Lafayette Local Road Safety Plan

Task Force Meeting # 3

02/01/2023

Agenda

- **Step 2: Analyze Safety Data**
  - Recap of Meeting #2
  - Updated Priority Locations
  - Location Profiles
- **Step 3: Determine Emphasis Areas**
  - Emphasis Area
- **Step 4: Identify Strategies**
  - Draft Safety Measure Toolbox
- Next Steps

Source: FHWA

New to the Task Force

Step 2:

Recap of Meeting #2 on 10/25/2022

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The LRSP Development Process

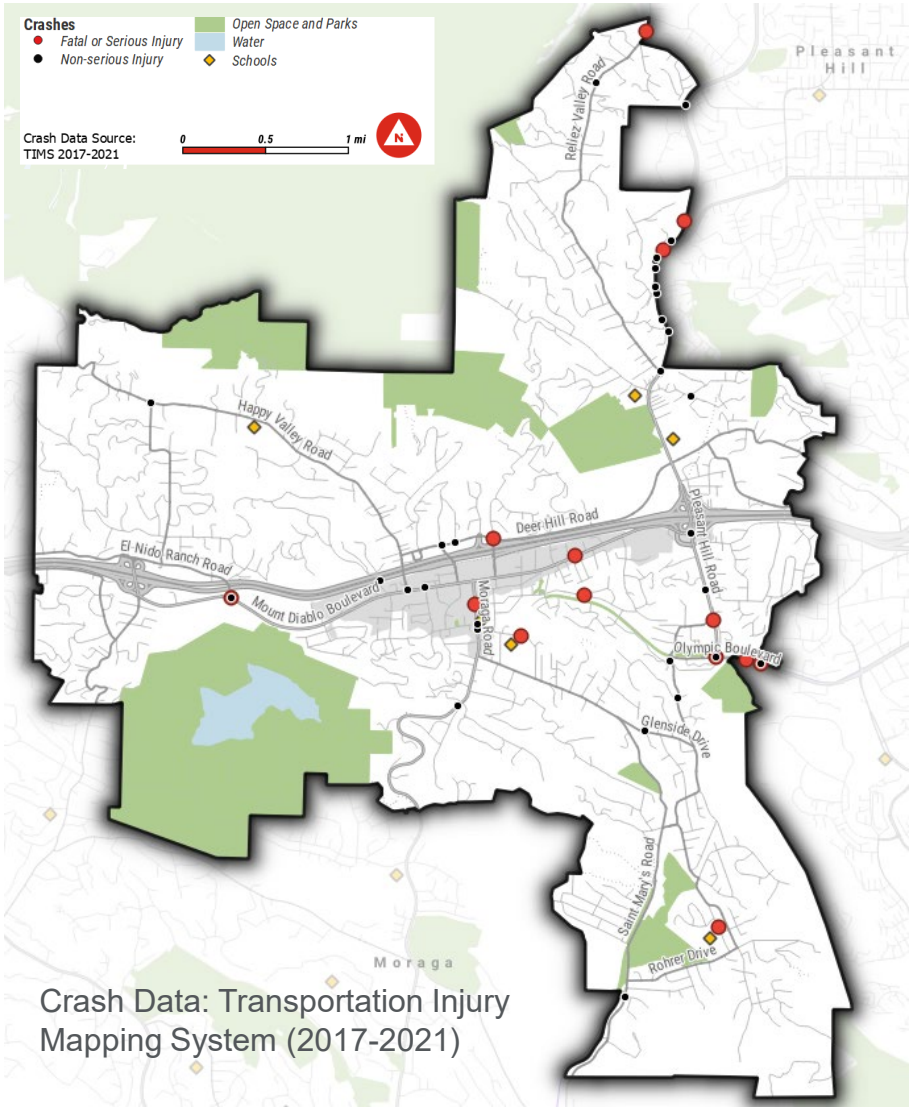
Step 2: Analyze Safety Data

- Crash Analysis
  - Citywide crash trends and patterns
- Priority Locations
  - Locations with highest crash risk
  - Based on frequency and severity

Source: FHWA

Recap: Crash Analysis Summary

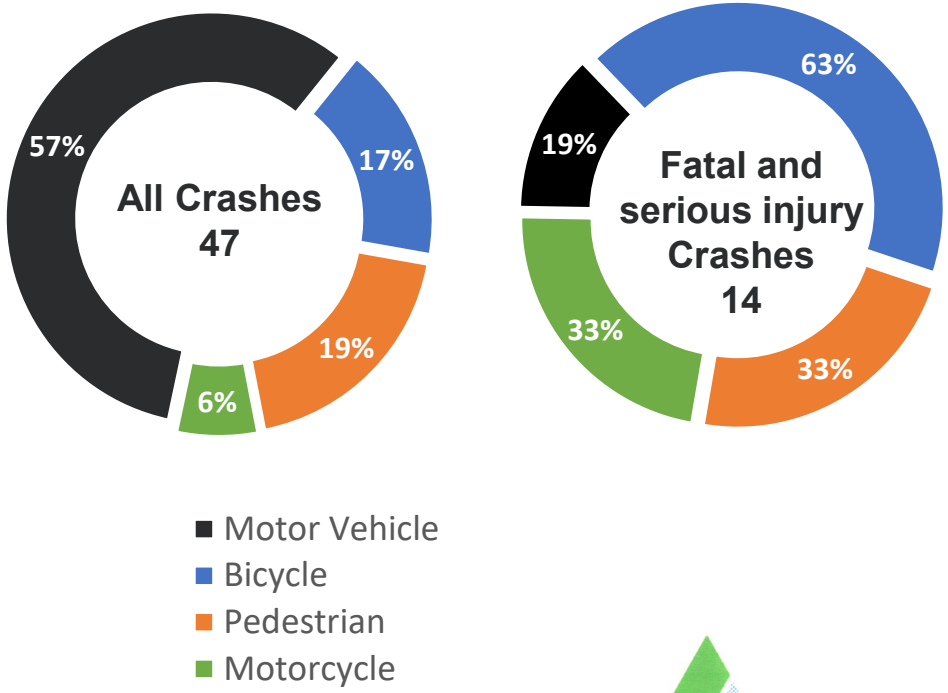
- Goal of crash analysis is to identify patterns throughout the City
- 2017-2021 TIMS data
- 47 crashes on local roads
- 14 Fatal or Serious Injuries



Crash Data: Transportation Injury Mapping System (2017-2021)

Recap: Crash Analysis Summary

- Unsignalized Intersections (43%)
- Solo crashes were most frequent (34%)
- Vulnerable Road users were most at risk for fatal & serious injury
- Most frequent crash types for all crashes were:
  - Hit Object (21%)
  - Broadside (17%)
  - Vehicle & Pedestrian Crashes (15%)
- Top reported violations were:
  - Unsafe Lane Change (23%)
  - Automobile Right of Way (19%)
  - Improper Turning (13%)



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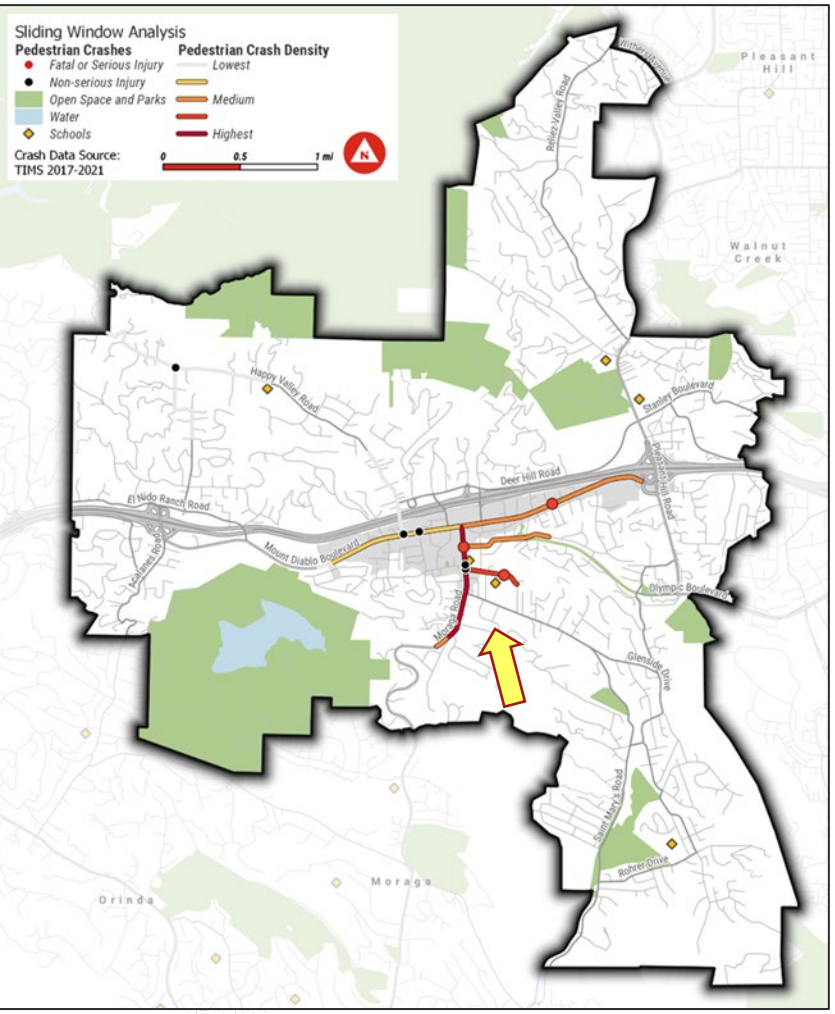
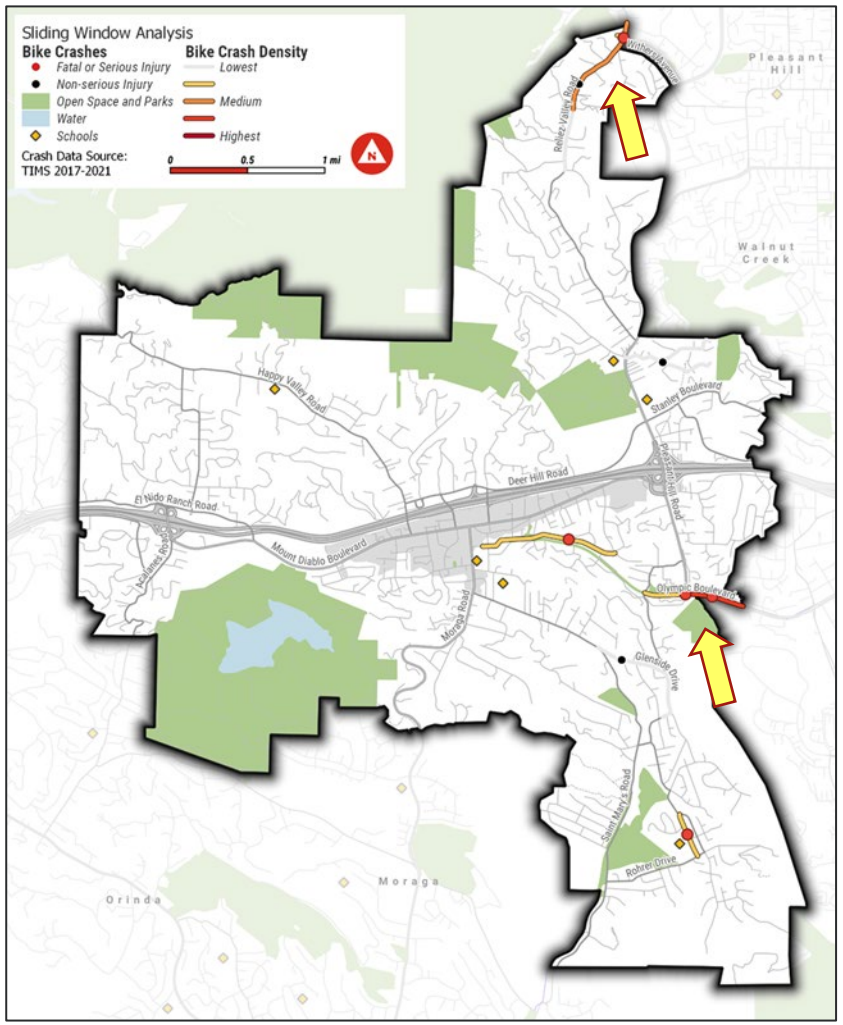
Recap: Priority Locations

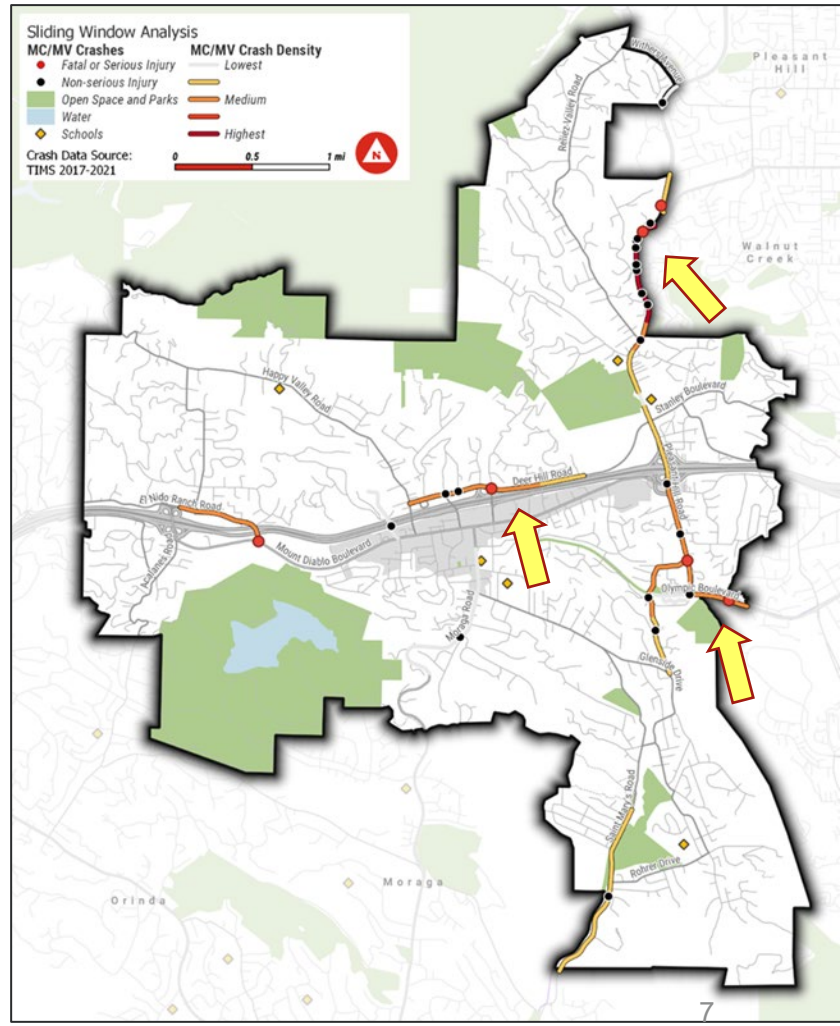
Pedestrian



Bicyclist



Motorist/Motorcyclist



Recap: Priority Locations- Task Force

Preliminary included list:

- **Mt Diablo Blvd** from Acalanes Rd to Pleasant Hill Rd
- **Pleasant Hill Rd** from Old Tunnel Rd to Olympic Blvd
- **Olympic Blvd** from Reliez Station Rd to Newell Ct
- **Moraga Rd** from Mt Diablo to St Marys Rd

Task Force:

- *Does this reflect your experience?*
- *Are there other unsafe streets in Lafayette?*
- *Are there specific locations along these road with safety issues?*

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Priority Locations- Task Force

What have we heard?

- School St
- Moraga Blvd
- Oak Hill Rd & Happy Valley Rd
- Deer Hill Rd
- Unprotected trail crossings were a common theme for crashes
- What about the unique characteristics of Lafayette such as ditches, hills, and windy roads?

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Step 2:

Updated Priority Locations

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Priority Locations- Holistic Approach

- Data Limitation
  - 14 fatal & serious injury crashes means hard to spot trends/patterns
  - Violation types can be ambiguous
    - Such as automobile right of way or pedestrian right of way
  - Data are not available
    - Such as speeding, road curvature, & bike facility type
- Data limitations → Future recommendations
- Public Engagement- the people are the experts!
- Field Observations- what are we seeing in the field?

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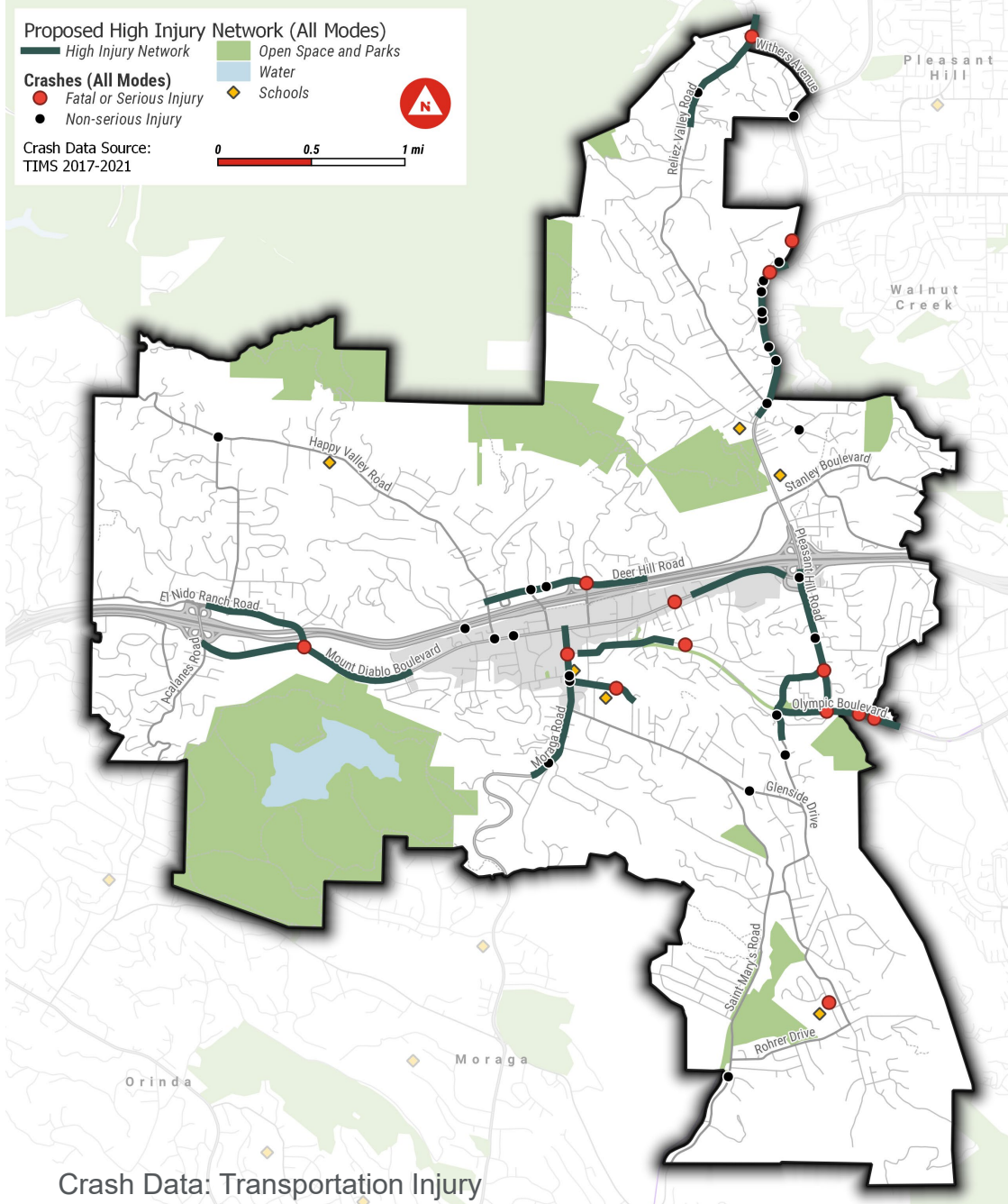
Priority Locations

High Injury Network Map

- Looked at ALL modes
- Corridors with at least one fatal and serious injury crash & one other crash
- Or at least four other crashes on a given corridor



Crash Data: Transportation Injury Mapping System (2017-2021)

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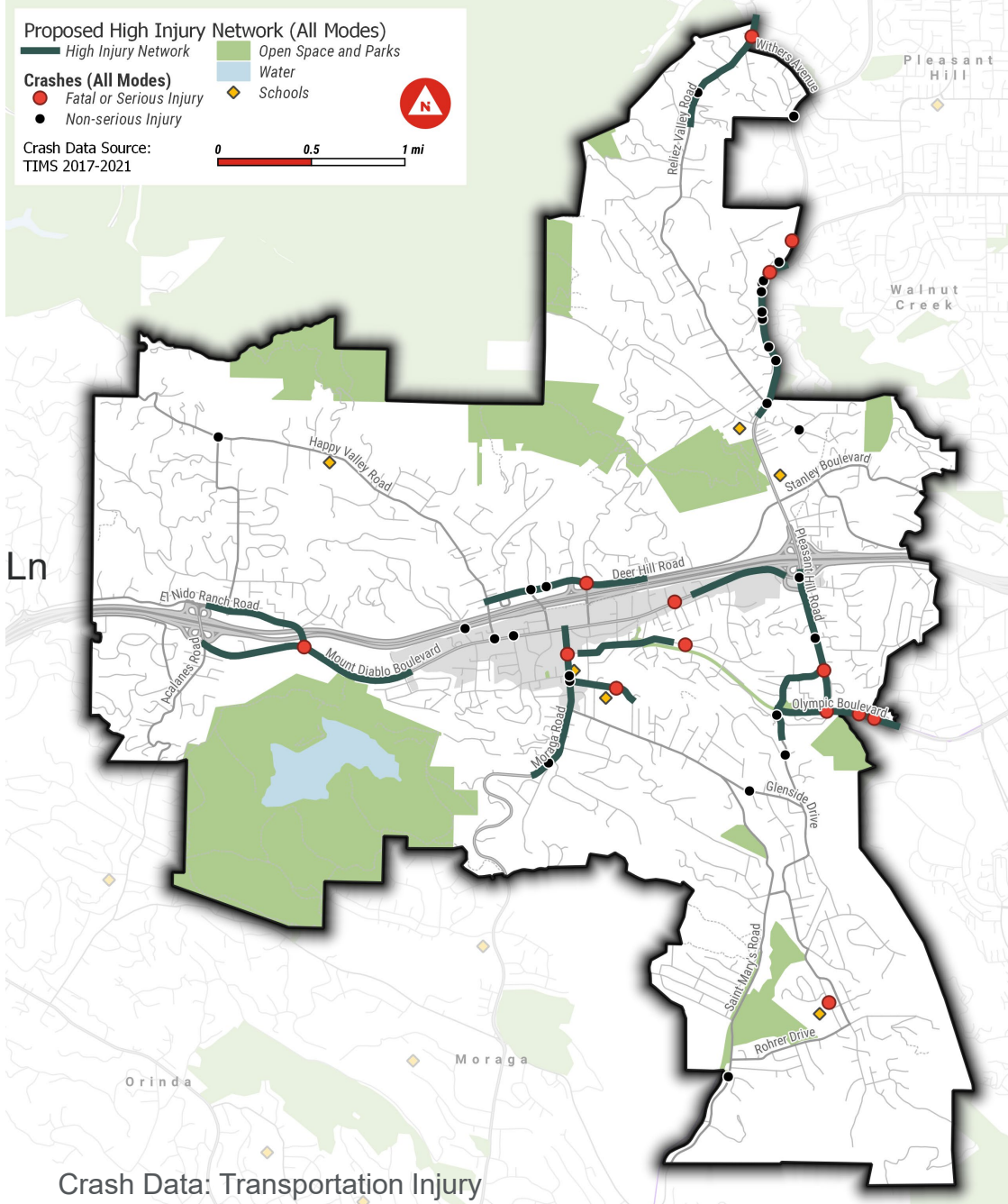
Priority Locations

1. **Olympic Blvd** between Reliez Station Rd & Newell Court
2. **Moraga Rd** between Mt Diablo Blvd & Old Jonas Hill Rd
3. **School St** between Moraga Rd & Topper Ln
4. **Reliez Valley Rd** between the northern city limit & Sterling Heights Ln
5. **Moraga Blvd** between Moraga Rd & Victoria Ave
6. **Mount Diablo Blvd** between Willow Dr & Pleasant Hill Rd
7. **Pleasant Hill Rd** between Springhill Rd & Taylor Blvd/Townsend Pl
8. **Deer Hill Rd** between Happy Valley Rd & Miller Dr
9. **Pleasant Hill Rd** between Mount Diablo to Olympic Blvd
10. **Mount Diablo Blvd** between Acalanes Rd & Risa Rd



Crash Data: Transportation Injury Mapping System (2017-2021)

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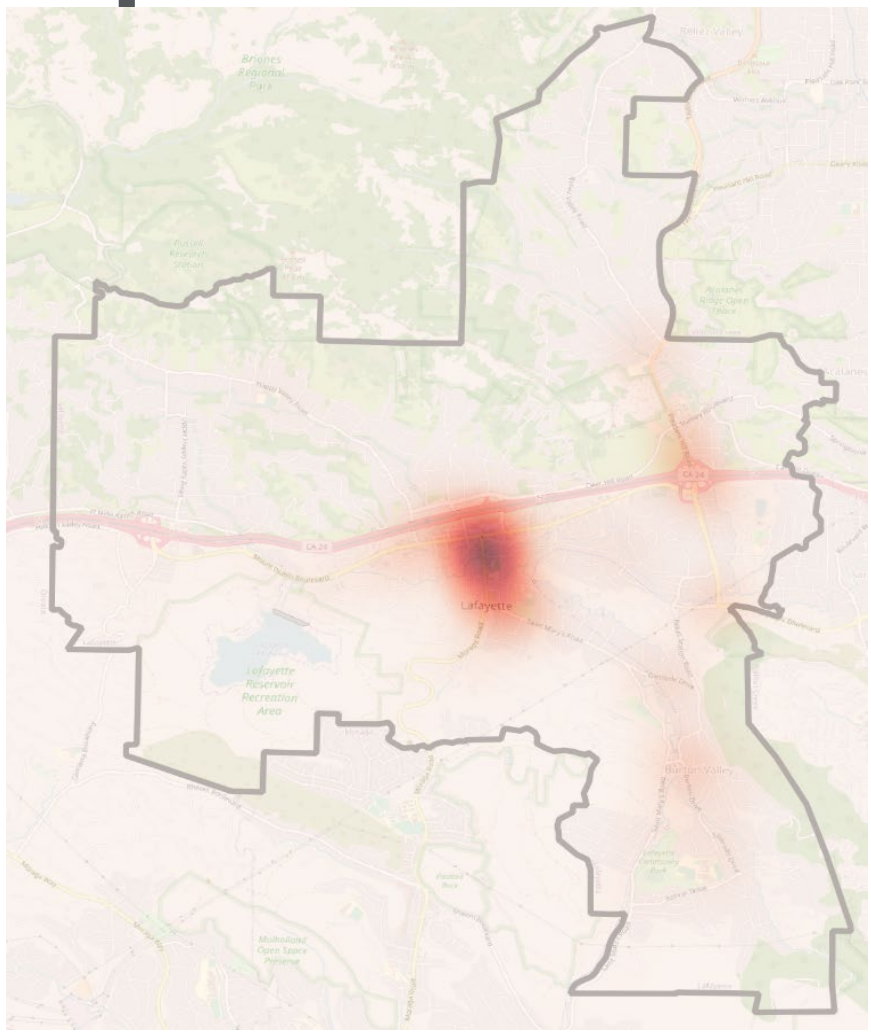
Priority Locations- Web map

How does this align with what the public has been saying?

- Web map survey from 10/24/2022 - 12/4/2022
- Identify where they felt unsafe
- More than 1,800 pins were dropped on the map!
  - Downtown focus- high density of people
  - Pleasant Hill Road- unsafe interchange
  - Olympic Blvd- confusing roundabout
  - Mt Diablo Blvd- lack of protected bike lanes
  - Moraga Rd- windy road



Heatmap from public engagement web map

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Priority Locations- Open House

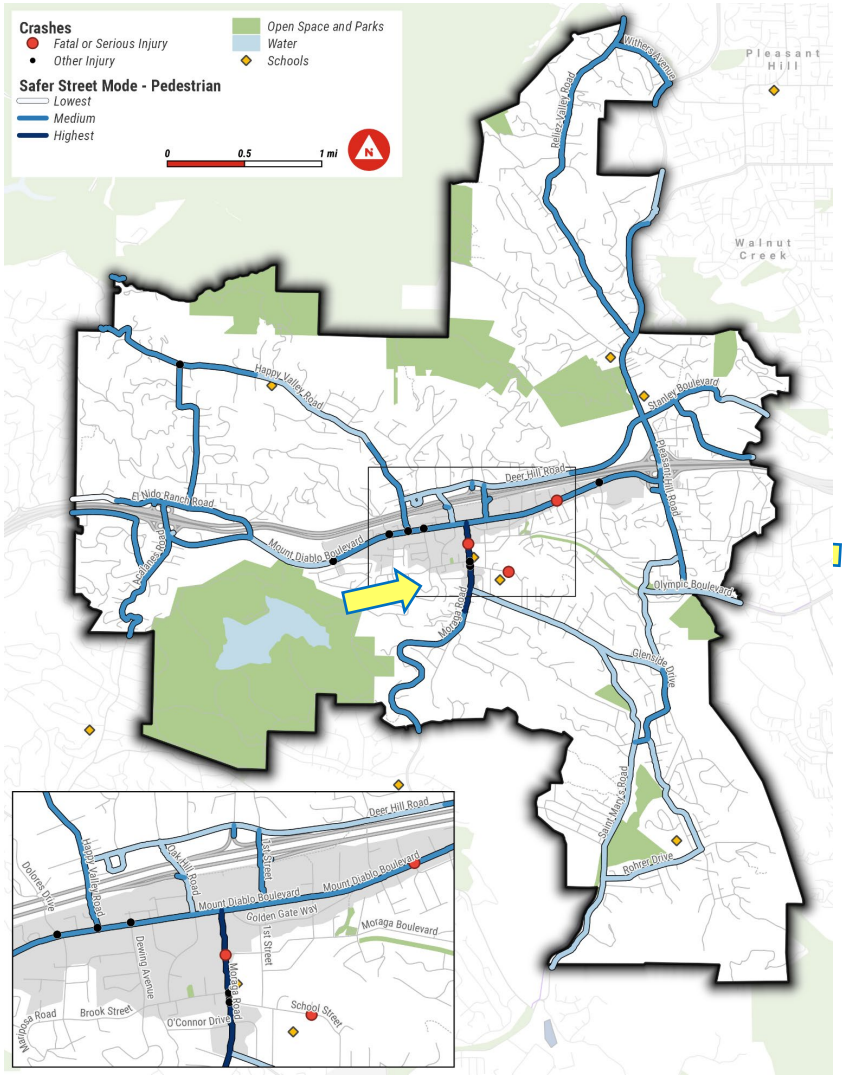
How does this align with what the public has been saying?

- Open House was held on 12/1/2022
- ~45 people attended & small discussion groups
- People were encouraged to share behaviors, roadway elements, & locations they felt unsafe
- Locations: Olympic Blvd, School St, Moraga Rd, Mt Diablo Blvd, and Oak Hill
- Factors: Wide roads, excessive signage, lack of lighting and walkways, and interest in trail areas

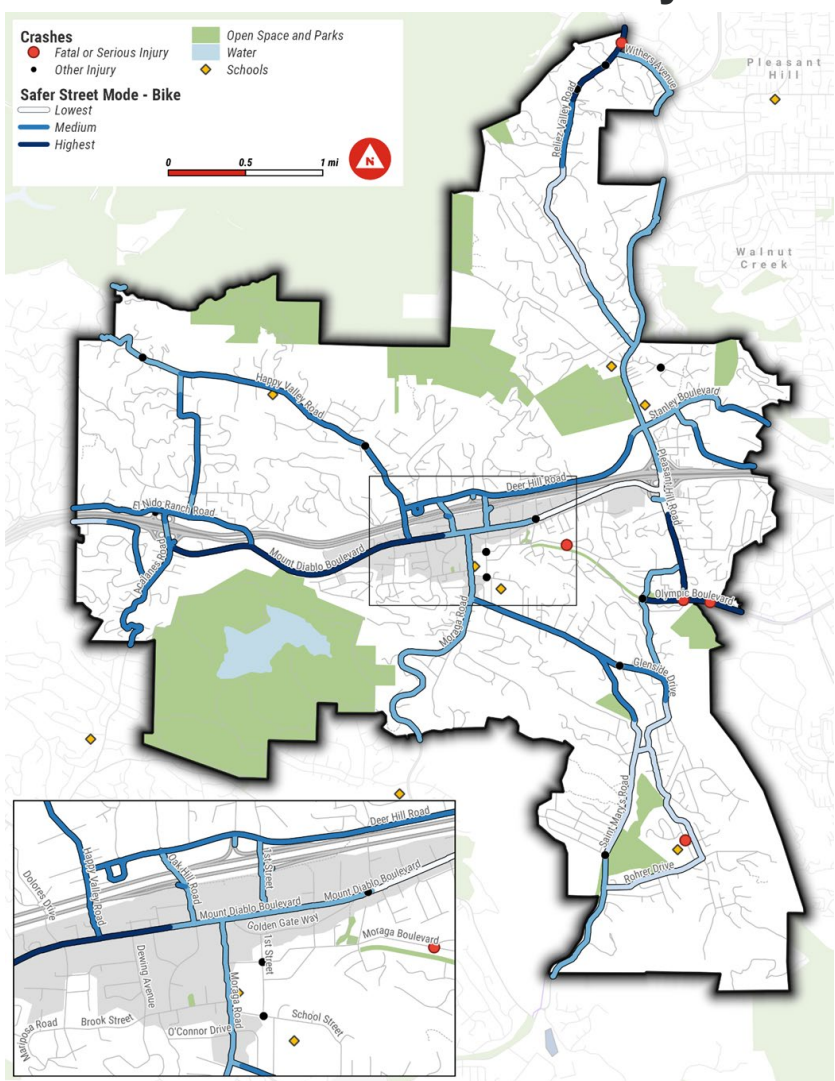
Screenshot from miro boards used during virtual open house 12/1/2022

Priority Locations- Estimated Risk

Pedestrian



Bicyclist



Safer Street Model

- Estimate crash risk throughout the system for pedestrian & bicyclist crashes
- Based on census tract & functional class

Priority Locations- Other References

Contra Costa (CCTA)'s Safety Priority Locations

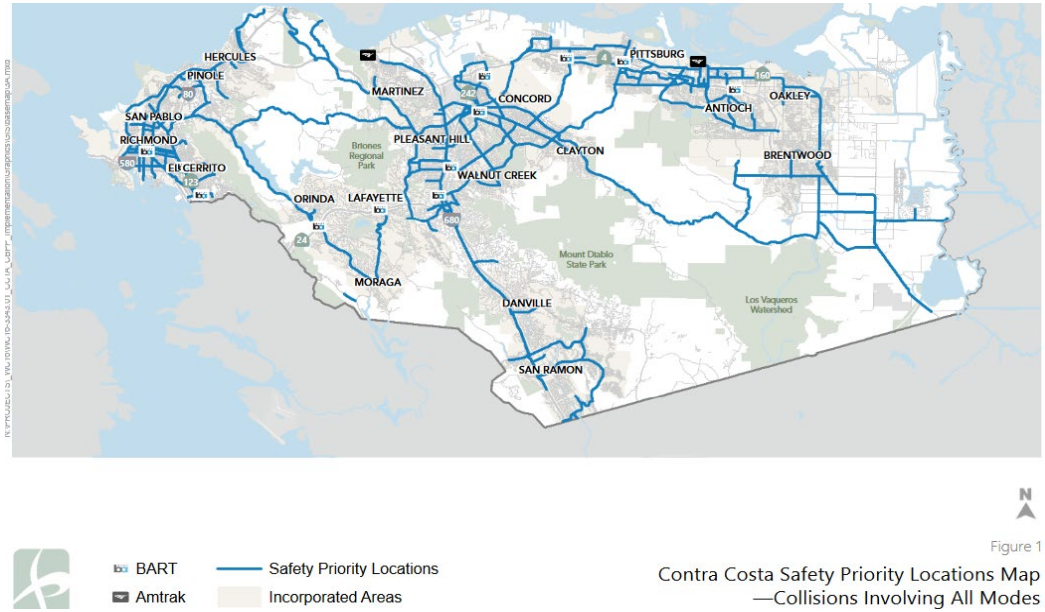
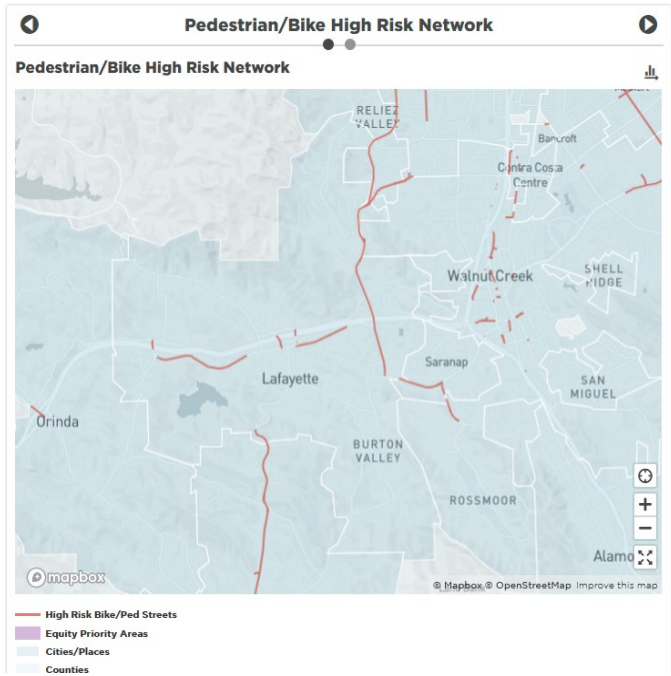
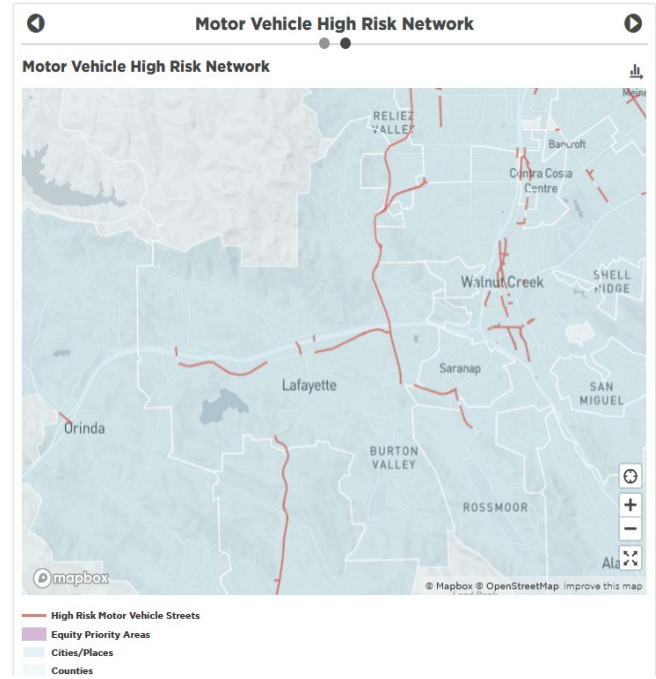


Figure 1
Contra Costa Safety Priority Locations Map
—Collisions Involving All Modes

Source: CCTA Vision Zero (VZ) Framework
(TIMS data from 2008 to 2017)

Metropolitan Transportation Commission (MTC) High-Risk Network





Source: Bay Area Vision Zero System *(Fatal & serious injury 2016-2020)*

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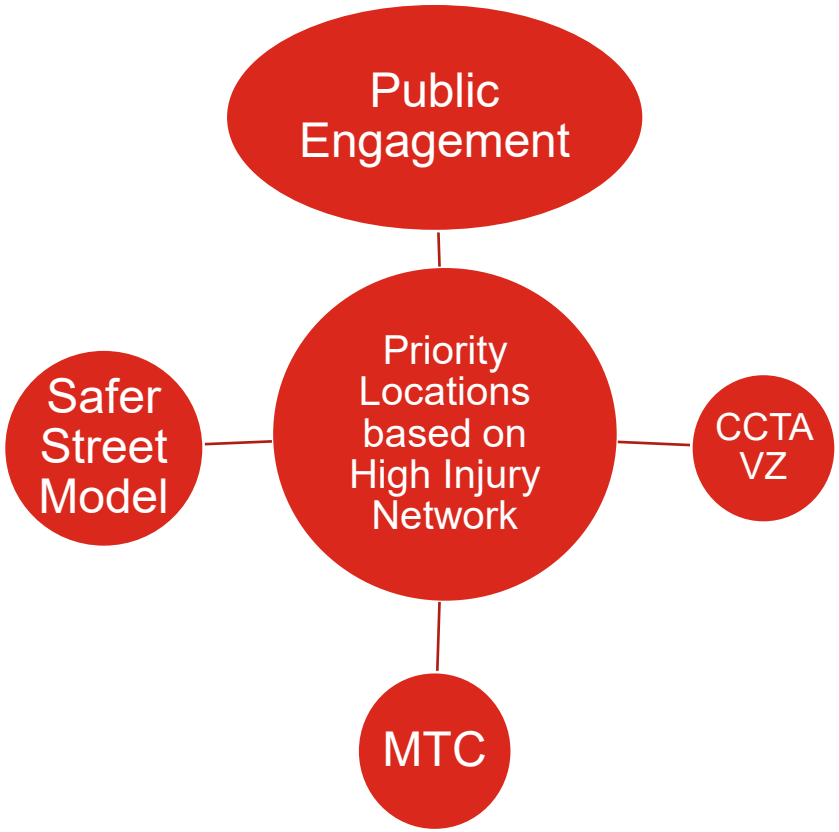
Priority Locations Summarized

Priority Locations			HIN	Public Engagement	Safer Streets Model	CCTA VZ	MTC
1	**Olympic Blvd**	between Reliez Station Rd & Newell Ct	X	X	X	X	
2	**Moraga Rd**	between Mount Diablo Blvd & Old Jonas Hill Rd	X	X	X	X	
3	**School St**	between Moraga Rd & Topper Ln	X	X			
4	**Reliez Valley Rd**	between the northern city limit & Sterling Heights Ln	X		X		
5	**Moraga Blvd**	between Moraga Rd & Victoria Ave	X	X			
6	**Mount Diablo Blvd**	between Willow Dr & Pleasant Hill Rd	X	X			X
7	**Pleasant Hill Rd**	between Springhill Rd & Taylor Blvd/Townsend Pl	X			X	X
8	**Deer Hill Rd**	between Happy Valley Rd & Miller Dr	X				
9	**Pleasant Hill Rd**	between Mount Diablo Blvd to Olympic Blvd	X	X	X	X	X
10	**Mount Diablo Blvd**	between Acalanes Rd & Risa Rd	X				X



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Questions?

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Step 2:

Location Profiles

[New to Task Force]

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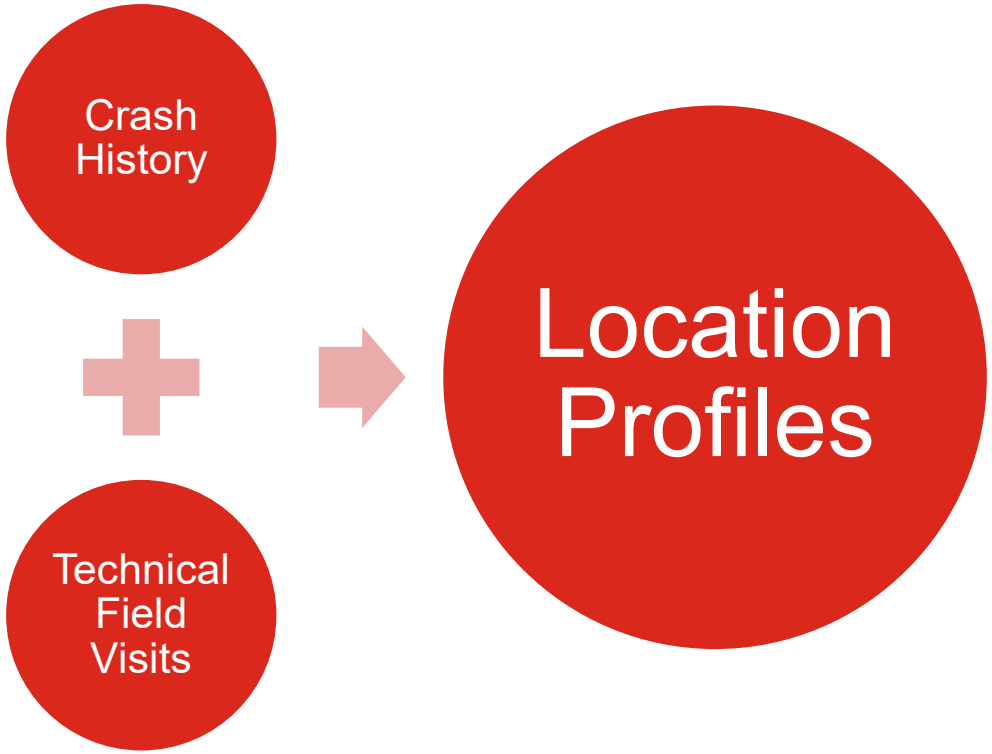
Location Profiles

- Developed for Priority Locations
- Field observations informed key observations city-wide, roadway behaviors, and pedestrian/bicyclist specific existing conditions



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Location Profile

General observations

- Wide lanes
- Lack of lighting
- Large corner radii
- Inconsistency in signage and pavement markings
- Active driveway
- Poor visibility for vehicles on minor street crossing or turning left onto a major street

Source: Google Street View- Feb 2021
Typical cross section along Mt Diablo Blvd with narrow bike lanes and wide travel lanes

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Location Profile

Speed related observations

- Limited speed limit signage
- Class II bike lanes may be inappropriate for speed and volume
  - Along Mt Diablo, Pleasant Hill Rd, Deer Hill Rd
- Varies speed limits
  - Along Olympic Blvd (15 mph, 30 mph, and 40 mph)
  - Along Pleasant Hill Rd (35 mph to 45 mph)
- Wide travel lanes and windy road- motorist appear to be traveling at high rates of speed
  - Along Mt Diablo, Pleasant Hill Rd, Deer Hill Rd

Source: Google Street View- Sept 2022
Slip lane merge with bicycle lane along Pleasant Hill Rd

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Location Profile

Failure to yield related observations

- Right turn on red encroaching onto crosswalk
- Congestion during peak hours leads to aggressive driving
- Lack of a center turn lane in the four-lane section seems to cause excessive weaving and queuing when motorist are waiting to take a left
  - Observed at Moraga Rd and St Mary Rd

Source: Toole Design- Jan 2023
Motorist failing to yield at Moraga Rd and Mt Diablo Blvd

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Location Profile

Pedestrian facilities related observations

- Inconsistency in or lack of pedestrian facilities
- Narrow sidewalks
- Most crosswalks are not high visibility
- Unsafe uncontrolled crossing
- Pedestrian crossing are spread-out
- Specifically in downtown Lafayette

Source: Toole Design- Jan 2023
Uncontrolled crossing along Mt Diablo Blvd across five lanes

Source: Toole Design- Jan 2023
Lack of pedestrian facility along Mt Diablo Blvd

Source: Toole Design- Jan 2023 Narrow sidewalk along Moraga Blvd

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Location Profile

Bicycle facilities related observations

- Bike lanes do not continue through intersections
- No bicycle facilities
- Class II bike lanes may be inappropriate for speed and volume
  - Along Mt Diablo, Pleasant Hill Rd, Deer Hill Rd

Source: Toole Design- Jan 2023
Bicyclist with child traveling through intersection of Moraga Rd and Mt Diablo Blvd

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Questions?

TOOLE DESIGN

The LRSP Development Process

Step 2: Analyze Safety Data Outcome

- Crash Analysis
  - Citywide crash trends and patterns
- Priority Locations
  - Locations with highest crash risk

Source: FHWA

Step 3:

Emphasis Areas

[New to Task Force]

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The LRSP Development Process

Step 3: Determine Emphasis Areas

- Help address key safety issues city-wide
- Proactive approach
- Specific populations, travel behaviors, and roadway design

Source: FHWA

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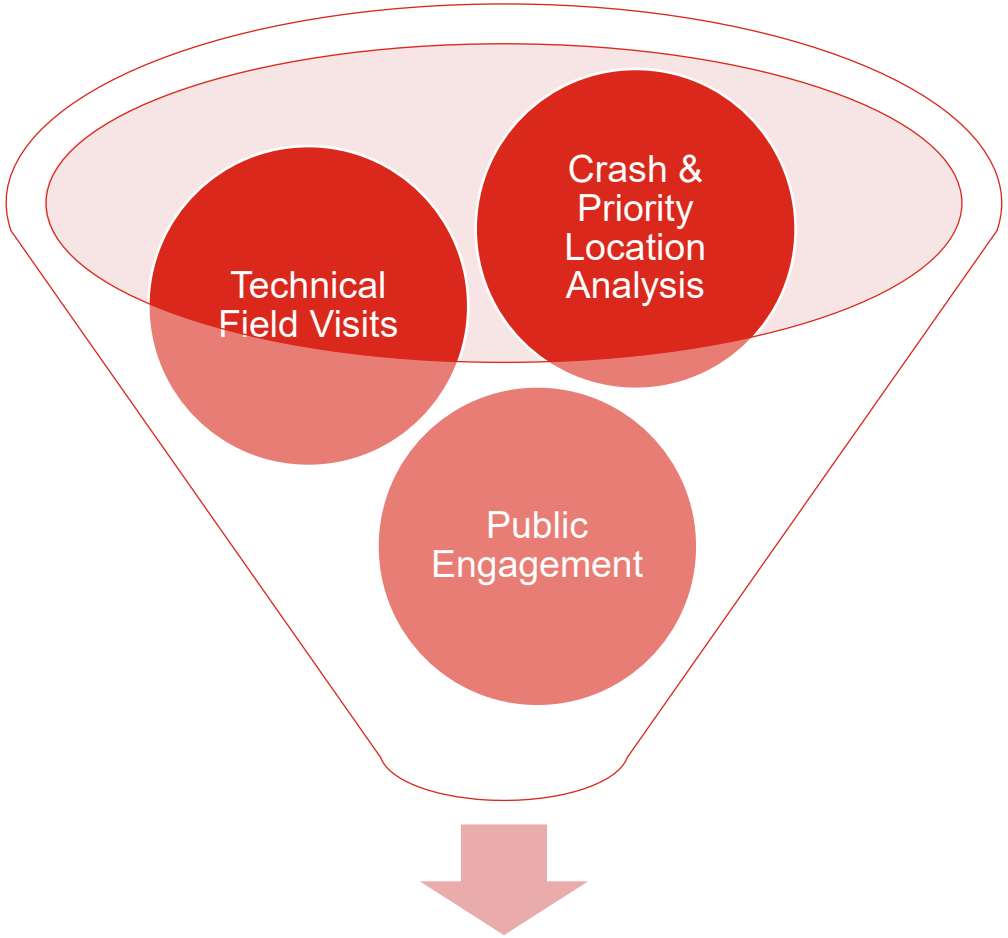
Emphasis Areas

How are emphasis area developed?

- Based on crash patterns/trends
- Field observations
- Public engagement



Public Engagement- Survey

What did the public say?

- Survey on roadway behavior & design
- The survey drew over 1,200 visitors with ~600 unique IP address
- People could visit the survey multiple times (up to 40+xs)
- Although no improvement was the most common response, the goal of the LRSP is to eliminate fatal & serious injury crashes
- Focused on safety improvements

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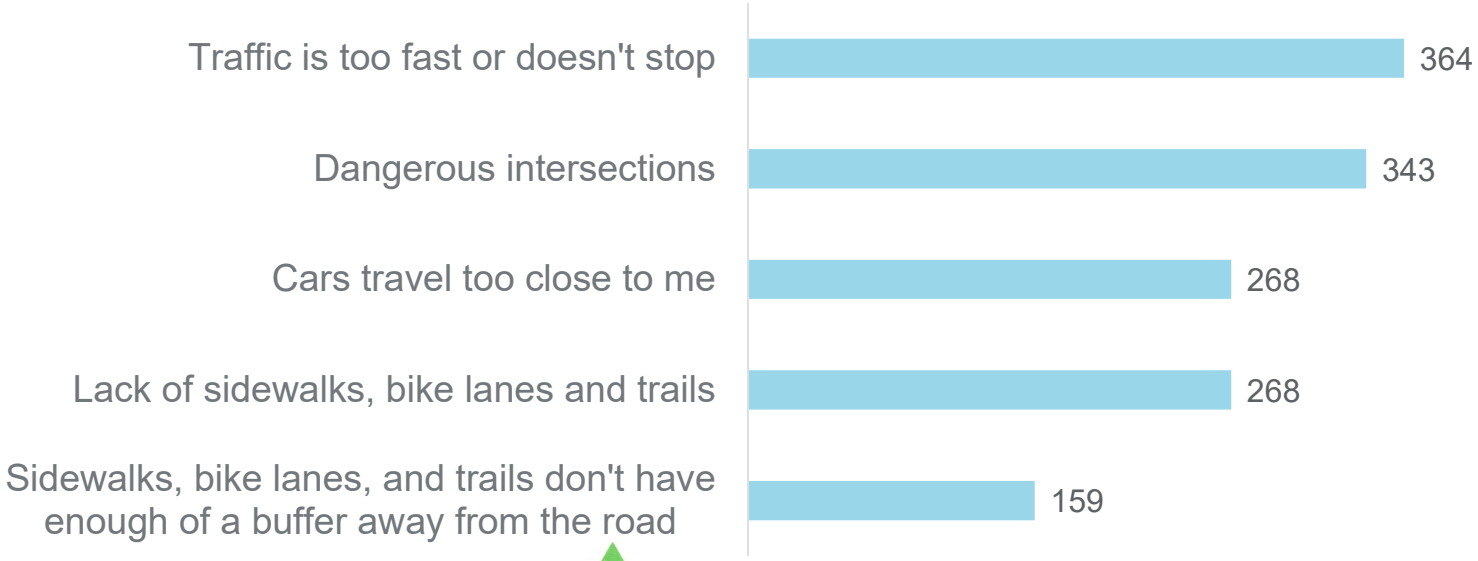
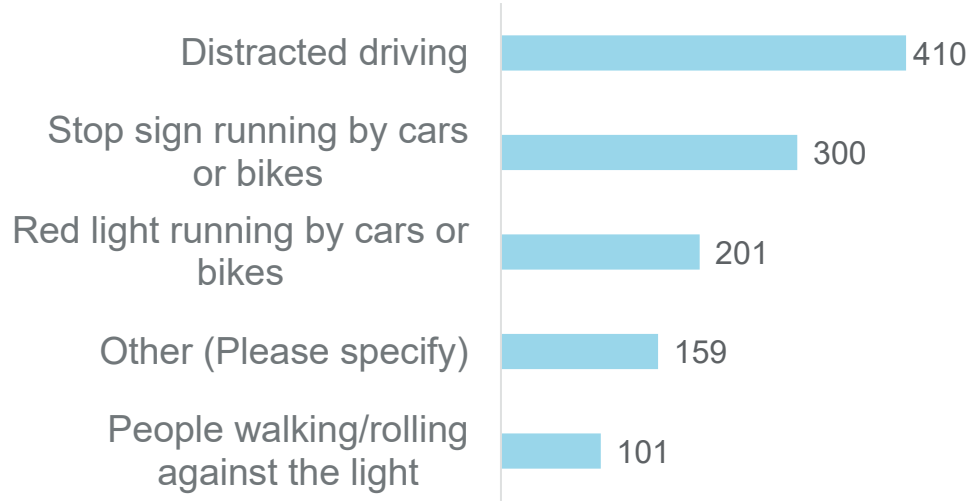
Public Engagement- Survey

What did the public say?

Question 2: Which of the following factors make you feel unsafe while walking, rolling, biking, or driving?



Question 3: Which of the following behaviors make you feel most unsafe on roads in Lafayette?



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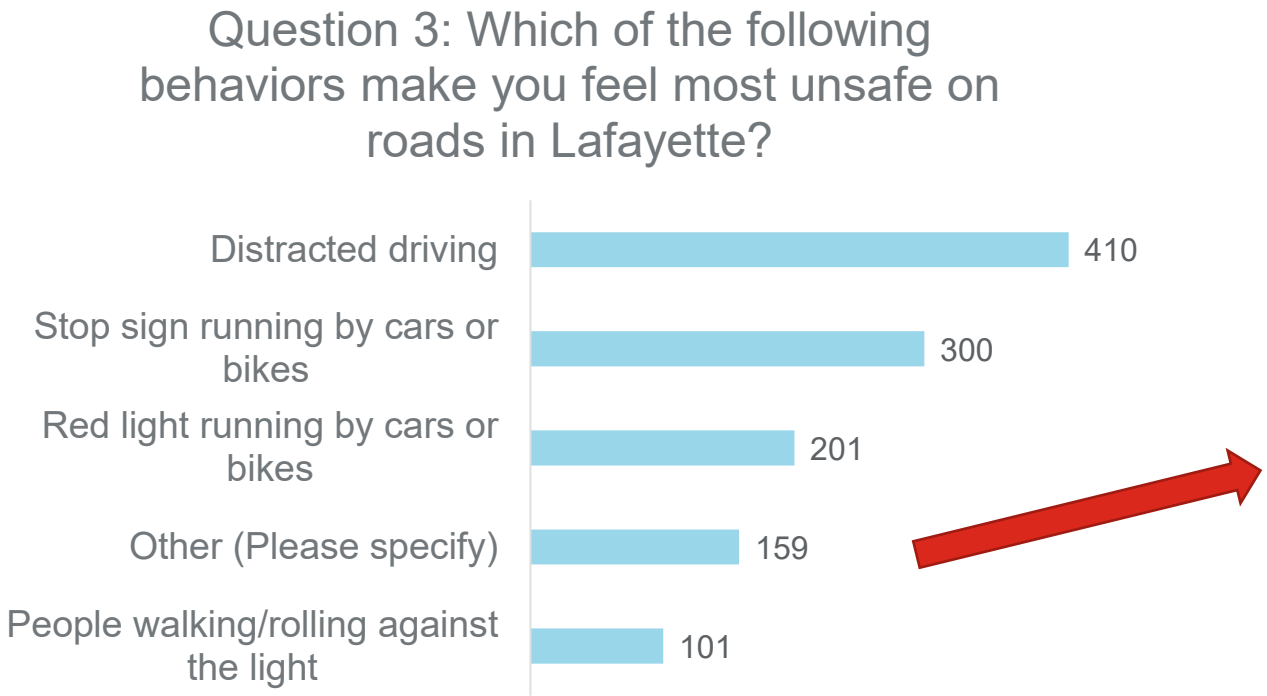
Public Engagement- Survey

What did the public say?



Emphasis Areas

Specific Populations

- Pedestrian
- Bicyclists

Behaviors

- Speeds
- Failure to yield
- Distracted driving

Built Environment Factors

- Unsignalized intersections
- Lane departure
- Improper turning
- Bus stop at an intersection
- Trail crossing

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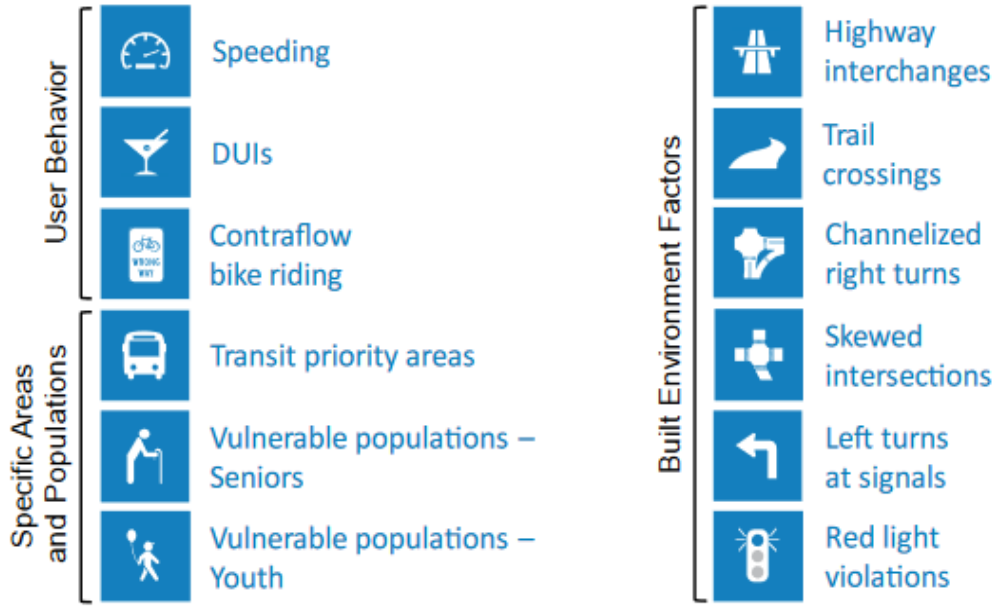
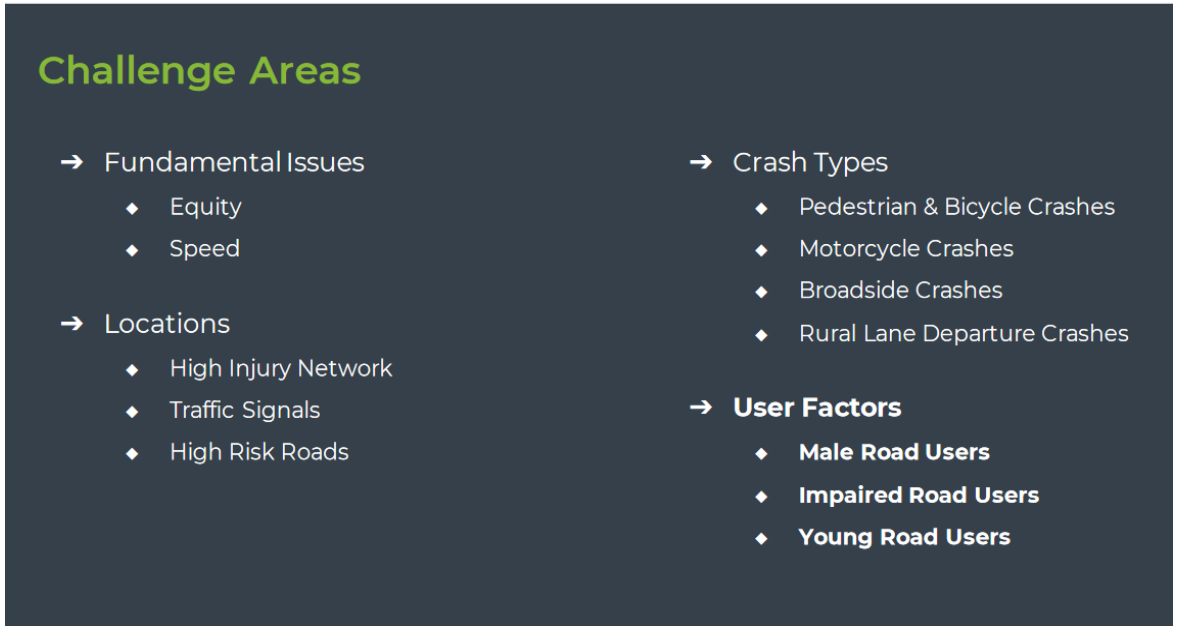
Emphasis Areas- Other References

Inset 11. Contra Costa Common Collision Patterns (based on 2008 through 2017 data)



Source: CCTA Vision Zero (VZ) Framework *(TIMS data from 2008 to 2017)*

Challenge Areas



Source: Bay Area Vision Zero System *(Fatal & serious injury 2016-2020)*

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Emphasis Areas

Emphasis Areas	Crash/Location Analysis	Field Visit	Public Engagement	CCTA VZ	MTC
Speeds	X	X	X	X	X
Unsignalized intersections	X	X	X		
Lane Departure	X	X	X		X
Failure to yield	X	X	X		
Improper turning	X		X	X	
Bus Stop at Intersection	X			X	
Vulnerable users - bicyclist	X	X	X	X	X
Vulnerable users - pedestrian	X	X	X		X
Distracted driving			X		
Trail Crossing		X	X	X	

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Questions?

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The LRSP Development Process

Step 3: Determine Emphasis Areas Outcome

- Lafayette specific emphasis areas based on crash patterns/trends, field observations, and public engagement
- Targets travel behaviors, roadway design, and specific populations

Source: FHWA

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Step 4:

Draft Safety Measure Toolbox

[New to Task Force]

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The LRSP Development Process

Step 4: Identify Strategies

- Public engagement
- Safe System Approach Framework
- Draft Safety Measure Toolbox
- Additional strategies

Source: FHWA

Safety Measure Toolbox

- Target top crash risk to reduce fatal and serious injury
- Consistency is key
- Less is more…
  - Caltrans approved countermeasures = 82 intersection and segment countermeasures
  - CCTA Safety Toolbox = 53 safety countermeasures
  - FHWA = 28 proven safety countermeasures
- What the public is used to
  - Recent SRTS rapid implementation
- What the public wants

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Public Engagement- Survey

What did the public say?

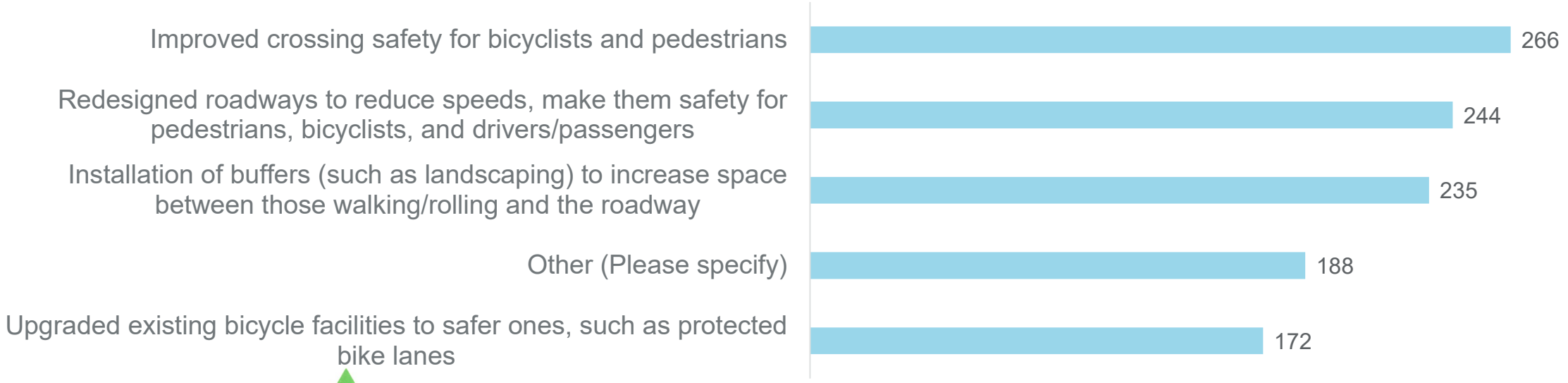
Source: Toole Design

Screenshot from miro boards used during virtual open house 12/1/2022

Public Engagement- Survey

What did the public say?

Question 4: Which of the following road design changes do you think would have the greatest impact of improving road safety in Lafayette?



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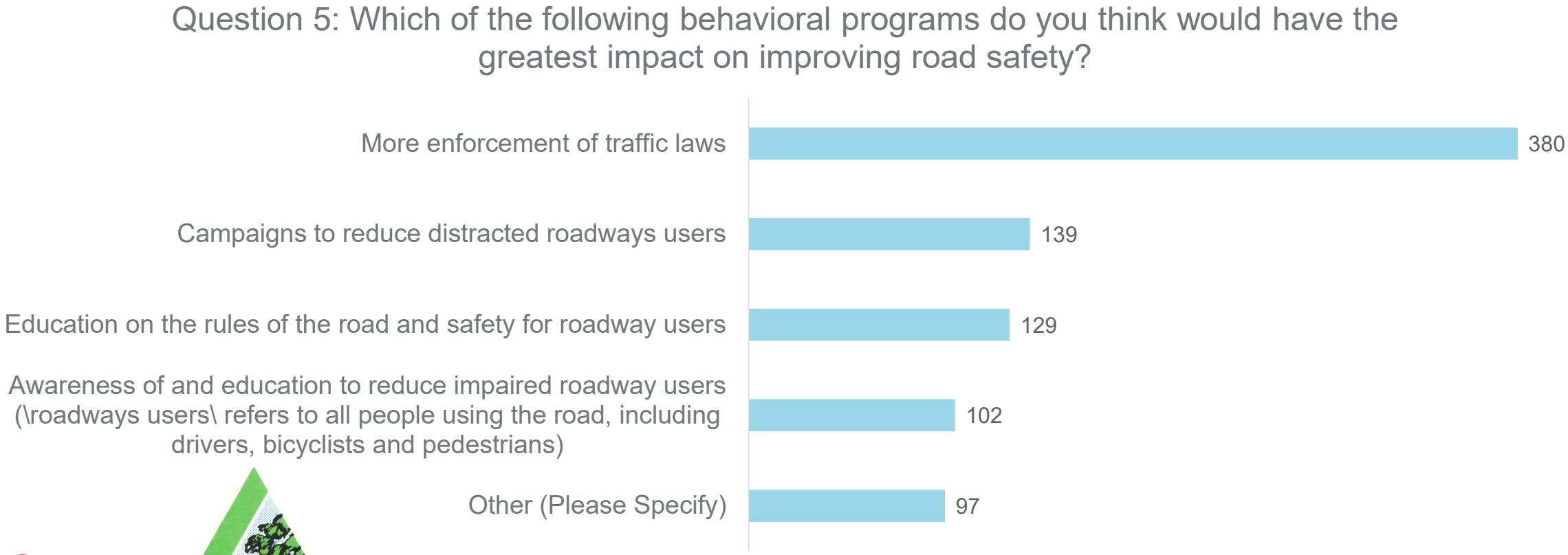
Public Engagement- Survey

What did the public say?



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Public Engagement- Survey

Policing and Enforcement

- Eyes and ears on the street
- Enforcement remains a key and necessary part of the equation
- Understand why we want more policing
  - Crash risk- red light and stop sign running; failure to yield; speeding
- Implement strategies on how and where to prioritize policing

Source: City of Lafayette

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Public Engagement- Survey

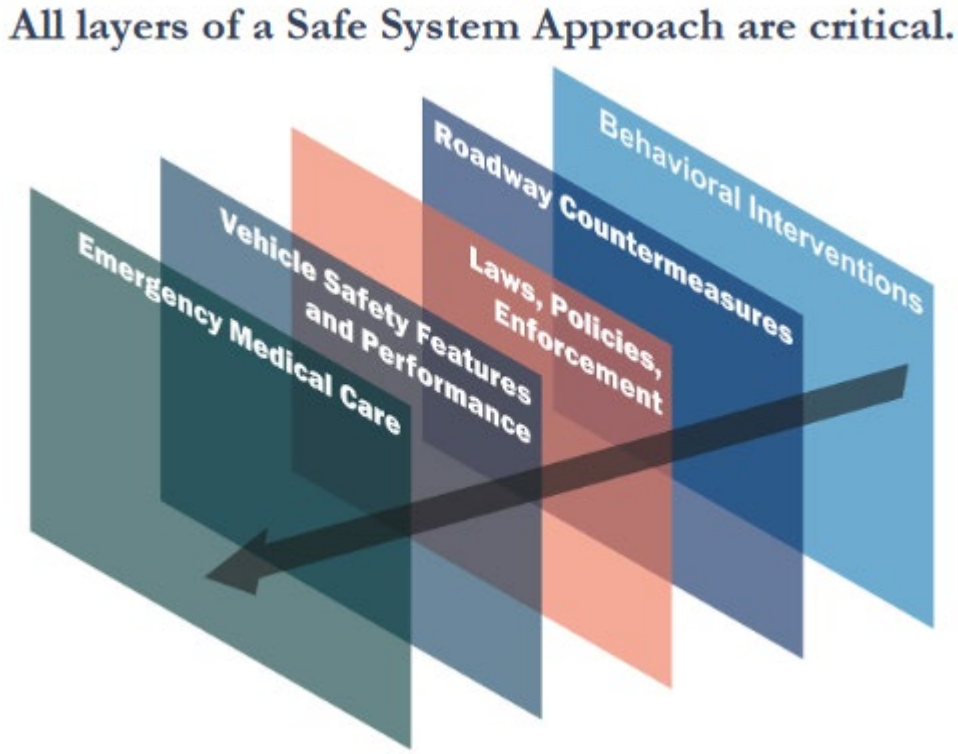
- Data driven approach
  - Who, what, when, where, why
- How we are reporting crashes
  - Crash risks?
- Automated Enforcement
  - Ex. red light and speed tracking cameras
  - Database for to understand where to focus

Source: City of Lafayette

Public Engagement- Survey

Self-enforcing

- “Design can help to make roads and streets “self-enforcing,” offering motorist contextual encouragement via lane width, intersection design, pedestrian and bicyclist infrastructure, and other features – to drive at safer speeds.”



Source: FHWA

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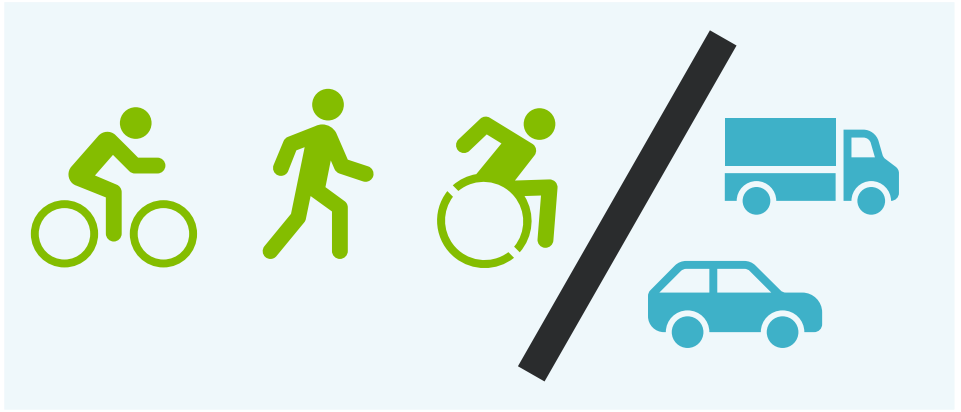
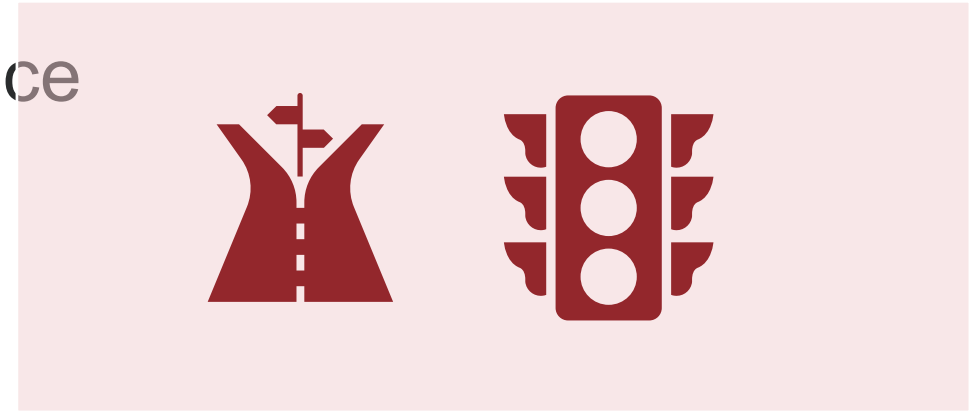
Safe System Approach Framework

- Anticipating Human Error
  - Separating Users in Space
  - Separating Users in Time
  - Increasing Attentiveness and Awareness
- Accommodating Human Injury Tolerance
  - Reduce Speed
  - Reduce Impact Forces





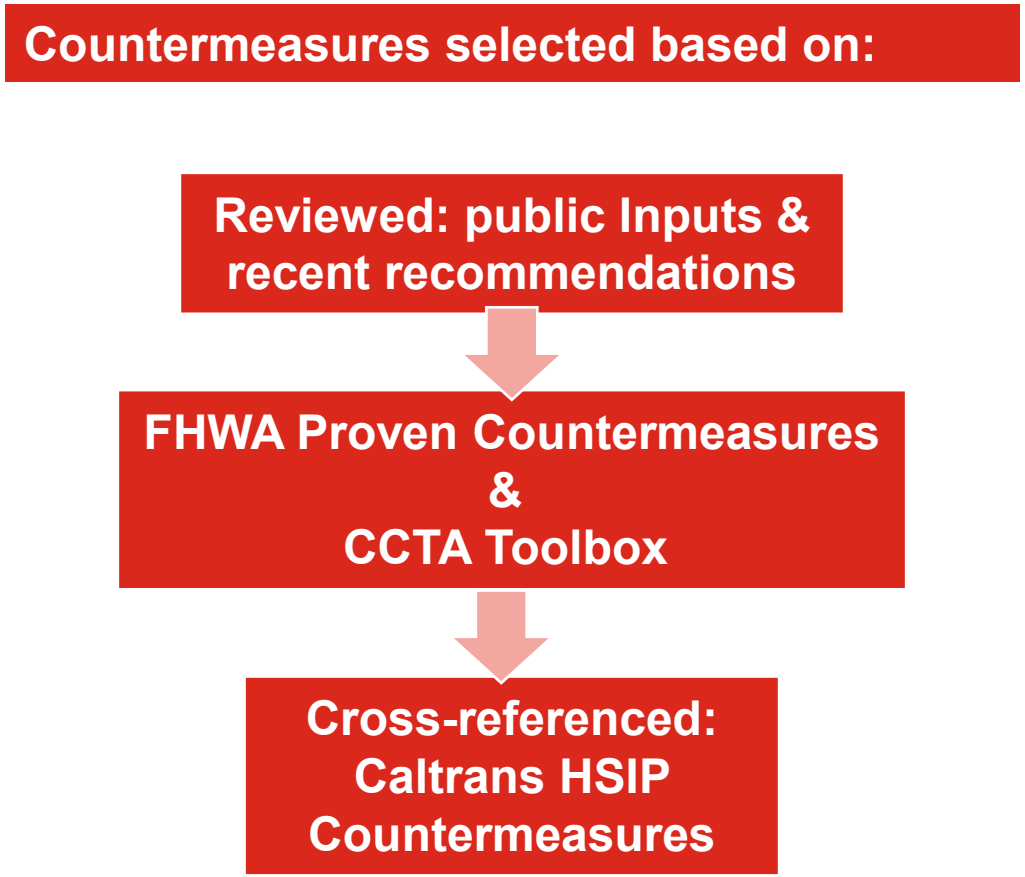
Source: Toole Design

Draft Safety Measure Toolbox

Developed to address specific or multiple emphasis areas

Formatted into the following sections:

- Speed Management
- Roadway Departures
- Intersections
- Pedestrian Facilities
- Bicycle Facilities
- Others



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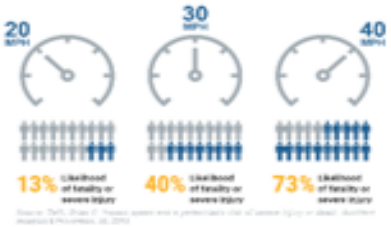
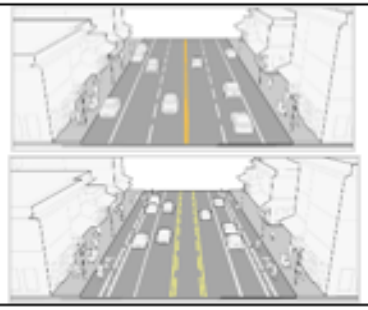
Draft Safety Measure Toolbox

Speed Management				
Tool	Speed Limit Reduction	Roadway Reconfigurations	Coordinated Signal Operation	Speed humps & Raised Crossings (Not on HSIP funding list)
			 Source: CCTA VZ	
Purpose	Reduce vehicle speeds to reduce the severity of crashes.	Reduce the speed of traffic, crossing distances, and/or provide additional space for other uses of the roadway.	Interconnected signal systems provide coordination between adjacent signals to better facilitate travel through a corridor. When implemented, the number of stops is reduced, and therefore the opportunity to run red lights is also reduced.	Reduce vehicle speeds, increase driver yielding, and improve safety for people crossing.

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Draft Safety Measure Toolbox

Lane Departure					
Tool	Centerline Rumble Strips and Stripes	Edgeline Rumble Strips and Stripes	Chevron Signs at Curves	Guardrail at Curves	Median Barriers
	 Source: FHWA	 Source: CCTA VZ	 Source: FHWA	 Source: FHWA	 Source: FHWA
Purpose	Address roadway departure and head-on crashes caused by distracted, drowsy, or otherwise inattentive drivers who drift from their lane		Alert drivers to upcoming curves, the direction and sharpness of the curve, and appropriate operating speed.	Reduce roadway departure fatalities and serious injuries by giving vehicles the opportunity to recover safely and by reducing crash severity.	Reduce the number of cross-median crashes, which are attributed to the relatively high speeds that are typical on divided highways

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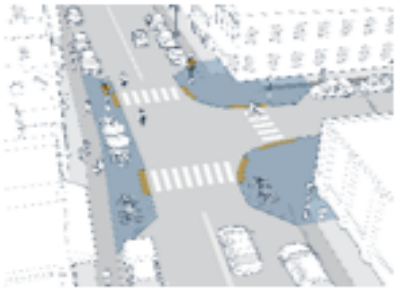
Draft Safety Measure Toolbox

Intersections				
	All Intersections			Unsignalized
Tool	Reduce corner radii at cross streets	Parking Restrictions at Crossings / Daylighting	Hardened Centerlines & Turn Wedges (Not on HSIP funding list)	Convert Two-Way Stop to All-Way Stop
				
Purpose	Shorten crossing distances, reduce motor vehicle turning speeds, improve visibility and sight distance at intersections.	Improve sightlines between drivers and pedestrians or bicyclists crossing the street.	Reduce vehicle turning speed and increase driver yielding to pedestrians.	Indicate where traffic is required to stop (using MUTCD standards).

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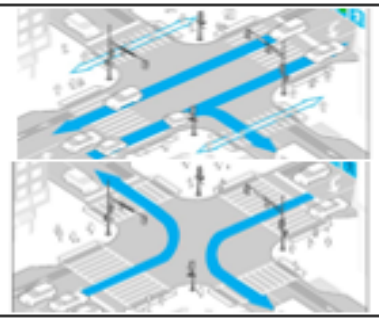
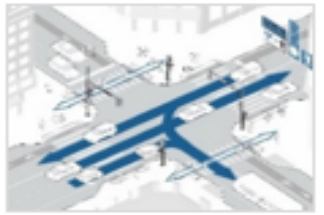
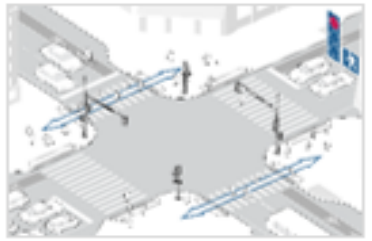
Draft Safety Measure Toolbox

Intersections				
	Signalized			
Tool	Protected left turn phase	Prohibit Right-Turn-on-Red	Improve signal timing	Leading Pedestrian Interval
				
Purpose	Can reduce conflicting movements between turns, vehicles going straight, and/or pedestrian and bicyclist movements.	Reduce conflicts between turning vehicles and other road users at intersections.	Phasing can also be adjusted to potentially reduce excessive queuing and delays and therefore, could potentially reduce aggressive driving behaviors.	Provide pedestrians with a head start when entering an intersection.

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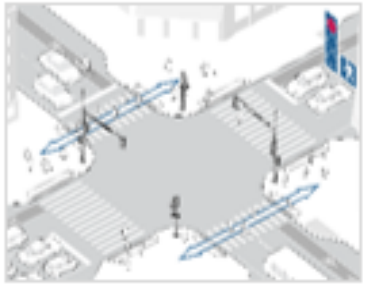
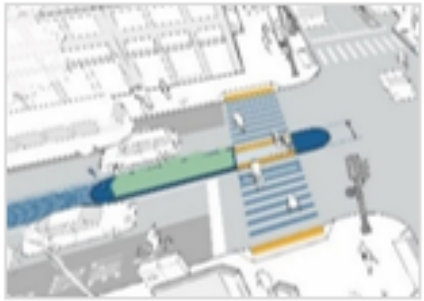
Draft Safety Measure Toolbox

Pedestrian Facilities				
Tool	Leading Pedestrian Interval	High-Visibility crosswalks	Add stop/yield bars in advance of existing crosswalks	Medians and Pedestrian Refuge Islands
			 Source: CCTA	
Purpose	Provide pedestrians with a head start when entering an intersection.	Alert drivers to expect pedestrians crossing and indicate preferred crossing locations for pedestrians.	Reduce potential conflicts with pedestrians from motorists encroaching on the crosswalk	Increase pedestrian visibility and provide a pedestrian waiting area.

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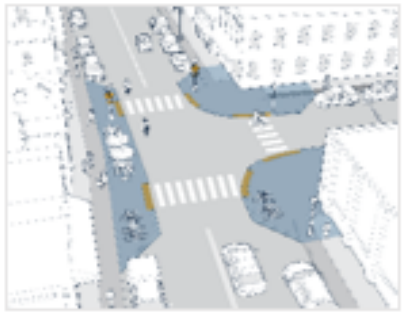
Pedestrian Facilities			
Tool	Curb extensions	Rectangular Rapid Flashing Beacons (RRFB)	Separation between pedestrians and vehicles
			
Purpose	Shorten crossing distances, reduce motor vehicle turning speeds, improve visibility and sight distance at intersections.	Increase driver yielding to pedestrians at uncontrolled crossings.	Provide space along a street for pedestrian travel that is separate from vehicles.

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Draft Safety Measure Toolbox

Bicycle Facilities					
Tool	Road Diets (Roadway Configuration)	Green Bike Lane Conflict Zone Markings	Conventional Bike Lanes	Buffered Bike Lanes	Separated Bicycle Facilities
					
Purpose	Reduce the speed of traffic, crossing distances, and/or provide additional space for other uses of the roadway.	Increase the visibility of the bicycle facility and identify potential areas of conflict.	Provide dedicated, on-road space for bicycling.	Provide dedicated on-road space for bicycling with more space between vehicles and bicyclists.	Provide physical separation between the bicycle lane and travel lane.

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Additional Strategies

Not on HSIP funding list

- Appropriate Speed Limits for All Road Users
- Mode shift strategies
- Campaign to increase attention and awareness
- Educational campaigns (such as through Safe Route to School program)
- Data collection and database to determine crash risk and appropriate treatment
  - Speeding
  - Presence of pedestrian and bicycle facilities
  - Road grades, curves, and width

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Questions?

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The LRSP Development Process

Step 4: Identify Strategies Outcome

- Safety Measure Toolbox
- Additional strategies

Source: FHWA

Next Steps

Review Task Force comments for Steps 3 and 4 for draft LRSP

- Emphasis areas and safety measure toolbox

Step 5: Prioritize and Incorporate Strategies

- Prioritize projects where fatal or serious injury (KSI) crashes have occurred and/or are occurring at the greatest severity and density
- Identify where similar conditions exist where KSI crashes could occur.
- Identify citywide systemic improvements that can be made to increase roadway safety across Lafayette.
- Benefit Cost Ratios based on Caltrans guidance

Source: FHWA

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Next Steps

- One more meeting with Transportation & Circulation Commission
- One more Task Force Meeting
  - Step 5: Prioritize and Incorporate Strategies
  - Draft LRSP Report formatting and envisioning

Questions?

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Thank you

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