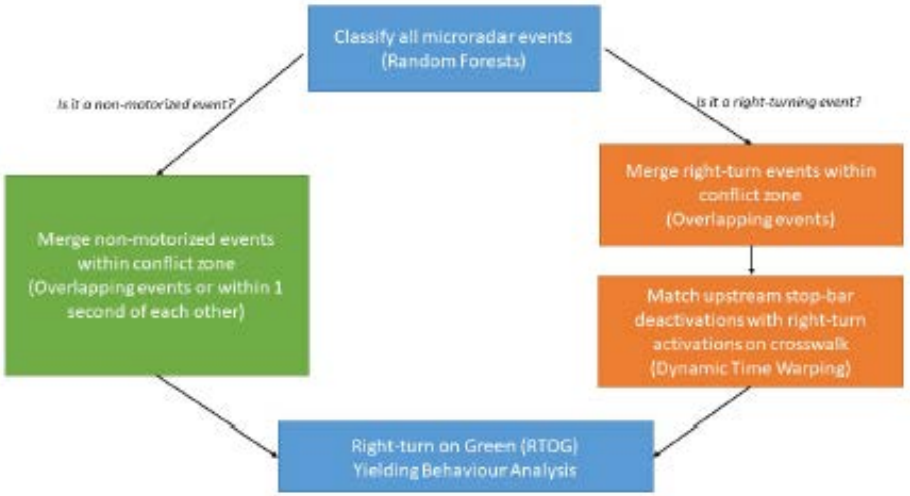
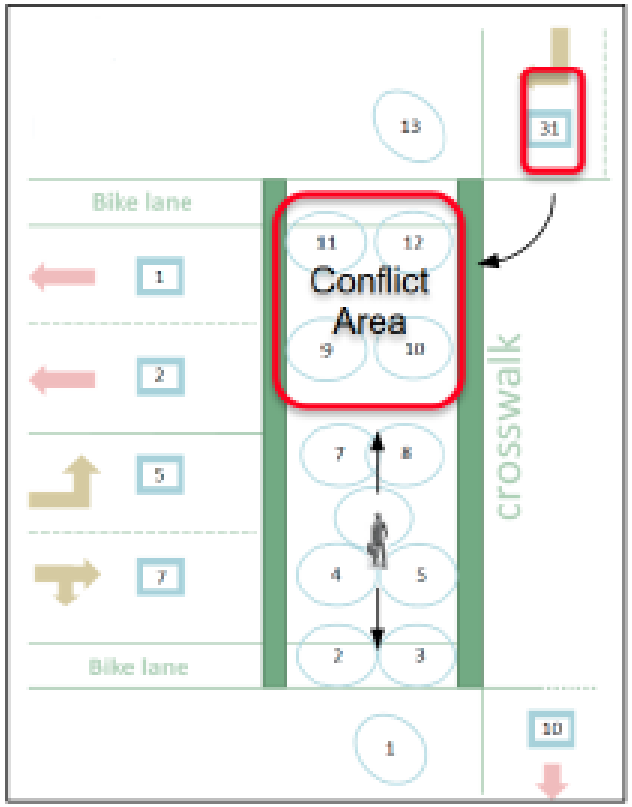
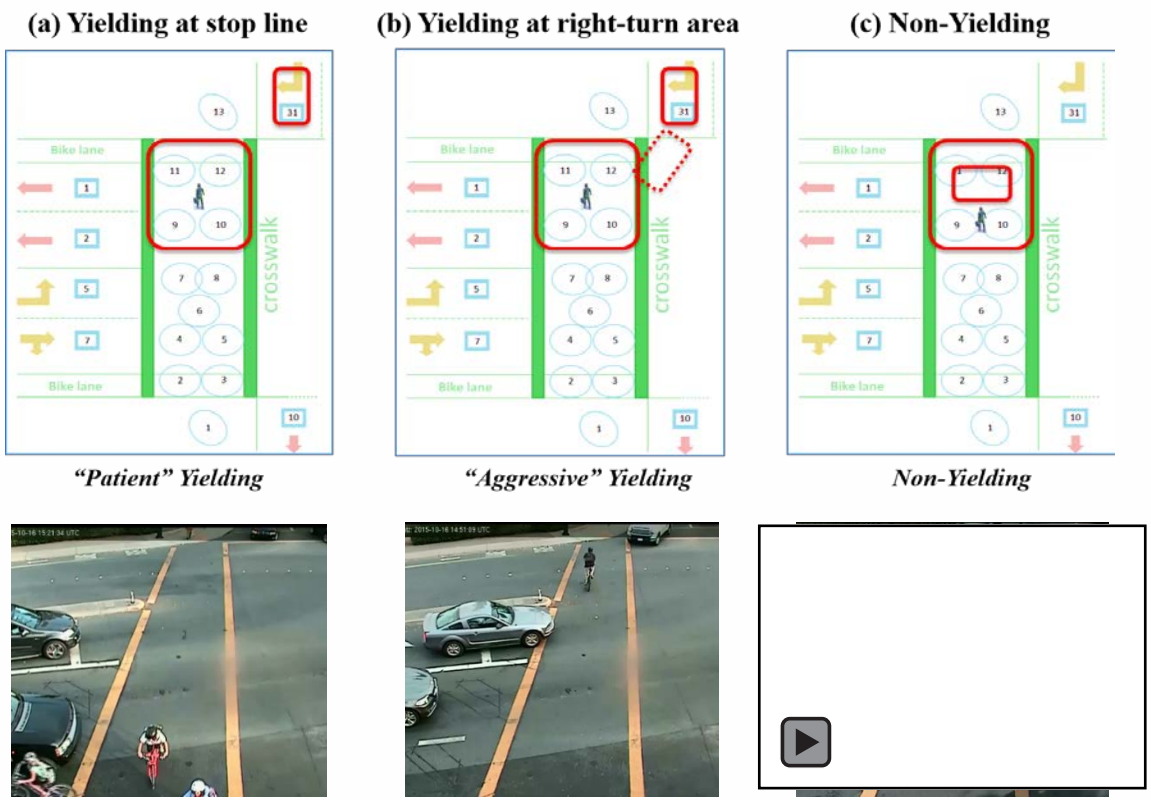
Analyzing yielding behavior during right-turns-on-green



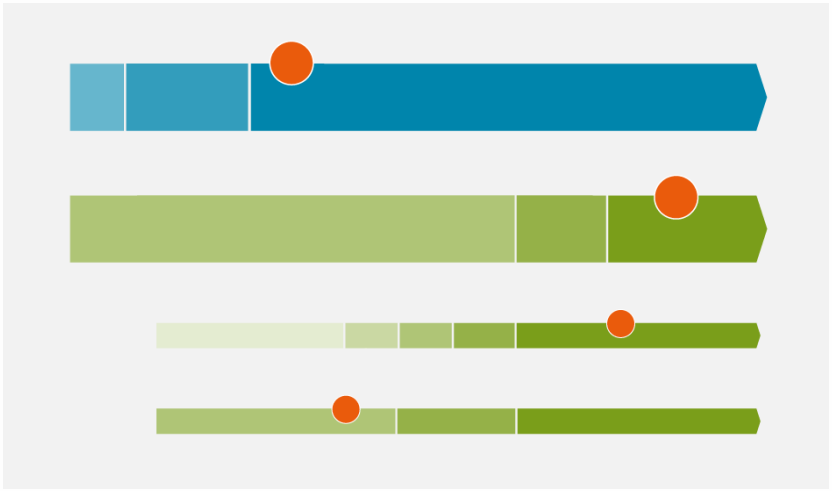


Tools to Identify Yielding-related Interactions



- **Statistical**
- Three types of yielding interactions
- Aggressive yielding are more similar to non-yielding interactions as opposed to patient yielding.

Proactively Monitor Safe Operations at Intersection



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Web-based Tools for Community Engagement

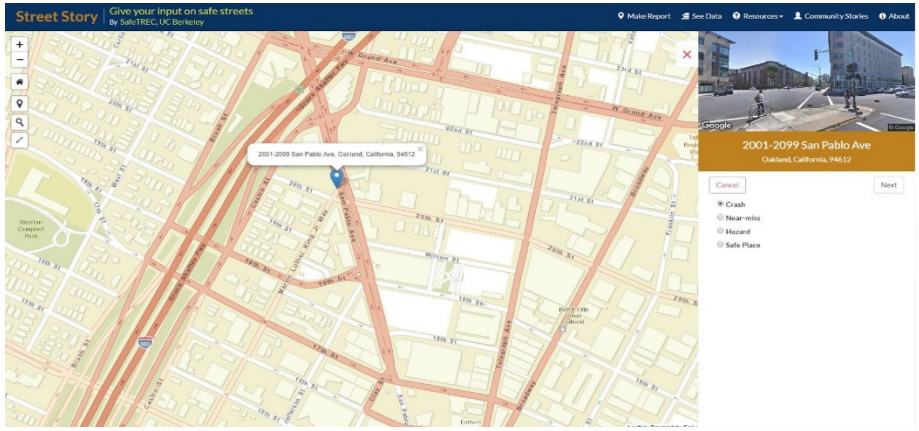
Jill Cooper

UC Berkeley Safe Transportation Research and Education Center (SafeTREC)

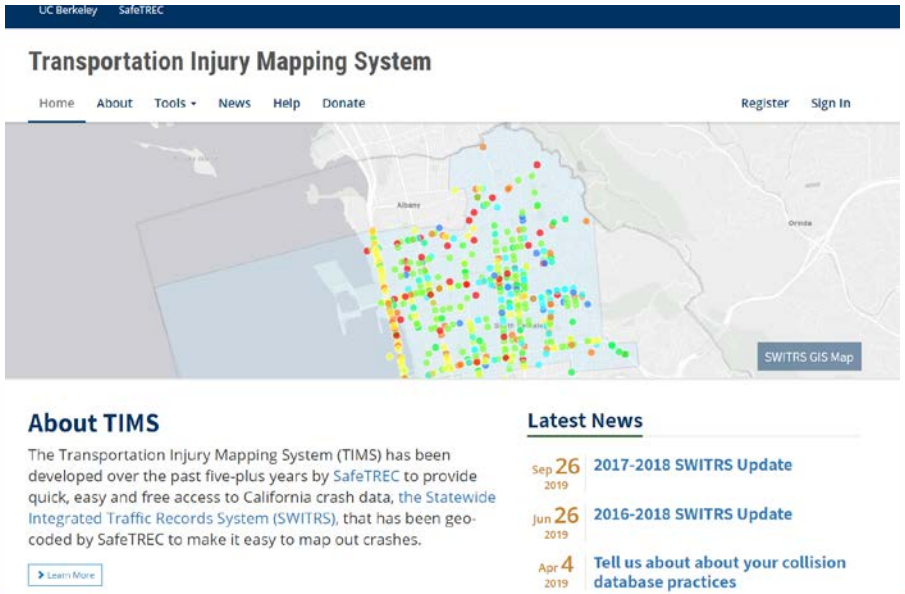
October 30, 2019

Web-based tools for communities

Street Story helps organizations collect information for transp. safety but is difficult to gather and analyze.



TIMS geocodes CA crash data (SWITRS) to allow users to view maps of collisions by city, county, tribe.



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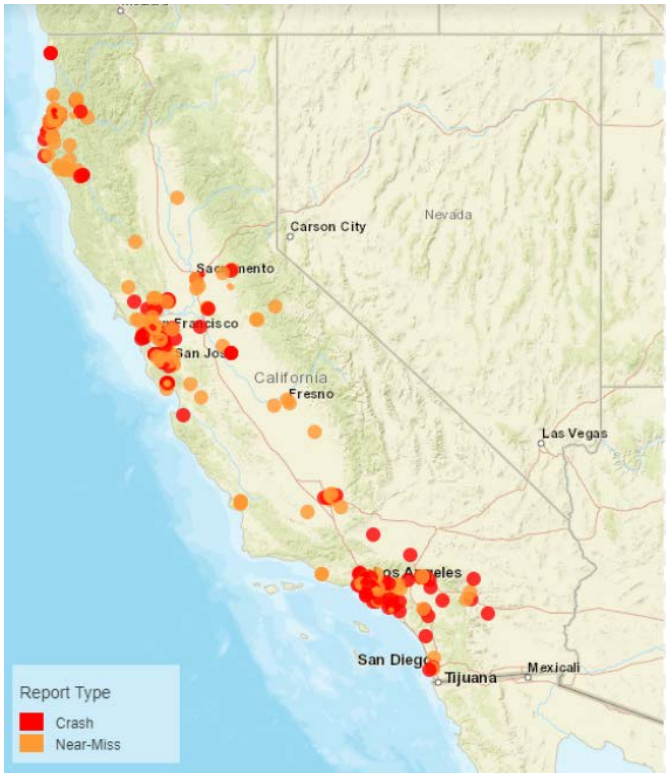
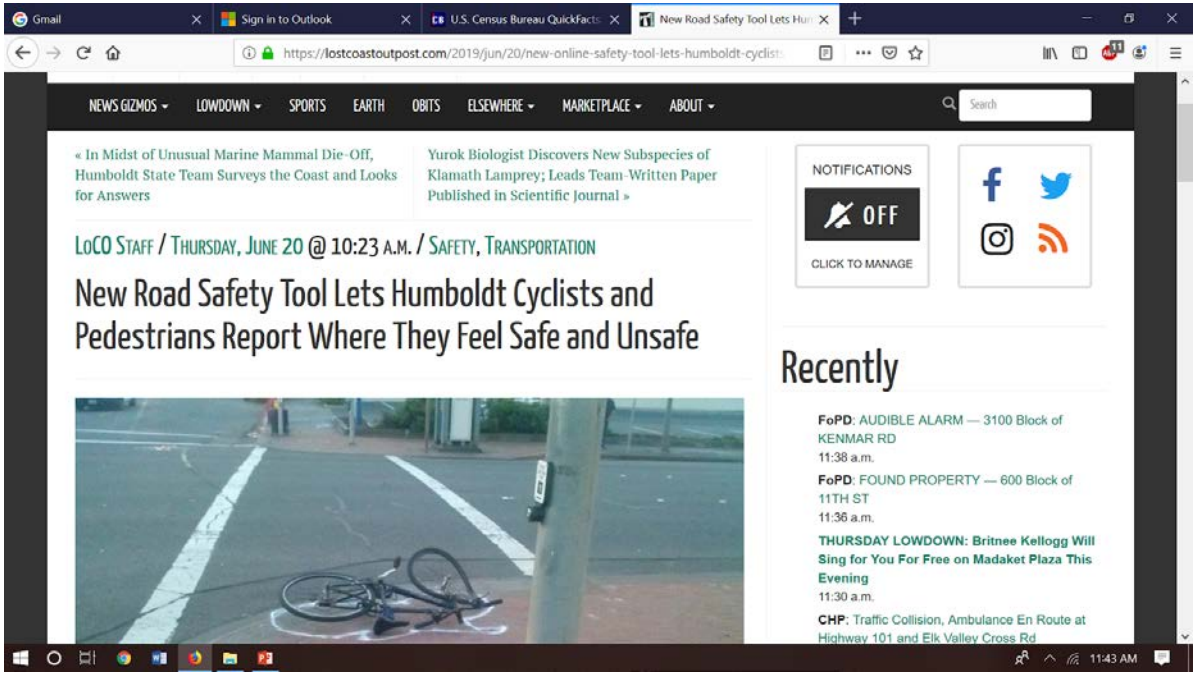
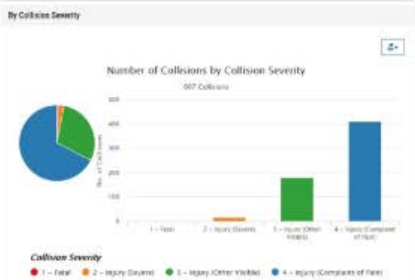
Street Story in Action



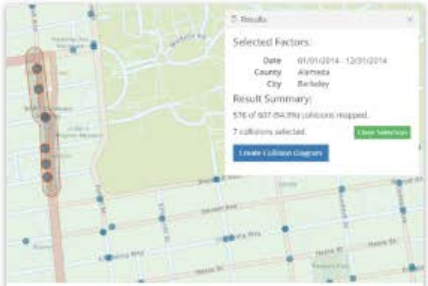


TIMS – Available Tools



SWITRS Query & Map

A basic tool for accessing fatal or injury collisions from the California Statewide Integrated Traffic Records System (SWITRS).

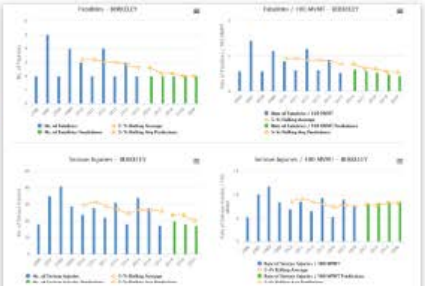


SWITRS GIS Map

The Geographic Information Systems (GIS) offers an interactive map with capability of multiple tasks including Rank by Intersection, Collision Diagram, etc.

Collision Diagram

The Collision Diagram tool allows users to generate an interactive collision diagram. The Collision Diagram is accessible through SWITRS GIS Map.



California Safety PM Target Setting

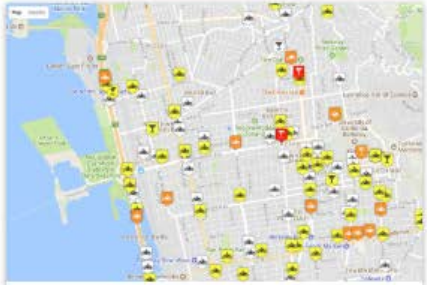
California Safety Performance Management (Safety PM) Target Setting Support Tool based on FARS, SWITRS, and HPMS data.

SRTS Map Viewer

Provide a pedestrian and bicycle collision map within half mile radius of public schools in California.

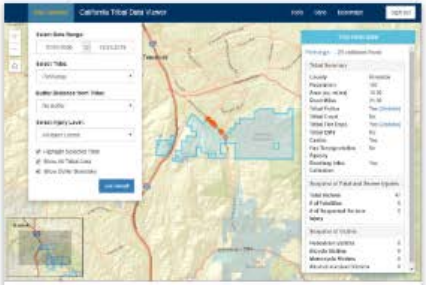
ATP Maps & Summary Data

Utilize multiple collision maps to find pedestrian and bicycle collisions hot spot and generate data summaries within specified project and/or community limits.



Motorcycle Collision Map

Provide a simple means to explore motorcycle collisions in California by selected county and/or city.



Tribal Crash Data Tool

Provide tribes with access to a web-based interactive analysis and mapping tool for tribal areas.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Senior Transportation Planner


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Rural Active Transportation Safety Challenges

Jerry Barton, Senior Transportation Planner

El Dorado County Transportation Commission

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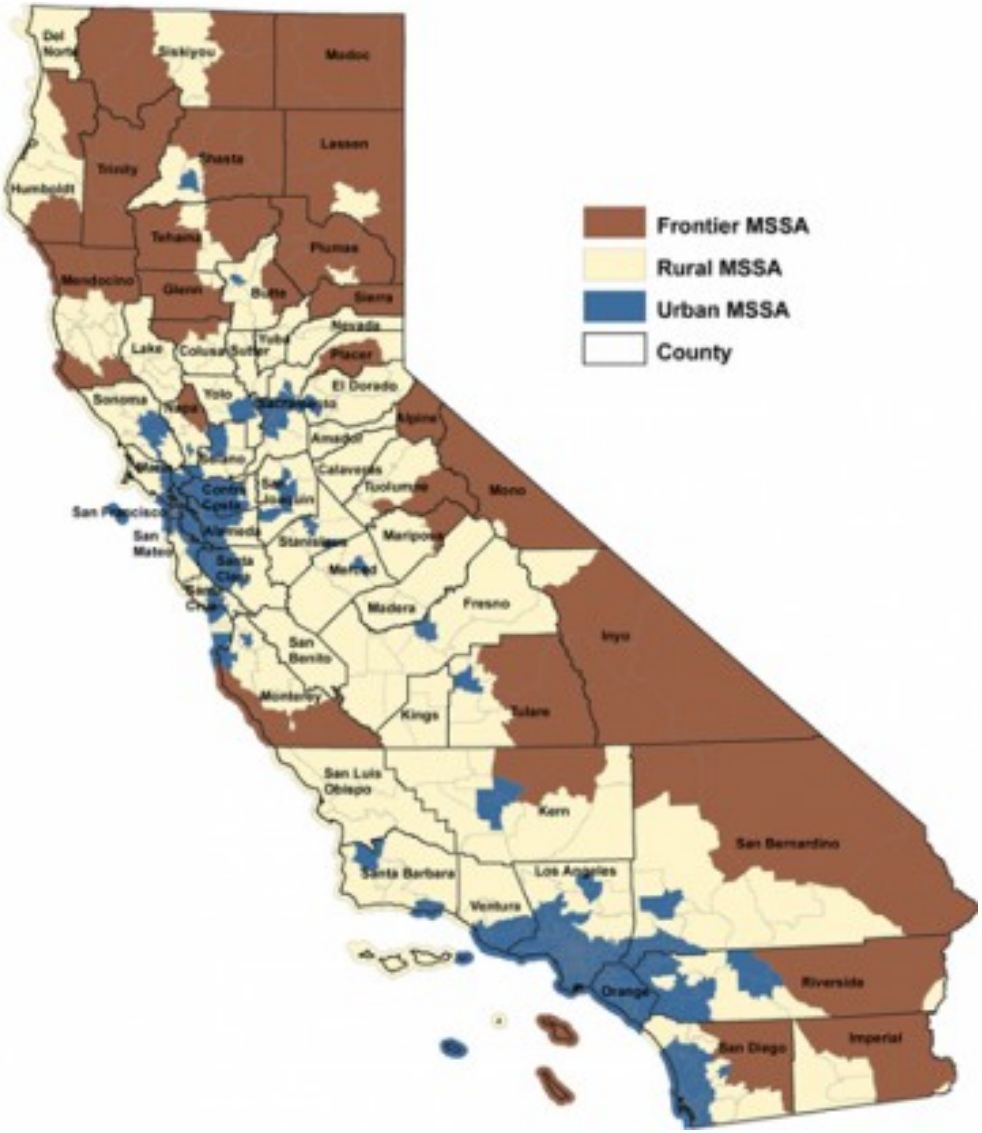
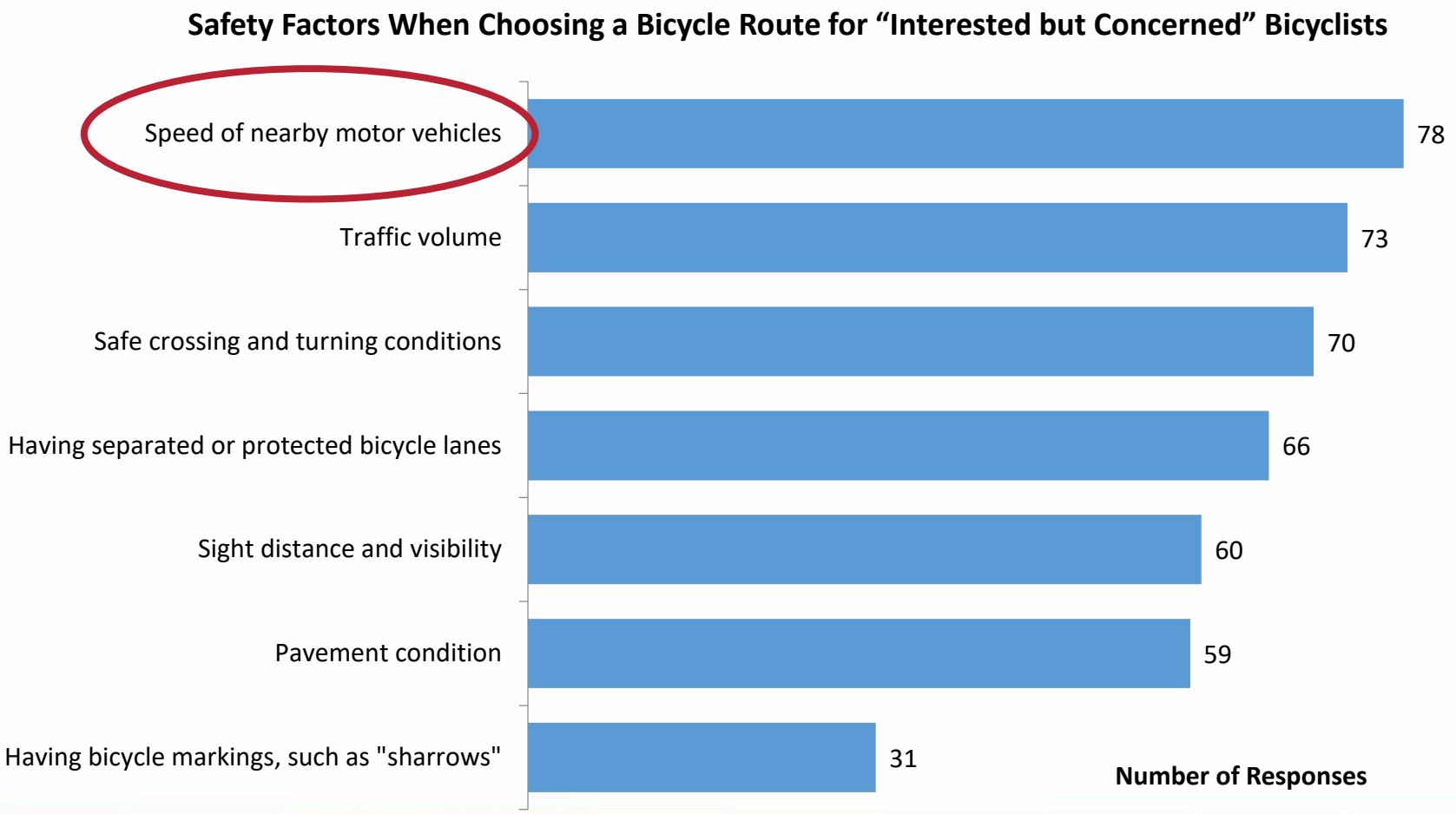
Rural California?



Characteristics of Rural Road Systems

- Road system originally designed to support resource based economic activities such as logging, mining, agriculture
- Demands for improvements are increasing as communities grow up around rural roads, and many carry heavier traffic loads than intended
- Community pride in rural character

Rural Survey Data – El Dorado County



Non-Standard Design

Access Control Challenges

Unique Challenges

Lack of Facilities/Developing Areas

High Speed Crossings

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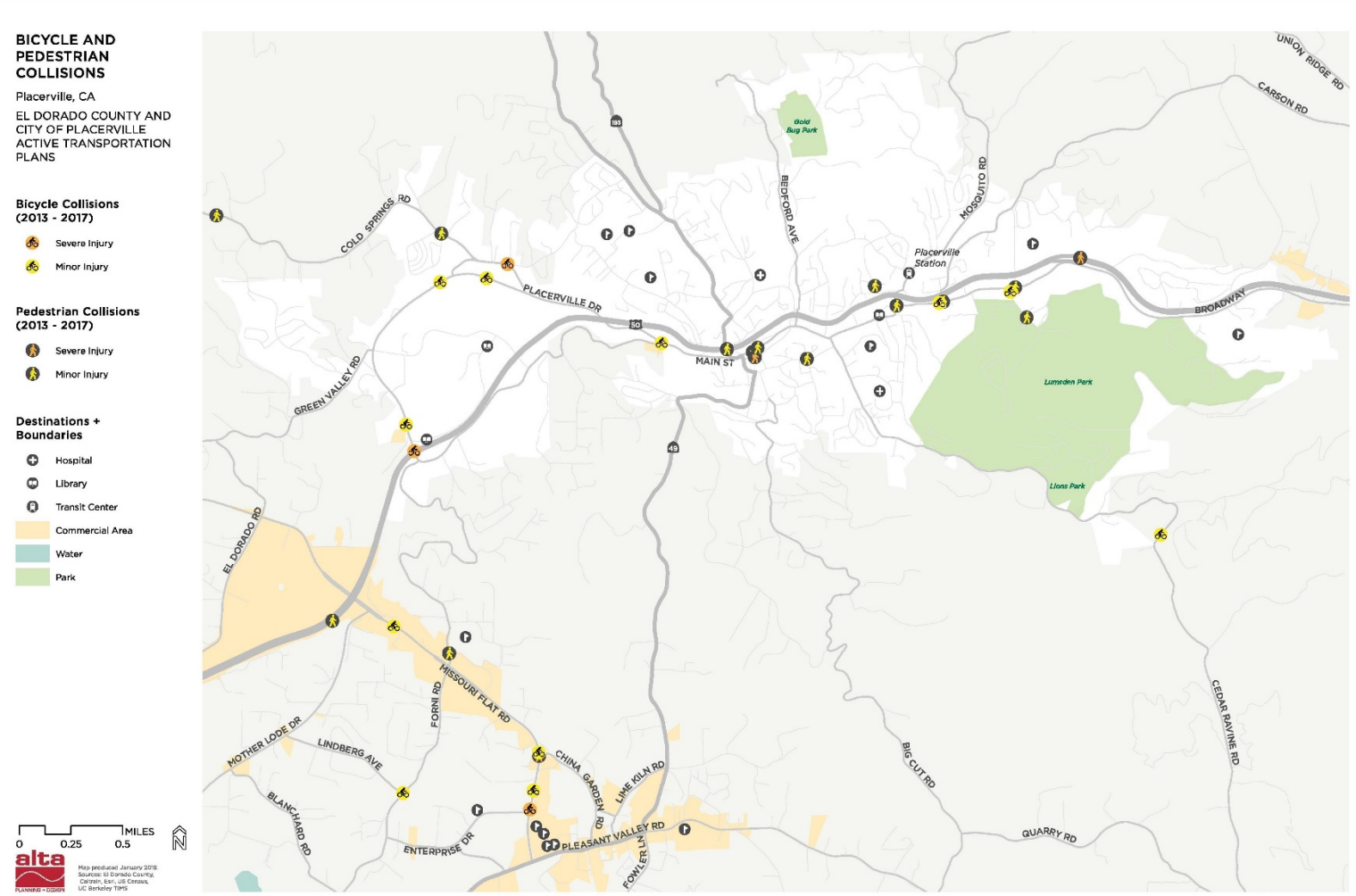
Narrow Shoulders

Maintenance Needs - Shoulders

Collision Locations – Few Clusters



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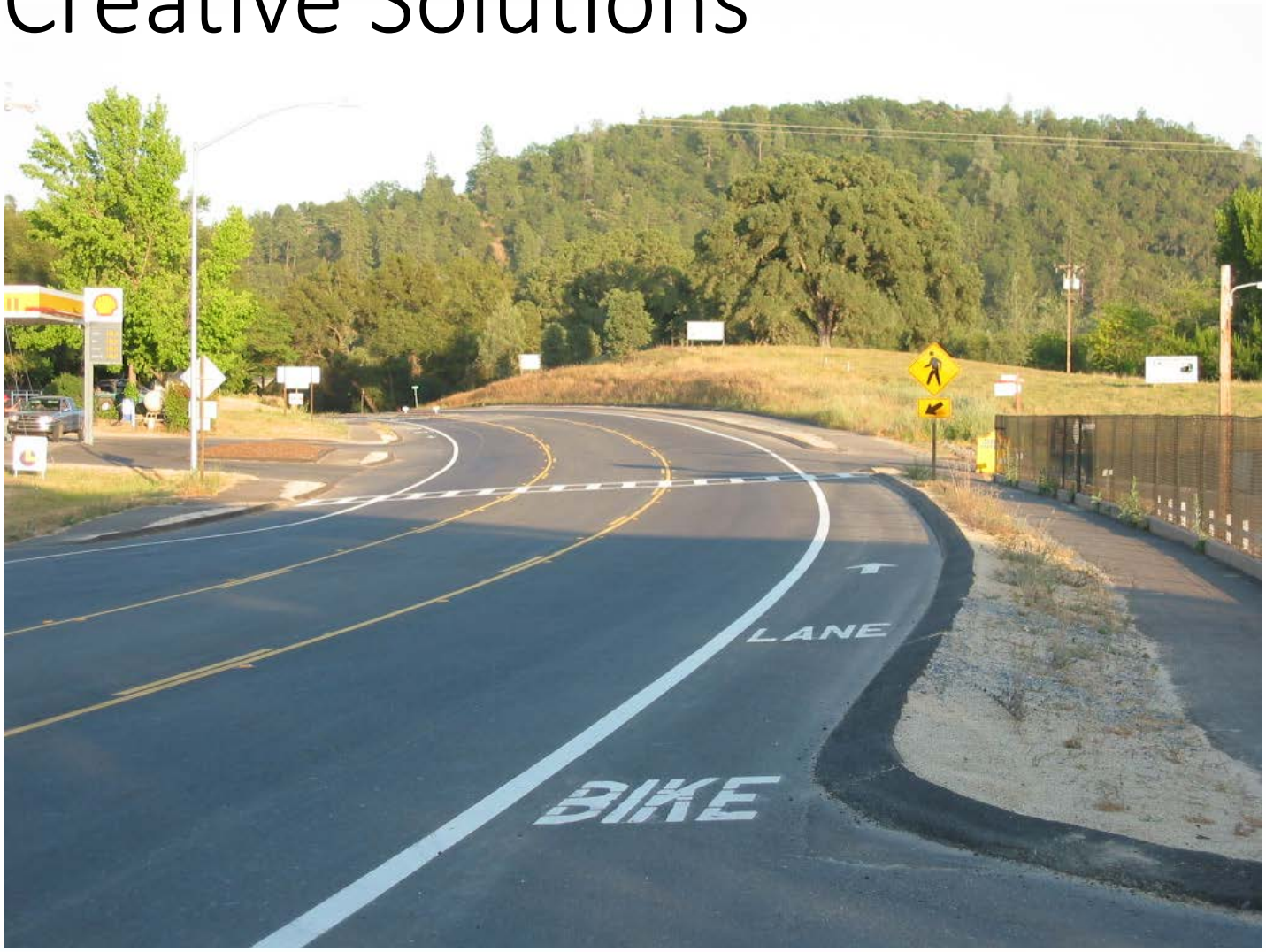
Opportunities

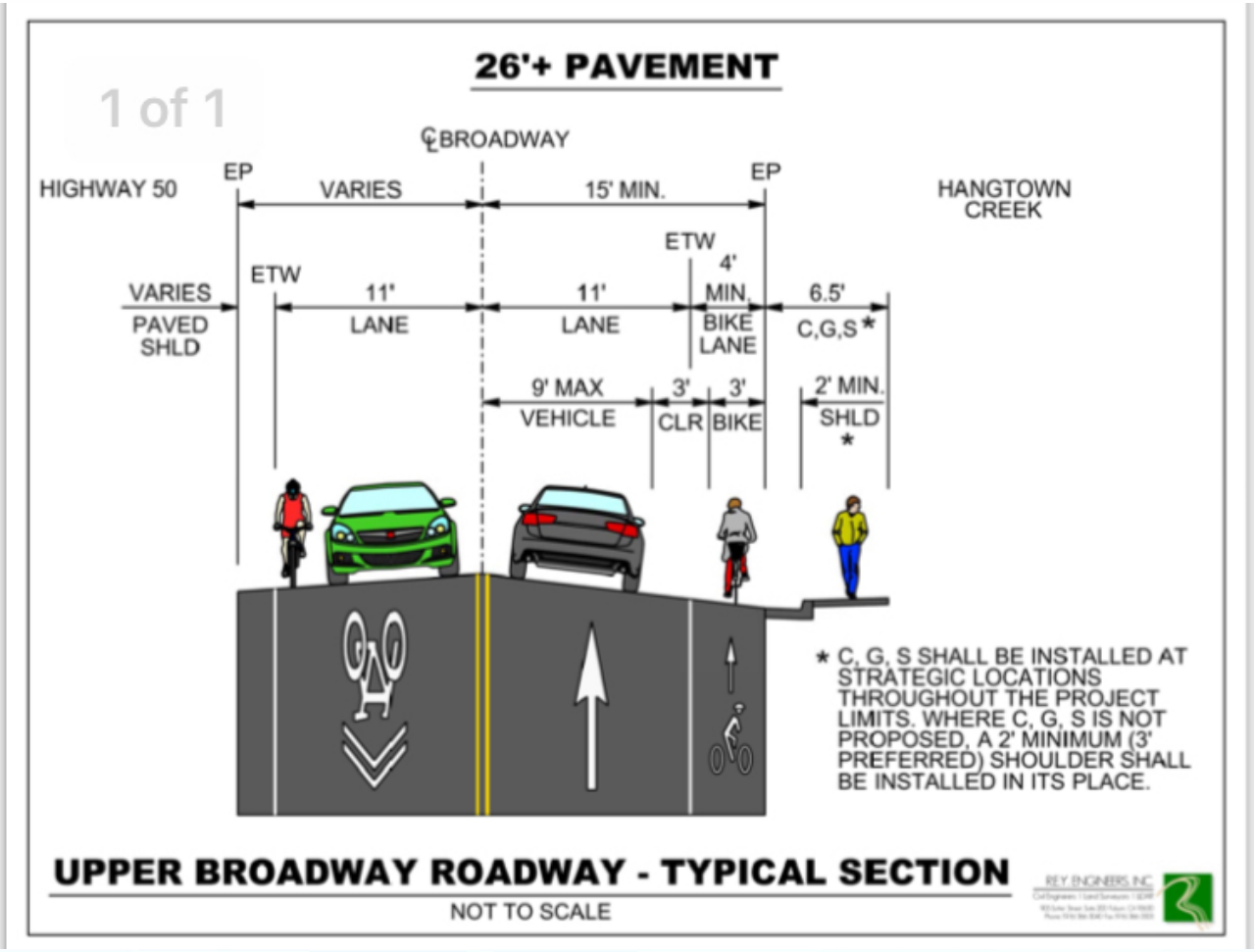
- Education & Awareness
- Community Engagement
- Creative Engineering Solutions

Creative Solutions

Creative Solutions



Creative Solutions – Uphill Class II - Downhill Sharrow



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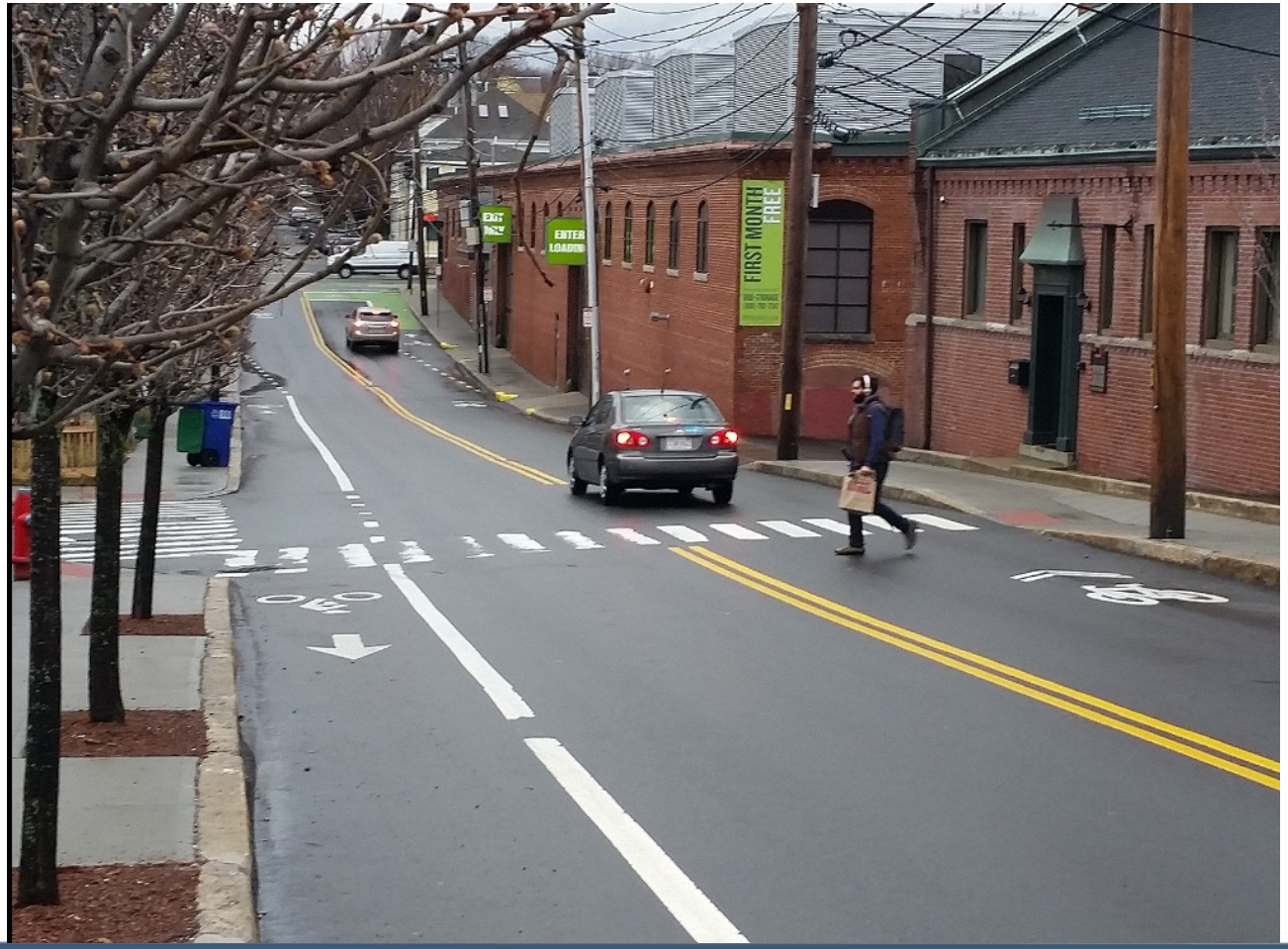
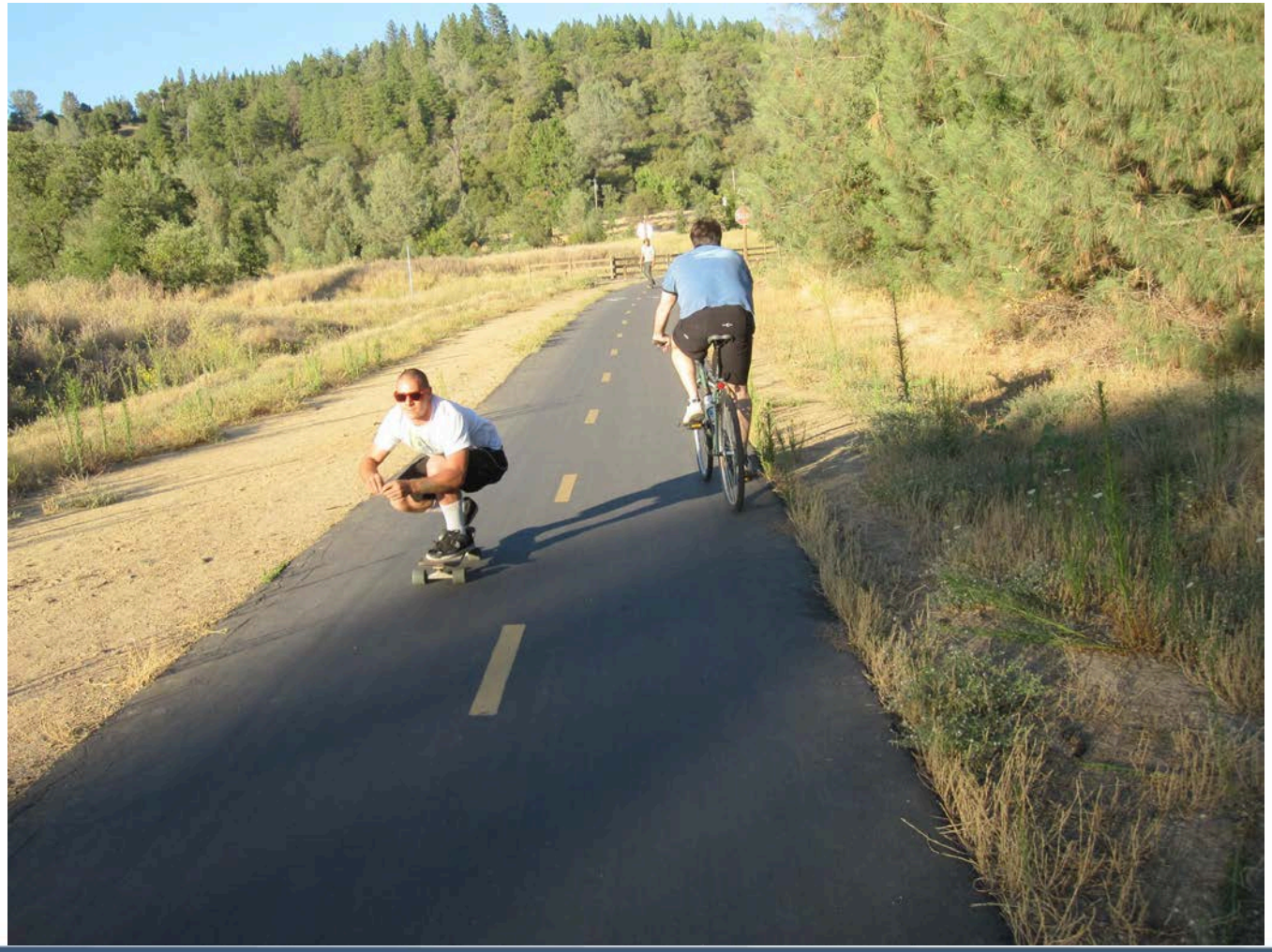


Room for Rural Class I Facilities

Safety Challenges Unique to Rural Areas

- Non-standard designs
- Lack of facilities
- Maintenance needs
- Random collision locations
- Low volume of active transportation users
- Recreation and tourism traffic, recreational cycling or walking
- Vehicular speed, type
- Rugged topography, narrow road widths, short sight distances, scenic viewsheds
- Darkness

Thank You!

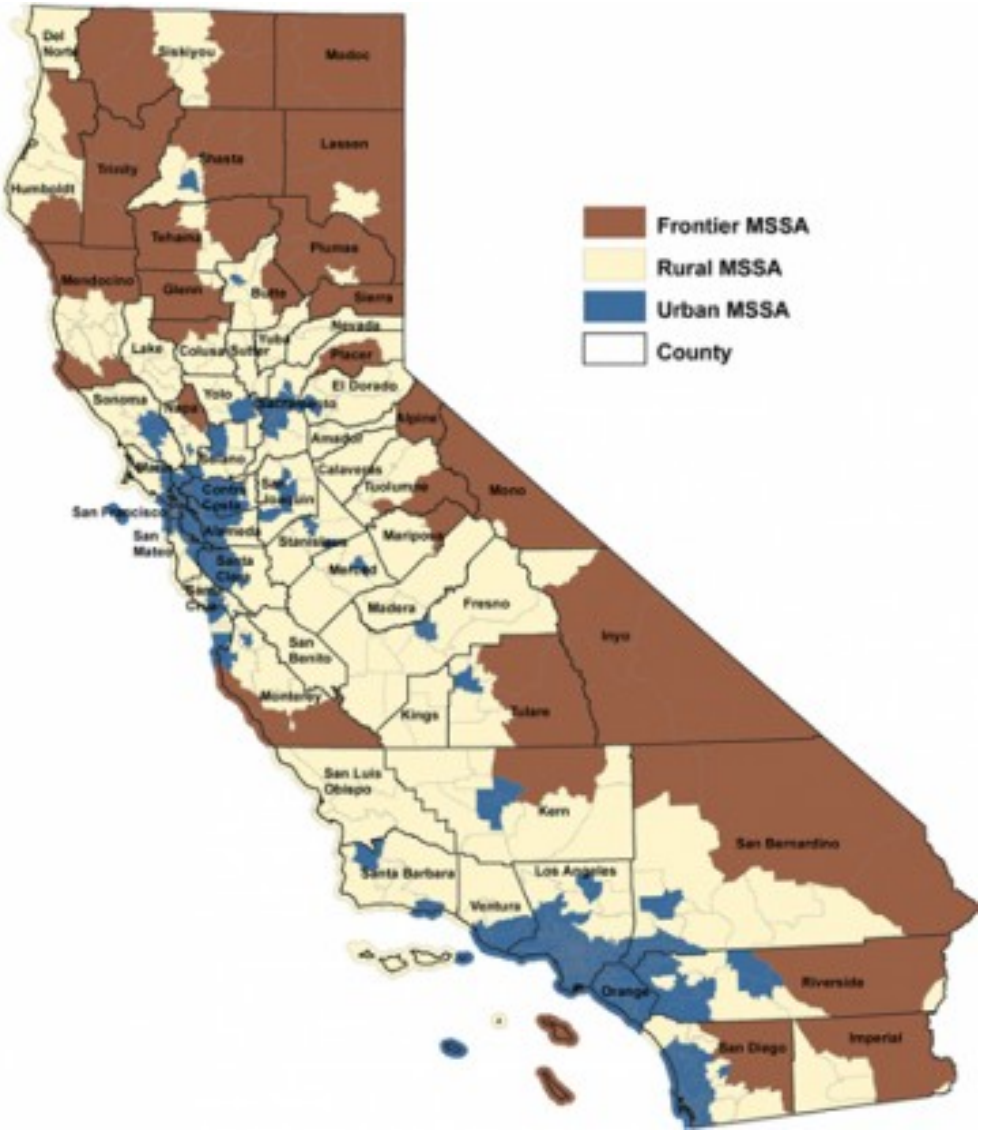


Rural Active Transportation Safety Challenges

Jerry Barton, Senior Transportation Planner

El Dorado County Transportation Commission

Rural California?



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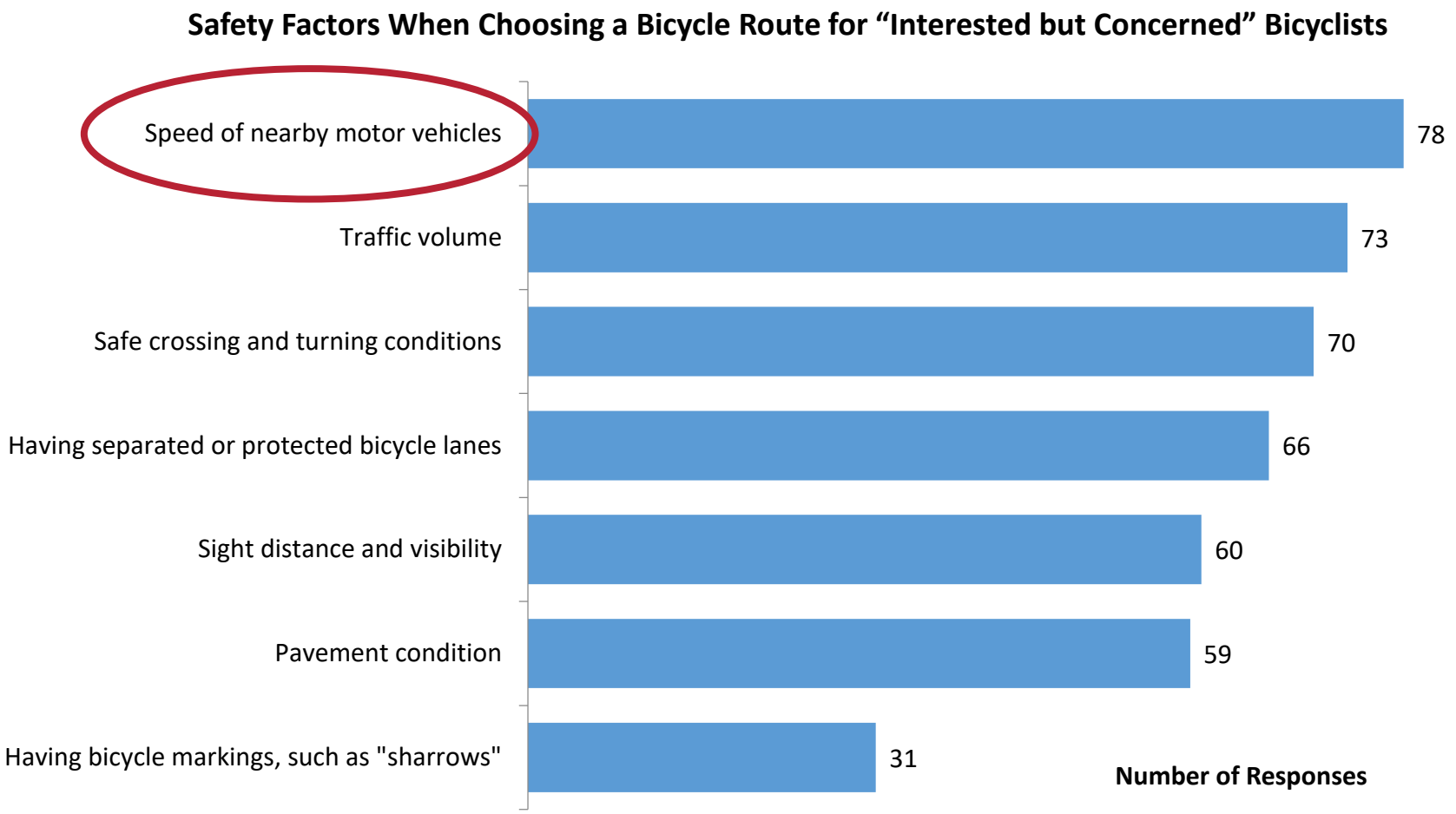
Rural Survey Data – El Dorado County



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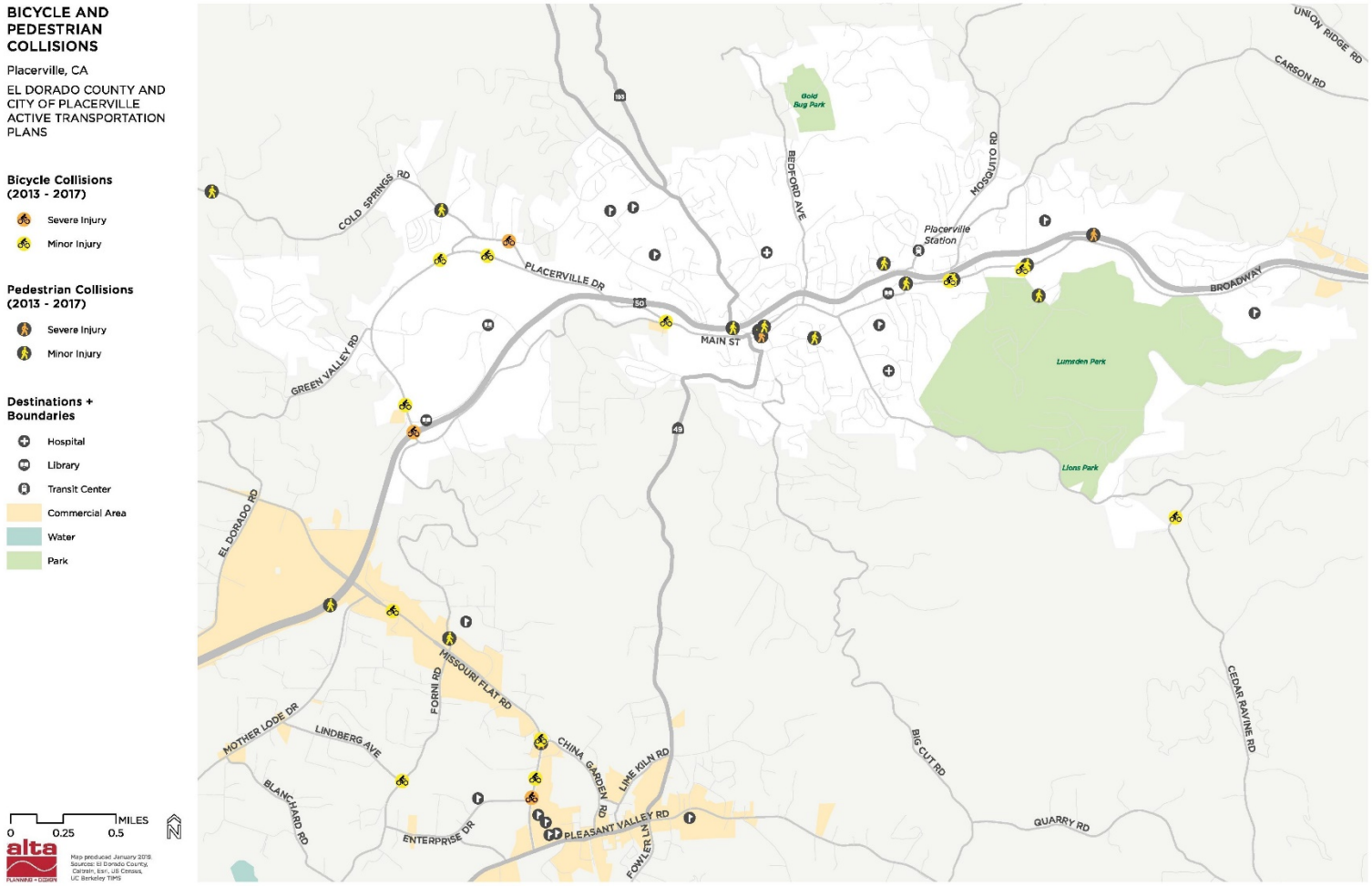

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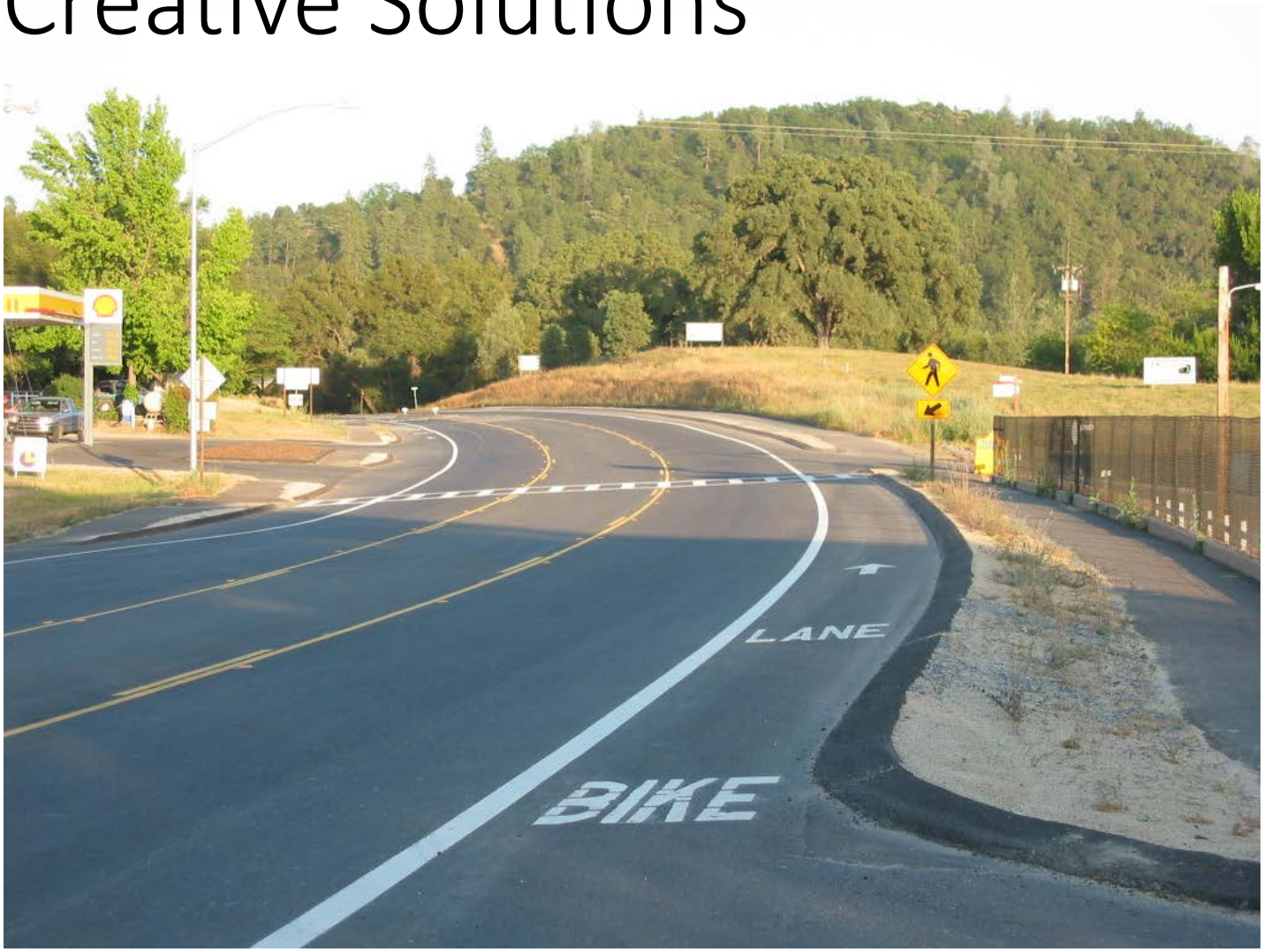

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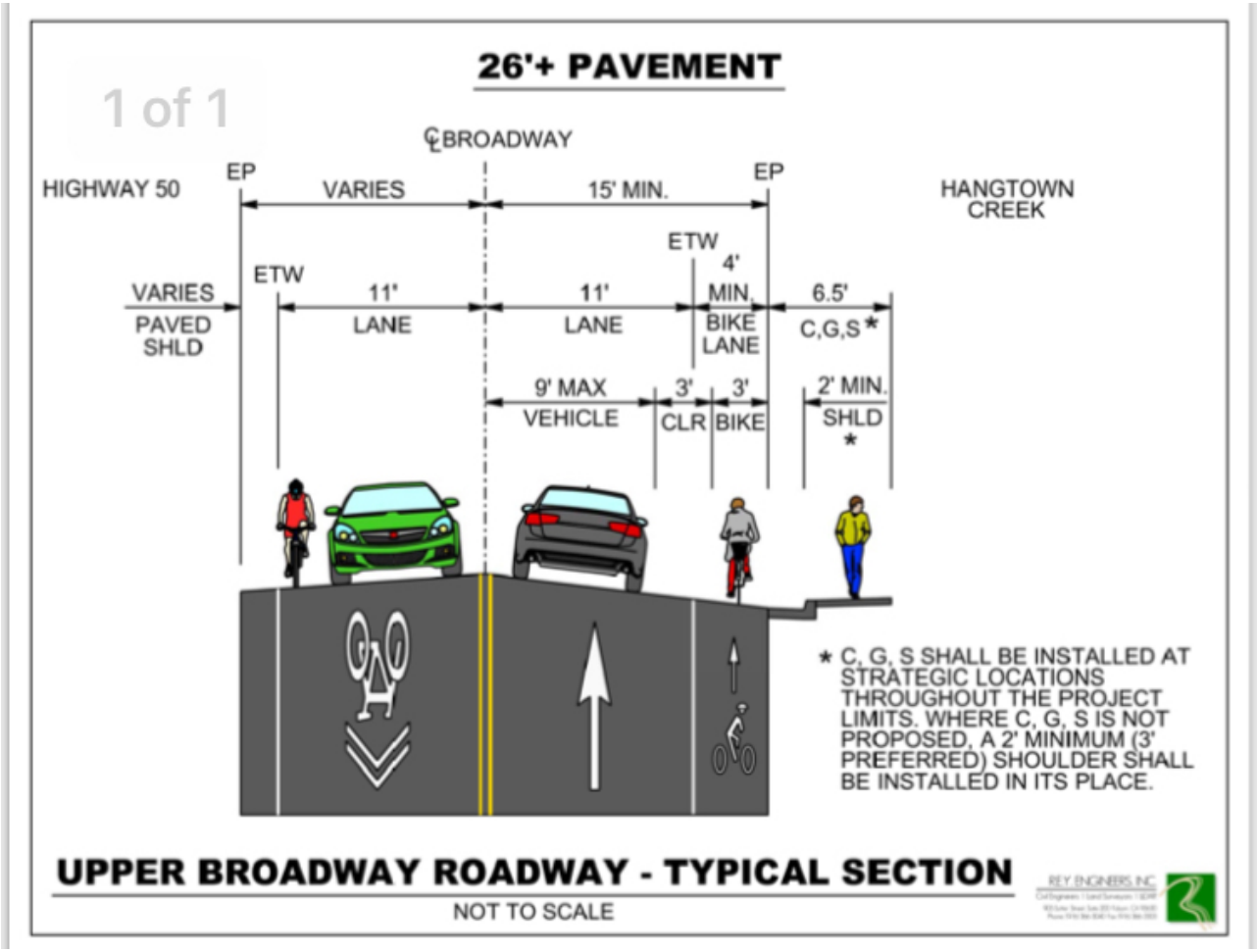

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