

ARKANSAS STATE HIGHWAY COMMISSION

DALTON A. "ALEC" FARMER, JR.
CHAIRMAN
JONESBORO

PHILIP TALDO
VICE CHAIRMAN
SPRINGDALE

KEITH GIBSON
FORT SMITH



P.O. Box 2261 • Little Rock, Arkansas 72203-2261
Phone (501) 569-2000 • Voice/TTY 711 • Fax (501) 569-2400
www.ARDOT.gov • www.IDriveArkansas.com

MARIE HOLDER
LITTLE ROCK

DAVID M. HAAK
TEXARKANA

LORIE H. TUDOR, P.E.
DIRECTOR

November 14, 2023

Ms. Vivien Hoang
Division Administrator
Federal Highway Administration
700 W. Capitol, Room 3130
Little Rock, AR 72201-3298

Dear Ms. Hoang:

Reference is made to the 2023 Arkansas Vulnerable Road User (VRU) Safety Assessment, a copy of which is enclosed.

The VRU Safety Assessment was developed in compliance with Federal requirements and guidance as an addendum to our Strategic Highway Safety Plan. As the Governor's Designee, I approve this VRU Safety Assessment, which will be published to the webpage of our Traffic Safety Section by November 15, 2023.

If additional information is needed, please advise.

Sincerely,

A handwritten signature in blue ink that reads "Lorie H. Tudor".

Lorie H. Tudor, P.E.
Director

Enclosure

c: Chief Engineer – Preconstruction
Assistant Chief Engineer – Planning
Planning



ARKANSAS

VULNERABLE ROAD USER

SAFETY ASSESSMENT

November 2023

**TOWARD
ZERO
DEATHS**



One is too many.

AR DOT
ARKANSAS DEPARTMENT
OF TRANSPORTATION



NOTICE OF NONDISCRIMINATION

The Arkansas Department of Transportation (ARDOT) complies with all civil rights provisions of Federal statutes and related authorities that prohibit discrimination in programs and activities receiving Federal financial assistance. Therefore, ARDOT does not discriminate on the basis of race, sex, color, age, national origin, religion (not applicable as a protected group under the Federal Motor Carrier Safety Administration Title VI Program), disability, Limited English Proficiency (LEP), or low-income status in the admission, access to, and treatment in ARDOT's programs and activities, as well as ARDOT's hiring or employment practices. Complaints of alleged discrimination and inquiries regarding ARDOT's nondiscrimination policies may be directed to:

Civil Rights Officer Joanna P. McFadden (ADA/504/Title VI Coordinator)
PO Box 2261, Little Rock, Arkansas 72203-2261
501-569-2298 (Voice/TTY 711)

Or to the following email address:

Joanna.McFadden@ardot.gov

Free language assistance for Limited English Proficient individuals is available upon request.

This notice is available from the ADA/504/Title VI Coordinator in large print, on audiotape, and in Braille.

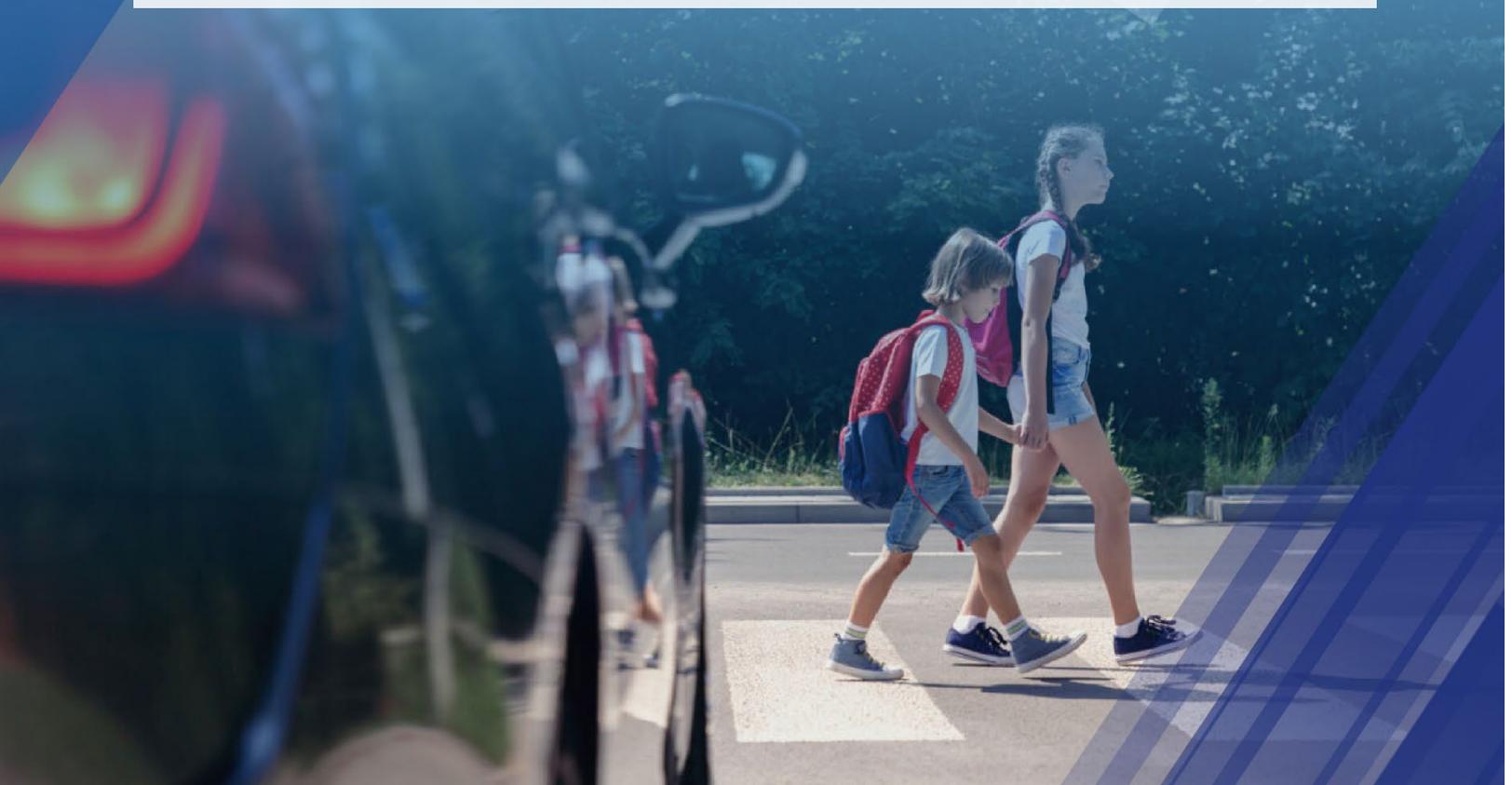


TABLE OF CONTENTS

1. Purpose And Need	1-1
1.1 Plan Content and Structure	1-2
2. Document Review	2-1
2.1 Documents Reviewed	2-1
2.2 Vision, Goals, Objectives, and Performance Targets	2-2
2.3 Strategies and Recommendations	2-4
2.4 Key Takeaways	2-4
3. Data Analysis	3-1
3.1 Data Sources	3-1
3.2 Vulnerable Road User Safety Trends	3-2
3.2.1 Historical Safety Trends	3-2
3.2.2 Equity & Vulnerable Road User Safety	3-7
3.3 High-Risk Corridors	3-9
3.3.1 Sliding Window Analysis Approach	3-9
3.3.2 Identified High-Risk Corridors	3-11
4. Stakeholder Consultation	4-1
4.1 Introduction	4-1
4.2 Objectives of Stakeholder Consultation	4-1
4.3 Consultation Process	4-2
4.4 SHSP Steering Committee Meeting	4-2
4.5 Local Agency Consultation Forums and Individual Local Consultation Meetings	4-3
5. Strategies & Actions	5-1
5.1 Strategies	5-1
5.2 Actions	5-2
5.2.1 Infrastructure and Design	5-2
5.2.2 Criteria to Consider	5-3
5.2.3 Education and Enforcement	5-4
5.2.4 Coordination	5-4
5.3 Conclusion	5-5

LIST OF FIGURES

Figure 1	The Safe System Approach.....	1-2
Figure 2	2022–2027 Arkansas SHSP Emphasis and Focus Areas	2-3
Figure 3	Non-Motorized Fatalities and Suspected Serious Injuries	3-3
Figure 4	Types of Non-Motorized Fatalities and Suspected Serious Injuries.....	3-5
Figure 5	Actions Prior to Crash for Non-Motorized Fatalities and Suspected Serious Injuries	3-6
Figure 6	Non-Motorized Fatalities and Suspected Serious Injuries by Lighting Conditions.....	3-6
Figure 7	Sliding Window Analysis Illustrative Example	3-10
Figure 8	Identified High-Risk Corridors.....	3-12
Figure 9	Methodology for Stakeholder Consultation	4-2
Figure 10	Potential Countermeasures to Improve Infrastructure and Design to Protect Vulnerable Road Users.....	5-3

LIST OF TABLES

Table 1	Documents Reviewed.....	2-2
Table 2	Non-Motorist Fatalities and Suspected Serious Injuries by MPO Area.....	3-4
Table 3	Non-Motorist Fatalities and Suspected Serious Injuries by Race/Ethnicity	3-7
Table 4	Non-Motorist Fatalities and Suspected Serious Injuries by Justice40 Category.....	3-9
Table 5	Identified State-Owned High-Risk Corridors	3-11
Table 6	Identified Locally-Owned High-Risk Corridors.....	3-11
Table 7	Justice40 Overlap with the Number of High-Risk Corridors.....	3-13

LIST OF ACRONYMS

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
ARDOT	Arkansas Department of Transportation
FHWA	Federal Highway Administration
HSIP	Highway Safety Improvement Program
HSO	Highway Safety Office
HSP	Highway Safety Plan
IIJA	Infrastructure Investment and Jobs Act
LRITP	Long-Range Intermodal Transportation Plan
L RTP	Long-Range Transportation Plan
MPO	Metropolitan Planning Organization
MTP	Metropolitan Transportation Plan
N.A.R.T.P.C.	Northeast Arkansas Regional Transportation Planning Commission
NWARPC	Northwest Arkansas Regional Planning Commission
RRFB	Rectangular Rapid Flashing Beacons
SARPC	Southeast Arkansas Regional Planning Commission
SHSP	Strategic Highway Safety Plan
SS4A	Safe Streets and Roads for All
SSA	Safe System Approach
STEP	Safe Transportation for Every Pedestrian
USDOT	United States Department of Transportation
VRU	Vulnerable Road User

1 PURPOSE AND NEED

A growing number of Vulnerable Road User (VRU) fatalities and suspected serious injuries are occurring on Arkansas State and local roadways, similar to a pattern experienced across the United States. This increase in VRU-involved roadway crashes prompted the U.S. Department of Transportation's (USDOT) Federal Highway Administration (FHWA) to mandate, through the Infrastructure Investment and Jobs Act (IIJA), that each State complete a VRU Safety Assessment as part of their Strategic Highway Safety Plan (SHSP) by November 15, 2023.



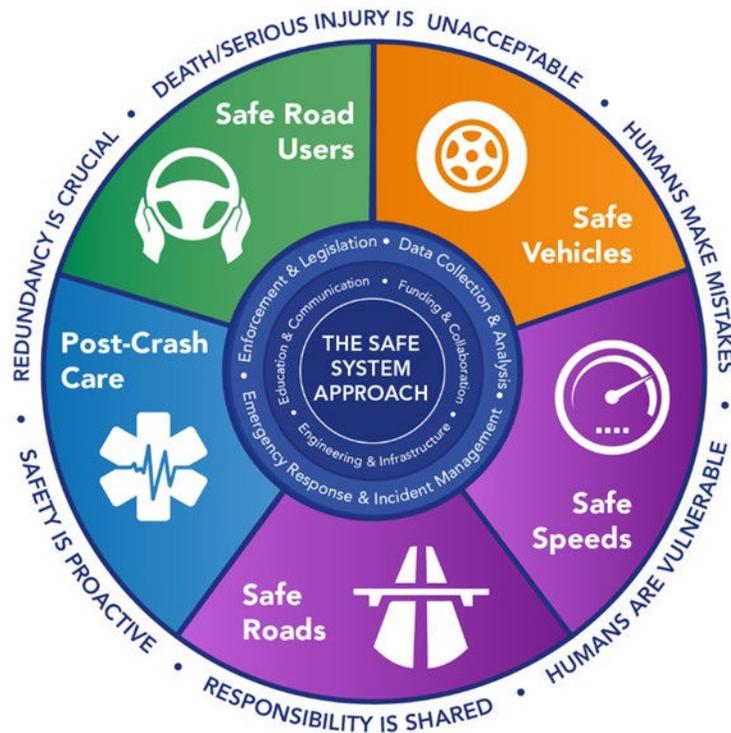
As defined by FHWA, a VRU includes the following: *pedestrians, bicyclists or other cyclists, a person on personal conveyance (e.g., someone skateboarding or on a scooter), or a highway worker on foot in a work zone.* The VRU definition does not include motorcyclists.

The purpose of the VRU Safety Assessment is to assess the safety performance of all public roads in the State of Arkansas with respect to VRUs. In alignment with FHWA guidance, the VRU Safety Assessment consists of the following steps described below:

- » A quantitative data-driven analysis on VRU crashes and demographics to identify high-risk corridors.
- » Consultations with local governments, metropolitan planning organizations (MPO), and regional planning organizations to gain local knowledge and perspective on factors contributing to the safety concerns of high-risk corridors and to document challenges addressing VRU safety.
- » Development of a program of strategies and actions to improve VRU safety in Arkansas based on the quantitative data-driven analysis and local agency consultation.

The Arkansas Department of Transportation (ARDOT) has adopted the Safe System Approach (SSA) as part of the 2022-2027 Strategic Highway Safety Plan (SHSP) to be the guiding paradigm for increasing road safety on public roadways in Arkansas. The SSA is a holistic approach that aligns with the USDOT's National Roadway Safety Strategy of working towards a future with zero fatalities and suspected serious injuries. As shown in Figure 1, the six SSA guiding principles (presented in the outer ring around the circle) and five elements (presented as the pie slices within the circle) were considered throughout the VRU Safety Assessment.

FIGURE 1 THE SAFE SYSTEM APPROACH



Source: 2022 Arkansas Strategic Highway Safety Plan, ARDOT.

Arkansas is committed to increasing the safety of those walking, biking, rolling, or working on State and local roadways. The VRU Safety Assessment builds upon existing State and local transportation planning efforts and is intended to inform project selection and guide investments to improve the safety of all road users. In addition, the VRU Safety Assessment supports national implementation of the SSA and the State's safety vision, Toward Zero Deaths, with the long-term goal of zero fatalities.

1.1 PLAN CONTENT AND STRUCTURE

The VRU Safety Assessment includes all content required by Federal guidance. The remaining sections are structured in the following manner:

- » Section 2 summarizes the document review completed by ARDOT to inform the development of this State plan. Relevant statewide safety documents, MPO plans, and other pertinent plans were reviewed that contributed to the production of strategies and actions identified in Section 5.
- » Section 3 compiles non-motorized fatal and suspected serious injury crash trends to better understand VRU safety needs in Arkansas. Additionally, this section includes a sliding window analysis to identify the top 10 State-owned and top 10 locally-owned high-risk VRU corridors in the State.
- » Section 4 contains a summary of stakeholder consultation activities completed to inform the assessment, which included consultation with the SHSP Steering Committee, meetings with MPOs, and engagement with other local agencies.
- » Section 5 describes strategies and actions Arkansas may implement to reduce the risk of VRU fatalities and suspected serious injuries on all public roads in Arkansas.

2 DOCUMENT REVIEW



To ensure that the VRU Safety Assessment is consistent with existing documents, ARDOT reviewed statewide and urban area transportation plans, as well as relevant documents that guide transportation safety efforts in Arkansas. This section summarizes the documents reviewed for the VRU Safety Assessment, the VRU-related goals and objectives, strategies and recommendations from other plans, and key takeaways to inform this State plan.

2.1 DOCUMENTS REVIEWED

ARDOT's Highway Safety Improvement Program (HSIP), SHSP, Bicycle and Pedestrian Transportation Plan, Statewide Transportation Improvement Program, Statewide Long-range Intermodal Transportation Plan (LRITP), and eight MPO Long-range Transportation Plans (LRTP), also known as Metropolitan Transportation Plans (MTP) were reviewed to understand how different agencies have incorporated safety into their transportation planning objectives, performance measures, and strategies and how these elements relate to VRU safety. Additionally, other relevant safety documents such as Safe Transportation for Every Pedestrian (STEP) reports and bicycle guides were reviewed.

TABLE 1 DOCUMENTS REVIEWED

DOCUMENT	YEAR	AGENCY
State-Level Safety Plans		
2022-2027 Arkansas SHSP	2022	ARDOT
FY 2023 Highway Safety Plan	2023	Arkansas Highway Safety Office (HSO)
Bicycle Safety in Arkansas	2013	Arkansas Department of Parks and Tourism
Long-Range Transportation Plans		
Arkansas Long-Range Intermodal Transportation Plan	2017	ARDOT
Central Arkansas 2050	2018	Metroplan
Together Frontier: 2045	2022	Frontier MPO
Propel 2045	2021	Northeast Arkansas Regional Transportation Planning Commission (N.A.R.T.P.C.)
2045 Metropolitan Transportation Plan	2021	Northwest Arkansas Regional Planning Commission (NWARPC)
2045 Metropolitan Transportation Plan	2020	Southeast Arkansas Regional Planning Commission (SARPC)
Texarkana 2045	2019	Texarkana MPO
2045 Metropolitan Transportation Plan	2020	Tri-Lakes MPO
Imagine 2050 Metropolitan Transportation Plan	2021	West Memphis MPO
Other Documents		
Arkansas HSIP	2022	ARDOT
Target Setting for 2024—Safety Performance Measures	2023	ARDOT
ADA Transition Plan	In Development	ARDOT
Statewide Transportation Improvement Program	2023	ARDOT
Arkansas Bicycle and Pedestrian Transportation Plan	2017	ARDOT
STEP Study: Highway 10 (Little Rock)	2019	Metroplan
STEP Study: Highway 141 (Jonesboro)	2019	Northeast Arkansas Regional Transportation Planning Commission (N.A.R.T.P.C.)
Developing an Effective VRU Program	2021	American Traffic Safety Services Association

2.2 VISION, GOALS, OBJECTIVES, AND PERFORMANCE TARGETS

Arkansas remains committed to the vision, Toward Zero Deaths, with a long-term goal of zero traffic fatalities. Looking to make significant progress in reducing the number of traffic-related fatalities and suspected serious injuries, Arkansas developed a set of goals and objectives that reflect the State’s priorities around safety performance.

The Arkansas SHSP is a federally required, statewide, coordinated safety plan that provides a framework for reducing traffic fatalities and suspected serious injuries on all public roads that must be updated every five years. The SHSP sets the priorities for other safety programs and initiatives in the State, including the HSIP (focusing primarily on engineering countermeasures) and the Highway Safety Plan (HSP, primarily focused on behavioral countermeasures). Projects funded with HSIP funds must reflect the SHSP at a strategic level.

As shown in Figure 2, the 2022-2027 SHSP identified four emphasis areas and 14 focus areas aligned with the SSA (outlined in Figure 1). To ensure Arkansas continues to make consistent progress toward the goal of zero fatalities and suspected serious injuries, the SHSP objective is to reduce statewide fatalities and suspected serious injuries by 2 percent annually until 2025, including non-motorist fatalities and suspected serious injuries.

FIGURE 2 2022–2027 ARKANSAS SHSP EMPHASIS AND FOCUS AREAS



Source: 2022-2027 Arkansas Strategic Highway Safety Plan, ARDOT.

While not directly part of the VRU Safety Assessment, ARDOT renews its five safety performance targets associated with the HSIP annually. One of these performance measures is the five-year moving average number of non-motorized fatalities and suspected serious injuries. For 2024, the target set by Arkansas is to have a five-year average of less than 267 non-motorized fatalities and suspected serious injuries per year.

With the five-year average increasing each year from 2017 to 2021, discussed in Section 3.2 and presented in Figure 3, Arkansas must take action to lower the five-year average to meet this target. It is anticipated that strategies from both the HSIP Implementation Plan, which was completed in August 2023, as well as this assessment will contribute to the reduction of non-motorized fatalities and suspected serious injuries in the State and the meeting of Arkansas’ non-motorized safety performance target. The HSIP Implementation Plan specifically identifies working with local jurisdictions to determine which corridors are at high-risk for non-motorist safety.

In the Arkansas Bicycle and Pedestrian Plan, ARDOT’s goals include building out the bicycle and pedestrian network and conducting analysis to implement more specific strategies to reduce pedestrian and bicyclist deaths, while the safety-related objectives include strengthening enforcement and education measures. Several MPOs of

Arkansas included safety in their MTP vision statements. MPOs envision a safe, well-connected, and multimodal transportation system to increase safety for motorized and non-motorized users.

2.3 STRATEGIES AND RECOMMENDATIONS

A mix of strategies and recommendations related to engineering and infrastructure, data collection and analysis, enforcement and legislation, and education and communication have been identified. Under the HSIP, ARDOT has administered various engineering projects including improvements addressing intersections, low-cost spot improvements, installing median barriers, and projects addressing roadway departures. In its SHSP, ARDOT developed engineering, enforcement, and education strategies for improving non-motorist safety as shown below:

- » Continue to improve statewide infrastructure and design to protect non-motorists.
- » Continue to implement countermeasures, programs, and policies to protect non-motorists.
- » Focus education efforts on safety and awareness of laws regarding non-motorist traffic.

Arkansas' Bicycle and Pedestrian Plan identified a range of safety strategies to achieve a significant reduction in fatalities and injuries. These include analyzing crash data, conducting road safety audits, and conducting educational programs and safety campaigns. Among the MPO plans reviewed, there were different approaches to reducing fatalities and suspected serious injuries. To understand local traffic safety challenges, MPOs have conducted crash analyses to identify high-risk corridors. For example, Texarkana MPO overlaid crash hot spots with high-need areas (areas with significant minority populations, significant poverty concentrations, or significant households without vehicles). As another example, Southeast Arkansas Regional Planning Commission (SARPC) intends to establish a safety management system to assist in recording crash incidents, identifying high-risk locations, and selecting appropriate countermeasures.

Other MPO-area, statewide and local studies have referenced STEP countermeasures. In its Action Plan for Implementing Pedestrian Crossing Countermeasures, ARDOT highlights STEP recommendations such as improving crash data collection, analyzing critical intersections, and engineering improvements that include curb extensions, advance yield bars, and pedestrian signs. Little Rock and Jonesboro conducted STEP Studies for Highway 10 in Little Rock and Highway 141 in Jonesboro to assess existing safety issues in these corridors. These studies provided a list of actions, which included ensuring ADA compliance, crosswalk and sidewalk improvements, and traffic signal modifications.

Other documents reviewed also offered a host of recommendations and strategies. Arkansas' Bicycle Safety Manual highlights four principles to avoid crashes: maintaining control of the bicycle, riding on the right and with traffic, being alert and visible, and wearing a helmet to reduce the risk of injury. ARDOT's Draft ADA Transition Plan lists actions that ARDOT will take to comply with the ADA, including making curb ramps and sidewalks accessible.

2.4 KEY TAKEAWAYS

The SHSP and HSIP provide a foundation for VRU safety planning in Arkansas. This foundation is supported by statewide goals, objectives, and targets. The strategies and countermeasures in the SHSP should serve as a basis for identifying projects and programs to reduce VRU fatalities and suspected serious injuries. Other statewide plans, such as the Bicycle and Pedestrian Transportation Plan, provide more focused action steps to consider when the project team conducts consultation with agencies representing the high-risk areas for VRUs.

The MPO MTPs provide a glimpse at the strategies being implemented in various regions to address VRU safety and safety in general.

Additional information is needed to understand the actions cities and counties are taking to address VRU safety and the VRU safety challenges in these communities. The local agency consultation meetings summarized in Section 4 focused on collecting more information on VRU safety challenges, needs, and planned or programmed projects. The meetings also provided an opportunity to understand the VRU safety stakeholders unique to each community (e.g., universities, schools, employers, tourist attractions, etc.).

3 DATA ANALYSIS



As part of the VRU Safety Assessment, Arkansas is required to include a data-driven analysis of the State's safety data that identifies areas as high-risk for VRUs. For this plan, ARDOT performed two different sets of analyses:

- » ARDOT analyzed the raw crash data with areas identified in the Justice40 Initiative to identify statewide trends in VRU safety. This analysis is discussed in Section 3.2.
- » ARDOT analyzed the location of crashes throughout the State, combined it with traffic volume data, performed a sliding window safety analysis, and identified 10 State-owned and 10 locally-owned corridors across the State that have the greatest VRU challenges. This is discussed in Section 3.3.

3.1 DATA SOURCES

ARDOT used five main data sources for this analysis. Three of them are compiled by Arkansas and two are compiled by the Federal government.

- » **Arkansas Crash Data (State)**—This dataset contains georeferenced crashes with attributes such as severity, location, collision type, and more. This was the main source of data for this analysis.
- » **Arkansas Roadway Inventory (State)**—This dataset contains Annual Average Daily Traffic volumes (AADT) for many roads in Arkansas.
- » **Climate and Economic Justice Screening Tool (Federal)**—This dataset is from the White House's Council on Environmental Quality and their Justice40 Initiative, which aims to provide 40 percent of overall benefits of certain Federal investments to disadvantaged communities. The data from this tool shows which Arkansas census tracts are underserved and why they meet that criterion.
- » **2022 Arkansas Highway Safety Improvement Program (State)**—This report contains official overall non-motorized fatality and suspected serious injury data, which is used in Figure 3 to show the trend of non-motorized fatalities and suspected serious injuries by year.
- » **2020 U.S. Census (Federal)**—Demographic data for the entire State was referenced in the analysis of race and ethnicity from the most recent U.S. census, discussed in Table 3.

3.2 VULNERABLE ROAD USER SAFETY TRENDS

This section identifies VRU safety trends in Arkansas and breaks down fatalities and suspected serious injuries to non-motorized users by year, location, non-motorist type, circumstances surrounding the crash, lighting conditions, race/ethnicity, and Justice40 identified areas. These analyses show patterns in non-motorized crash data and reveal trends that may help tailor the strategies and actions in Section 5 of this report to more effectively reduce fatalities and suspected serious injuries in Arkansas.

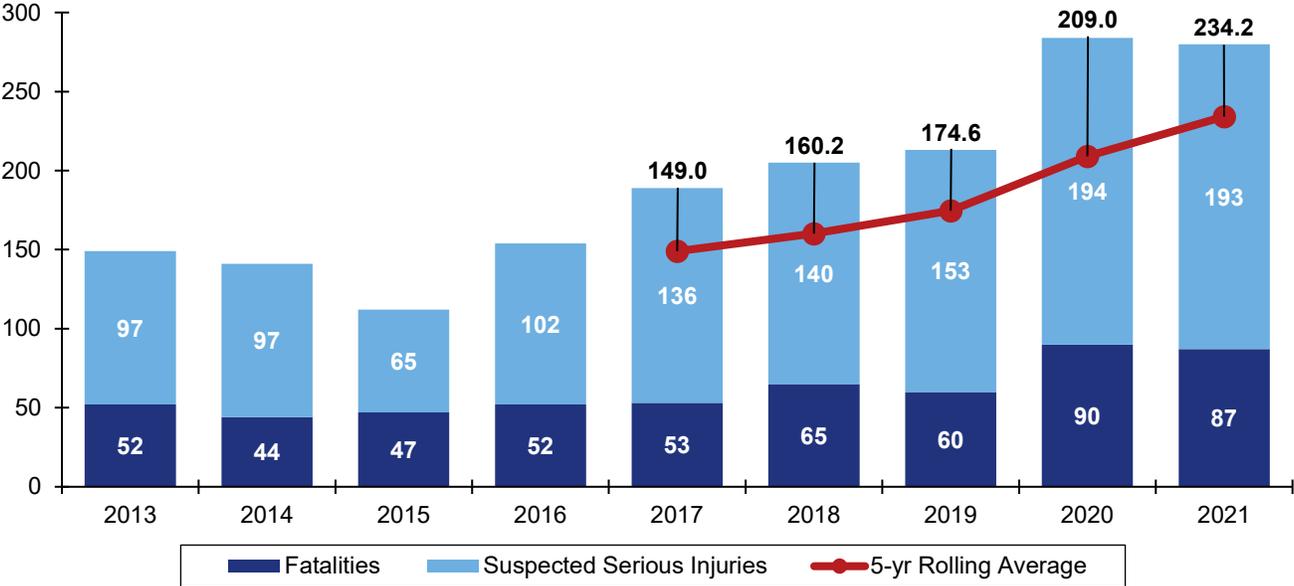
In general, the number of fatalities and suspected serious injuries may not be consistent among all figures and tables in this section as some use differing sources, and some fields of interest may not be consistently reported for all crashes. For example, how non-motorists' locations are noted in a crash report may not be consistent among law enforcement agencies, and driver or non-motorist impairment may not be available at the time the report is filed due to pending toxicology testing.

3.2.1 *Historical Safety Trends*

Figure 3 shows non-motorized fatalities and suspected serious injuries per year since 2013 and a five-year moving average from 2017 to 2021. This figure corresponds to one of the five safety performance metrics tracked in the HSIP. Each year Arkansas must set safety targets for five metrics, including the five-year moving average for non-motorized fatalities and suspected serious injuries. If Arkansas fails to meet these targets or show improvements from the baselines, ARDOT will be required to obligate a certain amount of funds specifically for HSIP-related projects and complete an additional HSIP Implementation Plan.

Recently, Arkansas did not meet three of five targets, including the non-motorized target. The 2017–2021 average was above the target of 220.3 non-motorized fatalities and suspected serious injuries. This concerning upward trend of non-motorized fatalities and suspected serious injuries over the past years has also been observed nationally. After dropping by 25 percent from 149 in 2013 to 112 in 2015, the annual number of non-motorized fatalities and suspected serious injuries in Arkansas has increased in each year except for a slight drop in 2021. Since 2015 total non-motorized fatalities and suspected serious injuries have increased 150 percent from 112 to 280 fatalities and suspected serious injuries in 2021. Additionally, the five-year moving average increased by more than 50 percent from 2017 (149.0) to 2021 (234.2).

FIGURE 3 NON-MOTORIZED FATALITIES AND SUSPECTED SERIOUS INJURIES (2013–2021)



Source: 2022 Arkansas Highway Safety Improvement Program.

Table 2 shows non-motorist fatalities and suspected serious injuries by MPO area. The second-to-last row shows that 67.5 percent of these crashes occurred in urban environments. It makes sense that a higher percentage occurred in urban areas as they generally have more people walking and biking due to denser land uses, public transportation, and higher populations. Metroplan’s study area (the Central Arkansas metro area) had the most non-motorist fatalities and suspected serious injuries with 476 over the seven years of available data, which accounted for approximately one third of the non-motorist fatal and suspected serious injuries in the State. This is followed by the Northwest Arkansas Regional Planning Commission (NWARPC) study area (the Northwest Arkansas metropolitan area) with 14.7 percent and the Frontier MPO’s study area (the Fort Smith metropolitan area) with 5.8 percent.

Although the majority of these crashes occur in urban areas, almost a third occur in rural areas. This highlights the need for Arkansas to develop strategies that are appropriate both for urban and rural areas. Strategies for each area type may look different due to differences in land use or characteristics of non-motorists in each area, as well as differing roadway environments.

TABLE 2 NON-MOTORIST FATALITIES AND SUSPECTED SERIOUS INJURIES BY MPO AREA (2015–2021)

MPO AREA	POPULATION		FATALITIES + SUSPECTED SERIOUS INJURIES		FATALITIES + SUSPECTED SERIOUS INJURIES PER 1 MILLION PEOPLE
	TOTAL	% OF STATEWIDE	TOTAL	% OF STATEWIDE	
Metroplan	707,590	23.5%	476	32.9%	672.7
NWARPC	530,198	17.6%	213	14.7%	401.7
Frontier MPO	162,735	5.4%	84	5.8%	516.2
Tri-Lakes MPO	92,358	3.1%	60	4.2%	649.6
N.A.R.T.P.C.	100,216	3.3%	59	4.1%	588.7
SARPC	56,839	1.9%	38	2.6%	668.6
West Memphis MPO	39,537	1.3%	25	1.7%	632.3
Texarkana MPO	32,614	1.1%	21	1.5%	643.9
Urban Total	1,722,087	57.2%	976	67.5%	566.8
Rural Total	1,289,437	42.8%	469	32.5%	363.7

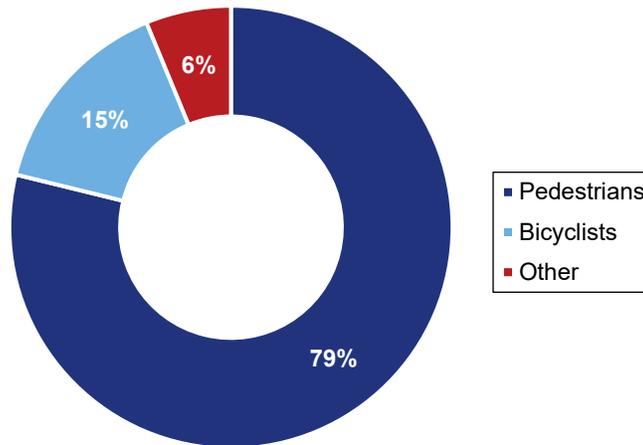
Source: ARDOT Crash Database.

Note: Within the context of this table, “urban” refers to areas within the boundaries of MPOs. “Rural” refers to areas that are not within an MPO boundary.

Figure 4 shows the non-motorist type in all non-motorist fatalities and suspected serious injuries over the most recent seven years of data. Almost 80 percent of non-motorist fatalities and suspected serious injuries in Arkansas are pedestrians, followed by about 15 percent being bicyclists. The remaining six percent includes people on scooters, in wheelchairs, or using other means of non-motorized personal conveyance. None of these categories include people on motorcycles, who are not considered VRUs (as defined by FHWA in the VRU Safety Assessment Guidance¹).

¹ Federal Highway Administration. Vulnerable Road User Safety Assessment Guidance. Available at https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-10/VRU%20Safety%20Assessment%20Guidance%20FINAL_508.pdf.

FIGURE 4 TYPES OF NON-MOTORIZED FATALITIES AND SUSPECTED SERIOUS INJURIES (2015–2021)

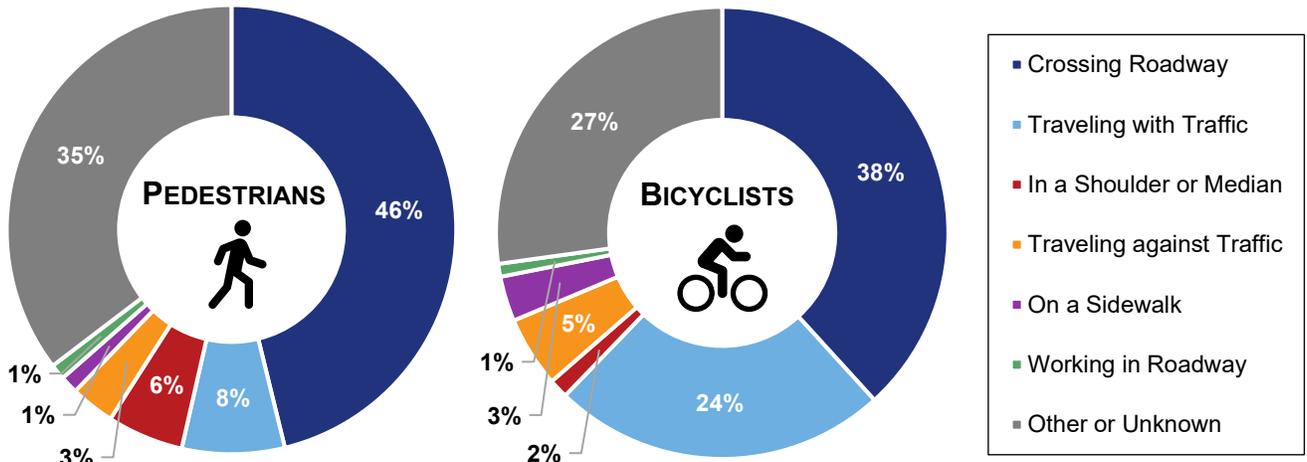


Source: ARDOT Crash Database.

Law enforcement officers complete a crash report form at the time of a crash, which identifies the preceding action of all parties involved in the crash, if known. For non-motorized users, this generally indicates where the non-motorist was in relation to the roadway. Figure 5 shows the non-motorists’ actions prior to fatalities and suspected serious injuries for pedestrians and bicyclists separately. In both cases, the action associated with the highest number of fatalities and suspected serious injuries is Crossing Roadway. Within the Crossing Roadway category, 46 percent of pedestrians and 38 percent of bicyclists suffered a fatal or suspected serious injury.

The second most common non-motorist action prior to a crash is Traveling with Traffic, which is much more likely for a bicyclist with 24 percent compared to pedestrians with 8 percent. Strategies that specifically address pedestrian crashes and strategies that specifically address bicyclist crashes may look different due to the differences in how these crashes occur; for example, bicyclists are much more likely to be traveling along the roadway as opposed to crossing it when compared to pedestrians. Therefore, potential countermeasures may look different for each.

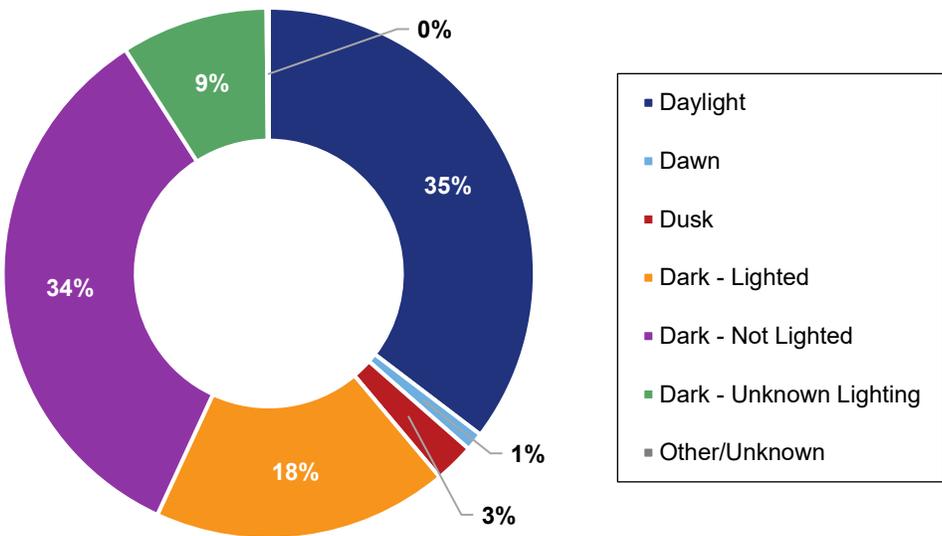
FIGURE 5 ACTIONS PRIOR TO CRASH FOR NON-MOTORIZED FATALITIES AND SUSPECTED SERIOUS INJURIES (2015–2021)



Source: ARDOT Crash Database.

Non-motorized users can be more vulnerable at night as poor visibility contributes to their risk. Figure 6 shows lighting conditions at the time of the crash for non-motorized fatalities and suspected serious injuries. Thirty-five percent of crashes occurred during daylight hours as opposed to 65 percent that occurred during reduced light conditions. Thirty-four percent of these incidents happened at nighttime where there was no artificial lighting, but an additional 18 percent happened at night where there was artificial lighting. Given that most non-motorized users are walking, biking, or rolling during daylight hours, the fact that almost two thirds of crashes occurred during dark conditions emphasizes the importance of adequate lighting conditions for non-motorists' safety. Even nighttime conditions with artificial lighting are relatively high-risk compared to daylight conditions.

FIGURE 6 NON-MOTORIZED FATALITIES AND SUSPECTED SERIOUS INJURIES BY LIGHTING CONDITIONS (2015–2021)



Source: ARDOT Crash Database.

3.2.2 Equity & Vulnerable Road User Safety

Law enforcement officers must provide demographic data on crash reports. Table 3 shows non-motorist fatalities and suspected serious injuries for each race or ethnicity, the corresponding population in the entire State, and the rate of non-motorist fatality or suspected serious injuries by population. Despite only accounting for about 16 percent of the State’s population, Black or African Americans account for 28 percent of non-motorist fatalities and suspected serious injuries in Arkansas. The fatality and suspected serious injury rate for this group is double the rate for the rest of the races or ethnicities as shown in Table 3.

TABLE 3 NON-MOTORIST FATALITIES AND SUSPECTED SERIOUS INJURIES BY RACE/ETHNICITY (2015–2021)

RACE / ETHNICITY	POPULATION		FATALITIES + SUSPECTED SERIOUS INJURIES		FATALITIES + SUSPECTED SERIOUS INJURIES PER 1 MILLION PEOPLE
	TOTAL	% OF STATEWIDE	TOTAL	% OF STATEWIDE	
White / Caucasian	2,203,950	73.2%	944	64.6%	428.3
Black / African American	487,994	16.2%	409	28.0%	838.1
Hispanic	256,847	8.5%	76	5.2%	295.9
Asian / Pacific Islander	82,423	2.7%	18	1.2%	218.4
American Indian	101,894	3.4%	3	0.2%	29.4
Other / Unknown	31,658	1.1%	11	0.8%	347.5

Source: Crash data from ARDOT Crash Database; Race and Ethnicity data from the 2020 U.S. Census.

Note: Race/Ethnicity categories align with options on the Arkansas crash reports; the sum of the population column may be higher than the total population of Arkansas due to people identifying as multiple races.

As described in Section 3.1, Justice40 data provides another way to analyze non-motorist safety for different groups who may experience disproportionate impacts. Justice40 data is available at the website for the White House Council on Environmental Quality². Within the Justice40 framework, there are eight categories for which a census tract can be considered “disadvantaged”. These are:

- » **Climate Change**—These burdens aim to measure expected agricultural value, building value, and population loss due to climate-related natural hazards, as well as projected wildfire risk and projected flood risk due to climate change.
- » **Energy**—These burdens aim to measure the energy cost as well as energy-related pollution within a census tract.
- » **Health**—These burdens aim to identify areas facing high rates of asthma, diabetes, heart disease, and low life expectancy within a census tract.

² White House Council on Environmental Quality. Version 1 of the CEJST: Technical Support Document. Available at <https://static-data-screeningtool.geoplatform.gov/data-versions/1.0/data/score/downloadable/1.0-cejst-technical-support-document.pdf>.

- » **Housing**—These burdens aim to measure the housing cost, the degree of lead paint exposure in housing, historic underinvestment due to redlining, lack of green space, and the share of homes without indoor plumbing or kitchens within a census tract.
- » **Legacy Pollution**—These burdens aim to measure how legacy, current, and potential pollution a census tract has through proximity to hazardous waste, Superfund sites (otherwise known as National Priorities List), Risk Management Plan facilities, abandoned mine land, and Formerly Used Defense Sites.
- » **Transportation**—These burdens aim to measure the transportation-related pollution, transportation barriers, and traffic-related noise and proximity to a census tract.
- » **Water and Wastewater**—These burdens aim to measure the census tract's proximity to toxicity-weighted wastewater discharges and underground storage tanks that may leak.
- » **Workforce Development**—These burdens aim to identify census tracts that would benefit from greater workforce development, such as areas with low median income as a percentage of area median income, percent of households in linguistic isolation, percent of the workforce experience unemployment, and percentage of a census tract's population in households where the household income is at or below the federal poverty level.

A census tract can be considered disadvantaged for meeting any one of these burdens, but multiple burdens may be applicable for a particular census tract.

Table 4 summarizes the population, non-motorist fatalities and suspected serious injuries, and the rate for each of the eight burden categories, as well as for Justice40 areas in total. Despite accounting for 55 percent of the population in the State, Justice40 areas account for 64 percent of total non-motorist fatalities and suspected serious injuries, indicating that they are more likely to occur in disadvantaged areas. Of the Justice40 areas, those that are overburdened from the legacy pollution or workforce development categories are most likely to correlate with higher numbers of non-motorist fatalities and suspected serious injuries. From 2015 to 2021, those areas experienced over 800 fatalities or suspected serious injuries per 1 million people, the highest rates for all Justice40 areas.

TABLE 4 NON-MOTORIST FATALITIES AND SUSPECTED SERIOUS INJURIES BY JUSTICE40 CATEGORY (2015–2021)

JUSTICE40 CATEGORY	POPULATION		FATALITIES + SUSPECTED SERIOUS INJURIES		FATALITIES + SUSPECTED SERIOUS INJURIES PER 1 MILLION PEOPLE
	TOTAL	% OF STATEWIDE	TOTAL	% OF STATEWIDE	
Climate Change	1,121,342	37.2%	458	31.7%	408.4
Energy	317,234	10.5%	198	13.7%	624.1
Health	921,926	30.6%	596	41.2%	646.5
Housing	411,222	13.7%	280	19.4%	680.9
Legacy Pollution	363,350	12.1%	304	21.0%	836.7
Transportation	358,078	11.9%	120	8.3%	335.1
Water & Wastewater	87,573	2.9%	53	3.7%	605.2
Workforce Development	401,777	13.3%	354	24.5%	881.1
Justice40 Areas Total	1,640,453	54.5%	922	63.8%	562.0
Non-Justice40 Areas	1,371,071	45.5%	523	36.2%	381.5

Source: Crash data from ARDOT Crash Database; Justice40 data from the White House Council on Environmental Quality.

Note: Each census tract may be tagged as more than one type of Justice40 category, so the sum of numbers of all individual Justice40 rows in the table above may not equal the total for all Justice40 categories.

3.3 HIGH-RISK CORRIDORS

This section outlines the approach to identifying high-risk corridors throughout the State, which are road segments with higher frequencies of crashes involving VRUs. A sliding window analysis was used to identify the top 10 State-owned and top 10 locally-owned corridors. This process focused on identifying areas where crash occurrences were disproportionately high in terms of severity. In other words, it aimed to pinpoint corridors with a higher concentration of fatal or suspected serious injury crashes involving VRUs.

3.3.1 Sliding Window Analysis Approach

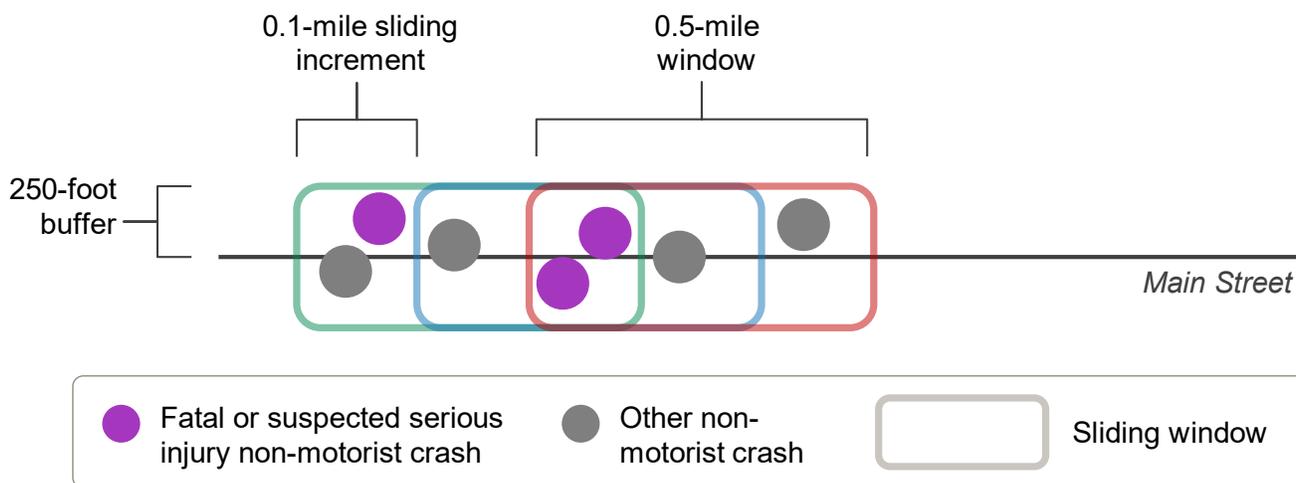
The screening analysis utilized a sliding windows approach, which is a recognized method supported by FHWA in the Guidebook on Identification of High Pedestrian Crash Locations.³ This approach has been widely used in Vision Zero studies to identify High-Risk Networks. By utilizing this approach, the VRU Safety Assessment identified high-risk corridors, highlighting the road segments where attention is needed to mitigate the risks faced by VRUs and enhance overall road safety.

The sliding windows analyses smooth out deviations in reported crash locations and improve the analysis of crashes by examining them within short segments along roadways. This process involves creating windows that cover the road network, with each window offset by a short distance from the previous one. The analysis is

³ Federal Highway Administration. Guidebook on Identification of High Pedestrian Crash Locations. Available at <https://www.fhwa.dot.gov/publications/research/safety/17106/17106.pdf>.

repeated until the entire road network is covered. An illustrative example is shown below in Figure 7 and the following paragraphs.

FIGURE 7 SLIDING WINDOW ANALYSIS ILLUSTRATIVE EXAMPLE



Within the context of this study, 0.5-mile road segment windows were used along all public roads in Arkansas. The windows were offset, or slid, along the network in 0.1-mile increments. Crashes within 250 feet of each roadway segment were counted and a severity weighted score was attributed to each window segment. Crashes that resulted in a fatality or suspected serious injury were weighted three times greater than all other crashes. The below formula and three examples show this calculation. The three colors in the examples relate to the three corresponding windows by color, shown in Figure 7.

Variables and Formula:

KA = # of fatal or suspected serious injury non-motorist crashes within the sliding window

BCO = Other non-motorist crashes within the sliding window

$$\text{Crash Score} = 3 * (\text{KA}) + 1 * (\text{BCO})$$

Examples:

$$\text{Crash Score for Green Window} = 3 * (3 \text{ crashes}) + 1 * (2 \text{ crashes}) = 11$$

$$\text{Crash Score for Blue Window} = 3 * (2 \text{ crashes}) + 1 * (2 \text{ crashes}) = 8$$

$$\text{Crash Score for Red Window} = 3 * (2 \text{ crashes}) + 1 * (2 \text{ crashes}) = 8$$

After the crashes were accounted for in each segment, AADT volumes were joined to the segments. The crash score for each segment was normalized by the AADT on each segment to develop a crash rate in addition to the raw number of crashes.

After this sliding window analysis, the segments with the highest scores for both raw crash score and crash rate were reviewed. This review aimed to identify and select the window segments that would comprise the final list of high-risk corridors. Ten corridors for State-owned roads and 10 corridors for locally-owned roads were identified. Additionally, roads were considered only if they had an AADT of 5,000 or greater, as roadways below that threshold (such as neighborhood roadways with low traffic volume) may not have accurate traffic data, which results in skewed crash rates.

Once the final high-risk corridors were established, the results were shared with stakeholders. This step involved collaborative discussions and feedback to confirm the identified high-risk corridors. By combining the analysis and input from local agencies, the assessment produced a list of corridors that reflect high-risk areas for VRUs.

3.3.2 Identified High-Risk Corridors

The identified high-risk corridors are summarized in Table 5 and Table 6. Table 5 shows the top 10 corridors on State-owned roads, Table 6 shows the top 10 corridors on locally-owned roads, and Figure 8 shows the location of the corridors within the State. The ID in the tables corresponds to the grey labels on the map.

TABLE 5 IDENTIFIED STATE-OWNED HIGH-RISK CORRIDORS

ID	NAME	MPO AREA
S1	Hwy 338 (Baseline Rd)	Metroplan
S2	US-70 (Asher Ave)	Metroplan
S3	Hwy 141 (N Main St)	N.A.R.T.P.C.
S4	Hwy 7 (Central Ave)	Tri-Lakes MPO
S5	US-67 (T.P. White Dr)	Metroplan
S6	US-70 (Roosevelt Rd)	Metroplan
S7	US-70 (E Broadway Ave)	West Memphis MPO
S8	US-70 Business (Grand Ave)	Tri-Lakes MPO
S9	Hwy 365 (Pike Ave)	Metroplan
S10	Hwy 91 (E Johnson Ave)	N.A.R.T.P.C.

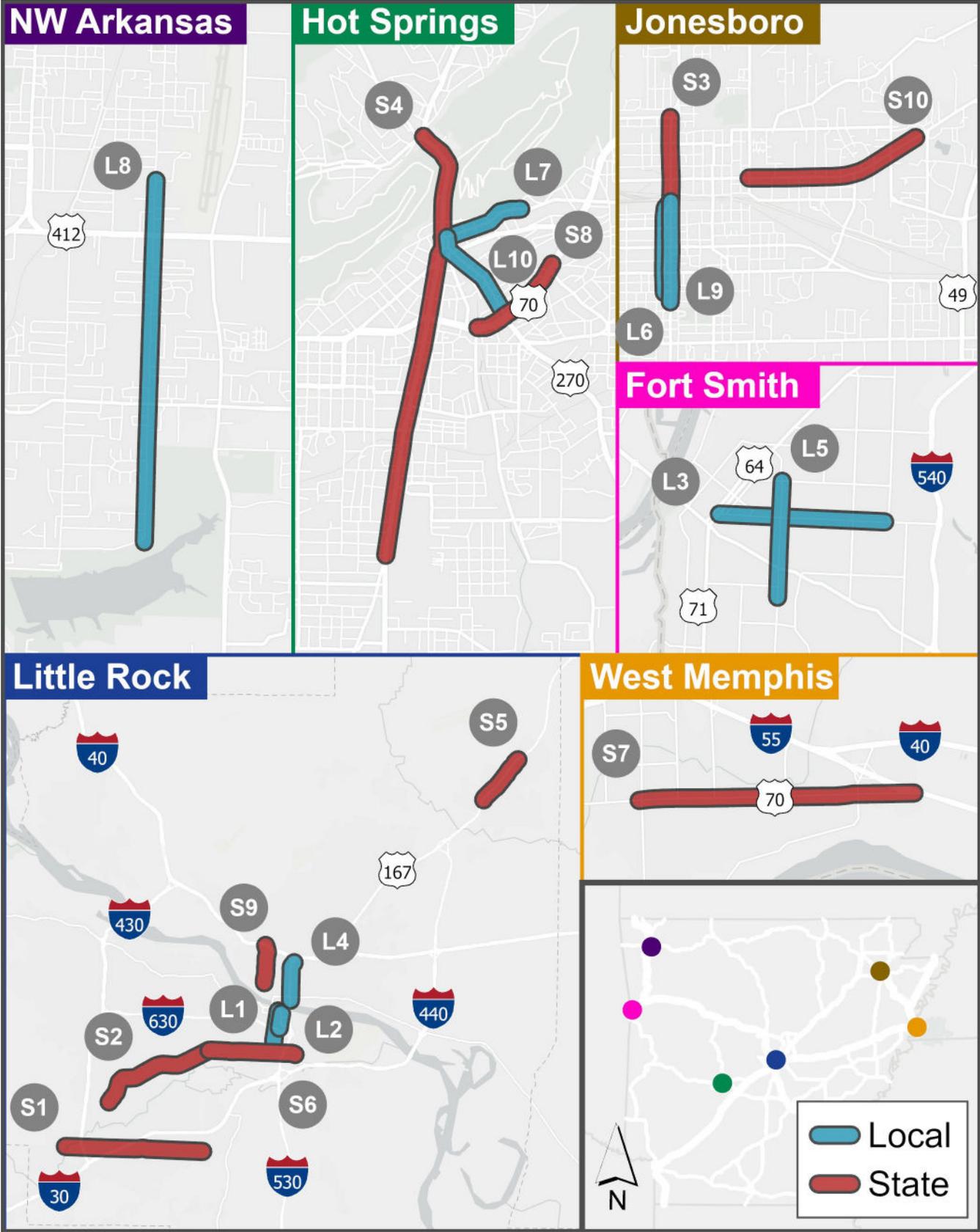
Source: ARDOT.

TABLE 6 IDENTIFIED LOCALLY-OWNED HIGH-RISK CORRIDORS

ID	NAME	MPO AREA
L1	Main St	Metroplan
L2	Cumberland St	Metroplan
L3	Grand Ave	Frontier MPO
L4	N Locust St	Metroplan
L5	N Greenwood Ave	Frontier MPO
L6	Union St	N.A.R.T.P.C.
L7	Spring St	Tri-Lakes MPO
L8	S Powell St	NWARPC
L9	S Main St	N.A.R.T.P.C.
L10	Malvern Ave	Tri-Lakes MPO

Source: ARDOT.

FIGURE 8 IDENTIFIED HIGH-RISK CORRIDORS



Source: ARDOT.

All 20 identified corridors are located within MPO boundaries, with many located in the center of each major city’s downtown area. This aligns with the analysis from Table 2, where the majority of crashes occurred in urban areas. Eight of the corridors are located within Metroplan’s boundary (the central Arkansas region), four are located within the Tri-Lakes MPO boundary (the Hot Springs region), and the rest are spread throughout Arkansas’ other MPO areas.

As noted at the beginning of Section 3.3.2, it is important to emphasize that these roads are not the only roads where VRU safety improvements may be considered. The identification of these roads is to help determine common factors among areas where VRUs are at risk in Arkansas. For example, many of these local roads go through downtown areas with land uses conducive to neighborhood shops and markets, and many of the State roads are arterials where many suburban-style land uses such as commercial businesses with large parking lots focused on vehicular movement are located. Roadways within the Texarkana MPO study area, SARPC study area, and rural areas of the State share these characteristics and strategies, and future planning may be applicable statewide, not only along these identified corridors.

For further analysis, the high-risk network corridors were overlaid with census tracts designated as Justice40 areas to determine common types of overburdened categories where these corridors are located as shown in Table 7. Areas with challenges in workforce development, health, housing, and energy were most likely to contain the identified high-risk corridors. This generally aligns with the data from Table 4 that shows in which Justice40 categories non-motorized fatalities and suspected serious injuries occur most frequently.

TABLE 7 JUSTICE40 OVERLAP WITH THE NUMBER OF HIGH-RISK CORRIDORS

JUSTICE40 CATEGORY	STATE-OWNED	LOCALLY-OWNED
Climate Change	4	5
Energy	6	3
Health	8	9
Housing	6	8
Legacy Pollution	4	4
Transportation	2	2
Water & Wastewater	2	0
Workforce Development	9	8

Source: Justice40 data from the White House Council on Environmental Quality.

4 STAKEHOLDER CONSULTATION



4.1 INTRODUCTION

For the VRU Safety Assessment, the FHWA recommends that all states conduct stakeholder consultations with the local governments, MPOs, and regional planning organizations that represent high-risk areas. The purpose of this consultation is to get feedback on the priority areas identified during the analysis and gain local knowledge on the factors contributing to the safety concerns in the area. As part of this consultation, the State also needs to consult with local organizations regarding local safety data that is required to perform quantitative analysis to identify high-risk areas. The local organizations also have insights on policies, plans, and regulations that are needed to better ensure consistent consideration of the safety needs of VRUs across all project types. Additionally, the local and regional stakeholders have first-hand knowledge of challenges and barriers faced by VRUs in their unique communities and may have insights for safety solutions that might work best to reduce VRU fatalities and suspected serious injuries.

4.2 OBJECTIVES OF STAKEHOLDER CONSULTATION

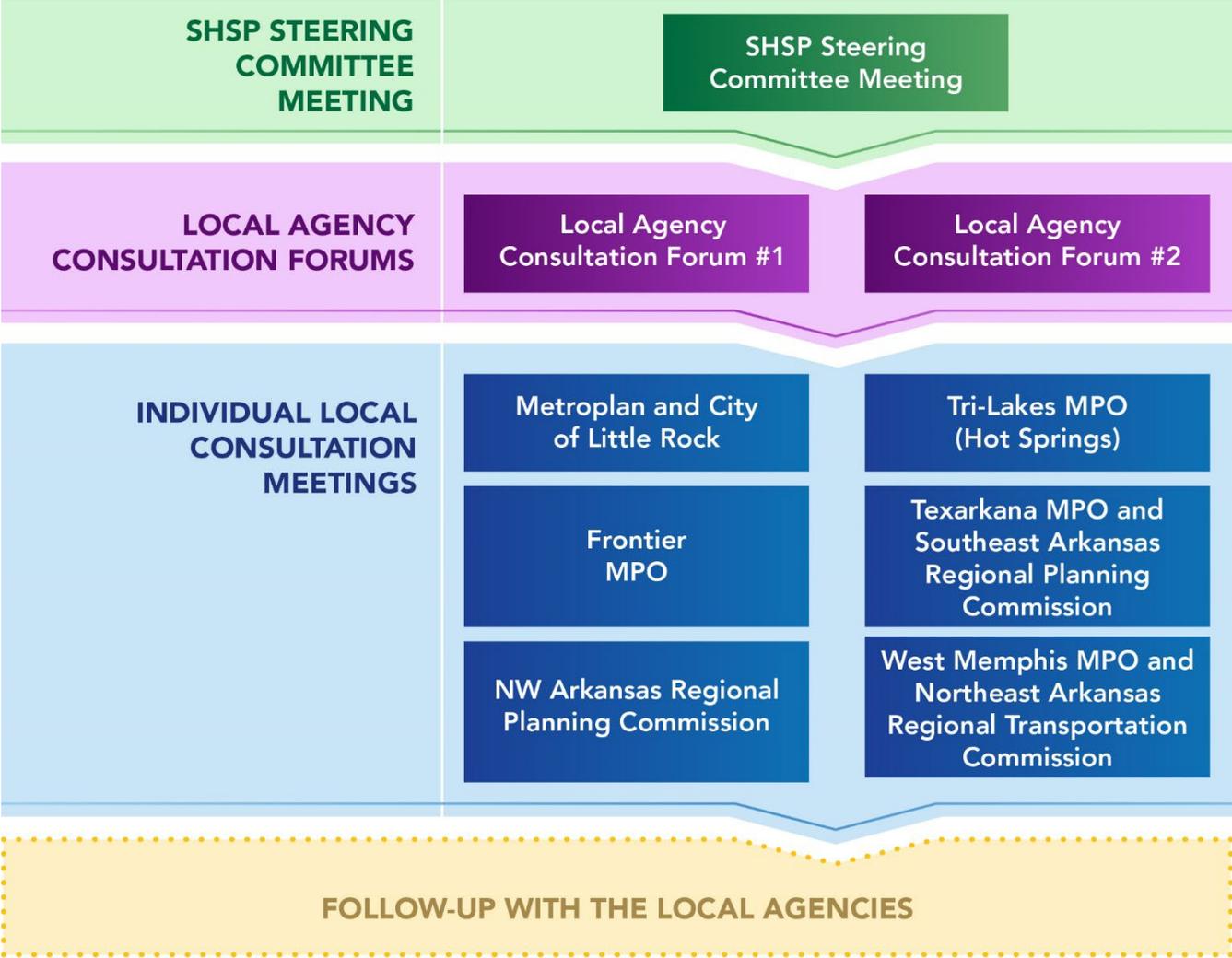
A series of meetings were conducted with local governments, MPOs, and regional planning organizations to achieve the following objectives:

- » Share statewide, regional, and local trends for VRU fatalities and suspected serious injuries.
- » Discuss the existing Arkansas SHSP Non-Motorist Focus Area strategies and actions with the agencies.
- » Introduce the high-risk area analysis and receive local insights.
- » Offer an opportunity for agency representatives to provide new information on VRU safety planning.
- » Understand the challenges faced by VRUs in underserved and low-income neighborhoods.
- » Receive insights on challenges in their jurisdictions for non-motorized user safety.
- » Determine strategies and actions both specific to their jurisdictions and statewide that will improve non-motorized user safety planning.

4.3 CONSULTATION PROCESS

For the VRU Safety Assessment, the team conducted meetings with the SHSP Steering Committee, MPOs, and local governments. For phase one, an initial meeting was conducted with the SHSP Steering Committee to kick off the consultation process. In the second phase of the consultation process, targeted meetings were conducted with agencies that represent high-risk areas to gather feedback on the factors contributing to safety concerns identified in the SHSP, recommendations on potential solutions, and concerns from the local agencies. Lastly, the team shared the preliminary strategies and potential solutions with the SHSP Steering Committee to gain their feedback. Figure 9 shows the stakeholder consultation methodology.

FIGURE 9 METHODOLOGY FOR STAKEHOLDER CONSULTATION



4.4 SHSP STEERING COMMITTEE MEETING

Since the Arkansas SHSP includes a Non-Motorists Emphasis Area, the project team kicked off the agency consultation process by meeting with the SHSP Steering Committee to leverage the committee’s understanding and experience on VRU safety challenges across the State and to introduce the project to the SHSP Steering Committee. The team shared overall VRU trends, discussed the existing Arkansas SHSP Non-Motorist Focus Area strategies and actions, and offered the opportunity for committee members to provide new information and

challenges on VRU safety. The team also provided an overview of the goals and objectives for local agency meetings to the SHSP Steering Committee. The SHSP Steering Committee provided recommendations for contacts or agencies/organizations to be contacted for additional information and input on high-risk areas.

4.5 LOCAL AGENCY CONSULTATION FORUMS AND INDIVIDUAL LOCAL CONSULTATION MEETINGS

The team conducted two information sessions open to the MPOs and regional planning organizations. The objective of these meetings was to discuss the purpose and goals of local agency consultations, gather information on who should be invited to future meetings, and when meetings should be scheduled. In the first meeting, a representative from Frontier MPO, Metroplan, SARPC, and NWARPC were present. In the second meeting, representatives from N.A.R.T.P.C., West Memphis MPO, Frontier MPO, and Texarkana MPO participated. The meetings helped the team to identify additional plans or resources that were useful for the VRU Safety Assessment. During these meetings, it was discovered that many organizations are already working on plans for improving VRU safety such as Comprehensive Safety Action Plans for the Safe Streets and Roads for All (SS4A) grant program, which funds regional, local, and Tribal initiatives through grants to prevent fatal and suspected serious injuries. Existing plans were reviewed as a part of the consultation process, and, when possible, regional staff and stakeholders for safety plans under development were invited to participate in individual consultation meetings.

The following is a list of common themes heard throughout these local agency consultation meetings that informed the strategies and actions discussed in the next section.

- » **Land use concerns**—For most of the crashes in the urban areas, the most important aspect is the land use surrounding the corridors, especially where residential corridors are adjacent to commercial uses. Typically, high volume, high-speed corridors adjacent to these land uses result in an environment where there are increased pedestrian crossings to access commercial areas. This especially impacts economically challenged areas where there are households with no cars. The commercial spaces that attract a large number of pedestrians include convenience stores, grocery stores, community centers, liquor stores, etc. These high-density areas lead to increased traffic and pedestrian volume, which increases the risk for VRUs. It was also recognized that many of the streets with high pedestrian traffic are near universities. In many of the high-speed, high-volume corridors adjacent to universities, there was a lack of infrastructure, such as sidewalk connectivity, ADA accessibility, and crosswalks.
- » **Safety on Public Roads**—Local agencies expressed concern for improving safety for VRUs along State highways in their communities. Some facilities are located near low-income areas or educational institutions which may have higher pedestrian traffic. Factors such as higher speed limits, limited crosswalks, and unmaintained or missing sidewalks also contribute to VRU safety challenges.
- » **High pedestrian and bicycle traffic in underserved areas**—Participants commented that neighborhoods consisting of a large percentage of low-income households may have higher pedestrian and bicycle traffic and transit use. Additionally, these areas may not have sufficient infrastructure for people to safely walk around, to cross streets, or to access bus stops. A lack of investment in these areas to provide adequate infrastructure for walking, biking, or public transit results in high-risk areas for VRUs.
- » **Potential safety solutions**—Participants suggested that road diets are a potential safety solution for urban streets in Arkansas. Other countermeasures include leading pedestrian intervals and speed tables, which have been implemented on some downtown streets in Little Rock and Jonesboro. Ensuring adequate lighting on streets is another countermeasure as increasing visibility for VRU helps reduce crashes. The use of traffic

cameras to increase the safety of bicyclists and pedestrians was discussed. However, participants noted that there is a State law that prohibits the use of traffic cameras for speed or red light enforcement, though a new law allows these traffic cameras to be implemented in highway work zones as long as a police officer is present. Other safety countermeasures brought up by stakeholders for consideration included limiting property access points, installing roundabouts, improving signage, ensuring ADA-compliant sidewalks, and installing bus boxes, raised medians, and marked crosswalks.

- » **Local Plans and Projects**—NWARPC has adopted a Regional Bicycle Pedestrian Master Plan that focuses on strategies for VRUs; the 2015 plan is currently undergoing an update. Frontier MPO prepared a Road Safety Plan in coordination with FHWA and ARDOT.
- » **Safety Action Plans under SS4A**—NWARPC, Texarkana MPO, Metroplan, West Memphis MPO, and Frontier MPO are each working on Safety Action Plans under the SS4A grant program. N.A.R.T.P.C. adopted its Move Safe Action Plan September 8, 2022. As of June 2023, NWARPC has adopted a Regional Comprehensive Safety Action Plan and Vision Zero Policy. These plans may provide additional opportunities for State, regional, and local stakeholders to coordinate on VRU safety solutions.
- » **Unreported crashes**—VRU crashes are sometimes not reported accurately, which complicates our ability to understand local patterns. Furthermore, it was noted in the consultation meetings that sometimes there is a discrepancy in the way police officers record the crashes, making it difficult to clearly interpret the VRU-related crashes. For some routes, such as State Line Avenue, which shares the border between Arkansas and Texas within Texarkana MPO, there is missing data for Arkansas from crashes worked by Texas law enforcement. This makes it difficult to analyze the total number of crashes.
- » **Coordination and monitoring**—To ensure the implementation of these potential safety solutions, all the MPOs, ARDOT, local law enforcement agencies, universities, and local communities need to work together. This proactive approach may help in identifying high-risk areas for VRUs, allowing agencies to make more informed decisions on where to provide safety solutions. Coordinated education programs, outreach, and safety campaigns can also raise public awareness about VRU safety issues to help reduce disparities.

5 STRATEGIES & ACTIONS



gettyimages
Credit: Prostock-Studio

The trends and high-risk areas identified by this assessment provide a data-driven analysis of VRU safety challenges in Arkansas. To address the challenges identified by the analysis, strategies and actions have been developed that encompass projects that have been demonstrated to improve safety for VRUs and support the SSA. These strategies and actions are designed to globally address VRU safety in Arkansas. As such, they do not provide location-specific recommendations, but rather planning level strategies and systemic considerations. The locations identified as a part of this assessment may require additional evaluation to develop context-sensitive projects to address VRU safety concerns and risks. As a part of the planning process, existing State and local efforts may be used to advance or promote projects at these locations.

5.1 STRATEGIES

The strategies in the SHSP and VRU Safety Assessment are aligned with the SSA's goal of eliminating fatalities and suspected serious injuries through a comprehensive approach that builds redundancy utilizing several key elements. One element of the SSA is Safe Road Users, which includes VRUs. People biking, walking, or rolling are the most vulnerable roadway users, as they have no protection in potential conflicts and collisions with motor vehicles. Another element of the SSA is Safe Roadways. Humans will continue to make mistakes while driving or traveling by other means, but improving roadway design and sharing the responsibility for safety can help prevent crashes and keep impacts to the human body at more survivable levels.

The Arkansas Strategic Highway Safety Plan includes a Non-Motorists Emphasis Area. The following strategies are identified in the Non-Motorists Emphasis Area Action Plan:

- » **Strategy 1**—Continue to improve statewide infrastructure and design to protect non-motorists.
- » **Strategy 2**—Continue to implement countermeasures, programs, and policies to protect non-motorists.
- » **Strategy 3**—Focus education efforts aimed at safety and awareness of laws regarding non-motorists.
- » **Strategy 4**—Improve non-motorist enforcement of existing laws and corrective behaviors.

The actions included in this assessment in Section 5.2 directly support and augment Strategies 1 and 2.

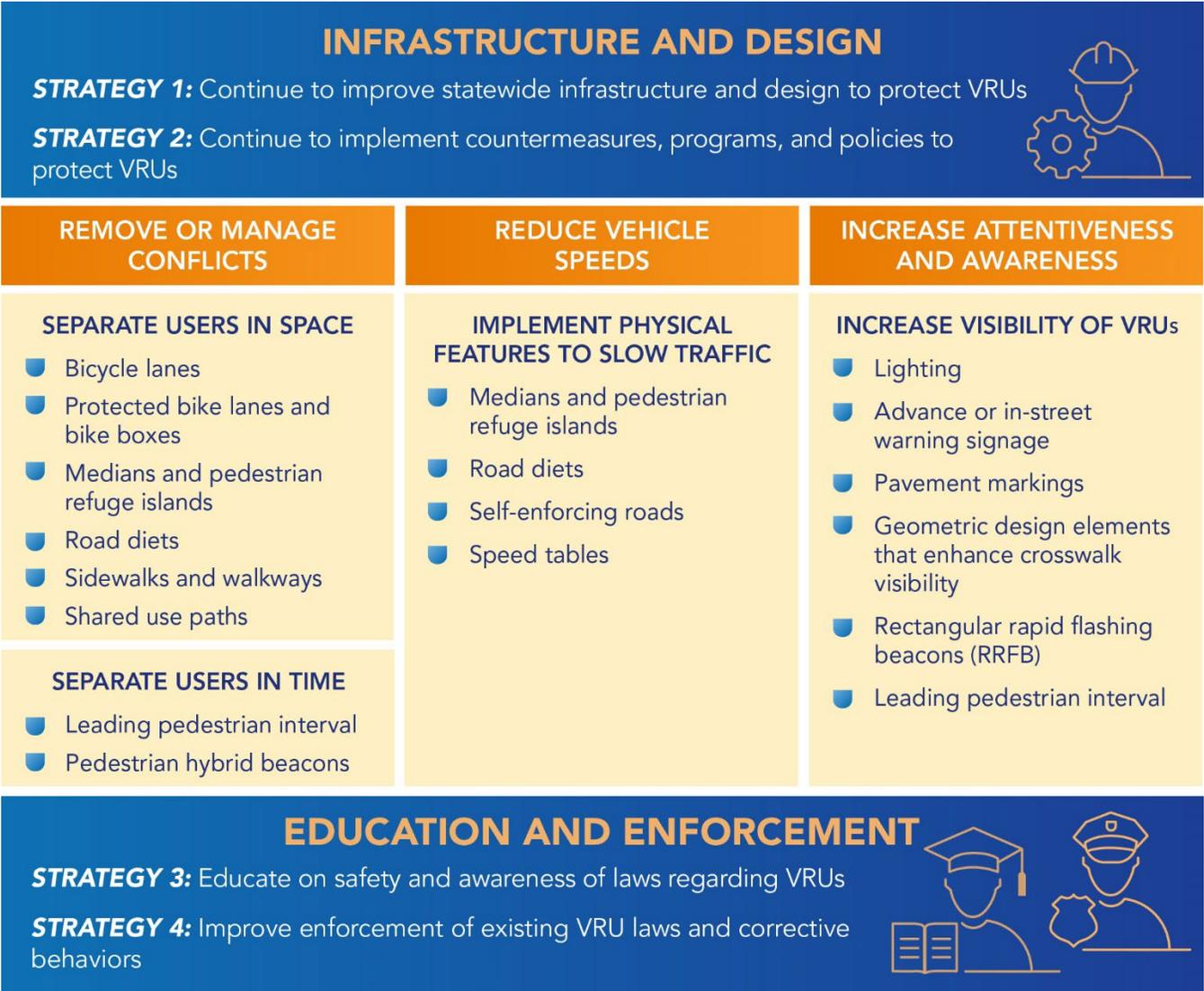
5.2 ACTIONS

5.2.1 *Infrastructure and Design*

The Non-Motorists Emphasis Area Action Plan in the AR SHSP includes a detailed list of actions Arkansas and its safety partners are implementing to reduce the number and severity of VRU crashes. For a full list, refer to the Non-Motorists Area Action Plan in the SHSP appendix. The following actions highlight some critical steps that support the needs identified during this assessment:

- » Improve existing bicycle and pedestrian accommodation on State highways and local roads following the most current American Association of State Highway Transportation Officials (AASHTO) guidance, as appropriate, and in accordance with FHWA guidance.
- » Design and implement pedestrian safety zone program in high-crash areas.
- » Consider non-motorists and ADA design accommodations in a proportional manner during the planning stages of future projects at the State, regional, and local jurisdiction levels.
- » Conduct study to determine risk factors most common at high-risk locations to be addressed systemically through context-sensitive network solutions.
- » Implement proven safety countermeasures at high-risk locations. The following actions may be used to prioritize countermeasures implemented using the SSA:
 - Remove or manage potential severe conflicts—Separate users in space, or separate users in time by how they move through a shared space or opportunity for conflict.
 - Increase visibility of VRUs—Provide features that make drivers more aware of VRUs presence.
- » Figure 10 shows how these actions align with the SSA and illustrates the need for ongoing coordination with education and enforcement strategies to eliminate VRU fatalities and suspected serious injuries.

FIGURE 10 POTENTIAL COUNTERMEASURES TO IMPROVE INFRASTRUCTURE AND DESIGN TO PROTECT VULNERABLE ROAD USERS



5.2.2 Criteria to Consider

The strategies and countermeasures identified in Figure 10 are not intended to replace engineering judgement, design standards, or a critical assessment of context-sensitive selection criteria. The following are criteria that should be taken into consideration:

- » **Functional Classification, Facility Type, Speed Limit**—Countermeasures should be appropriate for the roadway functional classification (arterial, collector, local) and whether the environment is urban or rural. Location should also be considered (segment or intersection). Countermeasures should be selected based on facility considerations, such as if they overlap with bike routes, transit routes, commercial/industrial access routes, and emergency vehicle access routes. Countermeasures should also be appropriate for the posted speed limit.
- » **Traffic Volumes**—Traffic volumes (AADT) dictate the appropriate use of VRU safety countermeasures in many cases. Additionally, locations with a high number of VRU crashes and high traffic volumes versus a

location with a high-crash rate (higher number of fatalities and suspected serious injuries per 100 million vehicle-miles traveled) may warrant different approaches to implement solutions.

- » **Land Use and Demographics**—Land use planning is conducted at the county or city level. Countermeasures to protect VRUs should be context-sensitive and take into consideration nearby land uses. For example, additional VRU countermeasures to slow traffic, reduce conflicts, and increase awareness and attentiveness should be implemented in corridors that mix residential and commercial land uses. Understanding the demographics of a corridor or community should also be considered when implementing countermeasures to address VRUs. Large populations of elderly, disabled, immigrants, low-income, and single-vehicle households increase the need for VRU countermeasures. Land uses that attract or generate VRUs in underserved populations also increase the need to prioritize VRU safety (e.g., nursing homes, senior centers, or homeless shelters).

5.2.3 *Education and Enforcement*

ARDOT is committed to coordinating with its stakeholders, such as the HSO, to provide education and enforcement actions that raise awareness of VRU safety challenges by promoting enforcement and raising awareness on existing VRU-related laws. Following are some highlighted actions among different safety stakeholders that support the challenges identified during this assessment:

- » Continue to provide public service messages to increase awareness of the dangers to non-motorists on high-volume/speed roadways and in school zones, and remind drivers of safe behaviors and laws intended to protect non-motorists.
- » Provide training to law enforcement on bicycle/pedestrian laws.
- » Educate law enforcement on accurately identifying non-motorized crashes and related details on the crash reports.
- » Provide crash studies to local law enforcement to aid with targeted enforcement in problem areas.

5.2.4 *Coordination*

Given the principle, “safety is a shared responsibility,” Arkansas recognizes the need to coordinate with a broad group of stakeholders to address VRU safety challenges. In addition to the coordination-related actions included in the SHSP Non-Motorists Emphasis Area Action Plan, this assessment highlights the following actions:

- » Coordinate with MPOs, cities, and/or counties developing SS4A Plans to integrate VRU challenges and locations of concern into the SHSP implementation process.
- » Provide technical assistance to MPOs, cities, and/or counties to determine specific strategies at the high-risk locations.
- » Invite local agencies and safety partners consulted during the assessment to participate in the SHSP Non-motorists Emphasis Area Team.
- » Evaluate potential changes to the SHSP and implementation process based on VRU Safety Assessment findings or future updates (e.g., Should the Non-Motorist Emphasis Area be changed to VRU Emphasis Area to avoid confusion? What changes should be made to the agency consultation process for the SHSP?).

- » Further expand SHSP stakeholders and partners to include organizations and agencies that provide services to underserved populations.

5.3 CONCLUSION

The Arkansas VRU Safety Assessment identifies strategies and actions to reduce VRU fatalities and suspected serious injuries. The assessment was developed through an analysis of Arkansas' public roads and consultation with regional and local jurisdictions. This assessment report is to be used by Arkansas and its safety partners to focus on implementing strategies that will reduce the risk of VRU fatalities and suspected serious injuries for all non-motorists. Key takeaways from this assessment include the following:

- » From 2015 to 2021, non-motorized fatalities and suspected serious injuries increased 150 percent from 112 to 280.
- » Despite accounting for 55 percent of the population in Arkansas, Justice40 designated census tract areas account for 64 percent of total non-motorist fatalities and suspected serious injuries in the State, indicating that they are more likely to happen in overburdened areas.⁴
- » Approximately 68 percent of non-motorized fatality and suspected serious injury crashes occur in urban environments in Arkansas. Metroplan's study area has the most non-motorist fatalities and suspected serious injuries and accounts for about a third of the entire State.
- » All 20 identified high-risk corridors are located within MPO boundaries, with many located in downtown areas. The identification of these roads helps to determine common factors among high-risk areas for VRUs.
- » Local consultation meetings identified potential countermeasures to address VRU safety, including road diets, leading pedestrian intervals, speed tables, enhanced lighting on streets to increase visibility, access management, bus boxes, raised medians, and crosswalks.
- » Additional analysis is needed to identify systemic corridor characteristics that represent high risks for VRU fatalities and suspected serious injuries beyond the 20 identified in this study. Identifying factors that can address risks for VRUs across the State may aid Arkansas and its safety partners as safety improvements are prioritized and implemented.

This assessment serves as a call to action for Arkansas. While the analysis has highlighted high-risk corridors, it also presents an opportunity to support broader integration of VRU safety considerations in project identification, prioritization, and implementation. The analysis and consultation conducted for this assessment serves as an impetus for stronger collaboration among State, regional, and local agencies.

⁴ Justice40 data from the White House Council on Environmental Quality

ARKANSAS

VULNERABLE ROAD USER
SAFETY ASSESSMENT

