NMDOT VRU Safety Assessment Meeting

Stakeholder Workshop

October 26th, 2023

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE


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STOP

Introduction

Agenda

- **Brief Introduction** *(5 minutes)*
- **Presentation** *(45 minutes)*
- **Q&A** *(20+ minutes)*
- **Wrap-up/next steps** *(5 minutes)*

What Brings Us here?

Infrastructure Investment and Jobs Act (IIJA)

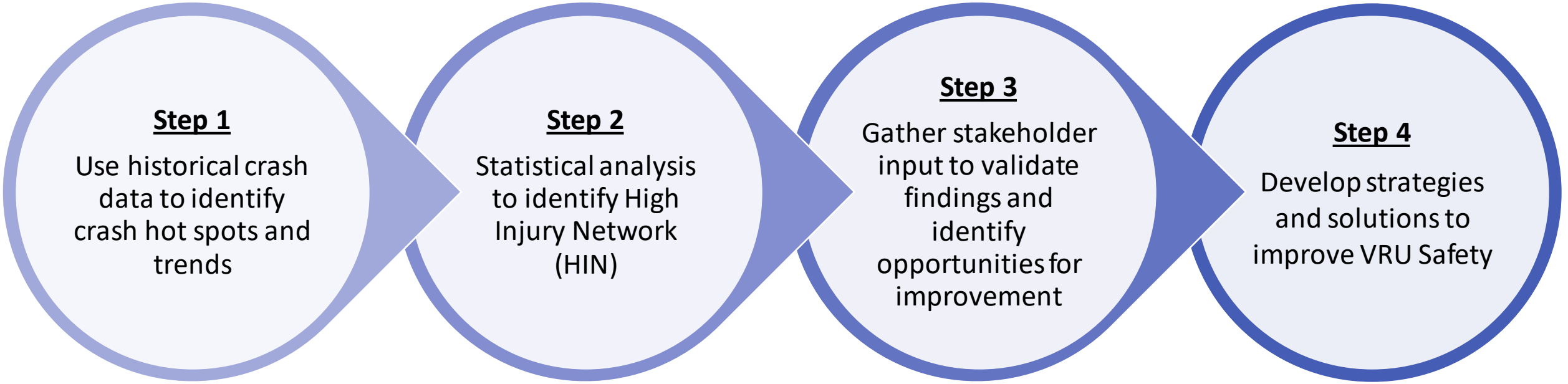
- New requirement: All states are <u>required</u> to develop a VRU Assessment
- Data-driven analysis
- Incorporate Safe Systems Approach (SSA)
- Requires stakeholder input

The FHWA is prioritizing safety for Vulnerable Road Users (VRUs)

Vulnerable Road Users

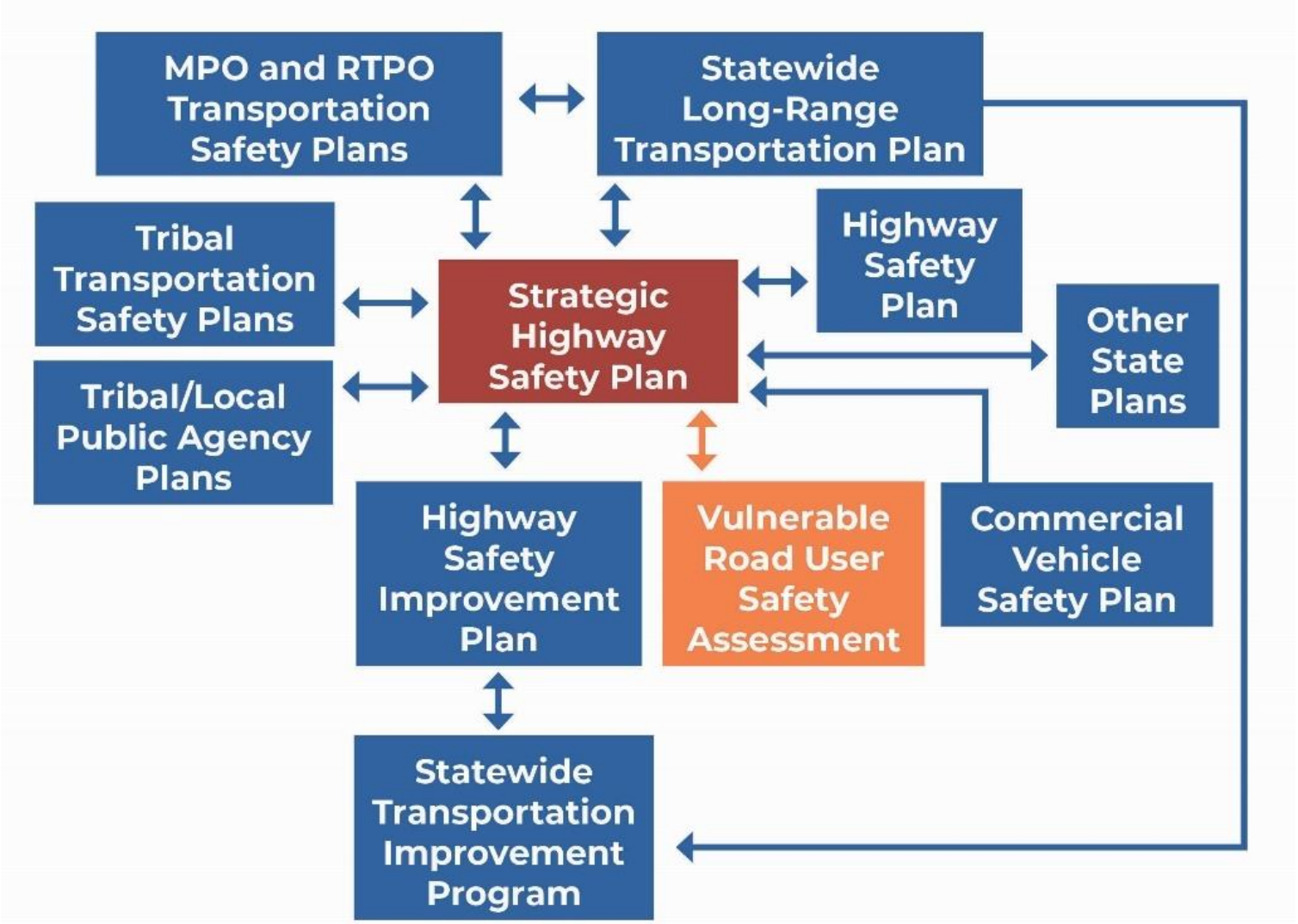
Vulnerable Road User
Those unprotected by an outside shield, as they sustain a greater risk of injury in any collision with a vehicle and are therefore highly in need of protection against such collisions. Examples include pedestrians, roadway workers, a person operating a wheelchair, a person riding a bicycle or scooter.

Vulnerable Road User Assessment Process



The final report will be included in the next New Mexico SHSP (2024)

How this plan will be used



This safety assessment:

- Documents the current state of VRU safety
- Identifies areas of especially high risk
- Analyzes who is most likely to be in a VRU-involved crash
- Prioritizes and categorizes (by typology) corridor segments and intersections for improvements
- Proposes recommendations for VRU safety improvements

What We Analyzed And How

Data Analyzed

- Crash data from the NM Statewide Traffic Records System database from **2012 to 2022**
- **2130** pedestrian- or bicyclist-involved KA crashes

KABCO Rating System

- **K** – Killed
- **A** – Serious Injury
- **B** – Suspected Minor Injury
- **C** – Complaint of Injury
- **O** – No Apparent Injury

Data Limitations

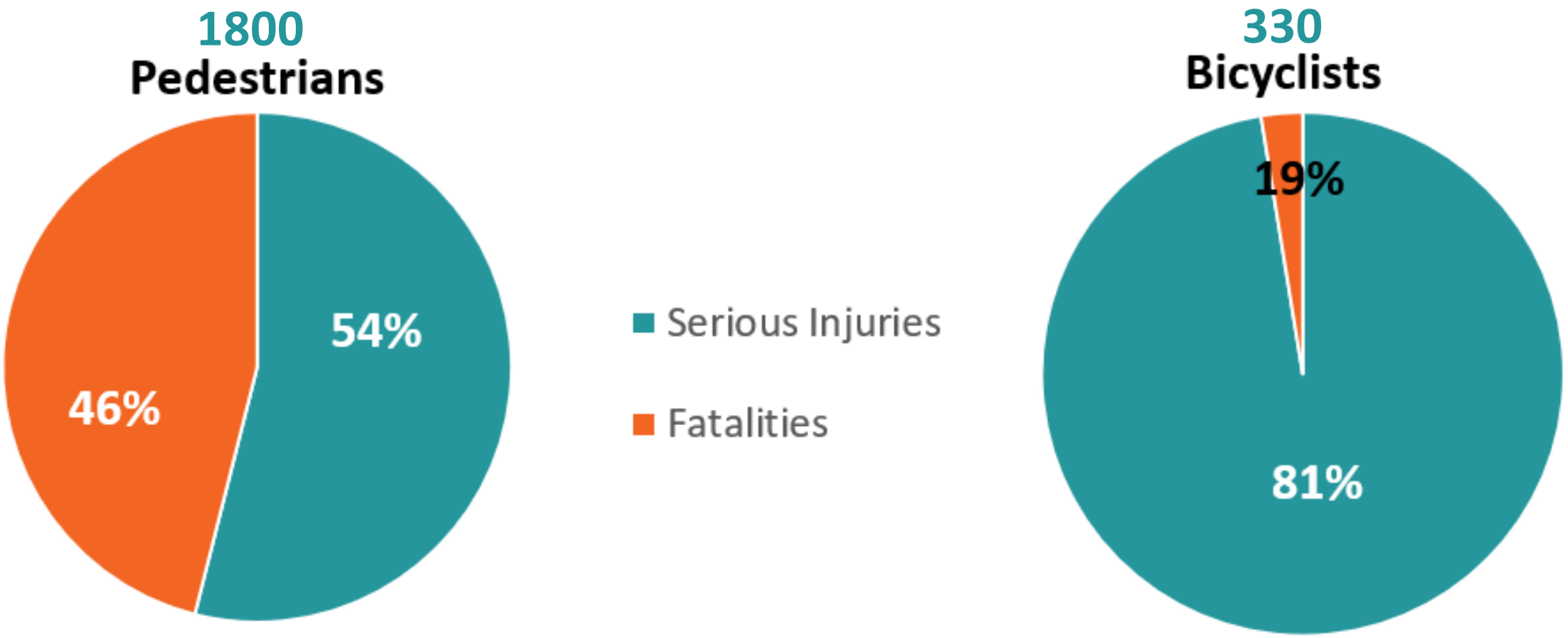
- Incomplete information from the UCR crash data
- No non-motorist categories other than “pedestrian” or “pedalcyclist”
- Limited statewide data on contextual information like sidewalks or crosswalks.
- Limited behavioral data (such as if a bicyclist was wearing a helmet)

How We Used the Data

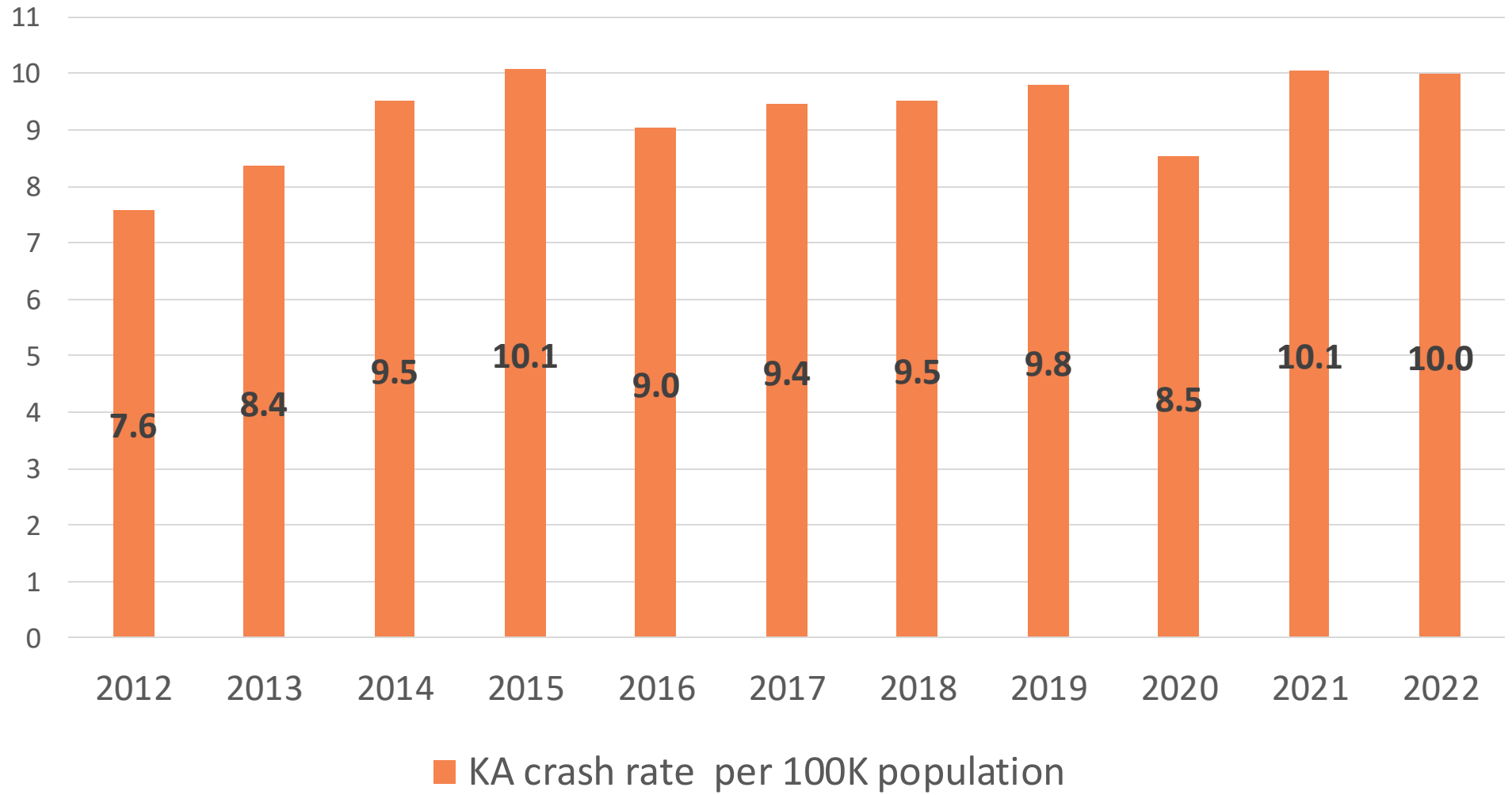
- Historical Crash Trends Analysis
- Equity Analysis
- Development of a High Injury Network
- Identification and Scoring of Priority Locations (corridor segments and intersections)

Historical Crash Trends Analysis

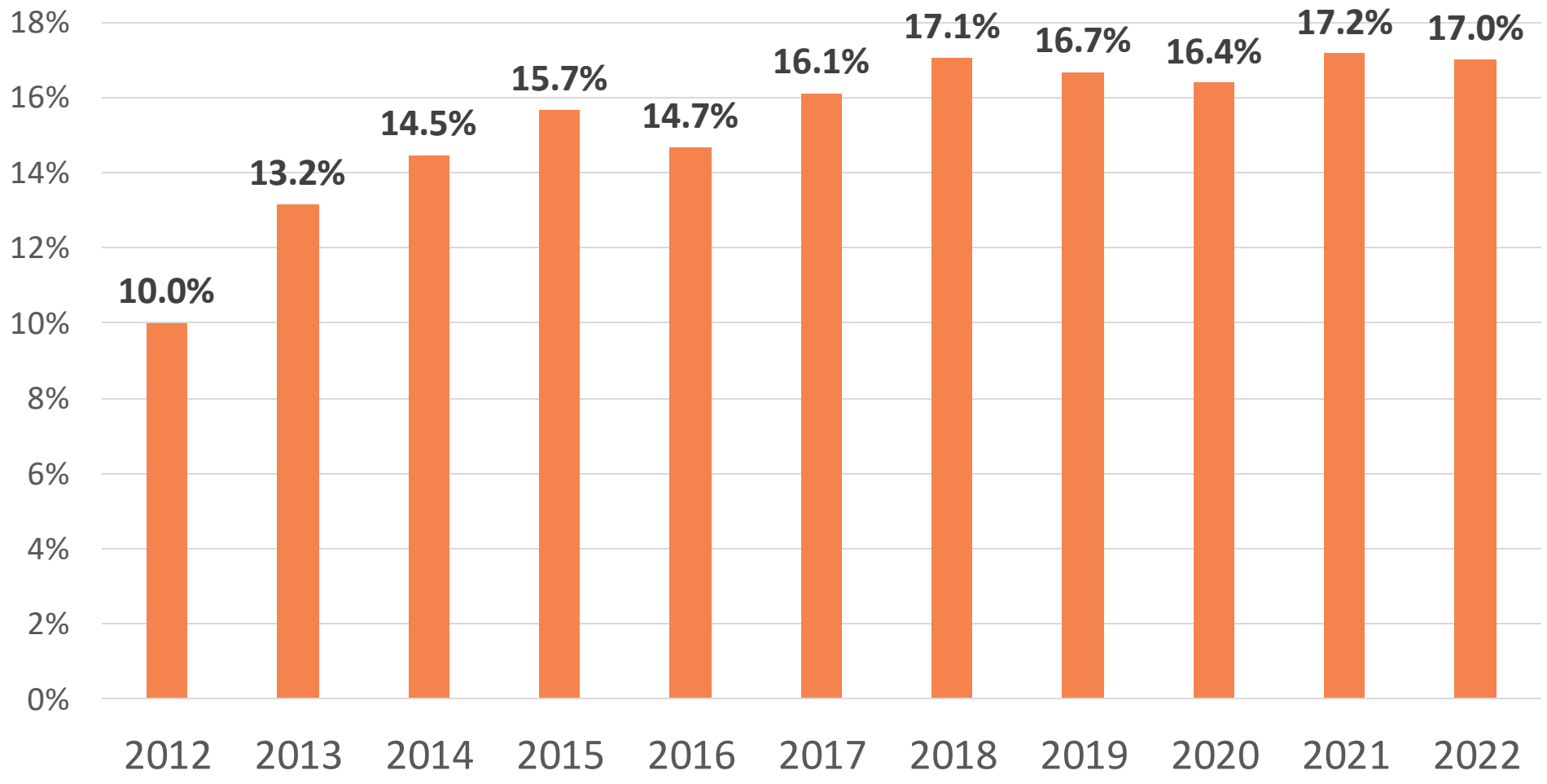
Between 2012 and 2022, 2,130 People involved in KA Crashes



Vulnerable Road User-Involved KA Crash Rate per 100,000 People



Vulnerable Road User-Involved KA Crashes as a Percentage of All KA Crashes



Trends Analyzed

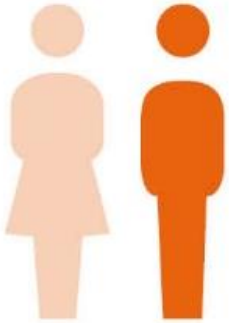
- **Location**
  - At intersection or along the roadway (non-intersection)
  - Near transit
  - Near signal
  - Urban or rural
  - Within Tribal lands
  - Population density of crash area
- **Roadway Characteristics**
  - Functional classification
  - Number of lanes
  - Speed limit
  - AADT
  - Presence of bicycle infrastructure (bicyclist crashes only)
- **Demographics**
  - Age of vulnerable road user
  - Gender of vulnerable road user
  - Race/ethnicity of vulnerable road user
  - Local or out-of-state driver
- **Date/Time**
  - Month of year
  - Day of week
  - Time of day
  - Lighting conditions
- **Crash Characteristics**
  - Top Contributing Crash Factor
  - Alcohol involvement (both driver and vulnerable road user)
  - Drug involvement (both driver and vulnerable road user)
  - Hit-and-run
  - Vehicle turning movements

Pedestrian-Involved KA Crash Victims

Race/Ethnicity

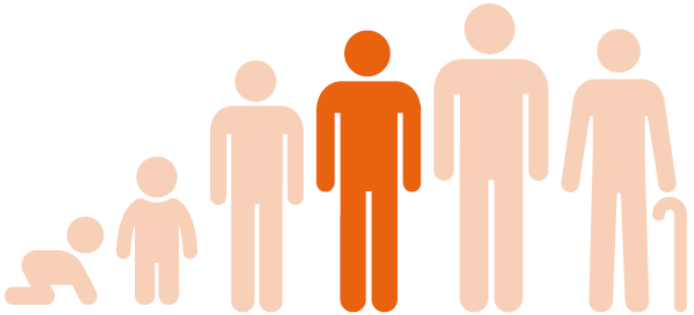
Those who were identified as **Native American** were **23.1%** the pedestrian-involved KA crashes victims

Gender



Men made up **72%** of all pedestrian-involved KA crash victims

Age



Those **aged 35-49** were the highest percentage (**25.5%**) of pedestrian-involved KA crash victims

Pedestrian KA Crashes

Lighting

70% of pedestrian-involved KA crashes occur **outside of daylight hours**

Time of Day

48% of pedestrian-involved KA crashes occur **from 5 to 9 pm**

Intersections

69% of pedestrian-involved KA crashes occur **near intersections**

Road Type

37% of pedestrian-involved KA crashes occur along a **major arterial**

Speed Limit

30% of pedestrian-involved KA crashes occur on **50 mph** speed limit roads

Alcohol

31% of pedestrian-involved KA crashes involve **Alcohol/ drugs**

Hit-and-Run

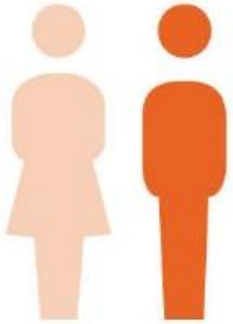
23% of pedestrian-involved KA crashes result in a **hit-and-run**

Bicyclist-Involved KA Crash Victims

Race/Ethnicity

Those who were identified as **White** made up **45%** of bicycle-involved KA crash victims

Gender



Men made up **84%** of all victims in bicycle-involved KA crashes

Age

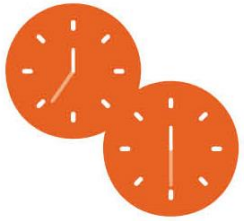
Those **aged 50-64** were the highest percentage (**27%**) of victims in bicycle-involved KA crashes

Bicyclist-Involved KA Crashes

Lighting

68% of bicycle-involved KA crashes occur **during daylight hours**

Time of Day



7.9% of bicycle-involved KA crashes occur **at 7 am, 7.9% at 6 pm**

Time of Year

Most bicycle-involved KA crashes occur from **June through August**

Intersections

79% of bicycle-involved KA crashes occur **near intersections**

Road Type

63% of bicycle-involved KA crashes occur along a **major or minor arterial**

Primary Cause

23% of bicycle-involved KA crashes involve **driver inattention**

Facility Type

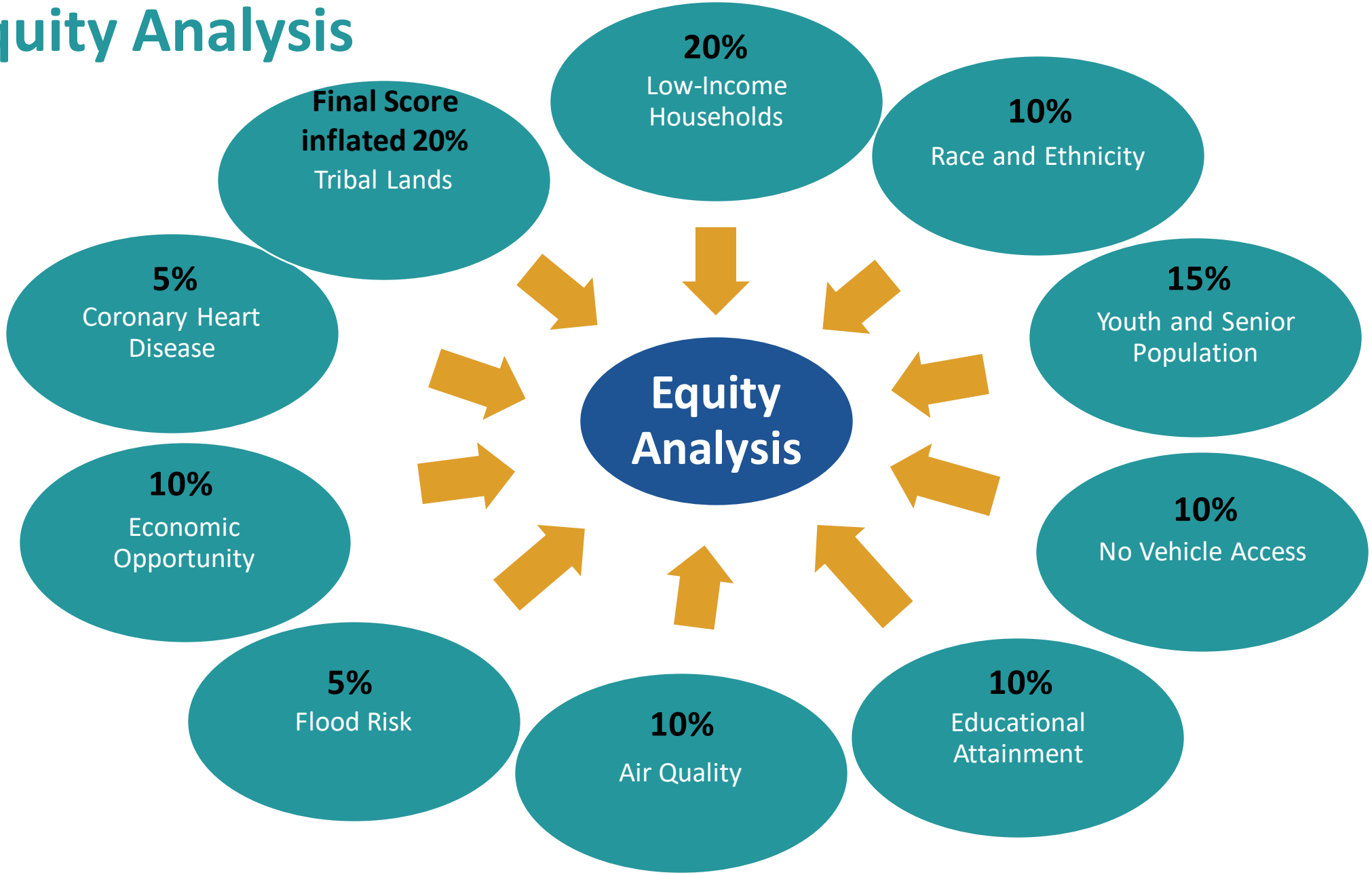
95% of bicycle-involved KA crashes occur on roads without **bike facility**

Equity Analysis

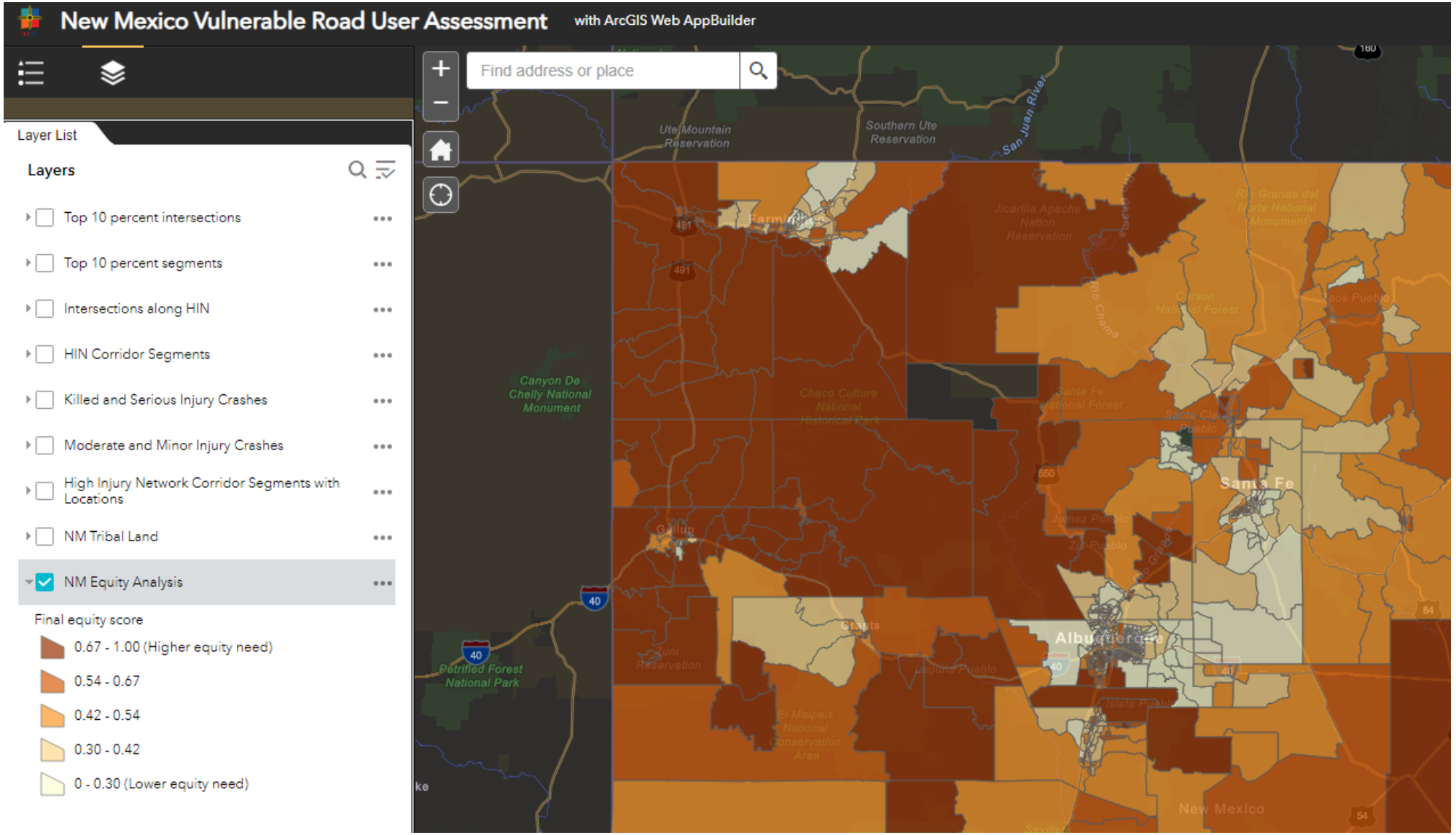
Equity's Role in Improving VRU Safety

- Identify groups disproportionately harmed by transportation system
- Historic inequalities have led to unequal outcomes
- Outcome: fair resource distribution based on need

Equity Analysis



Online Equity Analysis Map



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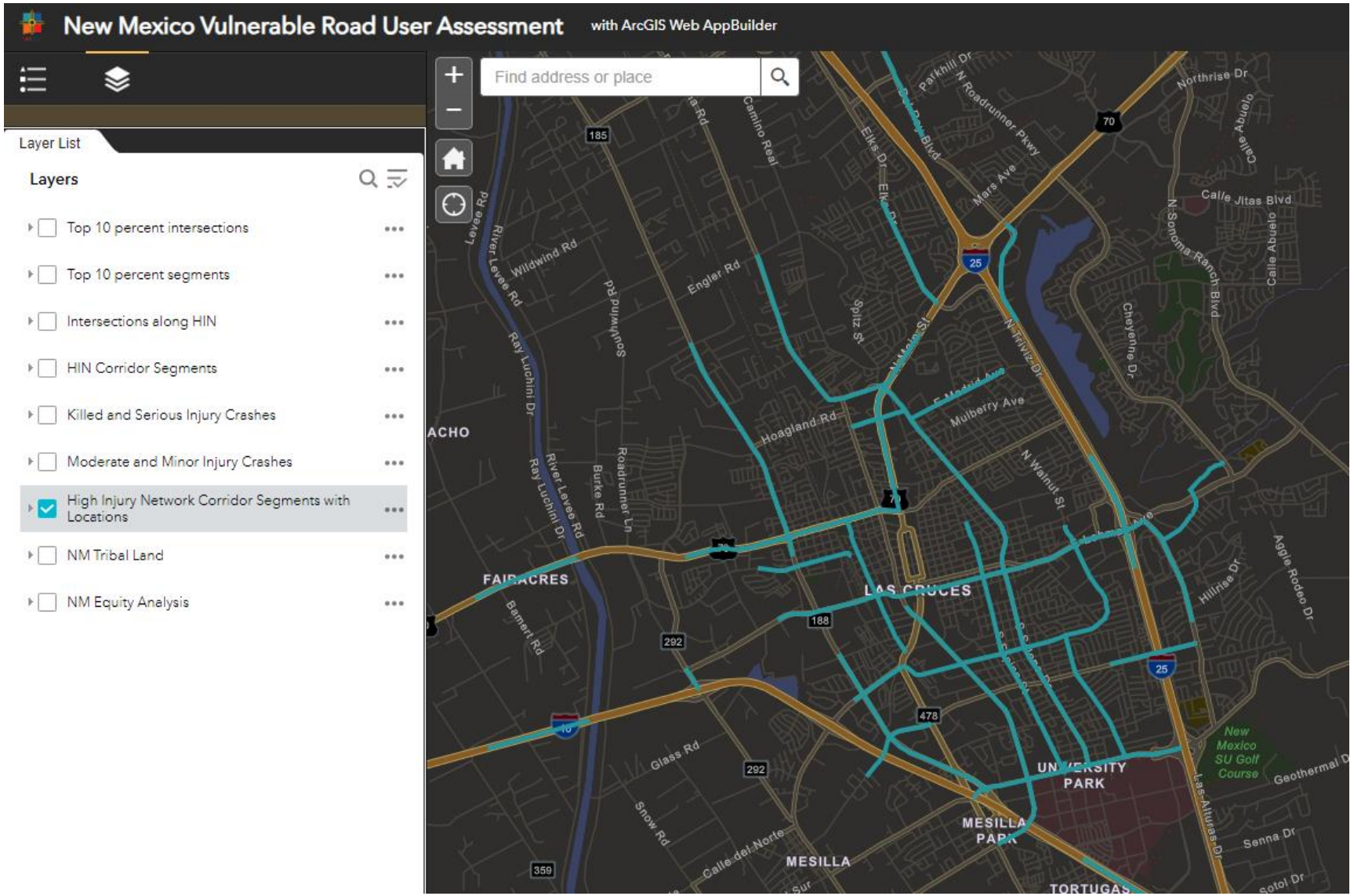
High Injury Network

The vulnerable road user Safety Assessment HIN accounts for 1.1% of all of New Mexico's road centerline miles and 62% of the state's VRU-involved injury-causing (KABC) crashes.

Crash Severity Index Weights

KABCO rating	Definition	Crash Severity Score Weights
K	Killed	20
A	Incapacitated: Carried from scene	5
B	Visible injury	1
C	Complaint of injury, but not visible	1
O	No apparent injury	0

Online High Injury Network Map



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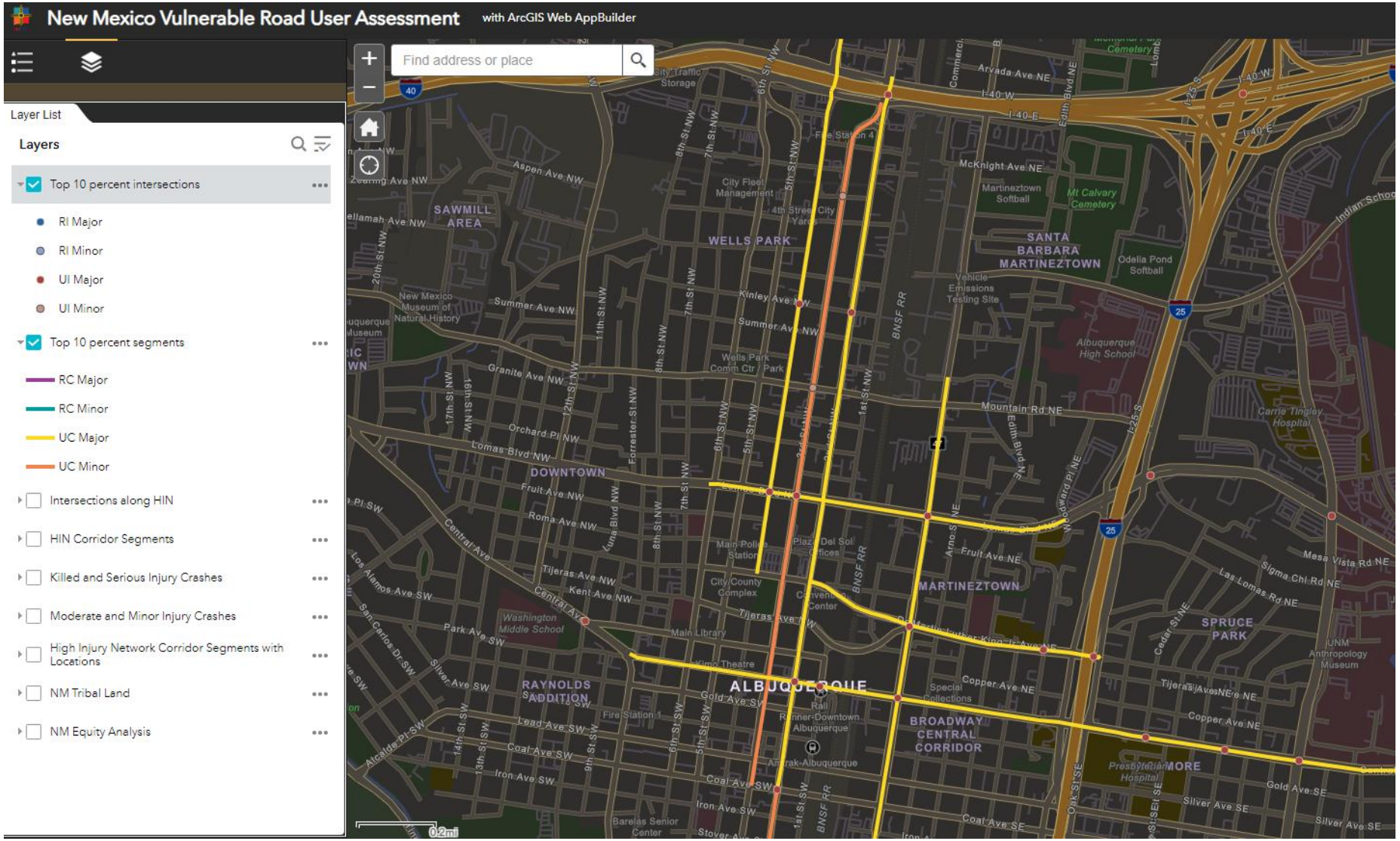
Identification and Scoring of Priority Locations

Project Location Prioritization Analysis

Criteria	Measures	Data Source	Weight
Safety	The typical intensity of severe, bicycle, and pedestrian crash patterns	New Mexico UCR	75%
Equity	Equity index leveraging a combination of demographic and public health data to identify socially vulnerable populations with high investment need.	Alta Equity Analysis tool	25%

- **All corridor segments and intersections that fall on the statewide HIN have been scored. This comprised 880 road segments and 3,856 intersections. The top 10% of corridor segments and the top 10% of intersections are considered "priority project locations."**
- **All Top 10% priority project locations have been assigned a typology to guide the implementation of safety improvements.**

Online Priority Project Location Map



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District Tables

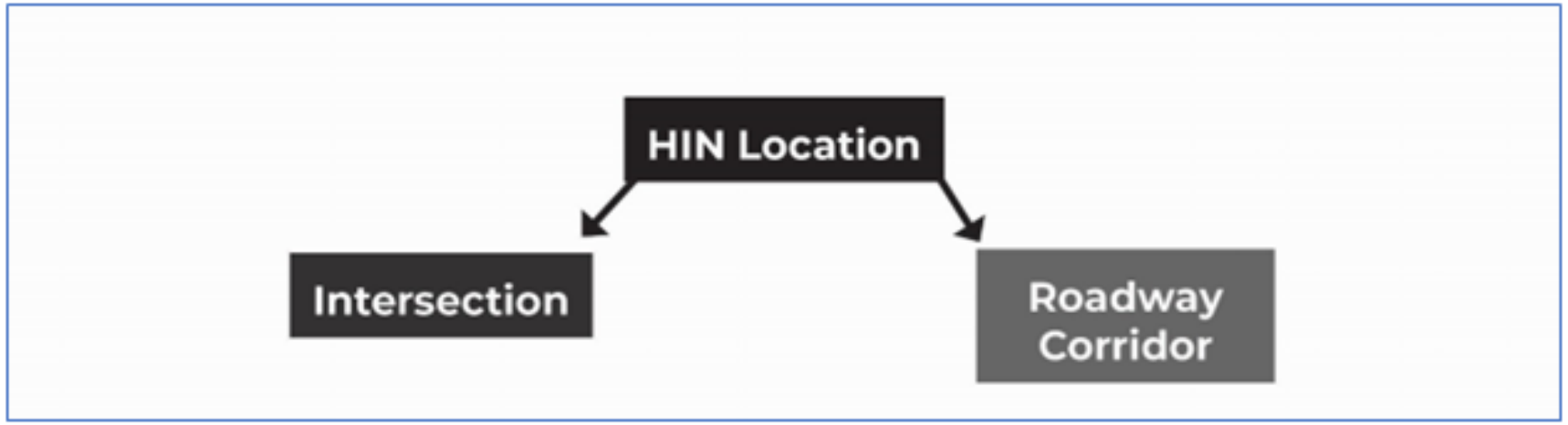
District 5 Top Prioritized Corridors

Road Name	From	To	Ownership	Prioritization Score	Equity Score	Crash Severity Index	Typology
Paseo del Pueblo Sur	New Mexico Highway 518	Este es Road	City of Taos	0.8814	0.6096	88.7	UC Major
Mount Taylor Boulevard	Uranium Boulevard	San Francisco Peak Boulevard	NMDOT	0.8755	0.7800	61.2	RC Major
Avenida de Las America	Milepost 51	Milepost 49	City of Santa Fe	0.8681	0.5292	138.0	UC Major
US 64	Milepost 43	Milepost 41	San Juan County	0.8543	0.5017	135.5	UC Major
US 491	US 64	Uranium Blvd	NMDOT	0.8466	0.7800	50.2	RC Major

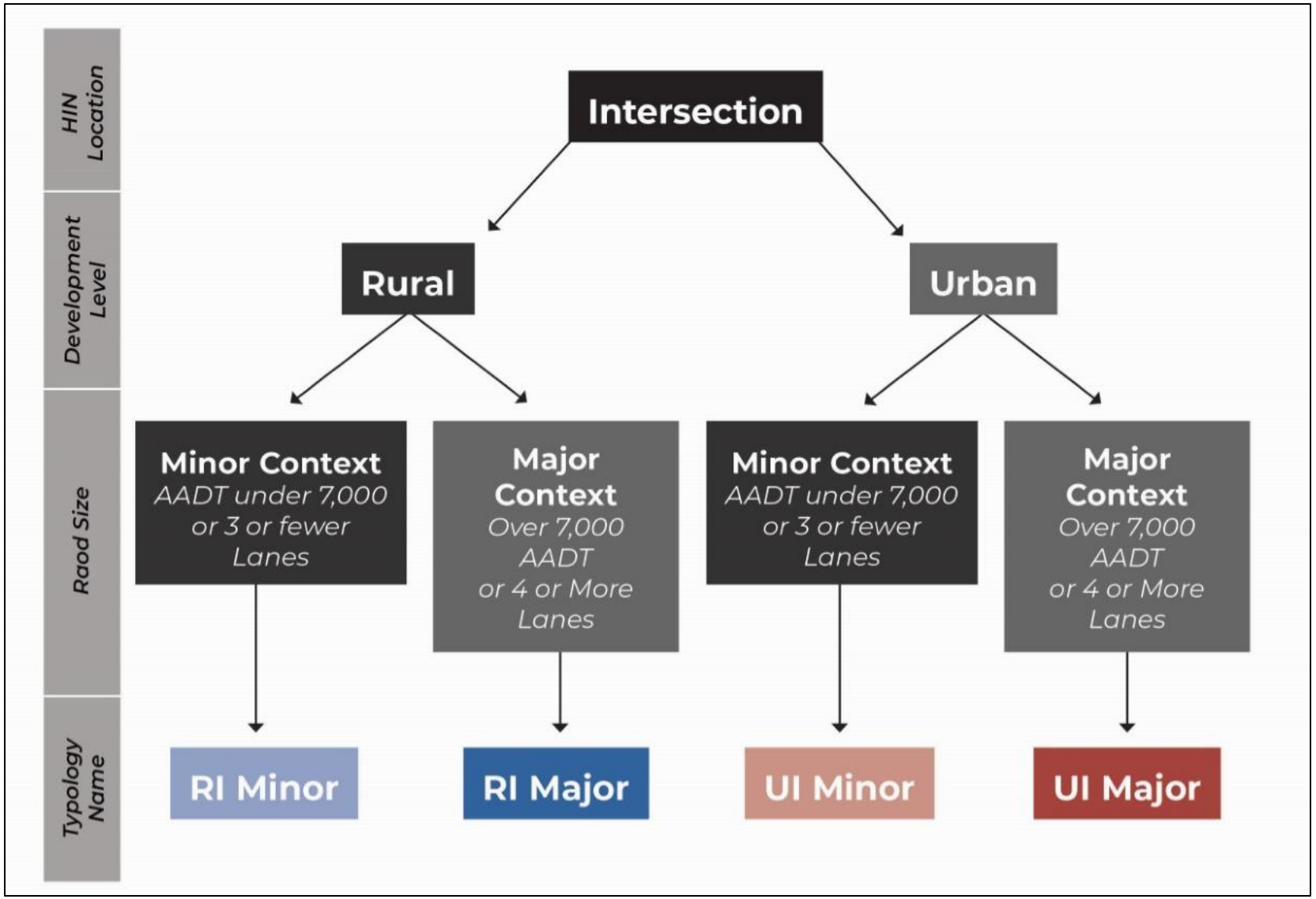
Typologies

Typologies

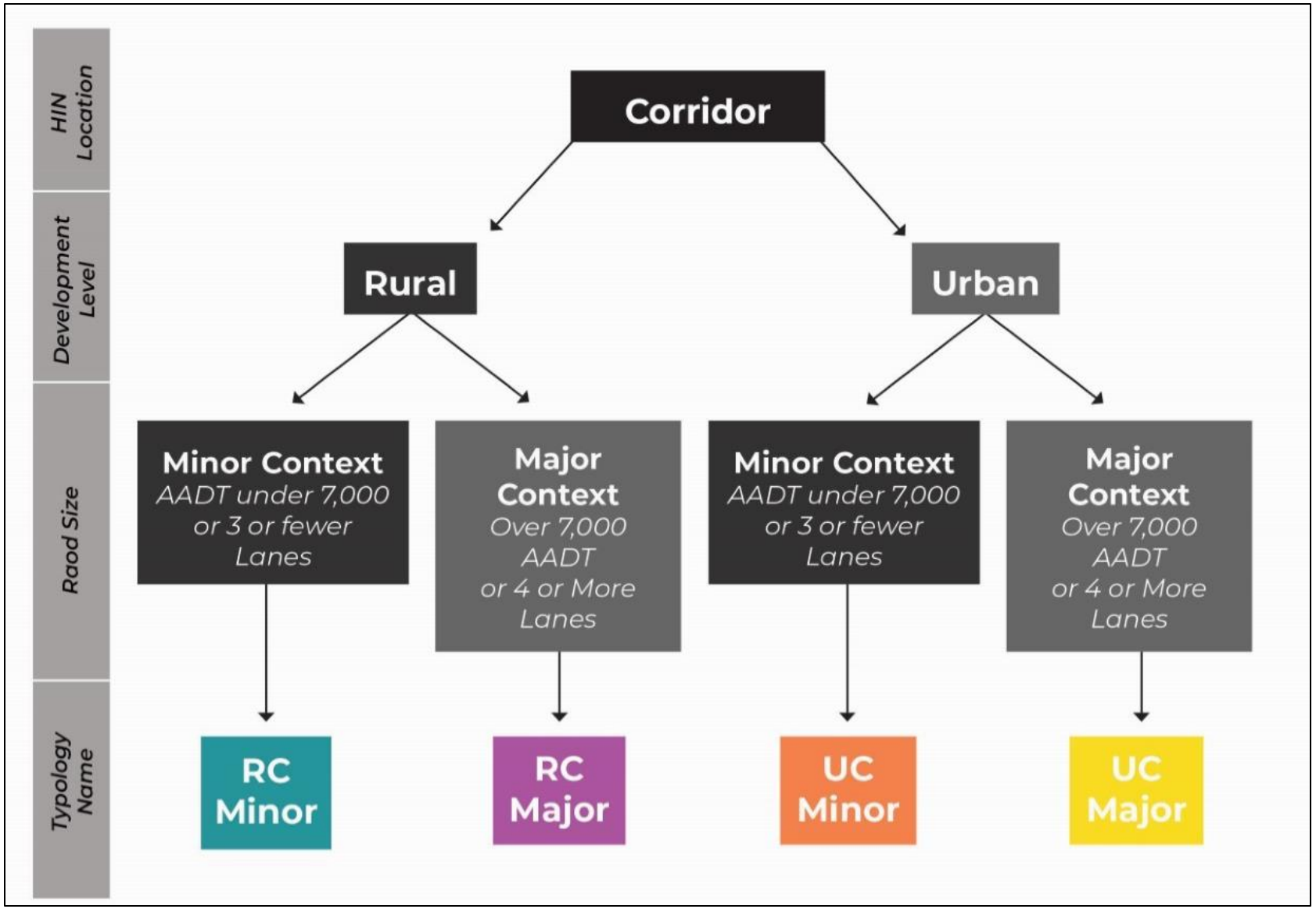
- **Purpose:**
  - To group roadways and intersections along the HIN into buckets with similar characteristics, that are suitable for a similar suite of recommended countermeasures.
  - To provide a framework for selecting potential safety interventions for identified priority locations.



Intersection Typology Decision Flowchart



Corridor Typology Decision Flowchart



Recommended Countermeasures

Countermeasures for RI Minor Typology

Typology: RI Minor			
Rural intersection with the major street having AADT under 7,000 or 3 or fewer lanes.			
Countermeasure	CMF	Why It Works	Why We Chose It
Convert intersection to all-way stop control	Reduction by 77%, all fatal and injury crashes (CMF #3128)	Reduces speed approaching the intersection, lowering impact speed of a crash and thus severity. Proven to be effective on high-speed roads as well as on low-speed roads.	Pedestrian safety at rural intersections is not as robustly studied as at urban intersections. However, reducing the speed of vehicles approaching the intersection will make a crossing safer for all users.
Convert intersection to roundabout (single lane)	Reduction by 79%, fatal and injury crashes in rural areas (CMF #10435)	Low entry speed. Fewer conflict points. Safer pedestrian crossing.	Proven safety countermeasure. Although roundabouts have been primarily studied for vehicular crashes, the speed reduction is safer for users of all modes.
Add traffic signal if warranted	Reduction of 44%, all crashes in rural area (CMF #325)	Signalizes intersection, making it safer for users of all modes to cross or turn left onto major street.	Standard countermeasure.
High visibility crosswalks	Reduction by 40%, pedestrian crashes (CMF #4123)	Enhances crosswalk visibility, increasing yielding.	Proven safety countermeasure.
Install advance yield signage and pavement markings in advance of crosswalk	Reduction of 25%, pedestrian crashes (CMF #9017)	Makes crosswalks more conspicuous and puts distance between drivers and crosswalk, increasing safety.	Proven safety countermeasure.

Countermeasures for UC Minor Typology

Typology: UC Minor				
Urban roadway corridor with an AADT under 7,000 or 3 or fewer lanes				
Countermeasure		**CMF**	**Why It Works**	**Why We Chose It**
Provide or enhance midblock crossings	*Median refuge islands*	CMF = 0.68 for pedestrian crashes (CMF #8799)	Provides safe midblock crossings for pedestrians by allowing them to focus on traffic in one direction at a time.	Proven safety countermeasure to enhance pedestrian safety at midblock crossings.
	High visibility crosswalks	CMF = 0.60 for pedestrian crashes (CMF #4123)	Enhances crosswalk visibility, increasing yielding.	Proven safety countermeasure.
	Install marked crosswalk with median refuge island	CMF = 0.54 for pedestrian crashes (CMF #175)	Provides a safe location to cross midblock for pedestrians.	Proven safety countermeasure.
	*Raised crosswalk**	CMF = 0.54 for pedestrian crashes (CMF #136)	Vertical deflection is an effective speed reduction technique. It also puts pedestrians into drivers' view by elevating them. Subtly communicates pedestrian priority by having road elevate to the height of sidewalk, instead of other way around.	Effective traffic calming measure, as well as increasing pedestrian comfort and safety. Improves yielding and has been used by jurisdictions all over the country for many years.
	RRFB	CMF = 0.31 for pedestrian crashes (CMF #11158)	Makes crosswalks more conspicuous to drivers, increasing yielding.	RRFBs are a proven safety countermeasure to enhance visibility of a crosswalk.

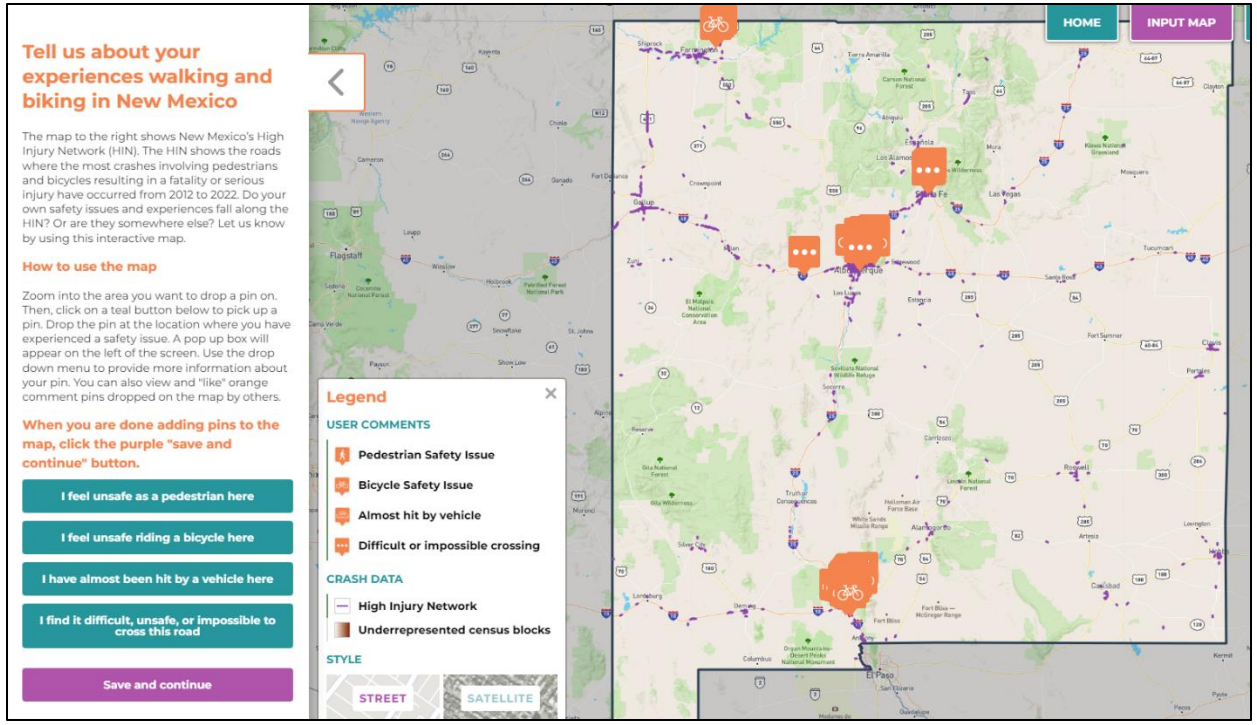
Stakeholder Input

Stakeholder Input Activities

Stakeholder Meetings

- Three virtual stakeholder meetings conducted in the three focus areas with the highest percent of the state's vulnerable road user KA crashes:
  - Albuquerque Metro Area
  - McKinley and San Juan Counties (Northwest Corner)
  - Doña Ana County

Web Map and Survey



https://newmexicodotshsp.com/

Stakeholder Meeting Discussion Themes

Question: What are your top priorities to improve safety for vulnerable road users?

Comment Themes	ABQ	NW Corner	Doña Ana	TOTAL
Pedestrian Infrastructure Improvements	9	9	7	**25**
Bike infrastructure improvements	5	2	4	**11**
Education	3	2	5	**10**
Enforcement	0	2	7	**9**
Speed reduction	2	2	3	**7**
Separation/barriers between vehicles and VRUs	1	4	1	**6**
Planning	0	0	5	**5**
Universal design/Americans with Disabilities Act (ADA)	2	2	1	**5**
Road diets	2	3	0	**5**
Road design	1	2	1	**4**
Signage	1	2	0	**3**
Maintenance	0	1	2	**3**
Shade/weather protection	3	0	0	**3**
Data	1	0	1	**2**
Policy	0	0	2	**2**
Streetlights	1	0	1	**2**

Stakeholder Meeting Discussion Themes

Question: What do you think are the main barriers to implementing strategies, policies, and projects that improve safety outcomes for vulnerable road users?

Comment Themes	ABQ	NW Corner	Doña Ana	TOTAL
NMDOT policies/roadway design	4	2	1	**7**
Car dependency/car-centrism	2	0	5	**7**
Ineffective leadership/collaboration	1	4	0	**5**
Lack of public interest/public attitude	0	2	2	**4**
Road design	1	1	2	**4**
Data tracking	1	0	2	**3**
Staffing/capacity	1	2	0	**3**
Funding	1	1	1	**3**
Priorities	0	2	0	**2**
Education	1	0	1	**2**
Infrastructure	1	0	1	**2**

Stakeholder Meeting Discussion Themes

Question: What do you believe are the main contributing factors related to vulnerable road user fatalities and serious injuries?

Comment Themes	ABQ	NW Corner	Doña Ana	TOTAL
Driver inattention/distracted driving	3	1	6	**10**
Road design	3	3	2	**8**
VRU infrastructure	4	0	3	**7**
Car-centrism/disregard for pedestrian safety	0	0	7	**7**
Speed	2	2	2	**6**
Large vehicles	2	1	2	**5**
Time of day	1	2	2	**5**
Impairment/intoxication	5	0	0	**5**
Equity	3	0	0	**3**
Pedestrian behavior	2	0	0	**2**
Weather	0	0	2	**2**
Planning	0	0	1	**1**
Lack of knowledge about road rules	1	0	0	**1**

NMDOT Policy, Process, and Program Strategies

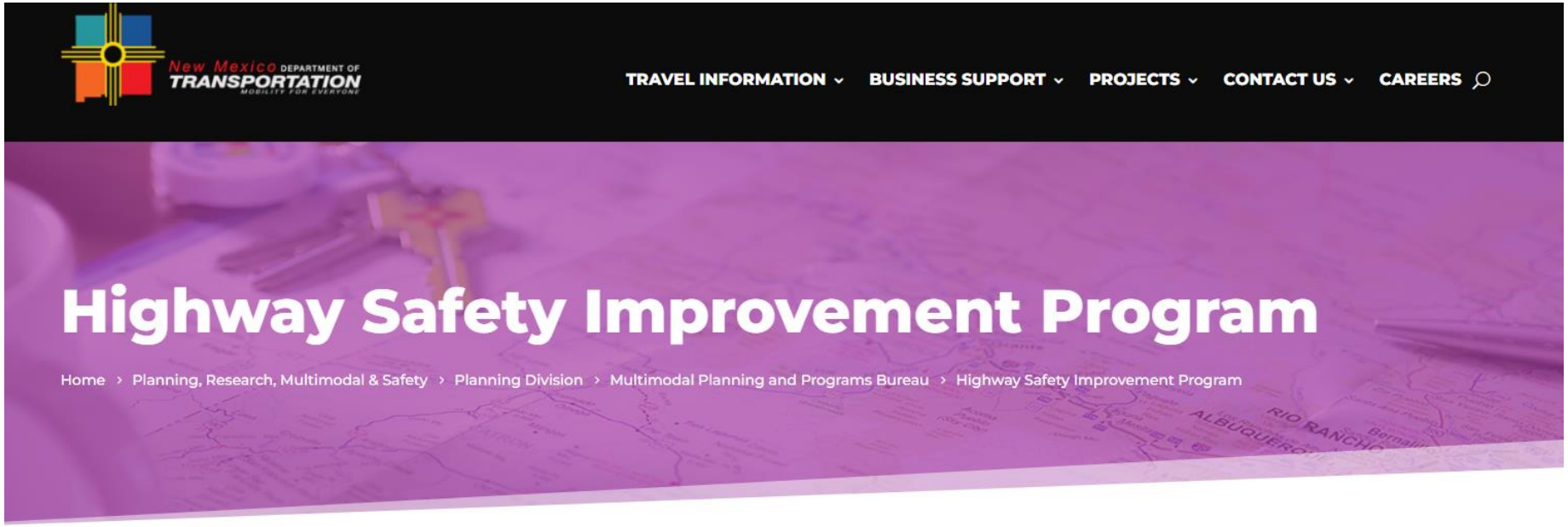
NMDOT Policy, Process, and Program Strategies

- **Recommendation Groupings**
  - Data Collection and Management
  - Communication and Education
  - Infrastructure on NMDOT-Owned Roadways
  - Infrastructure, on Both State- and Locally Owned Roadways
  - NMDOT Process, Programs, and Actions
  - Partnerships
  - Funding and Grants

	Alignment with Safe System Approach					Alignment with Previous Plans				
Recommendations	Safe Roads	Safe Speeds	Safe Road Users	Safe Vehicles	Post-Crash Care	Pedestrian Safety Action Plan	Statewide Transportation Plan	NM Bike Plan	Highway Safety Plan	Strategic Highway Safety Plan
Infrastructure on NMDOT-Owned Roadways										
Ensure future updates to existing NMDOT manuals align with national best practices in planning and design, as captured in the 2020 *NMDOT Design Manual*.	■					■				
Install 10 or more PHB signals on state roads.	■		■			■				
Install LPIs at 10 or more intersections.	■		■			■				
Develop a countermeasure quick-build guide for use by NMDOT staff and outside agencies.	■					■				
Incorporate roundabouts, gateways, and other traffic calming measures that slow traffic, through design, on approaches into rural towns.	■	■								
For segments of the HIN that contain transit routes, review pedestrian facilities for ADA compliance and accessibility.			■							■
Utilize quick-build projects to rapidly improve vulnerable road user safety until more permanent materials and installations can be funded.	■		■							
Advance a system of safe, high-quality, and comfortable bicycle facilities.	■		■					■		

	Alignment with Safe System Approach					Alignment with Previous Plans				
Recommendations	Safe Roads	Safe Speeds	Safe Road Users	Safe Vehicles	Post-Crash Care	Pedestrian Safety Action Plan	Statewide Transportation Plan	NM Bike Plan	Highway Safety Plan	Strategic Highway Safety Plan
Partnerships										
Partner with state and local law enforcement agencies to target enforcement along the 2023 vulnerable road user statewide HIN and identified high risk areas.										
Explore partnerships with American Planning Association, Institute of Transportation Engineers, other professional organizations, advocacy organizations, and local engineers and planners to lead vulnerable road user safety presentations to county and local government officials to educate them about traffic safety issues and concepts.										
Host a vulnerable road user safety meeting between the NMDOT Tribal Liaison and Tribal Nations and representatives to identify solutions to increase coordination between the NMDOT and Tribal Nations.										
Promote and support the expansion of vanpooling services to close transit service gaps, improve mobility, and reduce VMT.										

Online Map Functionality Tour



https://www.dot.nm.gov/planning-research-multimodal-and-safety/planning-division/multimodal-planning-and-programs-bureau/highway-safety-improvement-program/

SHSP and Next Steps

QUESTIONS?


THANK YOU!