Comparing Vulnerable Road User Safety Assessments in the Midwest

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Acknowledgements

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This project was a collaboration within **the RE-AMP Network**. RE-AMP is a network of 140 organizations with the shared goal of equitably eliminating greenhouse gas emissions in the Midwest. Their work on transportation emissions focuses on enabling people to get where they need to go without having to drive and on cleaning up motorized transportation.

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Introduction

One of the biggest barriers to our goal of enabling people to get where they need to be without a car is safety. If people do not feel safe, they are not going to walk, bike, or use public transportation. Over the past few years, crashes between drivers, pedestrians, cyclists and other vulnerable road user that results in serious injuries or death have increased greatly, especially during the pandemic.

As a result of this, in 2021, the **Bipartisan Infrastructure Law** required states to do an assessment of vulnerable road users (VRUs) every five years, known as a Vulnerable Road User Safety Assessment (VRUSA). This assessment is intended to provide a snapshot of how state Departments of Transportation (DOTs) assess crashes and fatalities among VRUs and what DOTs are doing to address those issues.

While state DOTs vary considerably in how they craft their VRUSA, the **US Department of Transportation identifies five key elements** that every state needs to include when writing their VRUSA. This includes:

1) Overview of VRU Safety Performance - what trends exist in VRU crashes and what progress is the state DOT making to address this?
2) Summary of Quantitative Analysis - what data and methodology did the state DOT use to identify high-risk areas of VRUs?
3) Summary of Consultation - who did the state DOT consult with and what solutions did these individuals or groups offer?
4) Program of Projects and Strategies - what specific steps is the state DOT taking to reduce VRU crashes?
5) Safe System Approach (SSA) - how was the Safe System Approach incorporated into the state DOT's VRUSA?

The central purpose of this document is to strengthen the quality of subsequent Vulnerable Road User Safety Assessments. It seeks to improve the guidance FHWA provides for the development of Vulnerable Road User Safety Assessments. Further, it is intended to serve as a guide for how transportation advocates can evaluate and strengthen their state's VRUSA for the future.

To accomplish this task, advocates reviewed the FHWA guidance before conducting a comparative analysis of the VRUSAs from six Midwestern states:

- Iowa
- Kansas
- Michigan
- Missouri
- Ohio
- Wisconsin

As a result, the bulk of this report is divided into three sections:

1) Recommendations for FHWA Guidance - Options that FHWA can consider to improve the guidance they provide to state DOTs on how to develop VRUSAs.
2) State VRUSA Observations - Insights on how each of the aforementioned states fulfilled the five key elements of a VRUSA.
3) State VRU Recommendations - Ways that the DOTs of the states evaluated can improve their VRUSAs and better serve the needs of vulnerable road users in their states.

Recommendations for FHWA Guidance

This section discusses general recommendations for how the Federal Highway Administration (FHWA) can improve its current guidance for how states develop their Vulnerable Road User Safety Assessments.

Overview of VRU Safety Performance

- Because this is an overview and is in part an attempt to tell the story of what has happened, FHWA should encourage state DOTs to include stories of people killed in crashes. This can help to humanize the data being shared and help to build a broader understanding of the toll of traffic violence.
- FHWA should continue to identify best practices for how states can set goals that help them reach Zero Traffic Deaths.

Summary of Quantitative Analysis

- Encourage states to use the same number of years for analysis (5, 7, 10, etc.). If a state can't look back that far, encourage them to provide an explanation as to why.
- It may also be useful to identify which states use the listed types of data-driven safety analysis from pages 9 to 10 of the current guidance (i.e. California uses HIN analysis; Kentucky used predictive safety analysis). Alternatively, it may be useful to consider if/how different analysis types work more effectively in urban, suburban, and/or rural settings.
- FHWA should encourage state DOTs to look more into analysis of crashes involving people with disabilities.
- When listing high-risk areas (especially specific jurisdictions), FHWA should encourage state DOTs to note if those local jurisdictions have their own plans for safety improvements (for example, Kansas City was listed as a high-risk area for Missouri, but MoDOT made no mention of the fact that Kansas City has a Vision Zero Action Plan).

Summary of Consultation

- Encourage state DOTs to list in their plan all of the organizations, committees, and other groups consulted for the VRUSA.
- State DOTs should consult with local advisory groups (i.e. bicycle and pedestrian advisory committees at the municipal and/or county level) in addition to advocacy groups.
- In addition to transit groups, state DOTs should consider consultation with disability rights groups as well.
- Specific language should be included encouraging state DOTs to engage with specific populations identified as being overrepresented in the quantitative analysis (i.e. Native Kansans are a group overrepresented among statewide pedestrian fatalities, so KDOT is encouraged to meet with tribal leaders if they haven't already done so).
- In lieu of Road Safety Assessments, it would strengthen the overall understanding for decision makers to instead conduct walk audits and group bike rides and/or transit rides instead, especially along the most dangerous corridors in a given state.

Program of Projects or Strategies

- Encourage states to list and/or reference their most recent update to their statewide active transportation plan. If they don't have one, encourage them to develop one.
- Encourage states to explain where they will incorporate the projects or strategies they identify (part of the long-range transportation plan, part of the update to the SHSP, etc.).
- Encourage state DOTs to list local examples of the deployment of proven safety countermeasures (i.e. Iowa DOT suggests deployment of Lead Pedestrian Intervals, points to their deployment/success rate in specific communities in Iowa as a local example).
- If states use and/or recommend education campaigns (i.e. "Buckle Up/Phone Down"), encourage them to share available data on the efficacy of those approaches in terms of reducing crashes, serious injuries, and fatalities.

Safe System Approach (SSA)

- For the sake of understanding how SSA is approached, the FHWA guidance should be revised to encourage the SSA explanation to be a separate, distinct section in future VRUSAs.

State VRUSA Observations

This segment of the report details how the state DOTs for Iowa, Kansas, Michigan, Missouri, Ohio, and Wisconsin (in general and individually) worked to fulfill the five core elements of a Vulnerable Road User Safety Assessment. For reference, those elements include:

1) Overview of VRU Safety Performance - what trends exist in VRU crashes and what progress is the state DOT making to address this?
2) Summary of Quantitative Analysis - what data and methodology did the state DOT use to identify high-risk areas of VRUs?
3) Summary of Consultation - who did the state DOT consult with and what solutions did these individuals or groups offer?
4) Program of Projects and Strategies - what specific steps is the state DOT taking to reduce VRU crashes?
5) Safe System Approach (SSA) - how was the Safe System Approach incorporated into the state DOT's VRUSA?

1) Overview of VRU Safety Performance

General	• While most states identified a clear trend on VRU crashes, only Ohio appears to have explicitly said whether or not they met their VRU safety goal in recent years. • State DOTs use different comparisons for the trends; some compared the performance to other users (Kansas), while some compared the performance to other states (Iowa).
Iowa	• Iowa DOT explains that the way non-motorist crash data was reported was changed in 2015, but there's no explanation for how or why that occurred. • In terms of VRU fatality trends, Iowa DOT compared some of its trends with the other states included in the **Mid America Association of State Transportation Officials**.
Kansas	• KDOT's overview found that fatal crashes involving VRUs increased at a faster rate compared to crashes overall. • More than 70% of those crashes involved pedestrians, and over 85% of these crashes happened on local roads as opposed to state roads. • Black and Native Kansans are twice as likely to be killed in a crash.
Michigan	• MDOT reported that while VRU crashes have declined in total since 2013, fatalities have not declined for bicyclists and have risen for pedestrians. • Among all fatal and serious injury crashes, pedestrians are overrepresented by almost 14 times, while bicyclists are overrepresented by almost 6 times their share of total crashes.

1) Overview of VRU Safety Performance (cont.)

Missouri	• According to MoDOT, more than 80% of crashes in the state happened at urbanized intersections. • Qualified low-income neighborhoods experienced 58% of all VRU crashes. • The three major metros of the state (Kansas City, St. Louis, and Springfield) account for 75% of fatal VRU crashes and 70% of all VRU crashes.
Ohio	• ODOT data shows that over the last five years, there were over 4,100 crashes that killed or seriously injured a VRU. • That represents 11% of all fatal or serious injury crashes in Ohio. • ODOT acknowledged that they didn't meet their VRU safety goals for 2021 and 2022, and pointed to interventions they intend to take to address these issues.
Wisconsin	• WisDOT identified a decline in total VRU crashes in Wisconsin, but fatal and serious injury VRU crashes have been increasing. • Three-quarters of these fatal and serious injury crashes occurred in urban areas. • Disadvantaged communities represent 14% of the state's population, but experience 36% of VRU crashes.

2) Summary of Quantitative Analysis

General	• There wasn't uniformity in how far back state DOTs looked when it came to crash data and trends; some states used four years, some used 10. • It also wasn't always clear what type(s) of quantitative analysis a state DOT used to identify hotspots or trends in VRU crashes.
Iowa	• Iowa DOT used the same data from their ***Statewide Bicycle and Pedestrian Systemic Safety Analysis*** (completed in 2020) for their quantitative analysis. • Raw census data was used as opposed to an aggregated data source, such as the **CDC's Social Vulnerability Index**, so that multiple attributes could be considered independently. • Iowa DOT identified seven urban areas and five rural areas as high risk.
Kansas	• KDOT looked at crash trends and contributing circumstances based on information from crash reports. • In addition to a High Injury Network, KDOT also developed a High Risk Network that uses roadway configuration and other contextual features to determine which portions of the overall road network create a higher risk. • KDOT identified five communities that are overrepresented in VRU fatal or serious injury crashes: Hutchinson, Kansas City, Salina, Topeka, and Wichita.

2) Summary of Quantitative Analysis (cont.)

Michigan	• MDOT's analysis is based on police crash reports from 2013 to 2022, and also looked at when those crashes occurred and some of the conditions under which those crashes occurred. • MDOT also did a high-level county analysis for pedestrian crashes and for bicyclist crashes. • While MDOT did include some equity analysis involving the **Climate and Economic Justice Screening Tool**, their explanations were somewhat unclear.
Missouri	• MoDOT pulled most of the data for their quantitative analysis from a combination of police crash reports, roadway data, and hospital data. • MoDOT relied on a systemic safety analysis, where they essentially combined crash and roadway data. • The analysis shows that 19% of the 115 counties in the state are producing 70% of all VRU crashes.
Ohio	• Data used throughout this section came from ODOT's crash database between 2018-2022; they also used data from ODOT's Road Inventory, Active Transportation Need and Demand Analysis and USDOT's Justice40 Initiative. • ODOT found that ten counties account for ⅔ of all VRU fatal or serious injury crashes in the state; they also found that 52% of VRU crashes occur on just 8% of the state's roadway network. • ODOT provided separate sections on safety insights for pedestrians, bicyclists, and Amish buggy users.

2) Summary of Quantitative Analysis (cont.)

Wisconsin

- WisDOT analyzed 10 years of police crash reports.
- WisDOT also identified 227 miles of high-risk roadway segments where multiple fatal or serious injury crashes occurred within a half-mile.

3) Summary of Consultation

General	• The bulk of the consultation and engagement appeared to focus on internal DOT staff and/or decision makers at the regional or local levels. • Several states also deployed surveys, but most of these were targeted at staff and local decision makers as well.
Iowa	• Iowa DOT hosted three virtual stakeholder meetings: one with Metropolitan Planning Organizations (MPOs) and Regional Planning Affiliations (RPAs); one with their Bicycle Pedestrian Advisory Committee; and one with the Strategic Highway Safety Plan Advisory Team. • Iowa DOT asked six questions of each group related to topics such as barriers, innovation, education, enforcement, and more.
Kansas	• KDOT hosted two rounds of stakeholder engagement for their VRUSA. • The first round consisted of multiple statewide workshops. • The second involved two separate workshops: one with high-risk areas and one with low-risk areas to learn about challenges and opportunities in each.

3) Summary of Consultation (cont.)

Michigan	• MDOT doesn't appear to have done any consultation/outreach specifically for this document. Instead they point to past and future engagement for VRUs. • Past engagement included their MetroQuest Survey; Tribal Listening Sessions; and collaborations with organizations like the League of Michigan Bicyclists. • Future engagement is expected to involve consultation with key groups and workshops with stakeholders.
Missouri	• MoDOT hosted two stakeholder meetings and an online survey. • They hosted a special meeting with decision makers from the city and county of St. Louis.
Ohio	• ODOT consulted local governments, MPOs, state agencies, statewide committees, and policy and advocacy partners, but they don't appear to list which policy and advocacy partners. • ODOT also distributed a statewide safety survey to local governments. • ODOT also hosted focus groups with different-sized communities.
Wisconsin	• WisDOT conducted three surveys for their VRUSA: one for those involved with the Active Transportation Plan; one for VRU-focused orgs; and one for MPOs, RPCs, and Tribal Governments. • WisDOT also hosted a series of guided discussions with agency stakeholders. • Additionally, WisDOT hosted discussions with city stakeholders in Green Bay, Madison, Janesville, and Milwaukee.

4) Program of Projects or Strategies

General	• The degree of specificity for countermeasures and strategies varied considerably. Some were mere mentions of FHWA proven safety countermeasures (Missouri), while others were lists of plans and projects for specific parts of the state (Wisconsin).
Iowa	• Iowa DOT made recommendations for high-risk locations and strategies to assist with educating the public about VRU safety and funding VRU safety projects. • Iowa DOT created a table where they break down high-risk project locations further. • Iowa DOT also identified three types of strategies (public education campaigns, funding opportunities, and discretionary grants) to address VRU safety.
Kansas	• KDOT developed **an interactive map** for its Vulnerable Road User High Injury Network. • KDOT also identified a number of strategies to pursue that are expected to be rolled into the next update of their SHSP.
Michigan	• MDOT has listed more than two dozen strategies and policies to address VRU safety. • Most, if not all of the recommendations have been previously included in other documents, such as the Pedestrian and Bicycle Safety Action Team work plan. • Some of the strategies are not specifically related to VRUs; it's also not clear how some of the proposed strategies would affect VRU safety.

4) Program of Projects or Strategies (cont.)

Missouri	• MoDOT listed potential projects and strategies from MoDOT within the “Countermeasures” section of their VRUSA. • They identify a number of countermeasures that are all low-cost and have documented benefits.
Ohio	• ODOT categorized their program of projects or strategies as an action plan. • The action plan is organized into six categories: 1) Planning & Policy; 2) Implementation & Funding; 3) Equity; 4) Data; 5) Education; and 6) Collaboration.
Wisconsin	• WisDOT developed VRU-High Risk Areas and plans to periodically update this roadway network with up-to-date crash data. • While strategy ideas are presented for numerous subject areas (infrastructure, law enforcement, post crash care, etc.), these ideas are light on details for how they could be implemented.

5) Safe System Approach

General	• Most of the states examined for this comparative analysis had a limited incorporation of the Safe System Approach. • Overall, there still seems to be a greater emphasis on admonishing/correcting human behavior than on building safer networks.
Iowa	• Iowa DOT identified percentages of people injured or killed based on how it falls within the different emphasis areas of the Safe System Approach. • It's unclear with some of the emphasis areas how vulnerable road users specifically are counted within these statistics (i.e. were cyclists involved in work zone collisions?). • There needs to be a clearer explanation of how this will be used by Iowa DOT going forward.
Kansas	• KDOT's use of SSA was most prominent in their data analysis, engagement, and programs of projects and strategies. • KDOT used the SSA to guide their engagement with key stakeholders by informing those groups of the SSA itself. • One area where they don't rely as heavily on SSA is with safer vehicles, but they explained that this could change in the future.

5) Safe System Approach (cont.)

Michigan	• MDOT mentions the SSA most prominently in the introduction of their VRUSA and it is mentioned elsewhere in the document. • In most portions beyond the introduction where the SSA is mentioned, they have a larger focus on non-SSA items, such as education. • There doesn't appear to be a discussion of how the SSA would influence changes to MDOT's efforts on planning, design, implementation, and/or maintenance.
Missouri	• MoDOT explicitly mentioned the SSA in a single paragraph near the beginning of the document. • It doesn't appear that the SSA elements are clearly referenced elsewhere in the document.
Ohio	• The only explicit mention of SSA is in the executive summary of the report. • There are SSA elements referred to elsewhere in the document, but the actions associated with those items appear to be very broad in nature.
Wisconsin	• WisDOT included a full, distinct section on how they applied the Safe System Approach. • WisDOT identified key deficiencies and countermeasures, but these elements don't always seem to align effectively (i.e. when the issue is unauthorized crossing, the top countermeasure shouldn't simply be more education or training).

State VRU Recommendations

This section discusses recommendations for how the states evaluated can better support vulnerable road users in the development of future Vulnerable Road User Safety Assessments and beyond.

Iowa (Iowa DOT)

- Engage more directly with community members and advocates, especially with populations from areas that are overrepresented in VRU crashes.
- Iowa DOT should identify existing strategies that are barriers to improving VRU safety.
- The Iowa DOT's report should focus less on methodology and more on the findings and should include more clarity about the findings.
- The Iowa DOT should include all classes of VRUs identified in the federal rule.

Kansas (KDOT)

- Engage more directly with the leaders of populations and areas of the state that are overrepresented in VRU crashes.
- Work to quickly implement portions of the updated active transportation plan.
- Inform local communities of the **Vulnerable Road User Safety Assessment Tool** and ways they can incorporate it into their traffic safety efforts.

Michigan (MDOT)

- MDOT's program of projects and strategies should address the changes needed to make VRU safety a key criteria in road project funding prioritization (e.g. implementation of Virginia's SMART SCALE program).
- MDOT should identify existing projects and strategies that are a barrier to improving VRU safety.

Missouri (MoDOT)

- MoDOT is already working to develop a new VRUSA; make it a point to engage with advocates and community members.
- Develop a statewide active transportation plan to guide priorities and investments for people who walk, use assistive mobility devices, bike, and/or ride public transit.
- Take steps to incorporate local plans and priorities into state work plans for the years ahead.

Ohio (ODOT)

- While ODOT's VRUSA includes action steps and performance measures, they need to define clear benchmarks and progress metrics to improve accountability.
- ODOT should incorporate user experience surveys to understand the practical impact of safety measures and to gather a fuller understanding of the obstacles and concerns of VRU's. This includes engaging populations of VRU's most impacted by serious and fatal crashes.

Wisconsin (WisDOT)

- WisDOT identified strategies within their VRUSA, but should elaborate on how these ideas could be implemented, including measures to gauge success.
- Work closely with municipalities and MPOs to create action plans for the identified corridors within the high-injury network.
- Audit internal crash vetting process to figure out why recommended remediation differs based on identified party at fault (i.e. when the pedestrian fails to yield, countermeasures lean toward enforcement and education vs when a driver fails to yield, countermeasures lean higher toward infrastructure).

Conclusion

The Vulnerable Road User Safety Assessment represents an important milestone in our nation's efforts to understand and address the pervasive issue of traffic violence. While each state DOT has approached this process differently, there are core elements which must be fulfilled. All of this work remains critical for the people who walk, roll, bike, and use public transportation on our roads.

In drafting this report, the contributors hope to strengthen the Federal Highway Administration's guidance on how state DOTs develop future iterations of this document. They also hope to use this as a tool to help transportation advocates across the country push their state DOTs to do more to protect road users, regardless of their preferred mode of transportation.

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