

Improving Bicyclist and Pedestrian Safety with Road Safety Audits

Presented by FHWA Office of Safety, VHB, and UNC HSRC

Tamara Redmon FHWA Office of Safety

Elissa Goughnour VHB

Dan Gelinne UNC Highway Safety Research Center

Rachel Carpenter Caltrans

Terra Reed City of Albuquerque

January 6, 2021

pedbikeinfo.org

   @pedbikeinfo

Housekeeping

- ⇒ **Submit your questions**
- ⇒ **Webinar archive: www.pedbikeinfo.org/webinars**
- ⇒ **Live transcript: www.streamtext.net/player?event=HSRC**
- ⇒ **Certificates and professional development hours**
- ⇒ **Follow-up email later today**
- ⇒ **Review previous episodes and sign up for upcoming sessions**

Meet the Panel



Tamara Redmon
FHWA Office of Safety



Elissa Goughnour
VHB



Dan Gelinne
**UNC Highway Safety
Research Center**



Rachel Carpenter
Caltrans



Terra Reed
City of Albuquerque



U.S. Department
of Transportation

**Federal Highway
Administration**



Photos courtesy of Gettyimages.com

Pedestrian and Bicyclist Safety Program Overview

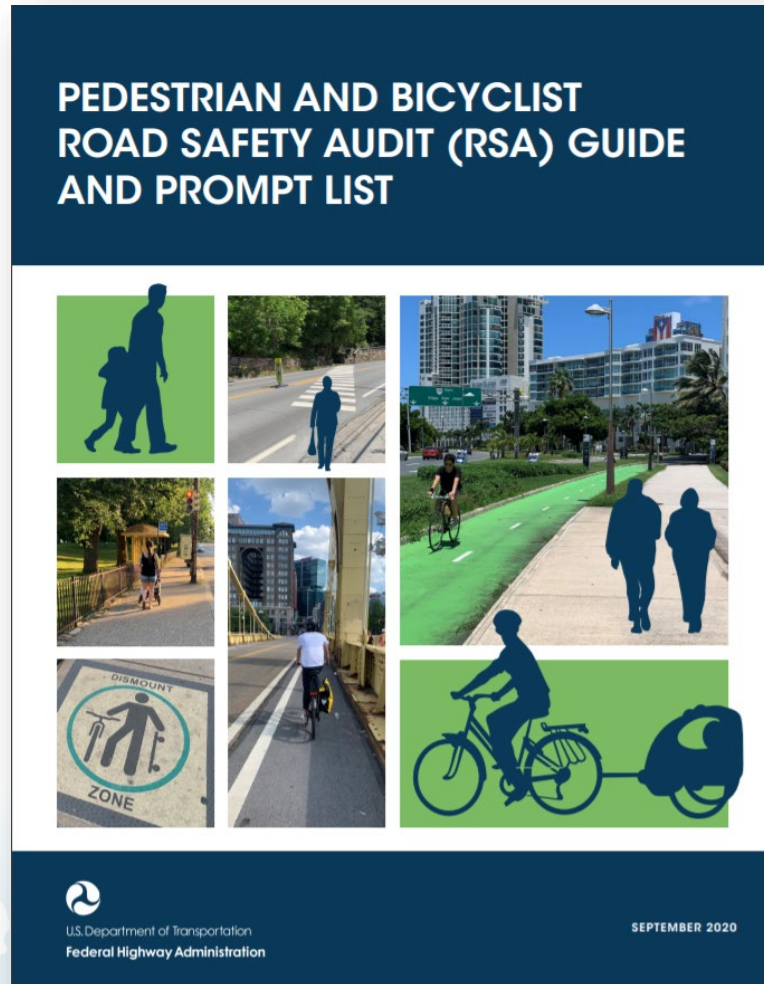
Tamara Redmon, Office of Safety, Federal Highway Administration

January 6, 2021

Resources Available to Help Improve Pedestrian and Bicyclist Safety

- » Updated Pedestrian and Bicyclist Road Safety Audit Guide and Prompt List.
- » Pedestrian and Bicycle Safety Focus States Efforts.
- » Bikeway Selection Guide.
- » USDOT Action Plan.
- » Safe Transportation for Every Pedestrian (STEP).

Pedestrian and Bicyclist Road Safety Audit Guide and Prompt List



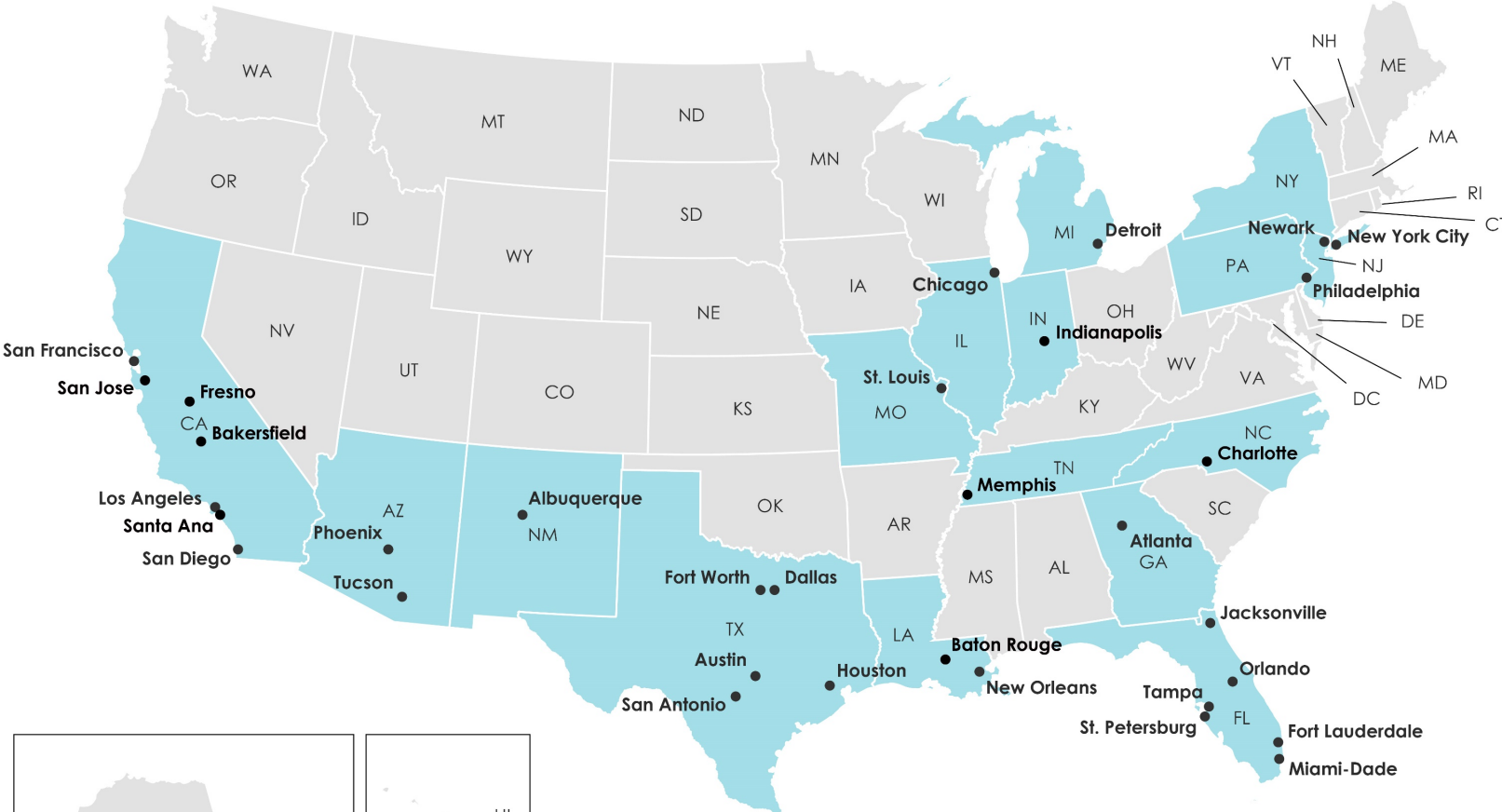
- » Intended to support agencies that are interested in conducting pedestrian- and bicycle-focused RSAs.
- » Includes information on safety risks for both modes, the RSA process, necessary data, and the roles and responsibilities of the RSA Team.
- » Includes prompt lists for pedestrians and bicyclists to use in the field.
- » This guide helps practitioners understand pedestrian and bicyclist issues in their jurisdiction and potentially achieve other goals in addition to safety.

Pedestrian and Bicycle Safety Focus States Efforts

FHWA's Safety Office has been providing extra resources to cities and states with the highest pedestrian and bicyclist fatalities and/or fatality rates.

- » Working with the states/cities to assist them with developing pedestrian and bicycle safety action plans.
- » Offering free technical assistance and training on how to design safe facilities and how to develop safety action plans.
- » We recently re-evaluated the current list of states and cities and will be rolling out the program to new and continuing states this winter.

Pedestrian-Bicycle Focus Cities and States



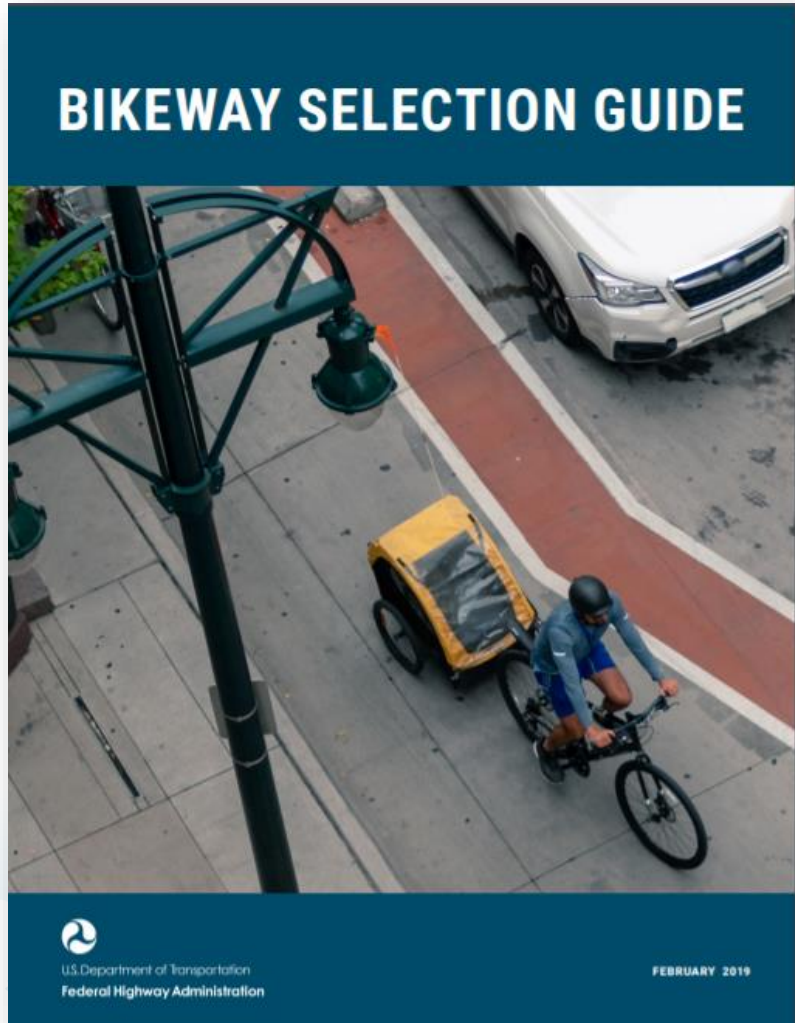
LEGEND

- Focus States
- Focus Cities

Pedestrian and Bicycle Safety Focus States and Cities

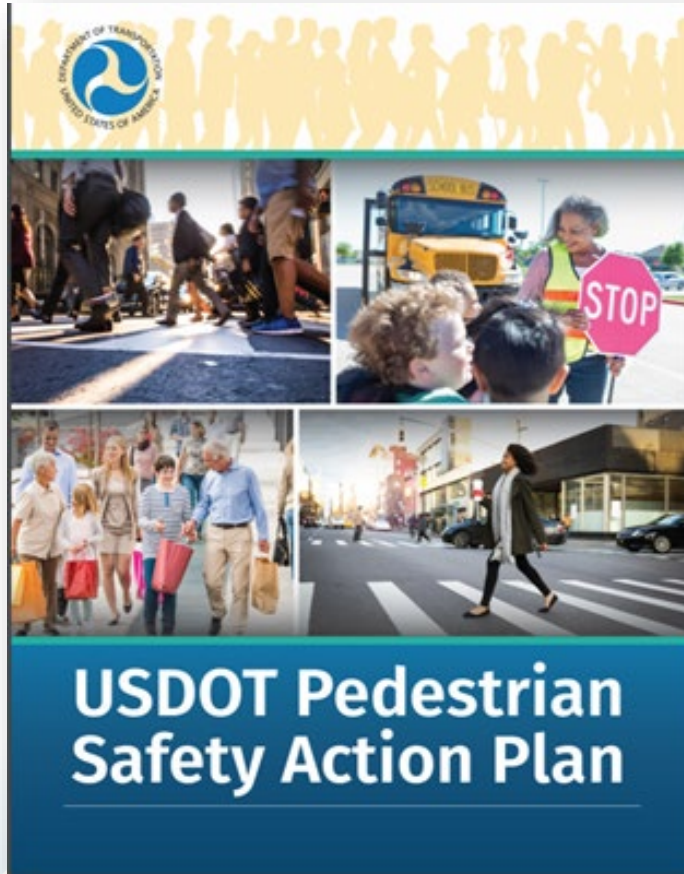
- » Over 300 training courses delivered.
- » Over 6,000 people trained.
- » Crash data analysis and countermeasure selection.
- » Webinars and peer exchanges.
- » Pedestrian and bike safety action plan development.
- » Executive briefings.

Bikeway Selection Guide



- » Helps transportation practitioners consider and make informed decisions about trade-offs relating to the selection of bikeway types.
- » Builds upon FHWA's active support for design flexibility and connected, safe, and comfortable bicycle networks.
- » Based on the complementary Literature Review: Resource Guide for Separating Bicyclists from Traffic.
- » Free Tech Assistance through Spring 2021.

USDOT Pedestrian Safety Action Plan

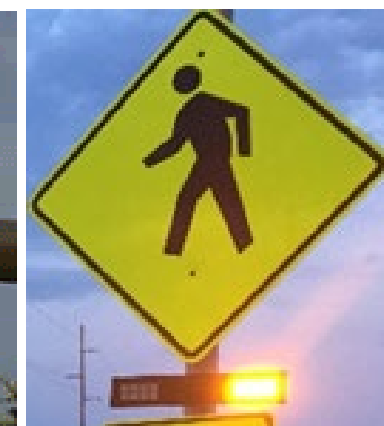


Complete in November 2020

The Plan identifies what the USDOT intends to accomplish with respect to pedestrian safety in the next 2 years and beyond.

Took into account the themes identified by stakeholders during the July 2020 Pedestrian Safety Summit webinars.

https://highways.dot.gov/sites/fhwa.dot.gov/files/2020-11/FHWA_PedSafety_ActionPlan_Nov2020.pdf



STEP

Safe Transportation for Every Pedestrian

https://safety.fhwa.dot.gov/ped_bike/step/resources/



U.S. Department
of Transportation
**Federal Highway
Administration**

The Spectacular Seven STEP Countermeasures



- Rectangular rapid flashing beacons (RRFBs)
- Leading pedestrian intervals (LPIs)
- Crosswalk visibility enhancements
- Raised crosswalks
- Pedestrian crossing/refuge islands
- Pedestrian hybrid beacons (PHBs)
- Road Diets

Technical Assistance

- » STEP Action Plans.
- » STEP Workshops (1/2 day – Full day).
 - » MPOs.
 - » New partners.
 - » State DOTs.
- » Scan Tours.
- » Road Safety Assessments (RSAs).
- » STEP UP Resources

https://safety.fhwa.dot.gov/ped_bike/step/step_up_campaign/



THANK YOU!

http://safety.fhwa.dot.gov/ped_bike/

E-mail: tamara.redmon@dot.gov

Order documents:

http://safety.fhwa.dot.gov/ped_bike/ped_bike_order.cfm



Conducting Pedestrian and Bicyclist Road Safety Audits

Elissa Goughnour, VHB

Dan Gelinne, UNC Highway Safety Research Center

Presentation Topics

1

Introduce Road Safety Audits (RSAs)

2

New Guidance for Pedestrian and Bicyclist RSAs

3

Steps for Planning and Conducting Pedestrian and Bicyclist RSAs

4

Examples of RSAs in California and Albuquerque, NM

A group of people, including several wearing high-visibility safety vests, are gathered outdoors, looking at and discussing documents. The scene is dimly lit, suggesting an overcast day. The background shows trees and a utility pole.

Road Safety Audit (RSA)

Proactive, formal safety performance examination of an existing roadway or future roadway project and its surrounding area

-FHWA

A photograph of two cyclists riding on a paved road. The cyclist in the foreground is wearing a blue helmet and a high-visibility vest. The cyclist in the background is wearing a black helmet and a high-visibility vest. In the background, there is a multi-lane road with several cars, a pedestrian bridge with a wooden railing, and a sign that says "JUNCTION 28".

Road Safety Audits...

Differ from traditional or informal field reviews



Road Safety Audits...

Are conducted by an independent, multidisciplinary team of transportation professionals

Road Safety Audits...

Can be used throughout the planning and project development process (from planning to construction)



Road Safety Audits...

Are recognized by FHWA as a Proven Safety Countermeasure

RSAs are used to answer two primary questions:

1

What elements of the road may present a safety concern: to what extent, to which road users, and under what circumstances?

2

What opportunities exist to eliminate or mitigate identified safety concerns?

Benefits of RSAs

- Identify design changes and countermeasures to prevent deaths and serious injuries
- Incorporate changes or make design corrections before projects are built
- Consider influence of land use and human behavior on observed safety problems; reveal problems not evident from other data sources
- Focus specific attention on the concerns of specific road users
- Build collaborative relationships between difference disciplines, departments and agencies

When can RSAs be used?

RSAs can be used at any stage throughout project planning and development:

Pre-Construction

Identify safety issues early in the planning and design process so they can be incorporated into the project

Construction

Audits can consider work zone traffic control and pre-opening of the roadway to inform the construction phase

Post-Construction

Observations of conditions after construction is complete to correct or alter aspects of the project

Pedestrian and Bicyclist RSAs

- RSA process specifically intended to improve safety for **pedestrians and bicyclists**.
- Guide released in **Sept 2020** by FHWA serves as an update to previous pedestrian (2007) and bicyclist (2012) RSA guides.
- Allows agencies to conduct detailed reviews that **focus on one or both modes**.

PEDESTRIAN AND BICYCLIST ROAD SAFETY AUDIT (RSA) GUIDE AND PROMPT LIST



U.S. Department of Transportation
Federal Highway Administration

SEPTEMBER 2020

https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa20042.pdf

Anatomy of the Ped/Bike RSA Guide

- A review of **crash trends** and **risk factors** associated with pedestrian and bicyclist safety
- Detailed **eight-step process** for planning, conducting and reporting findings from RSAs
- Recommended **roles and responsibilities** for those involved in the RSA process
- Sample **field materials, prompt lists and resources** to support RSA teams

PEDESTRIAN AND BICYCLIST ROAD SAFETY AUDIT (RSA) GUIDE AND PROMPT LIST



U.S. Department of Transportation
Federal Highway Administration

SEPTEMBER 2020

https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa20042.pdf

what's new?

- ★ Combined and simplified prompt lists
- ★ Incorporates micromobility
- ★ Use of new technologies to conduct RSAs
- ★ Emphasis on accessibility and user needs
- ★ Detailed review of safety risk factors
- ★ New and updated sample materials for planning and conducting RSAs

PEDESTRIAN AND BICYCLIST ROAD SAFETY AUDIT (RSA) GUIDE AND PROMPT LIST



 U.S. Department of Transportation
Federal Highway Administration

SEPTEMBER 2020

https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa20042.pdf

Pedestrian and Bicyclist RSA Process

Responsibilities

 RSA Team

 Design Team/Project Owner



Source: 2012 FHWA

A photograph of a road with utility poles and a person on the shoulder. The image is dark and serves as a background for the text. It shows a road with a white van in the foreground, a person standing on the shoulder talking on a phone, and a line of utility poles stretching into the distance under a clear sky.

Step 1: Identify Location for RSA

- High crash locations
- High risk locations
- Community feedback or locations of near misses

Step 2: Select RSA Team



Team Member Backgrounds

- Road safety
- Traffic operations
- Roadway design
- Accessibility perspective
- Bicyclist perspective
- Transit operations
- Law enforcement
- Emergency medical services

Step 3: Convene RSA Team Meeting

Valuable time to consider data and information that may not be available in the field:

- Crash report details
- Relevant plans and future development
- Traffic volumes and pedestrian and bicyclist counts
- Input from individuals/orgs not represented on team



Step 3: Convene RSA Team Meeting

Consider additional data
collection to enhance
understanding.



Step 4: Conduct the RSA Field Review

Drive, walk, and bike through the study area



January 6, 2021

Image: Elissa Goughnour, VHB

Step 4: Conduct the RSA Field Review

Sample Field Packet

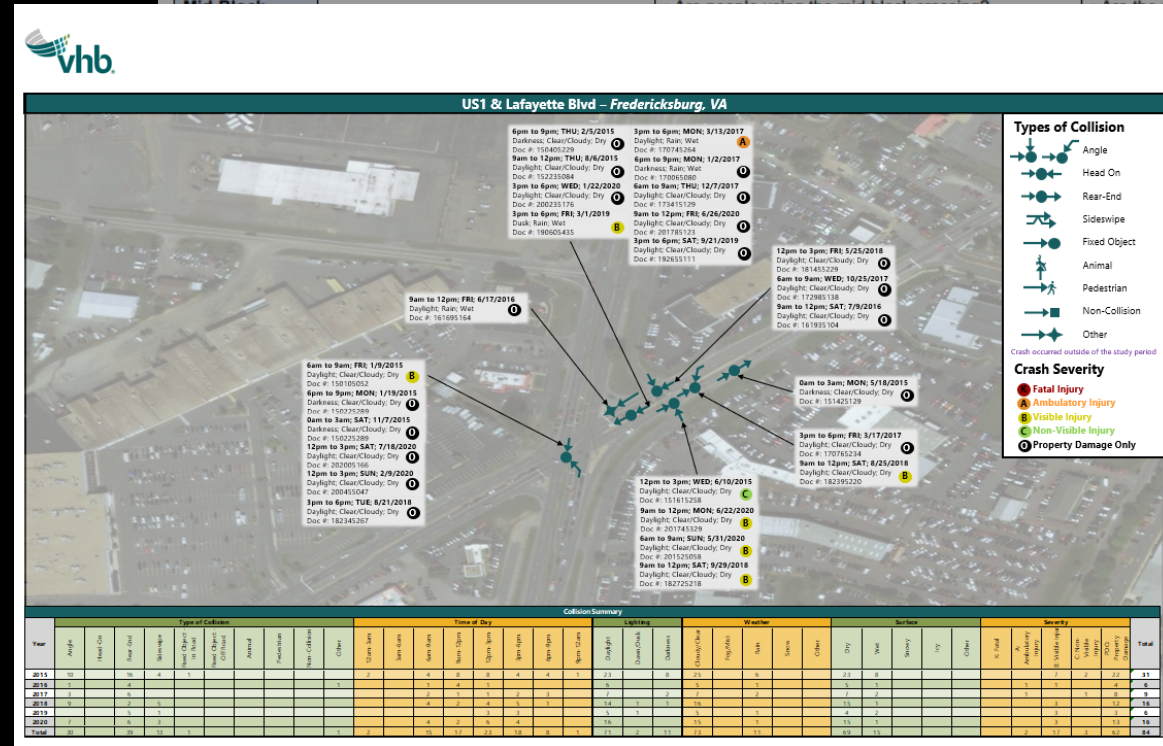
- Agenda
- Crash Diagrams
- Overview map
- Additional information (bike route map, transit route map, etc.)

Prompt Lists:

- Physical Environment / Infrastructure
- Traffic Control Devices
- Operations / Interactions / Behaviors

Pedestrian and Bicyclist RSA Guide

Location	Operations / Interactions / Behaviors		
	Characteristics	Mode Behavior	Interactions of Modes
Universal Considerations for Study Area	<ul style="list-style-type: none"> • Are design, posted, and operating traffic speeds compatible with pedestrian and bicyclist safety? • Is the safety of children in school zones adequately considered? 	<ul style="list-style-type: none"> • Do pedestrians or motorists regularly misuse or ignore pedestrian facilities? • Are drivers, pedestrians, and bicyclists behaving in a safe, compliant manner? • Are behaviors systemic across the network or at isolated locations? 	<ul style="list-style-type: none"> • Do roadway users look/scan for other travel modes? • Are drivers and bicyclists yielding to pedestrians at crossings? • Do drivers allow extra space or reduce speeds when overtaking or driving near bicyclists? • How do pedestrians and bicyclists interact with transit facilities?
Along Street (including driveways)	<ul style="list-style-type: none"> • Do scooters, bicycles, skateboards, or non-motorized vehicles create hazards for pedestrians (e.g., operating or parking on sidewalk)? • Are vehicles traveling at appropriate speeds? 	<ul style="list-style-type: none"> • If available, are bicyclists using their dedicated facilities? 	<ul style="list-style-type: none"> • Are drivers yielding to pedestrians at driveways? • Are there conflicts between bicycles and pedestrians on sidewalks?



physical environment and
of devices adequate for a
ng?

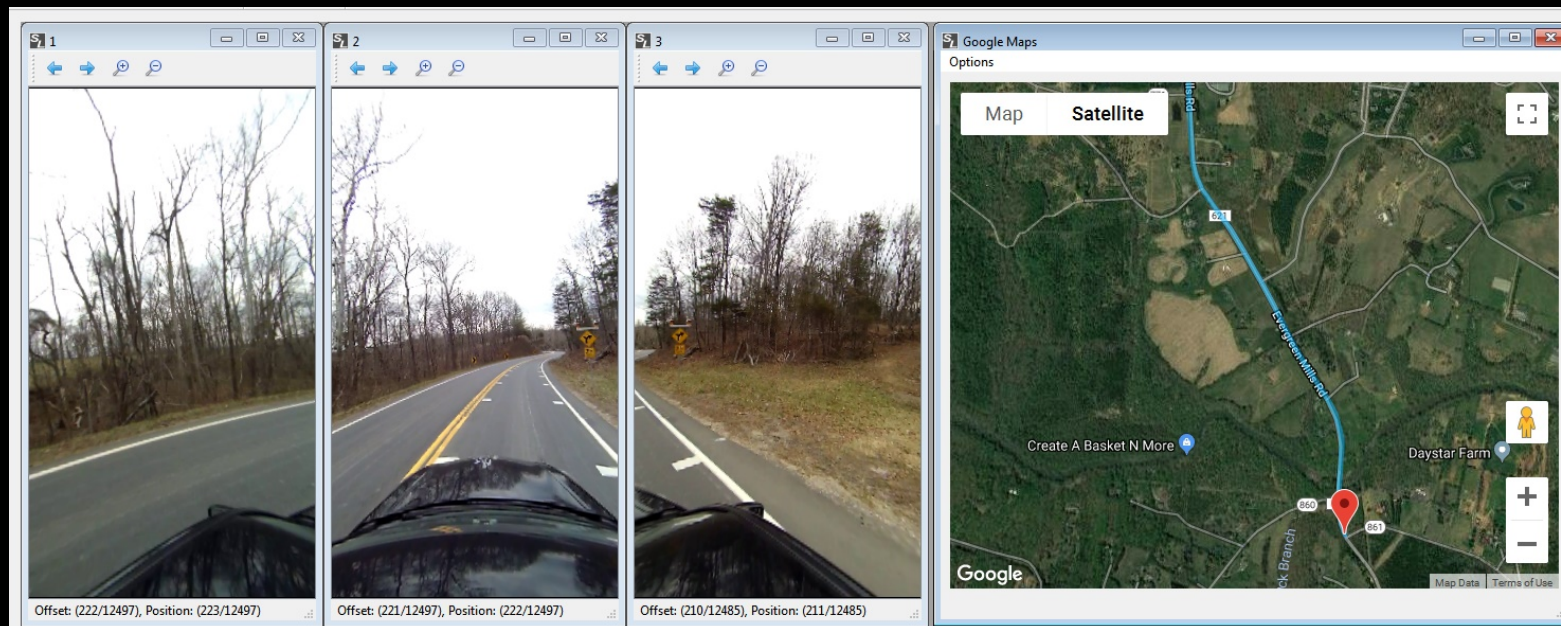
expecting crossing
s or bicyclists?

between roadway users
right-of-way and is there
?

yield to pedestrians and
when turning right or left?
pavement markings that
users? How are such
communicated to
with vision disabilities?
the levels of comfort for

Exploring Alternatives to In-Person RSAs

- Use technology to enhance communication and understanding
- Prepare and collect data in advance
- Communicate with team members and stakeholders
- Incorporate in-person components



Thank You!

Elissa Goughnour

VHB

egoughnour@vhb.com

Dan Gelinne

UNC HSRC

gelinne@hsrc.unc.edu



January 6, 2021
Federal Highway Administration



California's Bicyclist Collision Monitoring Program

Rachel Carpenter, PE
Chief Safety Officer
California Department of Transportation





Agenda

- ▶ Bicyclist Fatalities and Injuries
- ▶ Reducing Bicyclist Fatalities and Injuries
- ▶ Bicyclist Collision Monitoring Program
- ▶ Case Study: South Lake Tahoe U.S. 50
- ▶ Program Updates
- ▶ California's New Approach



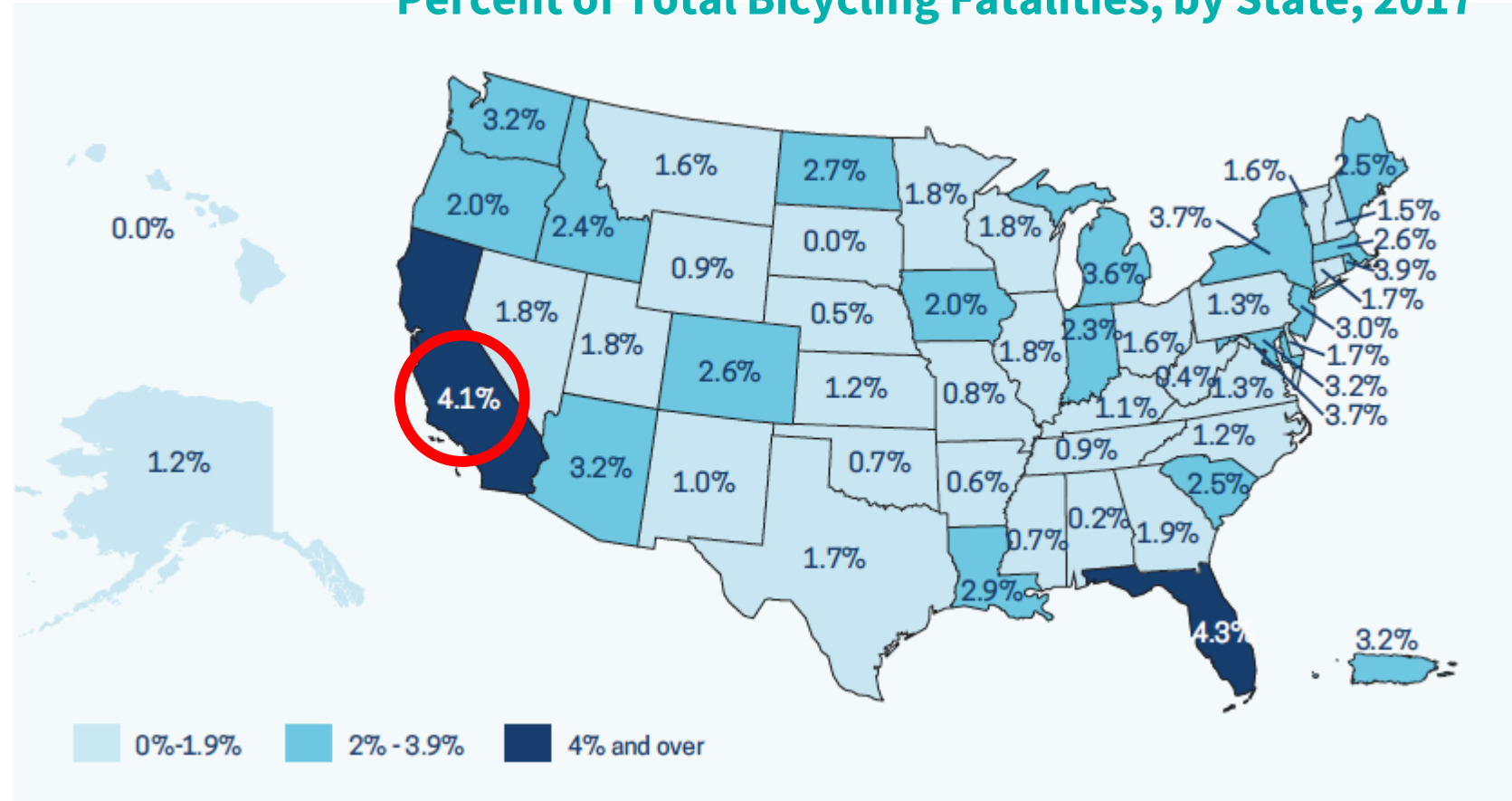


Bicyclist Fatalities and Injuries



► **2017:**
California had the 2nd highest rate of bicyclist fatalities in the U.S.

Percent of Total Bicycling Fatalities, by State, 2017





Then – Major Initiatives



- ▶ Adopted a “Towards Zero Deaths” framework
- ▶ Elevated bicyclist safety in 2015-2020 Strategic Plan
- ▶ Launched Pilot Bicycle Collision Monitoring Program in 2018



A State-Federal Partnership

- ▶ Caltrans identified high-collision locations and corridors throughout the State
- ▶ Caltrans adapted the RSA process for all corridor investigations and completed **252** investigations across all **12** Districts
- ▶ FHWA provided including technical assistance, training, and support for two Road Safety Audits (RSA)





Stakeholders – All Corridor Investigations

- ▶ Design engineer
- ▶ Maintenance staff
- ▶ Transit operators
- ▶ Local bicycling groups
- ▶ School staff
- ▶ District Bicycle and Pedestrian Coordinator
- ▶ Law enforcement/emergency responders
- ▶ Local agency staff
- ▶ Local community groups
- ▶ Transit Agencies



Challenges and Limitations



▶ Under-reporting of bicyclist collision data



▶ Unavailability of “exposure” data



▶ Lack of reliable CMF bicycle safety countermeasures



Case Study: South Lake Tahoe U.S. 50



- ▶ Road Safety Audit conducted by FHWA on U.S. 50 in South Lake Tahoe
- ▶ FHWA report recommendations include widened bicycle lanes, colored treatments, & mid-block crossings
- ▶ State provided funding to implement recommendations
- ▶ Anticipated completion date: End of 2021



Lessons Learned



- ▶ Develop and memorialize **partnerships**



- ▶ **Improve data** by conducting bicycle and pedestrian counts



- ▶ **Improve data** by improving crash reporting



- ▶ Utilize various **funding** options for planning, preliminary engineering, and construction



From Pilot to Permanent

- ▶ Bicyclist Collision Monitoring Program received permanent funding
- ▶ Similar path to Pedestrian Collision Monitoring Program
 - HCCL/corridor program (reactive)
 - Systemic (proactive)
- ▶ Both programs will be released annually





California's New Approach - Four Pillars

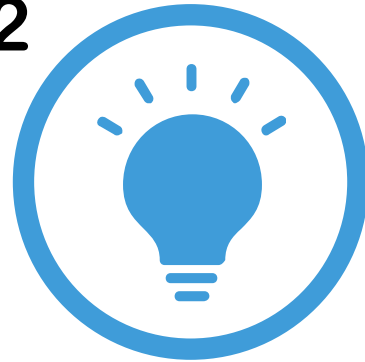


1



**Doubling
Down on
What Works**

2



**Accelerate
Advanced
Technology**

3



**Lead Safety
Culture
Change**

4



**Integrate
Equity**



California's New Approach – RSA Program



Road Safety Audits

A road safety audit is a proactive formal safety performance examination of an existing or future road or intersection by an independent and multi-disciplinary team.

SAFETY BENEFIT:

10-60%

Reduction in total crashes

Caltrans will develop a Road Safety Audit program

Benefits of Road Safety Audits include:

- ▶ Reduced number and severity of crashes
- ▶ **10-60% reduction** in total crashes
- ▶ Improved awareness of safe design practices
- ▶ Increased opportunities for multimodal safety strategies

Source: https://safety.fhwa.dot.gov/provencountermeasures/road_safety_audit/



January 6, 2021
Federal Highway Administration

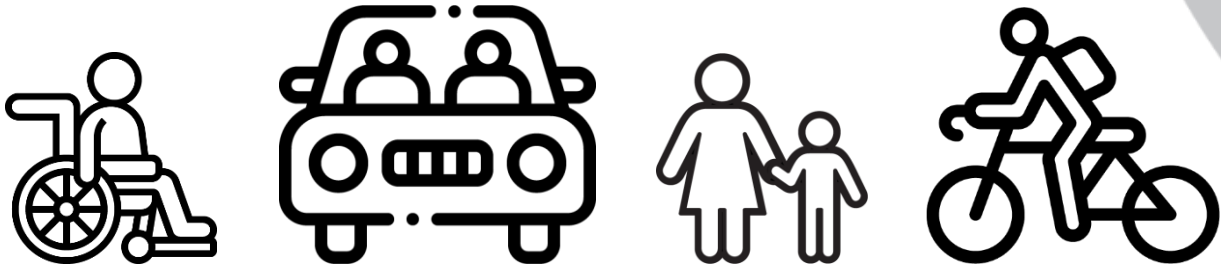


Thank you.

Contact:

rachel.carpenter@dot.ca.gov





VIRTUAL RSA: LESSONS LEARNED

TERRA REED | CITY OF ALBUQUERQUE

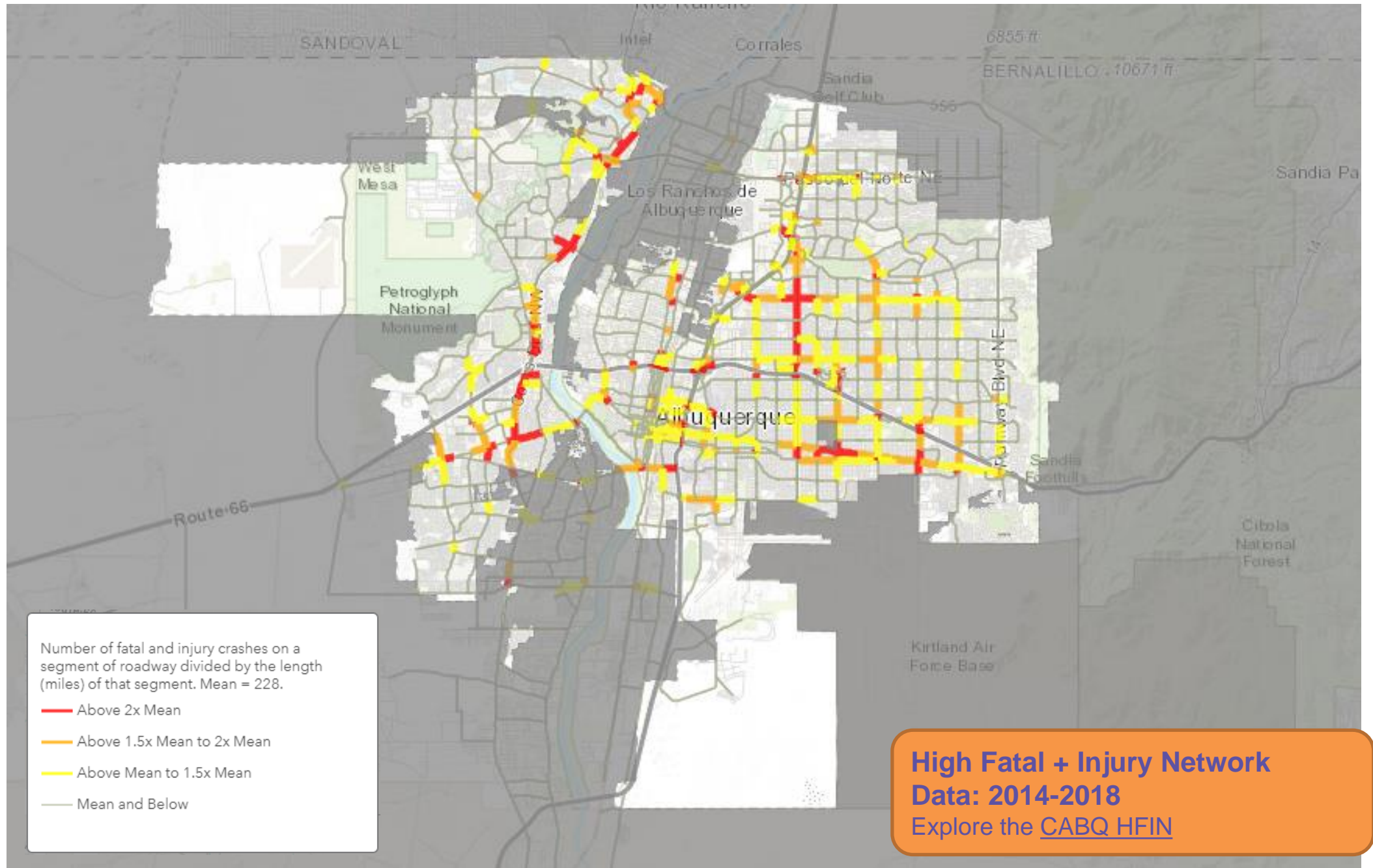
Improving Safety with Bicyclist and Pedestrian Road Safety Audits | 6 January 2021

ONE
ALBUQUE
RQUE

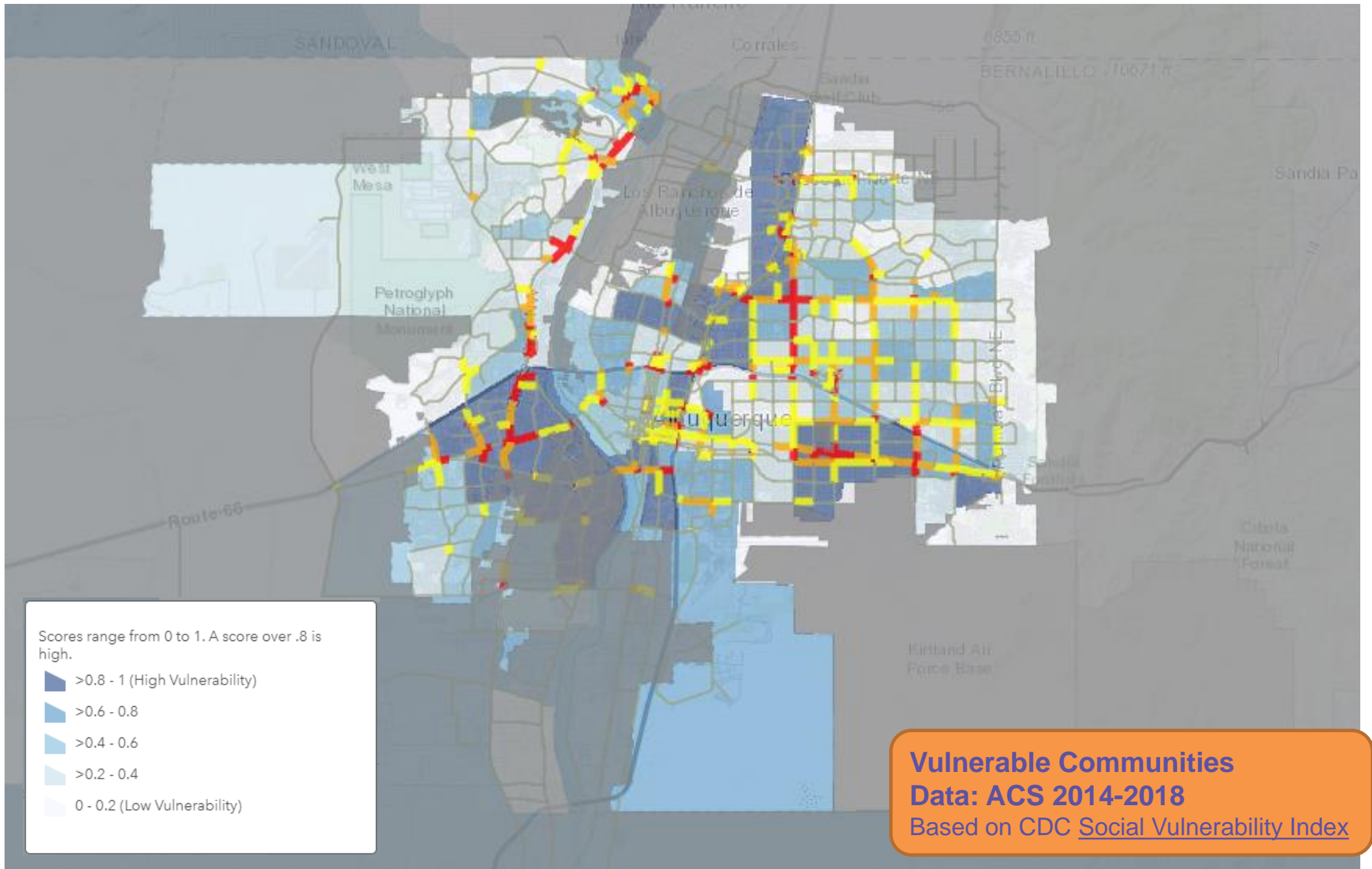
PRESENTATION OVERVIEW

- Background + Corridor Choice
- Lessons Learned: Going Virtual in Response to COVID-19
 - Preparation
 - Virtual Format + Platform
 - Setting the Context
 - In-person Options – Still Important!

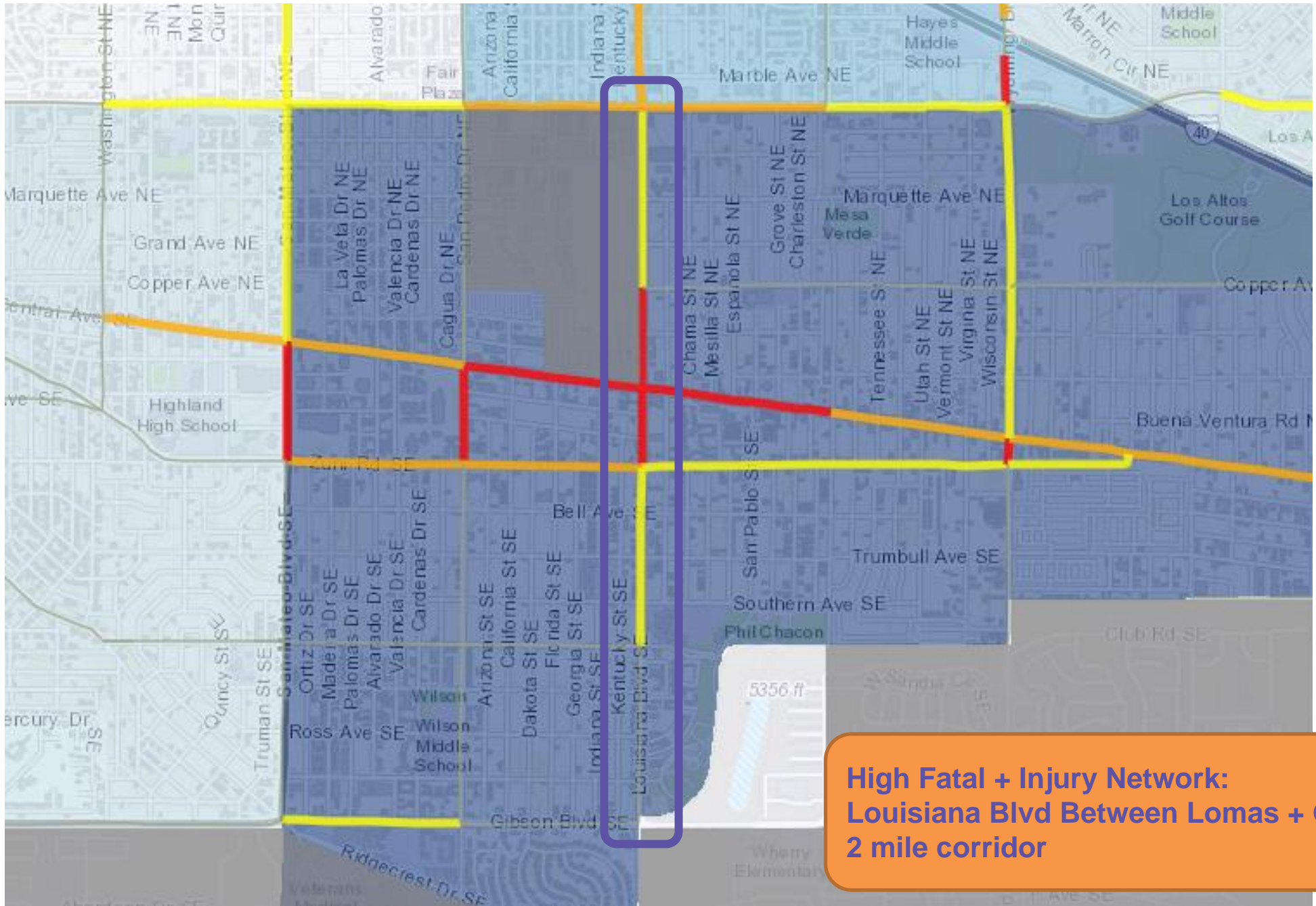
ALBUQUERQUE, NM



ALBUQUERQUE, NM

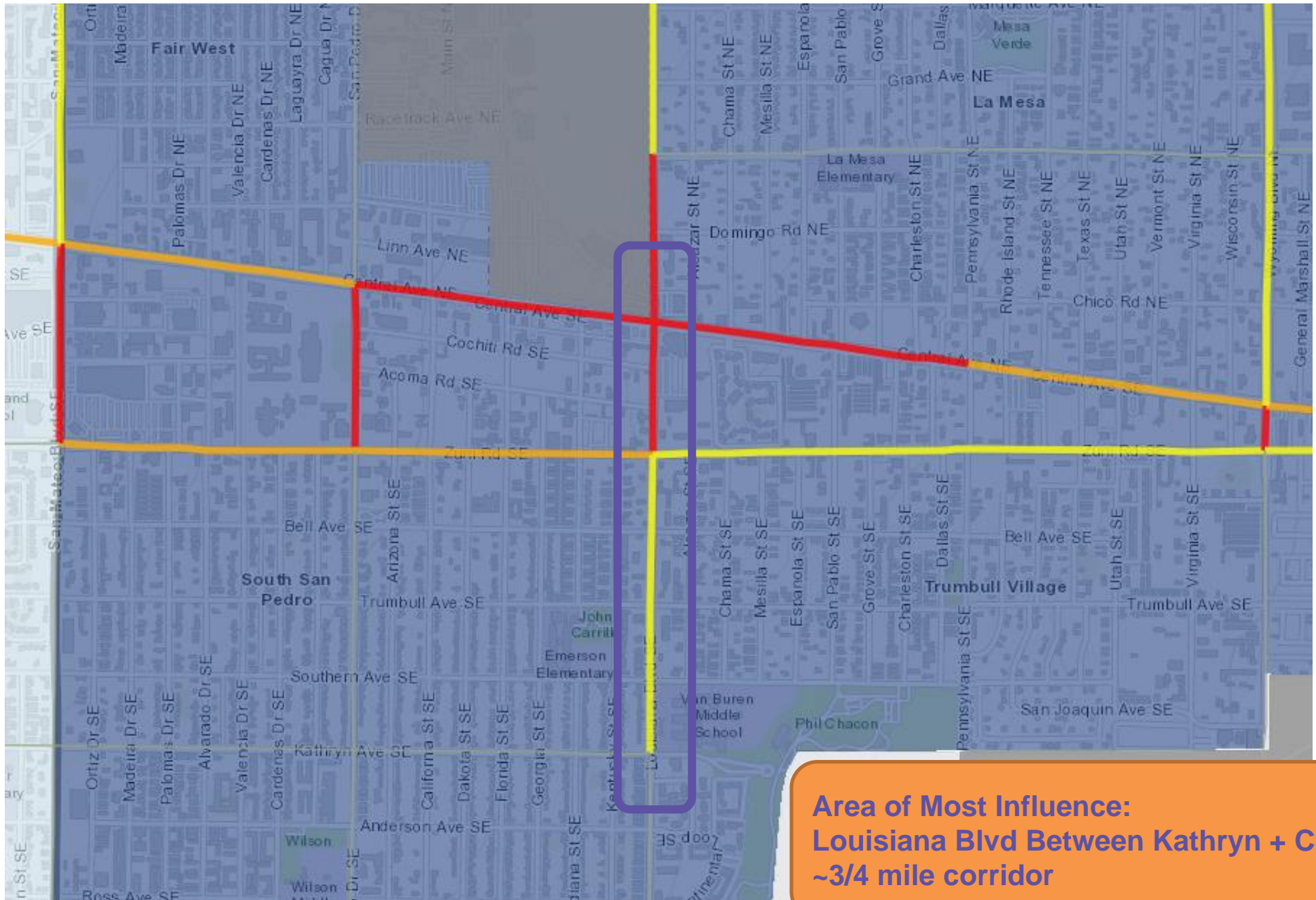


LOUISIANA BLVD



**High Fatal + Injury Network:
Louisiana Blvd Between Lomas + Gibson
2 mile corridor**

LOUISIANA BLVD



Area of Most Influence:
Louisiana Blvd Between Kathryn + Central
~3/4 mile corridor

~~APRIL 2020~~ JULY 2020...

PREPARING FOR THE VIRTUAL RSA

- Schedule and access
- Choose a platform (we used Zoom)
- Prepare Data + Background Info
- Virtual + In-person Options
- Follow-up + Discussion



PLATFORM + FORMAT

Choosing a Platform

- Screensharing options
- Chat function
- Accessibility

Lessons Learned

- Range of participants: City, MPO, School District, DOT, Community Partners
- Multiple ways to share + discuss
- Consider timing + attention spans
- Videos on for discussion (if possible)

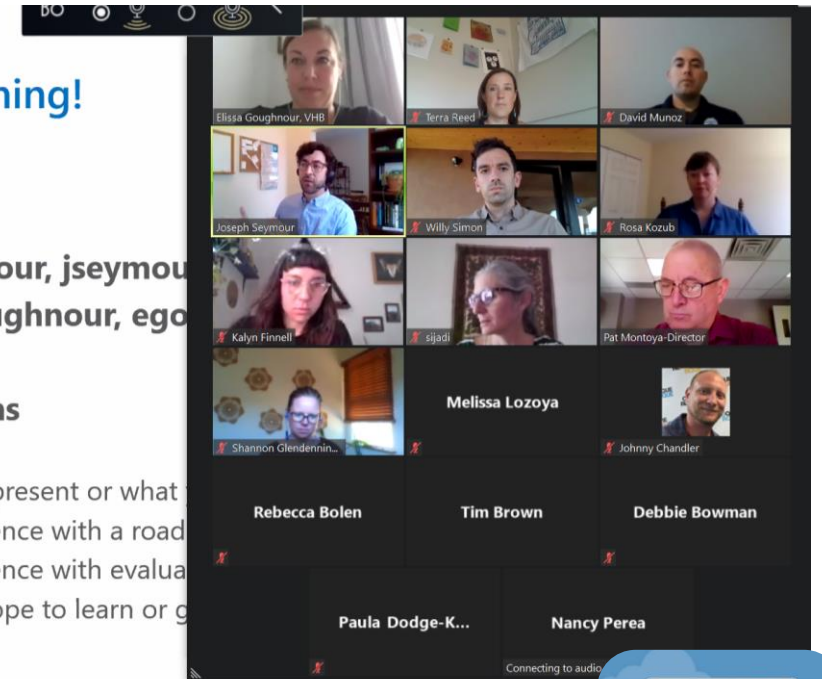
Good Morning!

Welcome

- Joe Seymour, jseymou
- Elissa Goughnour, ego

Introductions

- Your Name
- Who you represent or what
- Prior experience with a road
- Prior experience with evalua
- What you hope to learn or g



SHARED EXPERIENCE

Set the context for the virtual RSA – establish shared understanding. This helps participants get a sense of the study area.

Data

- Land use data
- Traffic counts
- Crash data
- Transit data
- Speed data
- Photos + video
- Community input

Direction	Stop_Name	StopID	AvgOn	AvgOff	On+Off
Northbound	LOUISIANA GIBSON	7344	0.7	0.1	0.8
Northbound	LOUISIANA EASTERN	2807	0.5	0	0.5
Northbound	LOUISIANA CONTINENTAL	2809	1.4	0.1	1.4
Northbound	LOUISIANA KATHRYN	5632	0.8	0	0.8
Northbound	LOUISIANA SOUTHERN	2813	0.4	0	0.4
Northbound	LOUISIANA TRUMBULL	7342	1.2	0.2	1.4
Northbound	LOUISIANA ZUNI	2819	0.4	0.2	0.6
Northbound	LOUISIANA COCHITI	2821	0.4	0.6	1
Northbound	LOUISIANA CENTRAL	2823	4.1	1.4	5.5
Northbound	LOUISIANA DOMINGO	2825	0.1	0	0.1
Northbound	LOUISIANA COPPER	2827	0.2	0	0.2
Northbound	LOUISIANA GRAND	2839	0.1	0.1	0.2
Northbound	LOUISIANA MARQUETTE	2831	0.2	0.1	0.3
Northbound	LOUISIANA LOMAS	2833	0.7	1.3	2
Southbound	LOUISIANA LOMAS NEARSID	2763	0.9	1	1.9
Southbound	LOUISIANA LOMAS FARSIDE	2765	0.2	0	0.2
Southbound	LOUISIANA MARQUETTE	2767	0.1	0.1	0.2
Southbound	LOUISIANA GRAND	2769	0	0.1	0.1
Southbound	LOUISIANA COPPER	2771	0.1	0.1	0.2
Southbound	LOUISIANA DOMINGO	2773	0	0.4	0.4
Southbound	LOUISIANA CENTRAL	2775	0.2	2.2	2.4
Southbound	LOUISIANA COCHITI	2777	1.7	0.9	2.7
Southbound	LOUISIANA ZUNI	2781	0.2	0.7	0.9
Southbound	LOUISIANA TRUMBULL	2783	0.1	1	1.2
Southbound	LOUISIANA KATHRYN	2785	0	0.6	0.6
Southbound	LOUISIANA ANDERSON	2787	0	1.1	1.1
Southbound	LOUISIANA EASTERN	2789	0.2	1.3	1.6
Southbound	GIBSON LOUISIANA	2915	0	0.4	0.4

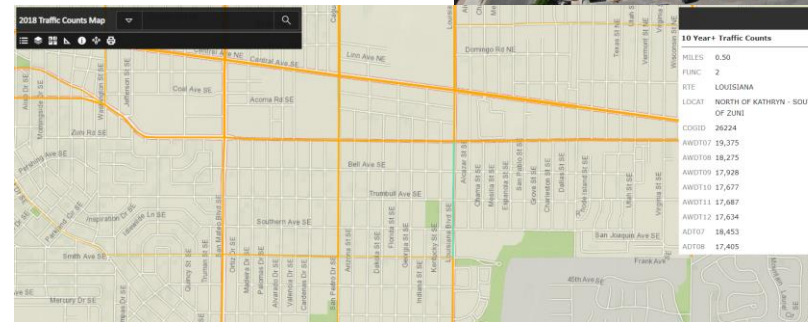
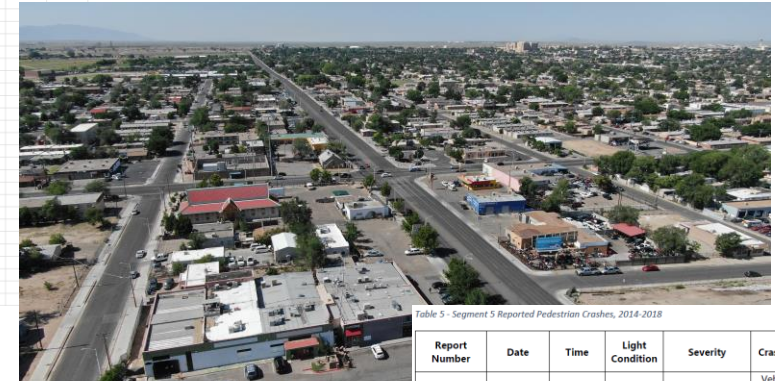


Table 5 - Segment 5 Reported Pedestrian Crashes, 2014-2018

Report Number	Date	Time	Light Condition	Severity	Crash Analysis	Highest Contributing Factor
710137537	5/31/2014	6:34 PM	Daylight	Injury Crash	Vehicle Going Straight	Failed to Yield Right of Way
710188639	8/19/2014	12:57 PM	Daylight	Injury Crash	Vehicle Going Straight	Pedestrian Error
710212140	11/20/2014	10:57 AM	Daylight	Injury Crash	Vehicle Turning Right	Avoid No Contact - Vehicle
710211113	12/14/2014	7:08 PM	Dark-Lighted	Injury Crash	Vehicle Going Straight	None
710265592	11/3/2015	5:53 PM	Dusk	Injury Crash	Vehicle Turning Right	Alcohol/Drug Involved
710272095	11/6/2015	2:05 PM	Daylight	Injury Crash	Vehicle Going Straight	None
710269765	5/28/2016	12:23 AM	Dark-Lighted	Injury Crash	Vehicle Going Straight	Pedestrian Error
710291777	8/4/2016	9:01 PM	Dark-Lighted	Injury Crash	Vehicle Going Straight	Avoid No Contact - Other
710369811	11/9/2016	5:14 PM	Dusk	Injury Crash	All Others and Not Known	Made Improper Turn
710280502	12/18/2016	3:16 PM	Daylight	Injury Crash	Vehicle Going Straight	Alcohol/Drug Involved
710371062	6/5/2017	12:38 AM	Dark-Lighted	Injury Crash	Vehicle Turning Right	Pedestrian Error
710204672	6/29/2017	10:21 PM	Dark-Not Lighted	Injury Crash	Vehicle Going Straight	Pedestrian Error
710405043	6/30/2017	12:08 PM	Daylight	Injury Crash	Vehicle Turning Right	Failed to Yield Right of Way
710367762	7/10/2017	9:01 PM	Dark-Lighted	Injury Crash	Vehicle Going Straight	Pedestrian Error
710365319	8/3/2017	10:32 PM	Dark-Not Lighted	Injury Crash	Vehicle Going Straight	Failed to Yield Right of Way

PHOTOS, VIDEO + SPEED MEASUREMENT

Drone Footage



Lessons Learned

- Use a variety of tools – be creative!
- Helps participants get oriented
- Plan for data management and filesharing

Speed Measurement



Speed	Frequency	Cumulative Frequency	Cumulative Percent	Speed Limit = 35
32	2	2	5%	
33	1	3	8%	
34	3	6	16%	
35	6	12	32%	
36	5	17	45%	Median
37	4	21	55%	Speed
38	1	22	58%	
40	3	25	66%	
41	4	29	76%	
42	3	32	84%	85th %
43	3	35	92%	
44	1	36	95%	
47	2	38	100%	

Street View



COMMUNITY INPUT

Human experience and perceptions are important to understanding the reality of the study area.

Sources

- Past studies
- Community events
- Participants

Lessons Learned

- Harder to capture in virtual format (especially during a pandemic)
- Consider using online tools prior to the RSA (ex: StoryMap)



OUR STREETS, OUR HEALTH:
WALKING IN THE
INTERNATIONAL DISTRICT



1/1/2018

A Neighborhood Pedestrian Safety Action Plan

Working with community members to identify barriers to walking and suggest ways to move forward on short term improvements and long term strategies to make streets in the Albuquerque's International District safer for everyone while promoting a convenient, comfortable walking environment.

IN-PERSON OPPORTUNITIES

Even if the RSA is virtual, there are many benefits to providing opportunities for in-person participation.



Field test data



Observe behaviors



Observe real conditions



Treat yo' selves

THANK YOU!

Terra Reed | Vision Zero Coordinator

City of Albuquerque Department of Municipal Development

treed@cabq.gov

ONE
ALBUQUE
RQUE

Discussion

⇒ **Send us your questions**

⇒ **Follow up with us:**

⇒ **Tamara Redmon tamara.redmon@dot.gov**

⇒ **Elissa Goughnour egoughnour@vhb.com**

⇒ **Dan Gelinne gelinne@hsrc.unc.edu**

⇒ **Rachel Carpenter Rachel.carpenter@dot.ca.gov**

⇒ **Terra Reed treed@cabq.gov**

⇒ **General Inquiries pbic@pedbikeinfo.org**

⇒ **Archive at www.pedbikeinfo.org/webinars**