

SUMMARY REPORT ON REQUEST FOR INFORMATION (RFI):

# IMPROVING ROAD SAFETY FOR ALL USERS ON FEDERAL-AID PROJECTS



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

**ZERO** IS OUR GOAL  
A SAFE SYSTEM IS HOW WE GET THERE

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# ACRONYMS

|        |  |
|--------|--|
| AASHTO | American Association of State Highway and Transportation Officials |
| BIL    | Bipartisan Infrastructure Law                                      |
| CAP-X  | Capacity Analysis for Planning of Junctions                        |
| CDAT   | Crash Data Analysis Tool   |
| CFR    | Code of Federal Regulations  |
| CMF    | crash modification factor  |
| COG    | council of governments   |
| CRASH  | Crash Reduction Analysis System Hub                                |
| DDSA   | Data Driven Safety Analysis  |
| DOT    | department of transportation                                       |
| FAHP   | Federal-aid Highway Program  |
| FARS   | Fatality Analysis Reporting System                                 |
| FHWA   | Federal Highway Administration                                     |
| GIS    | Geographic Information System                                      |
| HSIP   | Highway Safety Improvement Program                                 |
| HSM    | Highway Safety Manual  |
| ICE    | Intersection Control Evaluation                                    |
| IHSDM  | Interactive Highway Safety Design Model                            |
| IIJA   | Infrastructure Investment and Jobs Act                             |
| ITE    | Institute of Transportation Engineers                              |
| LOSS   | Level of Service of Safety   |
| MPO    | metropolitan planning organization                                 |
| MUTCD  | Manual on Uniform Traffic Control Devices                          |
| NACTO  | National Association of City Transportation Officials              |
| NEPA   | National Environmental Policy Act                                  |
| NHS    | National Highway System  |
| NRSS   | National Roadway Safety Strategy                                   |
| RFI    | Request for Information  |

|             |  |
|-------------|--|
| ROW         | right-of-way   |
| RSA         | road safety audit  |
| SAFER       | Safety Assessment for Every Roadway  |
| SHIFT       | Strategic Highway Investment Formula for Tomorrow  |
| SHSP        | Strategic Highway Safety Plan  |
| SMART SCALE | System for the Management and Allocation of Resources for Transportation with key factors including improvements to Safety, Congestion reduction, Accessibility, Land use, Economic Development, and the Environment |
| SPF         | safety performance function  |
| SRI         | Safer Roads Index  |
| TSAP        | Traffic and Safety Analysis Procedures   |
| U.S.C.      | United States Code   |
| USDOT       | United States Department of Transportation   |
| 3R          | Resurfacing, Restoration, and Rehabilitation   |

## EXECUTIVE SUMMARY

Highway fatalities continue to remain one of the top causes of death in the United States—with 42,514 motor vehicle-related deaths in 2022 according to the National Highway Traffic Safety Administration.<sup>1</sup> The U.S. Department of Transportation’s *National Roadway Safety Strategy* (NRSS) provides a framework for eliminating fatalities and serious injuries on our roadways. The Federal Highway Administration’s (FHWA’s) *Moving to a Complete Streets Design Model: A Report to Congress on Opportunities and Challenges*, coupled with the NRSS, highlight commitments and strategies to address the national crisis of traffic fatalities and serious injuries by prioritizing safety in all investments and projects. The NRSS includes a commitment to the goal of achieving zero deaths and serious injuries on the Nation’s roadways. Funding provided by the Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law (BIL), provides an opportunity for FHWA to work with State, local, and Tribal partners to incorporate safety for all users into every federally-funded road project.

FHWA sought to understand how transportation agencies, stakeholders, and advocates alike could better work together to improve road safety for all users and achieve the goal of zero fatalities and serious injuries on the Nation’s roadways and published the *Improving Road Safety for All Users on Federal-Aid Projects Request for Information (RFI)* in the Federal Register (88 FR 7510). The RFI asked whether changes to the FHWA Design Standards regulation or other FHWA regulations are needed to facilitate the development of Complete Streets and Complete Networks that serve all users, how the safety performance of Federal-aid projects are being and should be assessed, and how to include measures that improve safety performance across Federal-aid projects.

The RFI asked 27 questions in six categories: 1) Improving Road Safety for All Users, 2) Design Standards for the National Highway System, 3) Safety Performance Assessment Applicability, 4) Conducting a Safety Performance Assessment, 5) Safety Performance Assessment Process Evaluation and Outcomes, and 6) Safety Performance Assessment Implementation Considerations.

This report summarizes the 1,030 individual RFI responses from 125 unique respondents and is organized by the six categories of questions. Though the respondents represented a variety of transportation agencies, organizations, and others, there were several key takeaways from the responses:

- **Updating and strengthening regulations:** Most respondents expressed interest in additional requirements for safety, though others noted they preferred flexibility and less

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<sup>1</sup> NHTSA, *Overview of Motor Vehicle Traffic Crashes in 2022*, Report No. DOT HS 813 560, April 2024. <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813560>

stringent requirements. Respondents identified opportunities to update 23 CFR Part 625, such as including an explicit statement that eliminating fatalities and serious injuries is the primary goal, adding the prioritization of safety for all users as a condition of Federal-Aid Highway Program (FAHP) Projects, and clarifying existing language such as “highest practical and feasible level of safety.”

- **Adopting additional publications:** Respondents provided suggested documents for inclusion within regulations governing the FAHP.
- **Making the inclusion of design features that provide safety benefits for all users the default:** Respondents stated that not enough is being done to address safety for all modes of travel. Some respondents recommend explicit requirements for multimodal infrastructure and safety improvements in FHWA’s design standards with allowance for a design exception process when such measures are not provided.
- **Supporting requirements and retaining flexibility for safety assessments on all projects:** Practices for assessing safety performance vary by State (e.g., types of projects, tools, and methods used)—and most States expressed a preference to retain flexibility in determining their safety assessment process. Respondents reported conducting post-implementation evaluations primarily on Highway Safety Improvement Program-funded projects. Respondents encouraged conducting safety assessments at the planning/project development and design stage. Advocacy and Industry groups supported additional requirements for safety assessments on all projects. Other respondents did not express opposition to additional requirements, as they believe their internal policies and processes meet the intent of the safety assessments.

# 1 Introduction

## 1.1 Background

Roadway fatalities continue to remain one of the top causes of death in the United States—with 42,514 motor vehicle-related deaths in 2022 according to the National Highway Traffic Safety Administration.<sup>2</sup> The U.S. Department of Transportation’s (USDOT’s) *National Roadway Safety Strategy* (NRSS) includes a commitment to the ambitious goal of zero deaths and serious injuries on the Nation’s roadways and provides a framework for achieving this goal by adopting the Safe System Approach. This approach recognizes that humans make mistakes and aims to create a transportation system that is forgiving of those mistakes. It focuses on designing roads and infrastructure to minimize the severity of crashes and protect all road users.

The NRSS recognizes the importance of considering safety in all investments and projects. USDOT acknowledges that safety should be considered in all transportation investments to make significant progress towards achieving safety goals. Every transportation project, regardless of its purpose, presents an opportunity to improve safety.

USDOT’s efforts align with provisions in the Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law (BIL). For example, Section 11206 of BIL requires States and metropolitan planning organizations (MPOs) to dedicate 2.5 percent of funding for planning and research to Complete Streets standards or policies. BIL defined “Complete Streets standards or policies” as “standards or policies that ensure the safe and adequate accommodation of all users of the transportation system, including pedestrians, bicyclists, public transportation users, children, older individuals, individuals with disabilities, motorists, and freight vehicles” (BIL § 11206(a)). The BIL provides an opportunity for the Federal Highway Administration (FHWA) to collaborate closely with State, local, and tribal partners to incorporate safety for all users into federally-funded road projects.

Following the enactment of BIL, FHWA published the 2022 *Moving to a Complete Streets Design Model: A Report to Congress on Opportunities and Challenges (Report to Congress)*.<sup>3</sup> With a thorough review of Federal rules, policies, and guidance related to Complete Streets, the report identified five areas of opportunity for FHWA to advance Complete Streets:

1. Improve data collection and analysis to advance safety for all users.
2. Support rigorous safety assessment during project development and design to help prioritize safety outcomes across all project types.

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<sup>2</sup> NHTSA, *Overview of Motor Vehicle Traffic Crashes in 2022*, Report No. DOT HS 813 560, April 2024. <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813560>

<sup>3</sup> FHWA, *Moving to a Complete Streets Design Model: A Report to Congress on Opportunities and Challenges*, March 2022. <https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-03/Complete%20Streets%20Report%20to%20Congress.pdf> (2022 Report to Congress).

3. Accelerate adoption of standards and guidance that promote safety and accessibility for all users and support innovation in design.
4. Reinforce the primacy of safety for all users in the interpretation of design standards, guidelines, and project review processes.
5. Make Complete Streets FHWA's default approach for funding and designing non-access-controlled roadways.

FHWA's Complete Streets approach aims to design and operate roadways to accommodate the needs of all users, including pedestrians, cyclists, motorists, and public transit riders of all ages and abilities. The concept recognizes that streets are not solely for the movement of vehicles but also serve as public spaces that should prioritize safety, accessibility, and mobility for all users.

A Complete Streets approach involves considering the needs of different modes of transportation and incorporating features such as sidewalks, bike lanes, crosswalks, bus stops, and traffic calming measures. It also emphasizes the integration of land use and transportation planning to create vibrant, livable communities. By providing safe and accessible options for walking, cycling, and using public transit, Complete Streets contribute to improving safety, reducing congestion, improving air quality, and enhancing the overall quality of life in communities.

Complete Streets policies and guidelines have been adopted by many States and jurisdictions across the United States and around the world. These policies help ensure that transportation projects and roadway designs consider the needs of all users and prioritize safety and accessibility. The number of transportation agencies at the State, local, and regional level with Complete Streets policies and projects has grown over the last decade.

FHWA sought to understand how transportation advocates, agencies, and stakeholders alike could better work together to improve road safety for all users and achieve the goal of zero fatalities and serious injuries on the Nation's roadways. There are several key areas that influence how transportation agencies can institutionalize efforts to improve road safety: funding, statutes and regulations, safety beyond roadways, design standards on the National Highway System (NHS), and data-driven safety assessments (DDSA).

### **1.1.1 Funding**

The Highway Safety Improvement Program (HSIP) is the core funding program for safety within the Federal-aid Highway Program. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads with a focus on performance (23 U.S.C. 148(c)(2)). However, the HSIP represents only about six percent of the total Federal-aid funding. Other Federal-aid formula funds can be used for safety improvements, but there is no prescribed process for incorporating safety into these projects.

### **1.1.2 Statutes and Regulations**

To address safety more broadly, there are specific requirements in Federal statutes and regulations. For example, section 109 of title 23 of the United States Code (U.S.C.) requires that each Federal-aid project provide facilities that are conducive to safety (23 U.S.C. 109(a)(1)) and

specifies that the Secretary must consider the Highway Safety Manual (HSM) in developing design criteria for the National Highway System (NHS) (23 U.S.C. 109(c)(2)(D)). Title 23, U.S.C. also includes requirements to consider the safety of all users through the planning process (see 23 U.S.C. 134(h)(1)(B), 135(d)(1)(B)). Additionally, part 625 of title 23 of the Code of Federal Regulations (CFR) (herein referred to as Part 625) provides design standards for highways and states that “an important goal of the FHWA is to provide the highest practical and feasible level of safety for people and property associated with the Nation’s highway transportation systems and to reduce highway hazards and the resulting number and severity of accidents on all the Nation’s highways” (23 CFR 625.2(c)).

### **1.1.3 Safety for All Users of the Transportation System**

USDOT and FHWA recognize the need to improve safety for pedestrians and bicyclists, as they make up a significant portion of roadway fatalities and are among the most vulnerable when using the transportation system. While FAHP funding is available to fund bicycle and pedestrian facilities, there is still a need to assess the impact of current policies, rules, and procedures on the safety of road users outside of automobiles. The *Report to Congress* proposed potential solutions, including issuing guidance to better consider safety for all users when interpreting and applying design standards, and increasing the assessment of safety outcomes across all types of Federal-aid projects.

### **1.1.4 Design Standards on the National Highway System**

FHWA’s design standards in Part 625 are primarily applicable to new construction, reconstruction, resurfacing, restoration, and rehabilitation projects on the NHS (23 CFR 625.3(a)). These standards incorporate many documents by reference, including the American Association of State Highway and Transportation Officials (AASHTO) publication, *A Policy on Geometric Design Highways and Streets* (Green Book), which provides a range of values that allow for flexibility in design (see 23 CFR 625.4). Overall, the FHWA’s design standards in Part 625 provide a framework for designing roads on the NHS, with flexibility to accommodate different contexts and needs.

In cases where the design standards cannot be met, FHWA or a State DOT may consider design exceptions in accordance with 23 CFR 625.3(b). FHWA administers the design exception process based on adopted controlling criteria<sup>4</sup> to focus on those criteria with the most direct link to safety and operational performance. This allows for flexibility in design to accommodate the context and vision of the community while still meeting the purpose of the project. FHWA’s 2022 *Report to Congress* identified the need to ensure that design standards are interpreted and applied in a way that considers the safety of all users.

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<sup>4</sup> FHWA, *Information: Revisions to the Controlling Criteria for Design and Documentation for Design Exceptions*, May 2016. <https://www.fhwa.dot.gov/design/standards/160505.cfm>

### **1.1.5 Data-Driven Safety Analysis (DDSA)**

FHWA and other agencies have developed evidence-based policies, procedures, and tools to assess and analyze the safety performance of transportation facilities and projects. These tools, policies, and procedures include the use of DDSA techniques that inform State DOTs' and local agencies' decision making and allow them to target investments that improve safety. DDSA involves the application of evidence-based tools and approaches to assess the future safety performance of existing or proposed transportation facilities. This includes, but is not limited to, the use of the HSM, which provides guidance on quantifying the potential effects of transportation investment decisions in terms of crash frequency and severity, and Road Safety Audits (RSAs), which are formal safety performance examinations of an existing or future road or intersection by an independent, multidisciplinary team.

Overall, the goal of these assessments is to use evidence-based approaches to inform transportation investment decisions and prioritize safety improvements that will contribute to reduced fatalities and serious injuries on the transportation system.

## **1.2 Overview of RFI**

There is still a need for more safety action and progress to address the concerning number of roadway fatalities and serious injuries in the U.S. On February 3, 2023, FHWA published the *Improving Road Safety for All Users on Federal-Aid Projects Request for Information* in the Federal Register to explore how to address these challenges (88 FR 7510).<sup>5</sup> The RFI requested information from stakeholders on how design standards can be improved to better prioritize safety for all road users, how to improve the interpretation and application of the standards to enhance safety for all users, and ways to increase the assessment of safety outcomes across all types of projects and improve consistency in the application of safety assessments.

FHWA accepted responses to the RFI between February 3, 2023, and March 20, 2023. FHWA sought information on the strategies, programmatic adjustments, or regulatory changes that could reduce the number of fatalities and serious injuries on U.S. roadways. The RFI asked questions regarding FHWA Design Standards regulations and other regulations needed to support Complete Streets and Complete Networks, how to assess the safety performance of Federal-aid projects, how to optimize funding for safety improvements, and what data are needed to improve safety performance across Federal-aid projects. For purposes of this RFI and as referenced throughout the questions, a safety performance assessment involves the application of analytical tools and techniques for quantifying the potential effects of transportation investment decisions in terms of crash frequency and severity, or a formal qualitative examination of safety performance such as an RSA.

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<sup>5</sup> FHWA, *Improving Road Safety for All Users on Federal-Aid Projects*, Document Citation 88 FR 7510, February 2023. <https://www.federalregister.gov/documents/2023/02/03/2023-02285/improving-road-safety-for-all-users-on-federal-aid-projects>



The RFI asked 27 questions over six topic areas: 1) Improving Road Safety for All Users, 2) Design Standards for the National Highway System, 3) Safety Performance Assessment Applicability, 4) Conducting a Safety Performance Assessment, 5) Safety Performance Assessment Process Evaluation and Outcomes, and 6) Safety Performance Assessment Implementation Considerations.

### **1.3 Purpose of this Report**

The RFI served as an opportunity for stakeholders to provide input on their capabilities, experiences, and unique challenges. This report serves as a summary of the responses to the RFI. One intended outcome for the RFI summary report is to identify opportunities to encourage States and other funding recipients to prioritize and address safety beyond the HSIP. The responses to the RFI will also assist FHWA in identifying strategies for improving safety performance across all Federal-aid projects.

This summary report synthesizes the responses regarding Federal statutes and regulations applicable to Federal-aid highways and projects, notably the requirements pertaining to safety. Most relevant to the RFI were 23 U.S.C 134, 135, 109, and 23 CFR part 625. These statutes and regulations include different requirements that impact—directly or indirectly—State and metropolitan planning organization (MPO) projects and policies, design guidance requirements, inclusion of other modes of transportation, and set out a specific goal of achieving the highest practical and feasible level of safety.

Another intended outcome of this RFI summary report is to provide insight into the tools, policies, and procedures transportation agencies are currently using to conduct safety performance analyses of existing projects and facilities. Respondents were asked to provide input on how safety performance should be assessed and potential measures that improve safety performance. The RFI responses will assist FHWA in considering future rulemaking, guidance, and other resources (i.e., case studies, informational briefs) that can assist agencies with improving safety for all users on Federal-aid projects.

It is important to note that the RFI was not intended to address traffic control devices, which are covered in the *Manual on Uniform Control Devices for Streets and Highways* (MUTCD).<sup>6</sup> While RFI respondents did provide information related to the MUTCD, it is not the subject of the RFI and therefore, this report does not provide a summary of the related responses.

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<sup>6</sup> USDOT. <https://mutcd.fhwa.dot.gov/>

## **1.4 Organization of the Report**

This report includes summaries of the six broad question areas, followed by key takeaways and supplemental information. The report is organized as follows:

- Section 2 – Summary Data on RFI Responses.
- Section 3 – Improving Road Safety for All Users.
- Section 4 – Design Standards for the NHS.
- Section 5 – Safety Performance Assessment Applicability.
- Section 6 – Conducting a Safety Performance Assessment.
- Section 7 – Safety Performance Assessment Process Evaluation and Outcomes.
- Section 8 – Safety Performance Assessment Implementation Considerations.
- Section 9 – Overarching Themes.
- Appendices – Supporting Information.

## 2 Summary Data on RFI Responses

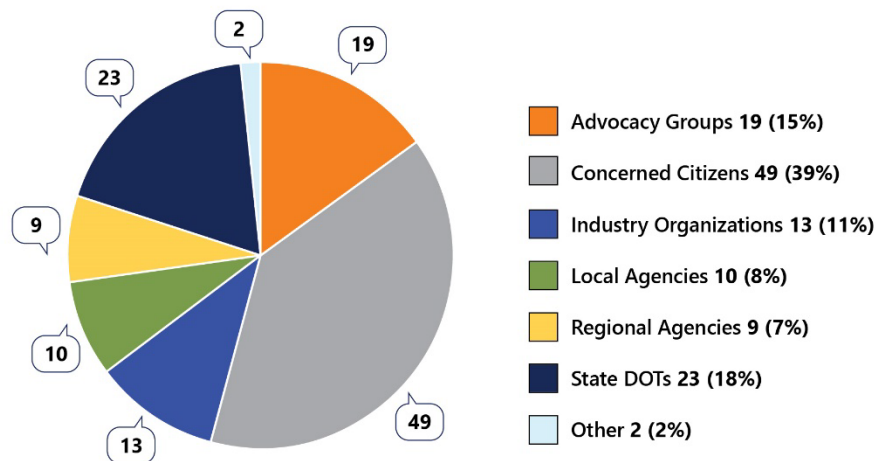
This chapter summarizes the data collected from the Improving Road Safety for All Road Users on Federal-Aid Projects RFI and focuses on respondents' organizations, responses by question, and response type.

### 2.1 Distribution of RFI Respondents by Organization

The RFI received a total of 1,030 individual responses. The various organization categories included:

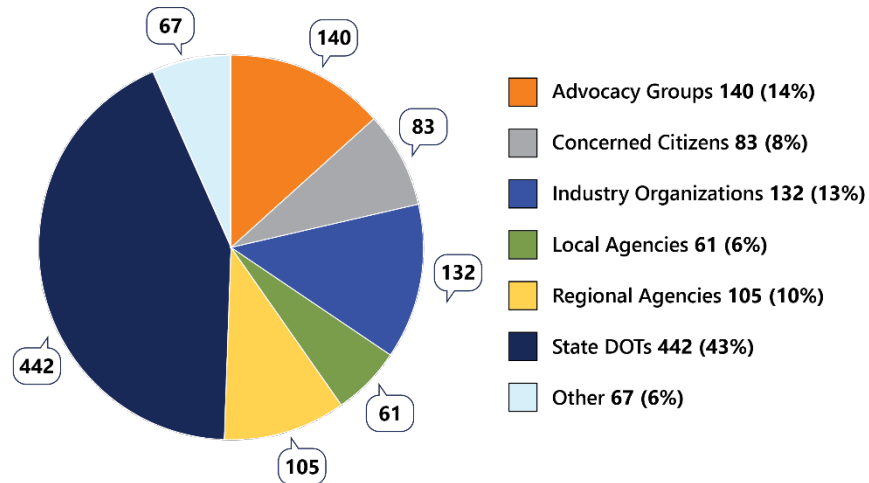
- **Advocacy:** Groups or individuals representing specific road user needs, grass roots groups, or that otherwise identify as an advocacy group.
- **Concerned Citizen:** Unaffiliated individuals.
- **Industry:** Groups related to advancing technical research, professional organizations, and other transportation-specific agencies.
- **Local:** Cities, towns, or other planning jurisdictions.
- **Other:** Individuals from consulting agencies and businesses.
- **Regional:** Regional transportation agencies, such as MPOs.
- **State:** State Departments of Transportation (DOTs).

There were 125 unique RFI respondents. Appendix A shows the category for each responding organization. Figure 1 shows the total number and percent of respondents by organization type. Concerned Citizens represented just under half of the respondents (39 percent), with State DOTs and Advocacy groups representing 18 percent and 15 percent, respectively.



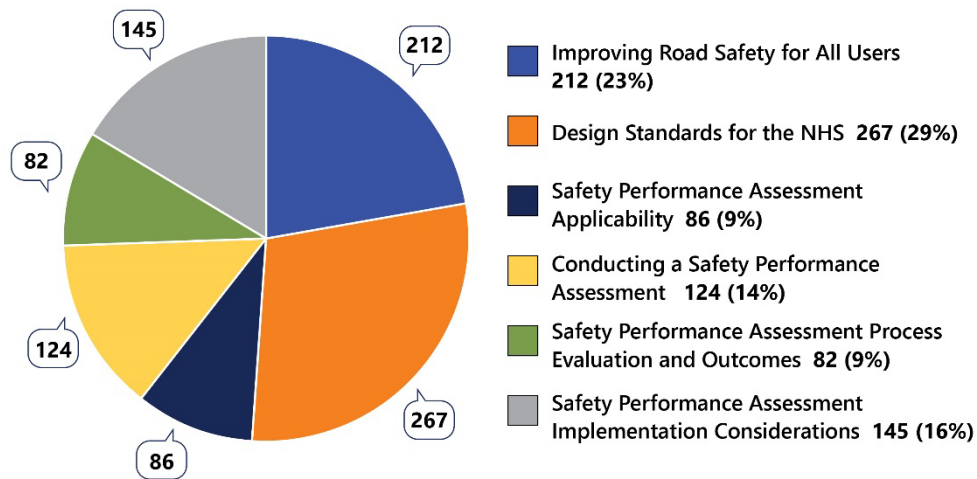
**Figure 1. Chart. Number of respondents by organization type.**

Figure 2 shows the total number and percent of responses received by organization type. The category of respondents with the greatest number of responses, representing almost half of received responses, was State DOTs (43 percent). Local agency responses represented the smallest number of responses (6 percent).



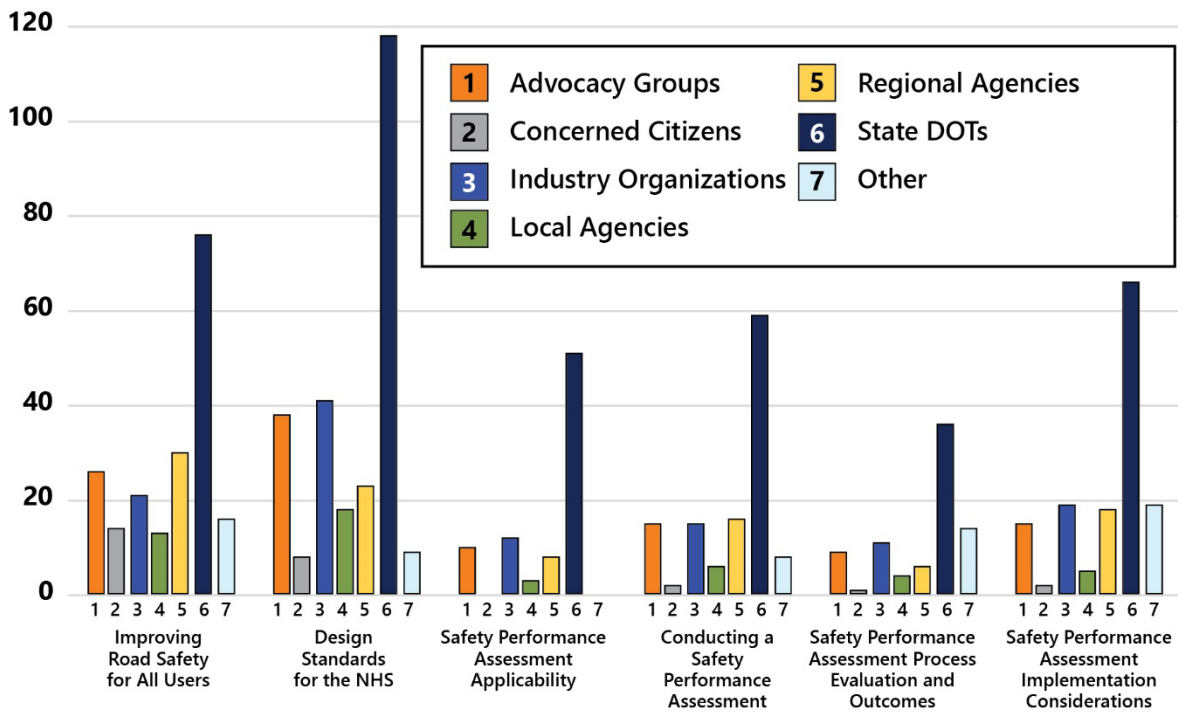
**Figure 2. Chart. Number and percent of RFI responses by organization type.**

Figure 3 illustrates the total number and percent of responses received per RFI topic area. "Design Standards for the NHS" received the most responses (267 responses), followed by "Improving Road Safety for All Users" (212 responses) and "Safety Performance Assessment Implementation Considerations" (145 responses). These three categories combined comprise two thirds of the total responses received. The RFI topic area of "Safety Performance Assessment Process Evaluation and Outcomes" received the least number of responses—82 of the total 1,030 responses.



**Figure 3. Chart. Number and percent of responses per RFI topic area.**

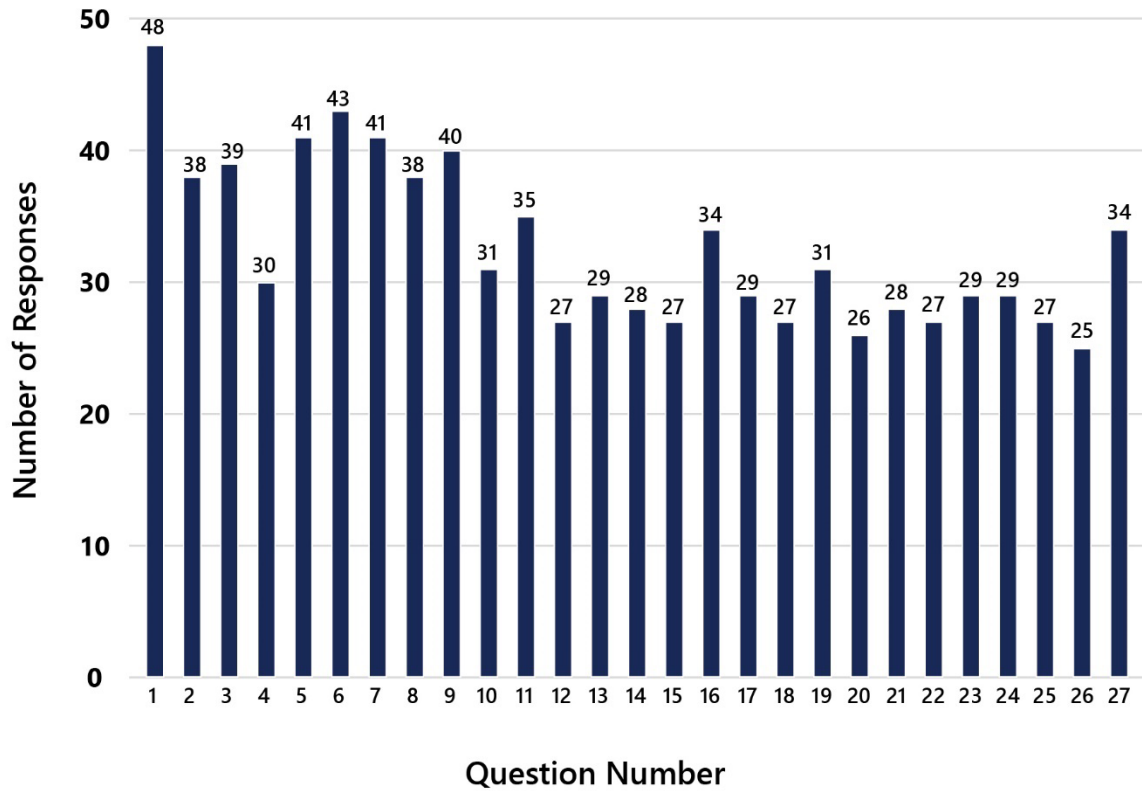
Figure 4 provides total responses received by topic area and organization. State DOTs provided more responses on “Designing Standards for the NHS”, followed by “Improving Road Safety for All Users.” Concerned Citizens followed a similar trend with most of their responses pertaining to “Improving Road Safety for All Users” and “Design Standards for the NHS.” The trends were similar among the other categories. Of note, respondents in the Other organization category focused primarily on “Safety Performance Assessment Implementation Considerations.” Regional organizations provided a similar number of responses across RFI question categories.



**Figure 4. Chart. Number of RFI responses received by organization type and RFI question topic area.**

## 2.2 Data on RFI Responses by Question

Appendix B provides the total number of responses by RFI question. There was a total of 27 RFI questions among six general question categories. Figure 5 offers a visual representation of the total number of responses. Question one, which asked what steps are being taken by the respondent or what steps are being taken by an agency the respondent is familiar with to improve safety for all roadway users, received the greatest number of responses. Questions 1-6 were generally the least technical questions and received the most responses overall. Question 26, a State-specific question, received the least number of responses. The number of responses per question ranged from 25 to 48. The average number of responses per question was approximately 32. The median number of responses was 31.

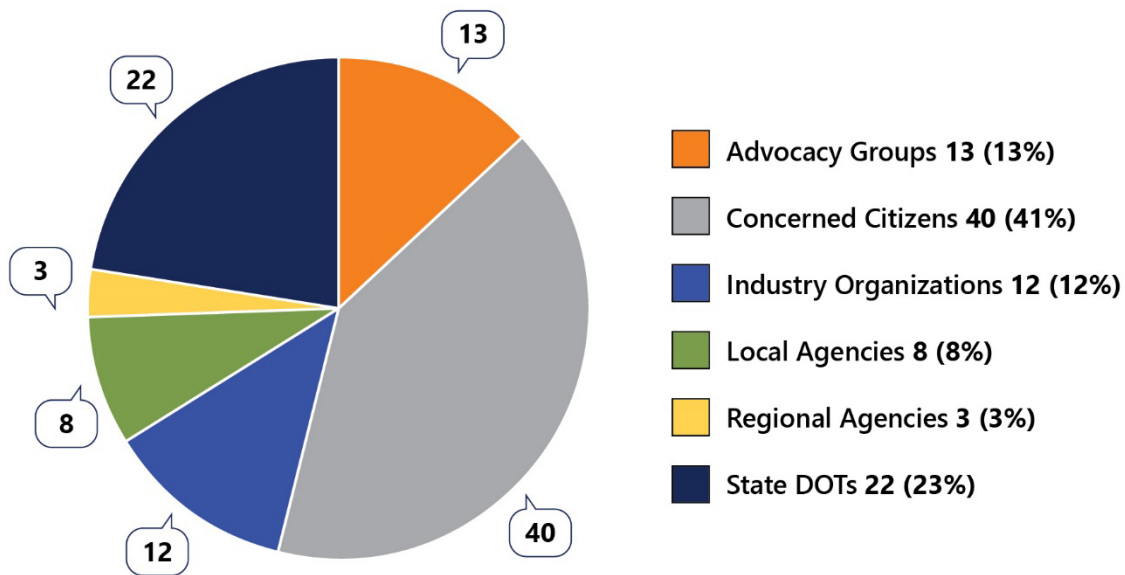


**Figure 5. Chart. Total number of responses per RFI question.**

### 2.3 Data on General RFI Responses

In addition to the 27 RFI questions, respondents were permitted to provide general responses, which are summarized in this section. There were 98 agencies, individuals, and groups that submitted general responses as parts of cover letters or general submissions. As previously noted, responses relating to the MUTCD are not included in this summary and were provided to the appropriate FHWA staff. This section provides data on the general responses as well as a summary of key themes.

Figure 6 below illustrates the percentage of responses by organization category. Concerned Citizens and States represented over 60 percent of responses received. Regional agencies provided the least amount of general feedback.



**Figure 6. Chart. Total number and percent of general responses by organization category.**

Respondents generally focused on three key themes. The first theme was transportation policies that contribute to increased fatalities and serious injuries among pedestrians, bicyclists, and others outside of vehicles. These general responses focused primarily on speed and speed setting approaches and encouraged FHWA to require agencies to adopt a Vision Zero goal.

The second theme was identifying specific roadway infrastructures and improvements that could result in reduced vulnerable road user fatalities and crashes. Respondents urged FHWA to encourage more widespread implementation of improved street lighting, midblock crossings, protected bicycle lanes, and increased sidewalk provisions.

The third theme focused on the need for more Federal funding for Complete Streets projects. Respondents urged FHWA to require Federal-aid projects to include provisions for the safety of all roadway users.

Table 1 further illustrates the key themes of the general responses by organization type.



**Table 1. Summary of general responses and themes by organization type.**

| Organization Type        | General Summary  |
|--------------------------|--|
| <b>Advocacy</b>          | <p>Most respondents suggested changes to policy to create safe streets. Additionally, several Advocacy groups emphasized the importance of reducing speeds.</p> <p>Over 40 percent of Advocacy groups mentioned general or specific opportunities to enhance the HSIP. Many Advocacy groups suggested the HSIP planning process could better incorporate a Safe System Approach.</p> |
| <b>Concerned Citizen</b> | <p>Many responses called for better bicycle facilities and better support for disabled or elderly pedestrians or both.</p>   |
| <b>Industry</b>          | <p>Many responses called for greater Federal funding restrictions so that funding for safety is not used for increasing motor vehicle capacity.</p>  |
| <b>Local</b>             | <p>Local agencies stated that the HSIP should incorporate a Safe System Approach and FHWA's regulations should add requirements for pedestrian and bicycle infrastructure.</p> <p>Local agencies also called for the creation of Federal standards for active transportation.</p>  |
| <b>Regional</b>          | <p>Regional agencies called for standardizing data collection practices for transportation safety to improve collaboration between municipalities.</p>   |
| <b>State</b>             | <p>State DOTs noted their preferences for consistent approaches to safety targets and reporting and greater flexibility in regulations. State DOTs further stated their preference for retaining the current regulations instead of imposing additional requirements.</p>  |

Many of these themes are explored in more detail as they relate to specific RFI questions in the following chapters.

## 3 Improving Road Safety for All Users

This chapter summarizes responses to Questions 1 through 5 of the RFI, which focused on improving safety for all users and included the following:

- What steps are being taken by your agency (if you are commenting on behalf of an agency) or an agency you are familiar with to improve safety for all roadway users, including pedestrians, bicyclists, public transportation users, children, older individuals, individuals with disabilities, motorists, and freight vehicles? How are equity and demographic data considered?
- For agencies that have adopted Complete Streets standards or policies (or similar policies), what benefits does your agency see in developing Complete Streets? Provide examples

and citations to relevant regulations, policies, procedures, performance measures, or other materials where possible.

- For agencies that have adopted Complete Streets standards or policies (or similar policies), what challenges has your agency experienced when implementing your Complete Streets policy?
- For agencies that have adopted Complete Streets standards or policies (or similar policies), but have not adopted an alternative classification system, how do you identify the appropriate context(s) for the application of a Complete Streets design model? Under what types of circumstances have you found the development of Complete Streets to be inappropriate?
- To inform decisions on street design, some agencies have adopted modal hierarchies, or alternative street classification systems, that prioritize pedestrians, bicyclists, or others on certain street types based on context. Has your agency incorporated such a hierarchy, or classification into agency policies, and if so, what benefits have been realized? Please provide a link to your documents for reference.

This section received 212 responses, with each of the five questions receiving between 30 and 48 responses. State DOTs were the primary respondents (39 percent), followed by regional agencies (15 percent).

The following sections summarize agency responses according to key themes and trends observed. The first section summarizes Question 1, which asked agencies how they are addressing safety generally. The second section summarizes Questions 2 and 3, which discussed the benefits and challenges of implementing Complete Streets policies and standards. The third section summarizes Questions 4 and 5, which asked how agencies are adapting Complete Streets policies to different roadway contexts, either through a classification system, modal hierarchies, or other strategies.

### **3.1 Agency Strategies to Improve Road Safety for All Users**

This section summarizes the responses to Question 1 in the RFI related to how agencies are improving safety for all roadway users, including pedestrians, bicyclists, public transportation users, children, older individuals, individuals with disabilities, motorists, and freight vehicles. The question also asked respondents to provide information on how they consider equity and demographic data.

Local and Regional agencies and State DOTs reported taking a variety of steps to address safety for all roadway users. The most mentioned steps include implementing Complete Streets policies, conducting RSAs, updating State Strategic Highway Safety Plans (SHSPs), prioritizing systemic safety projects, increasing outreach and community education programs, and implementing specific infrastructure changes to increase safety for all users. Generally, the actions reported in this section are categorized under several broad topic areas—Planning and Policy, Equity, Infrastructure and Design, and Education.

Table 2 illustrates the frequency of the responses by theme. The following sections provide more detail on the responses within each theme.

**Table 2. Summary of themes and response rate.**

| Themes of Strategy to Increase Safety | Number of Responses Mentioning Theme |
|---------------------------------------|--------------------------------------|
| Planning and Policy                   | 45                                   |
| Equity                                | 24                                   |
| Infrastructure and Design             | 28                                   |
| Education                             | 18                                   |

### 3.1.1 Planning and Policy Efforts

The most common topic from all respondents, regardless of agency type, was implementing plans and policies to improve safety for all users. Respondents mentioned a variety of policy strategies and plan types, but Complete Streets policies, plans, and projects were the most frequently mentioned. Local agencies and State DOTs reported adopting their own Complete Streets Policies, as well as developing their own guidebooks or manuals to guide implementation. For example, New Jersey DOT is updating its Complete Streets Policy to include a guide on best strategies for implementation called the *Comprehensive Solutions Approach Handbook – New Jersey Complete Streets Implementation Guide*<sup>7</sup>. The city of Philadelphia, Pennsylvania reported creating an Office of Complete Streets in 2017 that has now grown to nearly 20 staff members.

Local, State, Industry, and Regional respondents mentioned specific policies and design criteria to increase safety and accommodate pedestrians, bicyclists, public transportation users, and motorists. Examples of specific policies or strategies include the City of Denver's Complete Networks in *BluePrint Denver* that prioritizes pedestrians<sup>8</sup>; Georgia DOT's *Intersection Control Evaluation (ICE)* policy, which evaluates intersection design alternatives and considers safety goals and the needs of non-motorized users<sup>9</sup>; and the Greater Nashville Regional Council's decision to weigh safety as the most important goal in developing their Regional Transportation Plan.<sup>10</sup> Virginia DOT noted they adopted a *Policy for Integrating Bicycle and Pedestrian Accommodations*,<sup>11</sup> which states that the DOT will initiate all highway construction projects with the presumption that the projects shall accommodate bicycling and walking. AASHTO mentioned

<sup>7</sup> New Jersey DOT, *Complete Streets Design Guide*, 2017.

[https://www.nj.gov/transportation/eng/completestreets/pdf/NJCS\\_DesignGuide.pdf](https://www.nj.gov/transportation/eng/completestreets/pdf/NJCS_DesignGuide.pdf)

<sup>8</sup> City of Denver, *Blueprint Denver: A Blueprint for an Inclusive City*, April 2019.

[https://denvergov.org/files/assets/public/v/1/community-planning-and-development/documents/planning/blueprint-denver/blueprint\\_denver.pdf](https://denvergov.org/files/assets/public/v/1/community-planning-and-development/documents/planning/blueprint-denver/blueprint_denver.pdf)

<sup>9</sup> Georgia DOT, *Intersection Control Evaluation (ICE) Policy*, Policy 4A-5, April 2019.

<http://mydocs.dot.ga.gov/info/gdotpubs/Publications/4A-5.pdf>

<sup>10</sup> Greater Nashville Regional Council, *Middle Tennessee Connected Regional Transportation Plan 2021-2045*, February 2021. <https://www.gnrc.org/194/Regional-Transportation-Plan>

<sup>11</sup> Virginia DOT, *Policy for Integrating Bicycle and Pedestrian Accommodations*, March 2004.

[https://virginiadot.org/programs/resources/bike\\_ped\\_policy.pdf](https://virginiadot.org/programs/resources/bike_ped_policy.pdf)

that it is currently updating the *Green Book*. These policies allow agencies to create safer, more accessible, and more sustainable transportation networks. Regional agencies and State DOTs also reported using RSAs to assess the safety performance of existing road infrastructure and identify potential risks or deficiencies.

State DOTs noted using SHSPs to identify and prioritize safety improvements on roadways. This involves analyzing crash data and identifying high-risk areas or “hot spots” where crashes are more likely to occur. Based on this analysis, agencies develop strategies and action plans to address these high-risk areas and reduce the number and severity of crashes. The Kentucky Transportation Cabinet shared that their SHSP focuses on increasing safety for all users, with a focus on the emphasis areas of aggressive driving, distracted driving, impaired driving, occupant protection, roadway departure, and vulnerable road users.

State DOTs and Regional agencies commonly mentioned using the Safe System Approach when developing their Complete Streets policies. A Safe System Approach involves multiple layers of policy and planning changes, including planning and designing safe roads and roadsides, planning for safer speeds and promoting the use of safer vehicles and safer behaviors from users, and the involvement of multiple stakeholders or groups in safety strategies. ITE provided several examples of how they recommend State and local agencies design roadways with a Safe System Approach, including separating users in space and time, increasing attentiveness and awareness, reducing speeds, and reducing impact forces.

The Greater Nashville Regional Council stated that they use a Safe System Approach by treating safety planning as comprehensive and applying the approach at multiple levels with multiple stakeholders. The agency stated that it actively coordinates with multiple safety committees throughout the region to ensure a comprehensive and coordinated approach to safety that incorporates education, enforcement, planning, policy, and engineering.

Finally, Industry, State, Regional, and Local respondents reported creating Vision Zero programs, Comprehensive Safety Action Plans, or Pedestrian Safety Action Plans to address safety. Regional agencies and State DOTs shared their own work or the work of others in their jurisdictions, while Industry responses shared notable work of other local agencies and State DOTs. For example, the Denver Regional Council of Governments has adopted a plan titled *Taking Action on Vision Zero*, which has a toolkit for local governments to implement their own Vision Zero policies.<sup>12</sup> The City of Philadelphia also reported adoption of a Vision Zero Action Plan that prioritizes equity.<sup>13</sup> The Metropolitan Area Planning Agency and the San Diego Association of Governments reported that they have started working on Comprehensive Safety Action Plans, and the Mid-Ohio Regional

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<sup>12</sup> Denver Regional Council of Governments, *Taking Action on Regional Vision Zero*, June 2020.

[https://drcog.org/sites/default/files/Taking\\_Action\\_on\\_Regional\\_Vision\\_Zero\\_ADOPTED\\_061620.pdf](https://drcog.org/sites/default/files/Taking_Action_on_Regional_Vision_Zero_ADOPTED_061620.pdf)

<sup>13</sup> City of Philadelphia, *Vision Zero Action Plan 2025*, November 2020. <https://visionzerophl.com/wp-content/uploads/2023/03/Vision-Zero-Action-Plan-2025.pdf>

Planning Commission reported already adopting their own Comprehensive Safety Action Plan.<sup>14</sup> Examples of Pedestrian Safety Action Plans came from New York City DOT, South Carolina DOT, Texas DOT, and Virginia DOT.

### 3.1.2 Addressing Equity

State, Regional, and Local agencies responded that they are working to equitably distribute safety improvements across different neighborhoods and populations, considering the needs and priorities of marginalized and underserved communities. Respondents stated that they analyzed demographic data to identify disparities in safety outcomes, prioritizing interventions in areas with higher vulnerability or need, and collaborating with community groups and organizations to understand their specific safety concerns and involving them in the decision-making process.

Delaware DOT created a statewide map that identifies disadvantaged communities at the block group and residential levels, presents information on racial composition and household income, and then compares the data to the rest of the State. The intention is to use this map to identify vulnerable populations, inform transportation investment, and determine engagement or outreach needs.

Florida DOT mentioned their [Sociocultural Effects Tool](#), which helps them to identify vulnerable populations and how they might be affected by a transportation project.

For Local agencies, New York City and Portland stated that they consider equity in their transportation planning by analyzing demographic data. The Chicago Metropolitan Agency for Planning provided two examples of notable practices for Regional agencies. First, they incorporate equity into their transportation project prioritization by giving projects more weight if they are intended to serve minority communities. They also conducted an Equity in Transportation Fees study, which examined how transportation fees and fines can disproportionately burden low-income communities.<sup>15</sup>

Advocacy and Industry organizations made note of several groups of road users that are either overlooked or experience additional barriers to transportation access.

- The American Road and Transportation Builders Association focused on roadway worker fatalities, injuries, and exposure data.
- The National Safety Council emphasized that minority communities, especially Native American or Alaskan Native populations, often face disproportionate burdens due to

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<sup>14</sup> Mid-Ohio Regional Planning Commission, *Central Ohio Transportation Safety Plan 2019*.

<https://morpc.org/2023/wp-content/uploads/2023/02/Central-Ohio-Transportation-Safety-Plan-2019-web.pdf>

<sup>15</sup> CMAP, *Improving equity in transportation fees, fines, and fares: Findings and recommendations for northeastern Illinois*, April 2021.

[https://www.cmap.illinois.gov/documents/10180/1307930/FFF\\_final\\_report.pdf/1d74b660-c1c3-a2c0-dcb0-879d4493a499?t=1617741942903](https://www.cmap.illinois.gov/documents/10180/1307930/FFF_final_report.pdf/1d74b660-c1c3-a2c0-dcb0-879d4493a499?t=1617741942903)

inadequate transportation infrastructure (including transportation infrastructure that acts as a physical barrier) as well as higher than average traffic fatalities.

### **3.1.3 Infrastructure and Design**

State, Regional, and Local respondents reported working to improve infrastructure and design to address safety. Industry respondents provided their suggestions and resources for noteworthy practices in infrastructure and design. The improvements can take many forms, including:

- Designing roads to minimize the risk of injury in the event of a crash.
- Implementing countermeasures to reduce speeds or calm traffic and encourage motorists to comply with speed limits.
- Setting appropriate speed limits.
- Adding infrastructure to accommodate pedestrians and cyclists within the roadway corridor.
- Maintaining roadway infrastructure to minimize potential hazards.

Respondents mentioned a variety of infrastructure improvements, such as implementing traffic calming measures (e.g., speed bumps, roundabouts, traffic circles), installing pedestrian and bicyclist infrastructure (e.g., sidewalks, crosswalks, bike lanes, shared-use paths), and enhancing visibility and signage at intersections and crosswalks. Respondents also mentioned implementing traffic signal timing adjustments to prioritize pedestrian and bicyclist movements and reduce conflicts with vehicles and working to improve public transportation systems to increase accessibility for all and reduce the reliance on private vehicles.

### **3.1.4 Education**

State, Local, and Industry agencies stated that they have addressed safety through education and outreach, with many stating public education and awareness efforts are a key component of their safety work. These efforts included encouraging all roadway users to take responsibility for their actions and behaviors on the road, as well as encouraging the use of vehicles with advanced safety features and promoting vehicle maintenance.

Respondents reported using various strategies to reach the public and provide education on transportation safety. Examples included developing and launching public awareness campaigns to educate the general public about safe behaviors and practices on the road. These campaigns often focused on specific issues such as distracted driving, impaired driving, speeding, or pedestrian safety. Georgia DOT shared their state's use of the [\*Teens in the Driver's Seat Program\*](#) developed by Texas A&M University. The program is free and aims to educate young drivers about best safety practices and the specific risks that face teenage drivers.

To reach people in-person, respondents deployed public workshops or events to cover a specific safety topic, like how to properly use bicycle helmet, defensive driving, or noteworthy practices for child car seats. Agencies also collaborated with schools to implement safety education programs for students. These programs may include classroom instruction, interactive activities, and practical exercises to teach children about road safety rules, pedestrian and bicycle safety, and the

importance of wearing seat belts or bicycle helmets. Also related to schools, transportation agencies report working with driver education courses to update the course materials with noteworthy practices for safety.

## **3.2 Benefits and Challenges with Implementing Complete Streets Standards and Policies**

Questions 2 and 3 focused on implementing Complete Streets standards and policies.

### **3.2.1 Benefits to Implementing Complete Streets Policies**

Responses were generally positive when referring to Complete Streets policies. AASHTO shared in their response that 35 States and Puerto Rico have adopted Complete Streets policies. Out of the responses to this question, 10 State DOTs, 1 Regional agency, and 1 Local agency reported adopting their own Complete Streets policies, while other agencies mentioned implementing Complete Streets values into planning and design practices. Industry responses generally highlighted the benefits of Complete Streets and exemplary policies and plans around the country.<sup>16,17</sup> Advocacy agencies shared resources and fact sheets they developed to encourage the adoption of Complete Streets policies. Industry organization and State DOT respondents reported improvements to internal processes and project delivery, and benefits such as consistency between projects, clear guidance for developers and designers, logical terminus points for projects, and a focus on the safety of all road users. The National Complete Streets Coalition created tools and fact sheets to measure and document the benefits of Complete Streets policies. Other organizations—including the League of American Bicyclists, ITE, and Smart Growth America—recognized the importance of Complete Streets in creating safe and accessible transportation networks.

Overall, respondents stated Complete Streets policies offer a range of benefits that contribute to safer, more accessible, and more sustainable transportation networks. The most common benefits of Complete Streets implementation included improved safety, increased accessibility, economic benefits, and environmental sustainability. Other common themes include enhanced public health, improved quality of life, consistency and clarity in project delivery, and cost-effectiveness.

### **3.2.2 Challenges to Implementing Complete Streets Policies**

Respondent's challenges with Complete Streets implementation were consistent. The most noted challenges were with existing standards or priorities, increased need for coordination, physical and financial constraints, and challenges with marketing Complete Streets to stakeholders. Several Advocacy groups, Industry organizations, Local agencies, and State DOTs noted challenges in

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<sup>16</sup> City of Beverly Hills, *Beverly Hills Complete Streets Plan*, April 2021.

<https://beverlyhills.org/departments/publicworks/transportation/completestreets/>

<sup>17</sup> Northwest Council of Mayors, *Surface Transportation Program Handbook*, October 2023.

<https://www.nwmc-cog.org/transportation/northwest-council-of-mayors/current-program-and-methodology>



training staff, constrained right-of-way (ROW) and utility conflicts, resistance to change or to reducing vehicular capacity for pedestrian accommodations, challenges with winter maintenance and local matches, and accommodating freight.

### 3.2.3 Shared Benefits and Challenges

Questions 2 and 3 elicited responses with commonalities; however, sometimes a benefit for one agency was a challenge for another. Table 3 highlights the benefits and challenges that share common themes.

**Table 3. Shared benefits and challenges of Complete Streets implementation.**

| <b>Theme Area</b>                | <b>Benefits of Complete Streets</b>   | <b>Challenges of Complete Streets</b>  |
|----------------------------------|---|--|
| <b>Balancing Modes</b>           | Policies provide equal consideration to all modes of transportation.  | Balancing the needs of different road users and modes of transportation can be difficult.  |
| <b>Economic Development</b>      | Increased foot traffic to stores along corridor.  | Difficult to convince business owners to sacrifice street parking for Complete Streets infrastructure.   |
| <b>Funding</b>                   | Many Complete Streets improvements can be made affordably.  | Local matches are often hard to procure. Maintenance of Complete Streets facilities often falls on local jurisdictions, which is a cost burden. Incorporating Complete Streets policies may be costly. |
| <b>Goals and Priorities</b>      | Complete Streets creates common goals and priorities for transportation agencies.   | Complete Streets priorities and goals can conflict with the priorities of State or local agencies.   |
| <b>Implementation</b>            | Complete Streets policies create a common goal or mission that can help prioritize project funding and lead roadway design. | The enforcement of Complete Streets policies can vary by jurisdiction.   |
| <b>Inter-agency Coordination</b> | Easier to coordinate projects under a common policy or mission.   | Often a heavy lift to get municipal, county, regional, and State agencies on the same page about Complete Streets policies. One may conflict with the other.   |
| <b>Project Delivery</b>          | Easier to deliver projects or extend them to meet Complete Streets goals.   | Adhering to Complete Streets policies has impacts on project schedules.  |
| <b>Public Opinion</b>            | Successfully implemented Complete Streets projects contribute to improved quality of life and community health.             | Initial resistance from public to give up space for vehicles in exchange for space for pedestrians or bicyclists.  |



| Theme Area | Benefits of Complete Streets  | Challenges of Complete Streets   |
|------------|---|--|
| <b>ROW</b> | Policies create more dedicated space for pedestrians and bicyclists in ROW. | Limited ROW sometimes can be a barrier to implementing Complete Streets infrastructure like bike lanes or sidewalks. |

### 3.3 Contextually Sensitive Design Strategies for Complete Streets Implementation

Due to the commonalities in Questions 4 and 5, the responses were grouped into similar trends: Alternatives to Context Classification Systems, Context Classification Systems and Modal Hierarchies, and Where Complete Streets Policies are Inappropriate. The following sections provide an overview of those trends.

#### 3.3.1 Identifying Appropriate Contexts for Complete Streets Without an Alternative Classification System

Regional agency and State DOT respondents that have not adopted a context classification system mentioned several methods for identifying the appropriate context for the application of a Complete Streets design. Examples included using a multi-disciplinary and collaborative approach, considering factors such as land use, functional classification, local or regional plans, and input from stakeholders and the community. These approaches also included analyzing the existing conditions of the roadway, such as traffic volumes, speeds, and crash data. Regional agencies and State DOTs also commented that they considered the needs and demands of different modes of transportation, including pedestrians, bicyclists, and transit users. The Mid-Ohio Regional Planning Organization stated that it has developed an [interactive web map](#) as part of their *Active Transportation Plan*<sup>18</sup> that practitioners can use to view relevant data about roadways that will help them determine the designs of Complete Streets improvements. Virginia DOT reported that they rely heavily on locally-adopted plans to inform the appropriate Complete Streets improvements, as well as surrounding land uses. Some State DOTs, such as South Carolina DOT and Caltrans, reported relying heavily on existing guidelines and standards, such as the AASHTO *Green Book*, to inform their design choices. These guidelines provide general design principles and recommendations that can be applied to different contexts. Ultimately, the determination of design choices without an alternative classification system may involve a combination of data analysis, stakeholder input, and reference to existing guidelines, plans, and standards. Respondents asserted that each project should be evaluated on a case-by-case basis to determine the most appropriate design elements.

#### 3.3.2 Where Complete Streets May not be Appropriate

Regional agencies and State DOTs shared that there have been a few situations where they found Complete Streets policies to not be appropriate. Some examples given include freeways and

<sup>18</sup> MORPC, 2021. <https://www.morpc.org/programs-services/active-transportation-plan/>

expressways where pedestrians and bicycles are prohibited, very rural agricultural settings with low demand for non-motorized transportation, and areas where safety would be compromised by implementing Complete Streets elements. New Jersey DOT provided a list of additional projects that they argued cannot accommodate Complete Streets improvements, including rockfall mitigation, guiderail replacement, bridge scour, horizontal curve signing, sign structure replacement, Intelligent Transportation Systems installation, and concrete pavement repair. Respondents stated that agencies should also consider other factors such as excessive cost, lack of need or demand, excessive maintenance requirements, and environmental or social impacts when determining the appropriateness of Complete Streets.

### **3.3.3 Benefits of Modal Hierarchies and Alternative Classification Systems**

Regional and Local agencies and State DOTs shared that they have adopted modal hierarchies or alternative street classification systems to guide decision making and prioritize different modes of transportation based on context and user needs. Modal hierarchies typically rank streets based on the type of service provided to different modes, such as pedestrians, bicyclists, transit users, and motorists. Traditional street classification systems prioritize motor vehicle movement and speed, while alternative street classification approaches depart from that approach. Four of the 19 State DOTs that responded to this question stated that they had developed alternative classification systems or modal hierarchies. Of the three Local responses, two agencies adopted modal hierarchies and one adopted an alternative classification system. Of the seven regional responses to this question, the Denver Regional Council of Governments stated that they had adopted an alternative classification system.<sup>19</sup> Industry responses shared other practices from member State or local agencies. The Chicago Metropolitan Agency for Planning and Omaha-Council Bluffs Metropolitan Area Planning Agency highlighted local examples of these practices within their jurisdictions.<sup>20,21</sup>

State DOTs and Local agency respondents noted many benefits to adopting modal hierarchies and alternative classification systems. The first benefit was increased safety. By considering the context and characteristics of different streets and roadways, modal hierarchies and alternative street classification systems can help determine appropriate speed limits and design features that improve safety for all users. Additionally, respondents stated that modal hierarchies and alternative street classification systems prioritize the needs and safety of pedestrians, bicyclists, and public transit users, creating a more equitable transportation system.

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<sup>19</sup> DRCOG, *Regional Complete Streets Toolkit*, October 2021. [drcog.org/sites/default/files/resources/TPO-RP-COMPLETESTREETS.pdf](https://drcog.org/sites/default/files/resources/TPO-RP-COMPLETESTREETS.pdf)

<sup>20</sup> Chicago DOT, *Complete Streets Chicago*, 2013. <https://40f4ba.a2cdn1.secureserver.net/wp-content/uploads/2016/02/Complete%20Streets%20Design%20Guidelines.pdf>

<sup>21</sup> City of Omaha, *Complete Streets Design Guide*, August 2019. [https://publicworks.cityofomaha.org/images/19-08-01\\_TFTC\\_Omaha\\_Complete\\_Streets\\_Design\\_Guide\\_AUGUST.pdf](https://publicworks.cityofomaha.org/images/19-08-01_TFTC_Omaha_Complete_Streets_Design_Guide_AUGUST.pdf)

Florida DOT listed the following specific benefits:

- A common language for describing context that can be used by all disciplines involved in a transportation project and the operation of the transportation system.
- The creation of context-based criteria to establish roadways that fit well in communities.
- A more useful way to assess safety problems and impacts by tying roadway geometry to land development contexts, which can then be overlaid with crash data.
- A more useful way to target safety interventions, using context classifications to help identify opportunities for proactive safety interventions.

The City of Omaha, Nebraska also shared that it found a benefit of a modal hierarchy to be consistency in communication between all parties involved in a project, all the way through the project development process.

State DOT and Local agency respondents provided examples of their own work adopting modal hierarchies and alternative classification systems, and several Industry responses highlighted the work of other agencies. Table 4 summarizes the common State examples that were shared.

**Table 4. Examples of modal hierarchies or alternative classification systems.**

| Agency                   | Modal Hierarchy or Alternative Classification System | Approach   |
|--------------------------|--|--|
| Chicago DOT              | Modal Hierarchy                                      | Developed a pedestrian-first modal hierarchy. <sup>22</sup>  |
| City of Boston, MA       | Alternative Classification System                    | Developed <i>Complete Streets Design Guidelines</i> that include a street classification system based on users and land use context. <sup>23</sup>       |
| City of Omaha, NE        | Modal Hierarchy                                      | Developed a <i>Complete Streets Design Guide</i> that includes a modal hierarchy that prioritizes vulnerable road users in some contexts. <sup>24</sup>  |
| City of Philadelphia, PA | Modal Hierarchy                                      | Has a <i>Strategic Transportation Plan</i> that includes a Transit First policy and prioritizes mass transit in its transportation system. <sup>25</sup> |

<sup>22</sup> Chicago DOT, *Complete Streets Chicago*, 2013. <https://40f4ba.a2cdn1.secureserver.net/wp-content/uploads/2016/02/Complete%20Streets%20Design%20Guidelines.pdf>

<sup>23</sup> City of Boston, *Boston Complete Streets Guidelines*, May 2013.

[https://www.boston.gov/sites/default/files/file/2019/12/BCS\\_Guidelines.pdf](https://www.boston.gov/sites/default/files/file/2019/12/BCS_Guidelines.pdf)

<sup>24</sup> City of Omaha, *Complete Streets Design Guide*, August 2019. [https://publicworks.cityofomaha.org/images/19-08-01\\_TFTC\\_Omaha\\_Complete\\_Streets\\_Design\\_Guide\\_AUGUST.pdf](https://publicworks.cityofomaha.org/images/19-08-01_TFTC_Omaha_Complete_Streets_Design_Guide_AUGUST.pdf)

<sup>25</sup> City of Philadelphia, *Connect: Philadelphia's Strategic Transportation Plan*, October 2018.

<https://www.phila.gov/documents/connect-philadelphias-strategic-transportation-plan/>

| Agency                    | Modal Hierarchy or Alternative Classification System | Approach  |
|---------------------------|--|---|
| City of Poughkeepsie, NY  | Alternative Classification System                    | Suggested its system to be incorporated into the City's zoning update. <sup>26</sup>  |
| City of Rochester, NY     | Alternative Classification System                    | Developed a <i>Street Design Guide</i> , which contains nine street categories that align with the City's Comprehensive Plan. <sup>27</sup>   |
| City of San Francisco, CA | Alternative Classification System                    | Has a <i>Better Streets Plan</i> that includes a street classification system based on users and land use context. <sup>28</sup>  |
| City of Seattle, WA       | Alternative Classification System                    | Created a <i>Streets Illustrated</i> guide that includes a curbside prioritization policy specifying how curbside lane space is assigned based on land use and mode of transportation. <sup>29</sup>                                |
| Denver Regional COG       | Alternative Classification System                    | Created the <i>Regional Complete Streets Toolkit</i> which includes a multimodal street typology to improve upon traditional classification systems. Modal priorities differ by street type according to the Toolkit. <sup>30</sup> |
| Florida DOT               | Alternative Classification System                    | Created a <i>Context Classification Guide</i> based on its Complete Streets principles and requires collaboration across disciplines to set target speeds depending on roadway context. <sup>31</sup>                               |
| Minnesota DOT             | Modal Hierarchy                                      | Implemented a Complete Streets Policy that includes transportation hierarchy based on expected volume, injury prevention, and land use context. <sup>32</sup>   |

<sup>26</sup> City of Poughkeepsie, *PK4Keeps Final Comprehensive Plan*, September 2022. <https://www.pk4keeps.org/>

<sup>27</sup> City of Rochester, *Street Design Guide*, April 2019. [https://www.gtcmpto.org/sites/default/files/plans-studies/rochester\\_camp-streetdesignguide\\_0.pdf](https://www.gtcmpto.org/sites/default/files/plans-studies/rochester_camp-streetdesignguide_0.pdf)

<sup>28</sup> City of San Francisco, *Better Streets Plan*, December 2010. <https://sfplanning.org/resource/better-streets-plan>

<sup>29</sup> Seattle DOT, *Streets Illustrated*, n.d.. <https://streetsillustrated.seattle.gov/overview/complete-streets/>

<sup>30</sup> Denver Regional COG, *Regional Complete Streets Toolkit*, October 2021.

<https://drcog.org/sites/default/files/resources/TPO-RP-COMPLETESTREETS.pdf>

<sup>31</sup> Florida, DOT, *FDOT Context Classification Guide*, July 2020.

<https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/roadway/completestreets/files/fdot-context-classification.pdf>

<sup>32</sup> Minnesota DOT, *Complete Streets*, October 2022. <https://www.dot.state.mn.us/complete-streets/policy.html>

| Agency                            | Modal Hierarchy or Alternative Classification System | Approach   |
|-----------------------------------|--|--|
| New York City DOT                 | Alternative Classification System                    | Used anticipated pedestrian volumes to designate street categories and determine pedestrian infrastructure needs. <sup>33</sup>      |
| Portland Bureau of Transportation | Alternative Classification System                    | Has a simplified speed limit matrix for fatal crash reduction based on roadway context. <sup>34</sup>                                |
| Washington State DOT              | Alternative Classification System                    | Developed an Injury Minimization and Speed Management Policy that includes suggestions for context-based speed limits. <sup>35</sup> |

### 3.4 Key Takeaways

The following are key takeaways from RFI questions regarding current practices related to improving road safety for all users:

- Respondents most mentioned implementing Complete Streets policies, plans, and projects. Many State DOTs and Local agencies reported adopting their own Complete Streets policies and policy material. Commonly reported infrastructure improvements included implementing traffic calming measures and enhancing active transportation infrastructure.
- To address equity within road safety, most agencies reported using updated demographic data to identify disparities in safety outcomes and involving a diverse range of stakeholders in the decision-making process.
- Industry organizations, State DOTs, and Local agency respondents concurred that public education and outreach is a key practice in improving safety outcomes.
- The most reported benefits of implementing Complete Streets standards and policies included improved safety outcomes, greater environmental, economic, and accessibility benefits, and improved internal processes.
- The most reported challenges included financial constraints, coordination, and conflicts with existing standards and priorities.

<sup>33</sup> New York City DOT, *Pedestrian Mobility Plan*, n.d.

<https://www.nyc.gov/html/dot/html/pedestrians/pedestrian-mobility.shtml>

<sup>34</sup> Portland Bureau of Transportation, *City of Portland's Proposed Speed Zone Review Methodology*, July 2016.

[https://bikeportland.org/wp-content/uploads/2016/08/PDX\\_AlternativeSpeedZone\\_packet-2.pdf](https://bikeportland.org/wp-content/uploads/2016/08/PDX_AlternativeSpeedZone_packet-2.pdf)

<sup>35</sup> Washington State DOT, *Washington State Injury Minimization and Speed Management Policy*, October 2020.

<https://wsdot.wa.gov/sites/default/files/2021-10/InjuryMinimization-SpeedManagement-PolicyElements-Recommendations.pdf>

## 4 Design Standards for Highways

This chapter pertains to Questions 6 through 12 of the RFI, which asked for thoughts on the design standards for highways regulation at part 625 of Title 23 CFR and other recommended changes to Title 23, CFR. The questions asked were:

- How could the FHWA regulations governing Design Standards for Highways (Part 625) be revised to consistently support prioritization of the safety of all users across all project types?
- What changes to other FHWA regulations codified at Title 23, CFR are needed to equitably improve safety for people of all ages and abilities who use urban and suburban streets?
- What changes to other FHWA regulations codified at Title 23, CFR are needed to equitably improve safety for people of all ages and abilities who use rural roadways, including in rural towns?
- What, if any, elements of design are not adequately covered by the existing design standards in Part 625?
- What specific provisions of Part 625 present an obstacle to equitably improving safety for people outside of vehicles, and why?
- Are there additional documents that FHWA should incorporate by reference in Part 625 to better facilitate the context-sensitive design of streets that safely serve all users? Please identify the documents and describe why they should be referenced in the regulation.
- Does Part 625 create any impediments to developing projects that meet the goals of your agency? If so, what goals are impeded, what are the impediments, and how would you suggest the regulation be revised?

These questions received 267 responses, with each of the 7 questions receiving between 27 and 43 responses. State DOTs represented the largest response group at 46 percent. Industry and Advocacy organizations were the next closest at 15 percent, respectively.

Because these questions deal directly with potential regulatory changes, responses are not summarized in this report. The responses received are under consideration by FHWA. Respondents suggested changes to specific regulatory language and made high-level suggestions for things to consider when referencing documents in Part 625. Responses submitted to these and other questions posed in this RFI are available in the docket at <https://www.regulations.gov/document/FHWA-2021-0011-0001>.

# 5 Safety Performance Assessment

## Applicability

This chapter focuses on Questions 13 through 15 of the RFI, which focused on safety performance assessments and included the following:

- For which current projects (i.e., by improvement type, funding program/level, facility type, etc.) are safety performance assessments or analyses conducted in your State?
- To what extent is the safety performance assessed on non-HSIP funded projects?
- What policies or procedures on conducting project-specific safety performance assessments and analyses does your agency have? Provide examples and citations to relevant laws, regulations, policies, procedures, or other materials where possible.

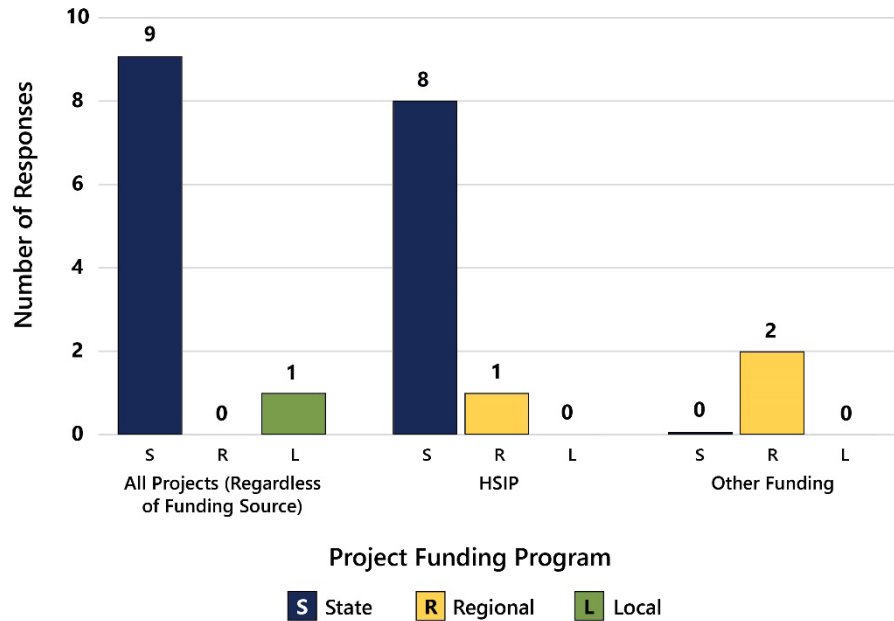
This section received 86 responses, with each of the three questions receiving between 27 and 29 responses.

Local and Regional agencies and State DOTs were the primary respondents for Questions 13 through 15. Some responses from Advocacy groups and Industry organizations were provided as well. While some responses did not address specific questions put forth by the RFI, they were categorized under this topic due to the nature of the information provided.

### 5.1 Projects Incorporating Safety Performance Assessments

This section summarizes responses to RFI Question 13. In this question, respondents provided information on the types of projects for which safety performance assessments are conducted. Responses varied across agencies, with respondents reporting differences by funding source, facility type, or improvement type. Most reported was conducting safety performance assessments on all projects, regardless of funding source (as illustrated in figure 7). California DOT, Florida DOT, Kentucky Transportation Cabinet, Massachusetts DOT, Michigan DOT, Missouri DOT, South Dakota DOT, Texas DOT, and Virginia DOT noted they conduct safety performance assessments to some degree on all projects, regardless of funding source.

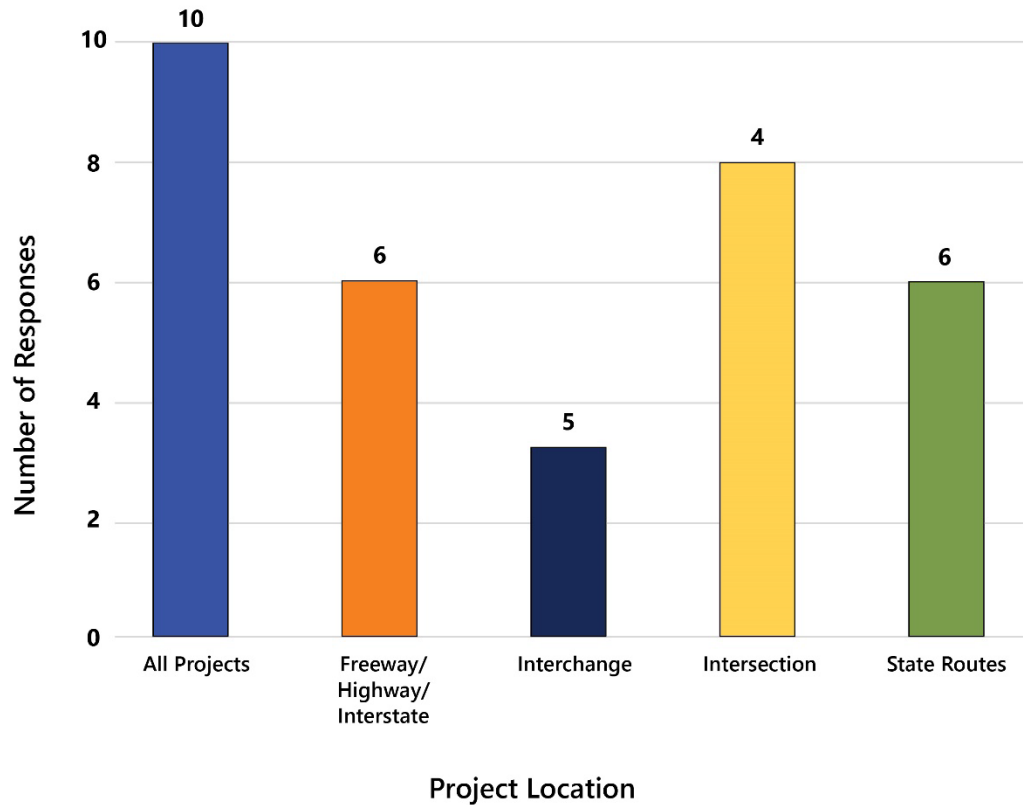
Advocacy groups and Regional agencies supported standardized guidance from FHWA on how to conduct these assessments, while some State DOTs suggested they prefer the freedom to determine the appropriate safety assessment methods by project. Another distinction between responses is smaller entities like Advocacy groups and Regional agencies reported feeling like not enough is being done to assess safety performance on projects (specifically concerning non-motorist safety).



**Figure 7. Chart. Respondents conducting safety performance assessments by funding program.**

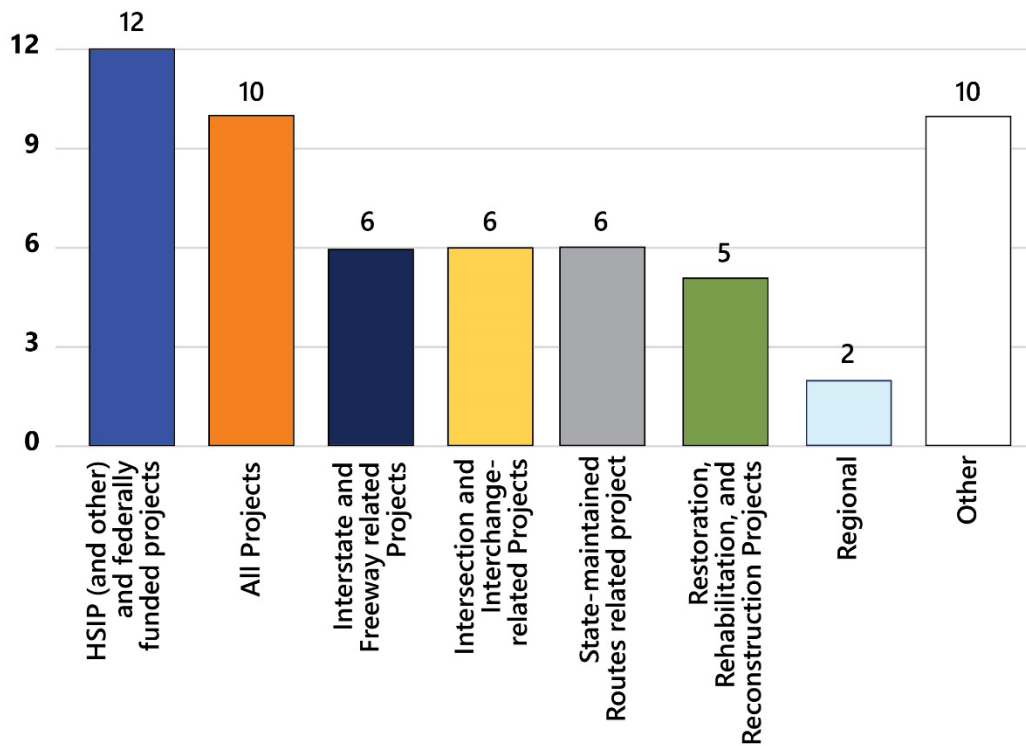
Respondents commonly cited conducting safety performance assessments for a variety of projects by facility type (as illustrated in figure 8). Examples included highways, freeways, interstates, interchanges, intersections, and State route projects. State DOTs reported conducting safety performance assessments on diverse types of improvement projects including innovative intersection installation, road widening, and signal installation. In addition to project types, some respondents provided the extent to which these safety performance assessments are conducted (e.g., specific mentions of procedures, methodologies, tools), while others simply stated the project type.





**Figure 8. Chart. Respondents conducting safety performance assessments by project location.**

Figure 9 presents a summary table of safety performance assessment practices reported by agencies. Agencies provided diverse examples of the projects for which safety performance is assessed in their State, and to what extent these assessments are made. Respondents most reported conducting assessments on HSIP projects, in accordance with 23 CFR 924.13. Other common practices included conducting safety performance assessments on intersection projects and interstate and State-maintained projects.



**Figure 9. Chart. Respondents conducting safety performance assessments by project type.**

## 5.2 Safety Performance Assessments for Non-HSIP Funded Projects

This section summarizes responses to RFI Question 14. Responses to this question outlined the extent to which their agency is conducting safety performance assessments for non-HSIP funded projects. Of those agencies that reported assessing safety performance on non-HSIP funded projects, most reported using in-house procedures, methods, and guidance. Therefore, the responses to this question varied greatly by respondent. In-house tools include Illinois DOT’s *Safer Road Index Ratings and Safety Tiers*<sup>36</sup>, Kentucky Transportation Cabinet’s *Strategic Highway Investment Formula for Tomorrow (SHIFT)*<sup>37</sup>, Texas DOT’s *Safety Scoring Tool*,<sup>38</sup> Missouri DOT’s

<sup>36</sup> Illinois DOT, Safer Road Index (SRI) Ratings and Safety Tiers, n.d. <https://idot.illinois.gov/transportation-system/transportation-safety/roadway-safety/engineering/sri.html>

<sup>37</sup> Kentucky Transportation Cabinet, *Strategic Highway Investment Formula for Tomorrow (SHIFT)*, n.d. <https://transportation.ky.gov/SHIFT/Pages/default.aspx>

<sup>38</sup> Texas DOT, *Safer by Design*, n.d. <https://www.txdot.gov/business/resources/safer-by-design.html#:~:text=TxDOT%20and%20Texas%20A%26M%20Transportation,into%20the%20roadway%20design%20process>

*Safety Assessment For Every Roadway (SAFER)*<sup>39</sup> tool, and Virginia DOT’s *Safety, Congestion, Accessibility, Land Use, Economic Development, and Environment (SMART SCALE)*<sup>40</sup> process.

There were commonalities in the reported procedures for safety performance assessments for non-HSIP projects. Commonly reported procedures involving used HSM methods, DDSA guidance, and RSAs. Responses suggest the extent to which these assessments are conducted for non-HSIP funded projects vary based on project objectives. Several respondents stated safety performance assessments are conducted for all projects regardless of funding source and to the same extent.

Table 5 summarizes examples of safety performance assessments for non-HSIP funded projects that were reported by agencies. Agencies provided diverse examples of the non-HSIP funded projects for which safety performance is assessed in their State, and to what extent these assessments are made on such projects.

**Table 5. State example safety performance assessments for non-HSIP funded projects.**

| Agency                   | Extent of Safety Performance Assessment for Non-HSIP Funded Projects   |
|--------------------------|--|
| <b>Alaska DOT</b>        | Considers crash history on all projects regardless of funding source, but without any formal/standard process for safety performance assessments.  |
| <b>California DOT</b>    | Uses HSM methods for safety performance assessments on non-HSIP funded projects, but states HSM does not have methods for all facility types addressing all road users. Requires HSM-based assessment for all projects regardless of funding source. |
| <b>Centre County MPO</b> | Regularly discusses and recognizes the importance of safety performance assessments for non-HSIP funded projects but cannot always pursue due to limited funding.  |
| <b>City of Portland</b>  | Assesses safety performance on all projects, although extent not stated.   |
| <b>Delaware DOT</b>      | Often performs qualitative assessments to some extent for non-HSIP projects, but not quantitative.   |
| <b>Florida DOT</b>       | Conducts safety performance assessments on non-HSIP projects that qualify under FDOT policy.   |

<sup>39</sup> Missouri DOT, *Safety Assessment for Every Roadway (SAFER)*, September 2023.

[https://epg.modot.org/index.php/907.9\\_Safety\\_Assessment\\_For\\_Every\\_Roadway\\_\(SAFER\)](https://epg.modot.org/index.php/907.9_Safety_Assessment_For_Every_Roadway_(SAFER))

<sup>40</sup> Virginia DOT, *SMART SCALE*, n.d. <https://www.smartscale.org/>

| <b>Agency</b>                          | <b>Extent of Safety Performance Assessment for Non-HSIP Funded Projects</b>   |
|--|---|
| <b>Georgia DOT</b>                     | Conducts safety performance assessments on a case-by-case basis for non-HSIP funded projects when requested by other Georgia DOT Offices or Districts. Georgia DOT’s Safety Program provides safety assessment for resurfacing projects and evaluates all projects containing bicycle and pedestrian designs. |
| <b>Illinois DOT</b>                    | Uses their SRI and other performance metrics for all State-maintained routes during project identification regardless of funding source.  |
| <b>Kentucky Transportation Cabinet</b> | Uses the SHIFT process to screen the network for any projects with a LOSS of 3 or 4, which are projects classified as experiencing greater than expected crashes. A safety performance assessment is likely to take place for these projects.   |
| <b>Maine DOT</b>                       | Assesses safety performance for non-HSIP funded projects if the projects specifically address safety concerns and alternative funding is available. Examples include roundabouts and road diets (expensive projects that include both safety and mobility benefits).  |
| <b>Massachusetts DOT</b>               | Conducts RSAs for all HSIP-eligible projects, regardless of funding source. There are also criteria for when ICE is used, regardless of funding source.   |
| <b>Michigan DOT</b>                    | Requires project-level safety analysis for all projects (regardless of funding source) unless advised otherwise by Michigan DOT’s DDSA guidance. HSM crash analysis is required as justification for any variance or exception in design. RSAs are required for various project types.                        |
| <b>Missouri DOT</b>                    | Promotes the SAFER tool for non-HSIP funded projects, and a comprehensive safety performance assessment may follow. Also uses a process for identifying opportunities to incorporate safety performance assessment throughout the project development process, regardless of funding source.                  |

| Agency  | Extent of Safety Performance Assessment for Non-HSIP Funded Projects  |
|---|---|
| <b>New Jersey DOT</b>   | Uses subject matter expert input and crash analysis for safety performance assessment for all projects regardless of funding source. HSM analysis is performed when crash analysis outcome is not clear. Crash reports and history are reviewed for Local-Aid projects to consider whether to implement certain countermeasures. Before-after analysis is conducted as another form of safety performance assessment. |
| <b>Oklahoma DOT</b>   | Reviews crash data for the State highway system for non-HSIP projects to determine if safety improvements are needed outside of initial project scope.  |
| <b>Omaha-Council Bluffs Metropolitan Area Planning Agency</b> | Makes general safety performance assessments to some degree for non-HSIP funded projects. Extent varies by project type, jurisdiction, data and resource availability, and funding type.  |
| <b>Pennsylvania DOT</b>                                       | Assesses safety for non-HSIP funded projects using standard crash report review and relevant data analysis. Pennsylvania DOT <i>Connects</i> <sup>41</sup> promotes safety performance assessment among planning partners and municipalities and prioritizes safety through this effort by considering safety early in project development.   |
| <b>South Carolina DOT</b>                                     | Uses safety performance assessments to prioritize non-HSIP funded projects. All design documents consider safety features as part of designs.   |

<sup>41</sup> Pennsylvania DOT, *PennDOT Connects*, n.d..

<https://www.penndot.pa.gov/ProjectAndPrograms/Planning/Pages/PennDOT-Connects.aspx>

| Agency                         | Extent of Safety Performance Assessment for Non-HSIP Funded Projects   |
|--------------------------------|--|
| <p><b>South Dakota DOT</b></p> | <p>Assesses safety performance on all Restoration (2R) and Rehabilitation (3R) projects by reviewing crash history and conducting predictive analyses at intersections and curves. Comprehensive analysis of safety performance is considered on Reconstruction (4R) projects. HSM, Interactive Highway Safety Design Model (IHSDM), in-house highway safety tools, and the safety performance function (SPF) tool are used for safety improvements considering future traffic volumes and other relevant data. Most Restoration (2R), Rehabilitation (3R), and Reconstruction (4R) projects are non-HSIP funded, although safety performance assessments are standard practice.</p> |
| <p><b>Texas DOT</b></p>        | <p>Requires a safety score during the design phase for applicable urban and rural project regardless of funding source. HSM predictive methods-based safety performance methods and crash modification factors (CMFs) are conducted for interstate construction projects. HSM predictive methods are recommended wherever applicable to evaluate safety performance of project improvements.</p>   |
| <p><b>Virginia DOT</b></p>     | <p>Assesses all projects for expected equivalent property damage only crash (cost-based weighted) and crash rate reduction benefits as part of the bi-annual <i>SMART SCALE</i> application. Projects are prioritized by generating a composite score that is divided by costs.</p>  |

## 5.3 Policies and Procedures Governing Safety Performance Assessments

This section summarizes responses to RFI Question 15. Responses focused on the policies and procedures governing safety performance assessments in each agency. Respondents commonly indicated using agency-specific policies and procedures, which included HSM procedures and DDSA guidance. A few examples included Florida DOT's HSM Implementation policy<sup>42</sup>; Missouri DOT's SAFER tool; Pennsylvania DOT's Highway Safety Program Guide<sup>43</sup> and Pennsylvania Safety Predictive Analysis Methods Manual<sup>44</sup> policies; Texas DOT's interstate access (*Interstate Access Justification Report*) standard operating procedures<sup>45</sup> and Traffic Safety and Analysis Procedures (TSAP) manual<sup>46</sup>; and Virginia DOT's *SMART SCALE* process.

Table 6 summarizes examples of safety performance assessment policies and procedures reported by agencies. Agencies provided diverse examples of policies and procedures governing safety performance assessments conducted in their State or agency.

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<sup>42</sup> Florida DOT, *Highway Safety Manual Implementation*, May 2016.

<https://pdl.fdot.gov/api/procedures/downloadProcedure/000-500-003>

<sup>43</sup> Pennsylvania DOT, *Highway Safety Program Guide*, Publication 638, October 2021.

<https://www.dot.state.pa.us/public/pubsforms/Publications/PUB%20638.pdf>

<sup>44</sup> Pennsylvania DOT, *Pennsylvania Safety Predictive Analysis Methods Manual*, Publication 638A, May 2021.

<https://www.dot.state.pa.us/public/pubsforms/Publications/PUB%20638a.pdf>

<sup>45</sup> Texas DOT, *Interstate Access Justification Report Engineering, Operation and Safety Analysis TxDOT Standard Operating Procedures*, March 2020. <https://ftp.txdot.gov/pub/txdot/des/iajr/sop.pdf>

<sup>46</sup> Texas DOT, *Traffic Safety and Analysis Procedures Manual*, January 2023.

<https://ftp.txdot.gov/pub/txdot/des/tsap/traffic-safety-analysis-procedures-manual.pdf>

**Table 6. State example safety performance assessment policies and procedures.**

| Agency                  | Policies and Procedures Governing Safety Performance Assessments  |
|-------------------------|---|
| <b>Alaska DOT</b>       | The Alaska Highway Preconstruction Manual guides the project development process. <sup>47</sup> The manual requires considerations of roundabouts for intersection projects, establishes a policy of context-sensitive solutions system-wide, and requires evaluation of existing traffic control devices for upgrades. Crash history and historical safety requests for considerations of implementing cost effective mitigation measures are also reviewed under the manual.  |
| <b>California DOT</b>   | <p>Caltrans issued a memorandum, <i>Performance-based Decision-Making Using the Highway Safety Manual</i><sup>48</sup>, which states that HSM proactive safety analysis is required for all projects proposing new non-standard design features, have multiple alternatives, and propose new or modified access on Interstates regardless of facility type, improvement type, project type, or funding source.</p> <p>It is procedure to perform 3-year before-after safety performance assessment for safety projects.</p> |
| <b>City of Portland</b> | <p>Applies the NCHRP Report 562 for intersections.<sup>49</sup></p> <p>HSM is considered but not standard procedure.</p>  |
| <b>Delaware DOT</b>     | Currently does not have specific procedures or policies in place for conducting safety performance assessments, although there are plans to incorporate them during the next Project Development Manual update.   |
| <b>Florida DOT</b>      | <p>Assesses safety performance at some level on all projects, as required by Florida DOT’s HSM Implementation Policy.</p> <p>Florida DOT HSIP guidelines.</p> <p>Florida DOT Design Manual.</p>   |

<sup>47</sup> Alaska DOT, *Alaska Highway Preconstruction Manual*, October 2023.

<https://dot.alaska.gov/stwddes/dcsprecon/preconmanual.shtml>

<sup>48</sup> Caltrans, *Performance-Based Decision-Making Guidelines using the Highway Safety Manual*, April 2022.

[https://dot.ca.gov/-/media/dot-media/programs/design/documents/attachment-1\\_decision-making-guidelines-using-the-hsm\\_2022-04-04-a11y.pdf](https://dot.ca.gov/-/media/dot-media/programs/design/documents/attachment-1_decision-making-guidelines-using-the-hsm_2022-04-04-a11y.pdf)

<sup>49</sup> NCHRP, *Improving Pedestrian Safety at Unsignalized Crossings*, March 2006.

<https://www.trb.org/Publications/Blurbs/157723.aspx>



| Agency                                 | Policies and Procedures Governing Safety Performance Assessments   |
|--|--|
|  | <p>Florida DOT Manual of Uniform Minimum Standards for Design.</p> <p>Construction and Maintenance (Florida Greenbook).</p> <p>Florida DOT Safety Analysis Guidebook for Project Development and Environment Manual.</p> <p>Manual on ICE.</p> <p>Florida DOT Access Management Guidebook.</p> <p>FHWA MUTCD.</p> <p>Florida DOT Traffic Engineering Manual.</p> <p>Quantitative Safety Analysis section of the Florida DOT Interchange Analysis Request User’s Guide.</p> <p>Florida DOT’s Actualizing Safe Access to Transit.</p> <p>Florida DOT Speed Zoning for Highways, Roads, and Streets in Florida.</p>       |
| <b>Georgia DOT</b>                     | <p>Follows HSIP policy for HSIP projects.</p> <p>ICE and Complete Streets are policy for non-HSIP projects.</p>  |
| <b>Kentucky Transportation Cabinet</b> | <p>The DDSA Implementation Plan provides guidance/tools for safety performance assessments.</p>  |
| <b>Massachusetts DOT</b>               | <p>Conducts RSAs and HSM Alternatives Analysis for HSIP-eligible projects.</p> <p>ICE procedure is used for intersection control.</p> <p>FHWA Interstate Access policy is followed for revised interstate access. Uses the policy to assess safety performance of applicable projects, and operational and safety analysis is conducted, ensuring mainline lanes, ramps (existing, new, or modified), ramp intersections with crossroads, and the local street network are not adversely affected.</p> <p>HSM procedures and methodologies are used to assess safety performance for complex interchange projects.</p> |
| <b>Michigan DOT</b>                    | <p>Uses DDSA procedures and RSAs.</p>  |
| <b>Missouri DOT</b>                    | <p>Employs the Safe System approach with its SAFER tool, a document used during project development that provides guidance using context-specific questions to find safety improvement opportunities in various areas. SAFER is part of Missouri DOT’s Engineering Policy Guide.</p>   |
| <b>New Jersey DOT</b>                  | <p>Follows HSM procedures for safety performance assessments.</p>  |

| Agency  | Policies and Procedures Governing Safety Performance Assessments   |
|---|--|
| <b>Oklahoma DOT</b>   | Currently reviewing existing process and creating Standard Operating Procedure documents agency-wide to help codify processes and spread awareness of the policies and procedures within the agency. |
|   | Transportation Alternative Program policy for qualifying projects.   |
|   | HSIP projects assessed by the State using 3-year subsequent crash data.  |
| <b>Omaha-Council Bluffs Metropolitan Area Planning Agency</b> | Surface Transportation Block Grant policy for qualifying projects.   |
| <b>Pennsylvania DOT</b>                                       | Follows PennDOT Publication 638 and 638A policies.   |
|   | State HSIP Implementation Plan.  |
|   | PennDOT Active Transportation Plan.  |
| <b>South Dakota DOT</b>                                       | Uses guidance from Chapter 2 of the South Dakota DOT Road Design Manual for safety performance assessments on various project types. <sup>50</sup>   |
| <b>Texas DOT</b>  | It is policy for safety scores to be generated for qualifying projects.  |
|   | TxDOT interstate access policy requires the HSM Predictive Method for interstate access projects.  |
|   | TxDOT TSAP Manual is used for suggestions on safety performance assessments.   |
|   | The Roadway Design Manual is being updated to incorporate latest Performance Based Practical Design guidance.  |
| <b>Virginia DOT</b>   | SMART SCALE provides data-driven multimodal project prioritization decisions.  |
|   | HSIP policy and Commonwealth Transportation Board resolutions guide the Virginia HSIP.   |
|   | The SHSP sets emphasis areas for analysis of project-specific performance.   |

## 5.4 Key Takeaways

The following are key takeaways from the RFI questions focused on safety performance assessments and their current applicability to projects facilitated by each agency:

- HSIP projects often received safety performance assessments.

<sup>50</sup> South Dakota DOT, *Road Design Manual – Chapter 2*, n.d. <https://dotfiles.sd.gov/rd/Rdmch02.pdf>

- Advocacy groups and regional agencies noted support of standardized guidance from FHWA on how to conduct safety assessments, while some State DOTs suggested they prefer the freedom to determine the appropriate safety assessment methods by project.
- Several respondents reported that safety performance assessments are conducted for all projects, regardless of funding, while some agencies reported conducting such assessments for select projects based on project objectives or funding source.
- HSIP policies, HSM procedures, and DDSA guidelines are typically used when completing safety performance assessments.

## 6 Conducting a Safety Performance Assessment

This chapter focuses on Questions 16 through 19 of the RFI, which focused on safety performance assessments for projects and included the following:

- What methods, tools, and types of safety performance assessments are used to analyze project-specific safety performance? What are the minimum data and analysis requirements that should be considered on how to conduct a safety performance assessment?
- With whom do States engage (i.e. counties, cities, MPOs, rural planning organizations, and other political subdivisions) when assessing safety performance? How do States engage the public or use the safety performance assessment results to communicate to the public using inclusive and representative processes?
- How are safety performance assessments integrated into the overall project development cycle? At which stage(s) of the project development process (e.g., planning and programming, environmental analysis, design, operations and maintenance) are project-specific safety performance assessments conducted? Are evaluations conducted after the project has been implemented? Responses may include examples of projects where safety performance assessments were conducted and how they informed the final project deliverables.
- How is safety performance assessed or considered at the system level planning or early transportation project identification/prioritization stage? How is network screening used to inform project decision making?

This section received 124 responses, with each of the three questions receiving between 27 and 34 responses. State DOTs and Regional and Local agencies were the primary respondents representing almost 67 percent of responses, although some responses from Industry and Advocacy groups were provided as well. Some responses did not address specific questions put forth by the RFI; however, they were categorized under this topic due to the nature of the information provided.

### 6.1 Methods, Tools, and Types of Safety Performance Assessments

This section summarizes the responses to RFI Question 16. Most agencies agreed that safety performance assessments should include at least five years of data. In general, most respondents reported analyzing safety performance through quantitative methods such as total number of fatalities or injuries. Additionally common methods often focused on roadway and geometric data

such as lane and sidewalk inventory, or specific corridors to frame the conversation of safety performance.

Table 7 summarizes the diverse examples of tools and methods respondents reported using for safety performance assessments.

**Table 7. Tools and methods used for safety performance assessments.**

| Tools and Methods Used                                     | Agency(ies)  | Additional Information (if provided or available)   |
|--|--|---|
| <b>AASHTOWare Numetric</b>                                 | Georgia DOT  | Used for safety screenings.   |
|  | Oklahoma DOT   | Collision database and analysis tool, will eventually replace Safe-T (the current collision database and analysis tool).  |
| <b>Before-After Analysis</b>                               | Florida DOT  | When HSM methods not applicable, simple before-after analysis with traffic volume correction and shift in proportions methods are used.<br><br>Empirical Bayes method used for project and countermeasure-level evaluation when SPFs and sufficient data are available, in accordance with the HSM. |
|  | Maine DOT  | For individual safety spot improvement projects using HSIP funds.   |
|  | Virginia DOT   | For all eligible projects funded by HSIP.   |
| <b>Benefit-Cost Assessment</b>                             | Omaha-Council Bluffs Metropolitan Area Planning Agency | Crash-based analysis.   |
| <b>Capacity Analysis for Planning of Junctions (CAP-X)</b> | Kentucky Transportation Cabinet                        | --  |
| <b>CMF Clearinghouse</b>                                   | Caltrans   | CMFs from the CMF Clearinghouse for qualitative analysis.   |
|  | Oklahoma DOT   | Predictive method, CMFs.  |
|  | South Carolina DOT                                     | --  |
|  | South Dakota DOT                                       | CMFs from the CMF Clearinghouse for predictive analysis.  |

| Tools and Methods Used  | Agency(ies)  | Additional Information (if provided or available)  |
|---|--|--|
| <b>Crash Analysis</b>   | Michigan DOT   | Annual expected crash frequency, LOSS, and non-motorized crash frequency and risk are evaluated for required projects according to the DDSA guidance.  |
| <b>Enhanced Interchange Safety Analysis</b>                       | Oklahoma DOT   | --   |
|   | Texas DOT  | --   |
| <b>Geographic Information System (GIS) Mapping</b>                | Pennsylvania DOT                                       | Used for network screening.  |
| <b>HSM</b>  | Caltrans   | --   |
|   | Delaware DOT   | --   |
|   | New Jersey DOT   | Safety analysis methods from the HSM, including RSAs, annual average daily traffic, design elements and geometry, descriptive analysis of existing crash conditions, crash rates, contributing factors, collision diagrams, benefit-cost analysis, CMFs, and the predictive method are used to evaluate alternative solutions. |
|   | Omaha-Council Bluffs Metropolitan Area Planning Agency | Predictive methods prescribed by the HSM for use of CMFs.  |
|   | South Carolina DOT                                     | SPFs.  |
|   | South Dakota DOT                                       |  |
|   | Texas DOT  | Predictive methods (SPFs and CMFs).  |
|   | Virginia DOT   | --   |
| <b>ICE/Safety Performance for Intersection Control Evaluation</b> | Caltrans   | --   |
|   | Kentucky Transportation Cabinet                        | --   |
|   | Massachusetts DOT                                      | --   |
|   | Oklahoma DOT   | --   |
|   | Pennsylvania DOT                                       | --   |
| <b>IHSDM</b>  | Kentucky Transportation Cabinet                        | --   |
|   | Oklahoma DOT   | --   |
|   | Texas DOT  | --   |

| Tools and Methods Used         | Agency(ies)                     | Additional Information (if provided or available)  |
|--------------------------------|---------------------------------|--|
| <b>Qualitative Assessments</b> | Delaware DOT                    |  |
| <b>RSAs</b>                    | Georgia DOT                     | Conducts at least 14 per year. Can generate over 100 safety-focused recommendations.   |
|                                | Florida DOT                     | Work zone RSAs on active construction projects.  |
|                                | Maine DOT                       | For identified locations from screenings.  |
|                                | Massachusetts DOT               | For HSIP eligible projects.  |
|                                | Michigan DOT                    | For various projects.  |
|                                | Missouri DOT                    | --   |
|                                | New Jersey                      | Used to evaluate alternative solutions.  |
| <b>State-Developed Tool</b>    | Caltrans                        | Traffic Safety Index Analysis. Safety Performance Worksheet.   |
|                                | Illinois DOT                    | SRI and Safety Teams (compared expected safety performance relative to roadways exhibiting similar characteristics and used to prioritize projects).   |
|                                | Kentucky Transportation Cabinet | CAP-X. CDAT.   |
|                                | Massachusetts DOT               | IMPACT (interactive map and dashboard tool used for network screening)   |
|                                | Missouri DOT                    | SAFER (tool helps identify safety issues for a variety of users, including vulnerable road users. Comprehensive safety analysis is not required by the SAFER tool, depending on the project, but does provide safety evaluation and consideration on all projects to some extent). |
|                                | Oklahoma DOT                    | SAFE-T (collision database and analysis tool).   |

| Tools and Methods Used      | Agency(ies)        | Additional Information (if provided or available)  |
|-----------------------------|--------------------|--|
|                             | Pennsylvania DOT   | Pennsylvania Safety Predictive Analysis Methods Manual (based on the HSM).   |
|                             | Texas DOT          | Texas DOT Safety Scoring Tool or System (in-house scoring system developed for safety reporting during project development).<br><br>Highway Safety Software.   |
|                             | Virginia DOT       | SMART SCALE (process for roadway, trail, transit, and freight projects).<br><br>GIS-T Tool (in-house tool that uses Virginia DOT's roadway network, traffic volumes, and 5-year crash data along with proposed CMFs to determine expected crash reductions). |
| <b>State-Developed SPFs</b> | South Carolina DOT | --   |
|                             | Virginia DOT       | For network screening.   |

-- Denotes that the respondent did not provide additional information regarding their response.

## 6.2 Engagement

This section summarizes responses to RFI Question 17 which asked who States engage when assessing safety performance and how they engage the public in an inclusive and representative process. Responses to this question varied by organization type, so the common themes are broken down by organization type.

- Advocacy groups suggested State DOTs should enhance their engagement with local stakeholders, as well as increase transparency on how they conduct engagement efforts. The groups also encouraged State DOTs to engage as early as possible with local stakeholders and potentially allow stakeholders to influence project scopes.
- Industry group respondents noted there is not one approach to performing safety assessments and the key to communication is to meet the community being served where they are.
- Regional respondents generally reported that they maintained updated MPO information and communicated through websites or planned regional workshops.
- State respondents consistently stated that they first engage with MPOs and then later smaller municipalities. States also asserted that they maintain engagement with various planning partners and aim for engagement to happen early so that feedback can be used throughout every step of the planning process. Common stakeholders that State



respondents mentioned engaging with included local agencies, advocacy organizations, regional commissions, law enforcement, non-profit organizations, and school representatives. Many States mention using surveys, hosting public outreach events, or holding reoccurring meetings to communicate safety performance assessment results.

## **6.3 Project-Level Integration of Safety Performance Assessments**

This section summarizes responses to RFI Questions 18 and 19. Questions 18 and 19 were combined because the nature of the questions were similar and elicited either very similar responses or a reference to the other question for the response. Responses provided information regarding how safety performance assessments are integrated into the overall project development cycle and at what stage safety performance is assessed in the planning and project initiation phase.

Generally, most respondents agreed that incorporating safety performance assessment depends on the nature of the project. However, most respondents agreed that safety performance assessments are generally integrated as early as possible into system-level planning and early project identification and prioritization, and rarely are completed after the project has been implemented. Most agencies follow a quantitative, data-driven process to identify safety needs; network screening is one of the primary tools used to identify potential safety projects.

Other responses to this question varied by organization type, so the remaining common themes are discussed by organization type.

- Advocacy organizations asserted safety performance assessments should be required and completed before and after a project is implemented.
- Industry organizations mentioned that safety considerations are incorporated early into the design process.
- State DOT respondents made note of safety performance assessments being completed during the planning and programming stage. Several DOTs mentioned RSAs being performed during the 25- to 30-percent design stage. Respondents also noted using crash rates and fatality numbers to perform safety performance assessments. Some States specifically highlighted including SPFs, CMFs, and crash reduction factors. Additionally, State respondents noted that safety is often considered at the project prioritization stage through project evaluation criteria.

## 6.4 Key Takeaways

The following are key takeaways on the RFI questions regarding conducting a safety performance assessment RFI question series:

- A variety of quantitative and qualitative tools are used to conduct safety performance assessment evaluations. RSAs were one of the most mentioned tools. Several State DOTs reported using unique tools generated by their own respective DOT.
- Inclusive engagement is typically addressed through public outreach efforts, such as stakeholder engagement, and is implemented early in the assessment process.
- Safety performance assessments are often conducted early in the project planning process and programming stage.

# 7 Safety Performance Assessment Process Evaluation and Outcomes

This chapter focuses on Questions 20 through 22 of the RFI, which focused on safety performance process evaluation and outcomes and included the following:

- What indicators or measures have been used to determine the effectiveness of safety performance assessments?
- To what extent is the safety performance assessment or analysis used to inform project decision making? How is safety performance weighted in relation to factors such as environmental impact or traffic congestion? Are there requirements to include countermeasures or evaluation of alternative designs that are expected to improve safety performance? If yes, please provide examples of the requirements or projects where the safety performance assessment led to the implementation of countermeasures and strategies that improved safety performance.
- How is safety performance evaluated after the project is implemented? To what extent are countermeasures, alternative designs, or strategies to improve safety performance replicated on other projects, based on past project evaluations?

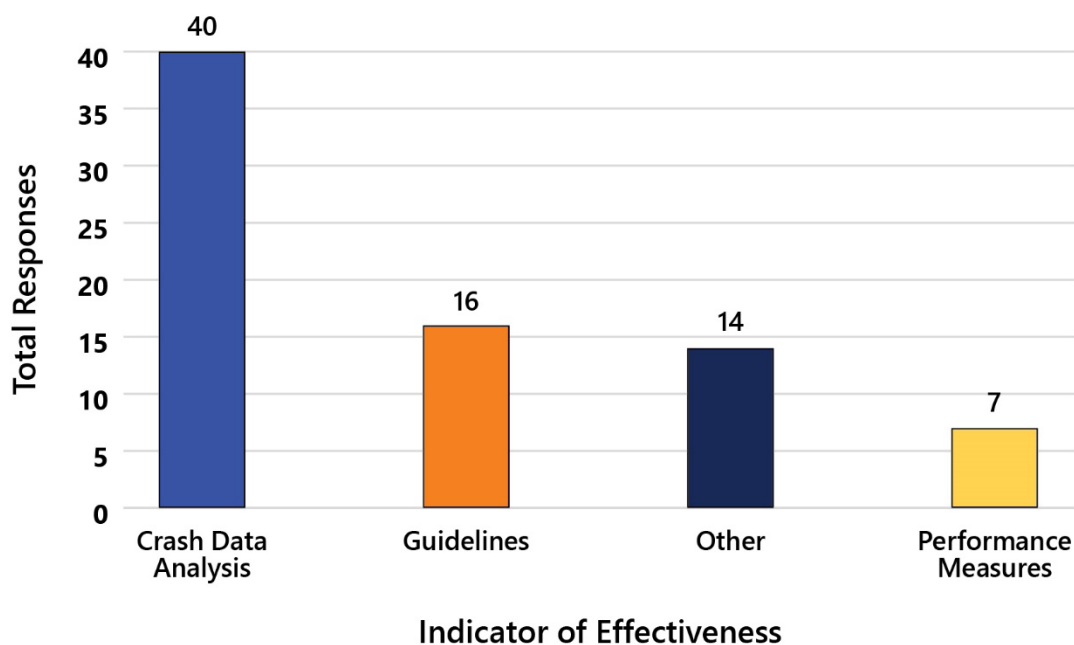
This section received 82 responses, with each of the 3 questions receiving an average of 27 responses. State DOTs represent nearly half of total responses received, 14 percent of responses were by Industry agencies, and 11 percent were by Advocacy agencies.

## 7.1 Safety Performance Assessments

Respondents to Question 20 provided information about current safety performance assessment evaluation processes and metrics used to determine effectiveness. This section summarizes the indicators and measures respondents reported using to determine countermeasure effectiveness.

Respondents most noted using crash severity data, which include metrics such as number of injury crashes, number of injuries, number of fatal crashes, and number of fatalities. The next most popular metrics included determining a safety benefit-cost ratio and conducting before-and-after safety studies post-implementation.

Figure 10 summarizes the metrics respondents mentioned and includes the frequency of responses for each. Crash data analysis indicators included crash severity data, benefit-cost analysis, before-after analysis, and lives saved. Guidelines referred to systemic analyses, internal State processes, the HSM, and CMFs. Examples of performance measures included pedestrian and bicycle safety metrics and Federal performance measures. The “Other” category included community feedback, change in transportation demand, change in property value, and change in retail demand.



**Figure 10. Chart. Indicators of effectiveness for safety performance assessments.**

## 7.2 Post-Implementation Assessment

Respondents to Question 21 provided information on how they currently do post-implementation safety assessments on projects. This section summarizes how safety is evaluated after a project is implemented and how results from these assessments influence other projects.

### 7.2.1 Project Post-Assessment Processes

Four respondents indicated they rarely conduct post-implementation assessments or there was no standard process to assess all projects after completion. Those that responded on conducting post-assessment reviews cited several ways to decide which projects to review. State DOTs reported performing post-implementation safety assessments through the HSIP process—seven responding State DOTs mentioned doing before-and-after studies for HSIP projects.

Outside of HSIP-funded projects, three State DOTs and one Local agency reported conducting analyses for specific categories of projects. The most common type of projects respondents stated would trigger a post-implementation review are roundabout installations, followed by all-way stop intersections. New traffic signals and automated enforcement technology were also mentioned as project types that would warrant post-implementation review.

Chicago Metropolitan Agency for Planning, Delaware DOT, and South Dakota DOT responded they only routinely perform post-implementation assessments for unique or high-profile projects and projects containing less proven countermeasures. For example, Delaware DOT reported performing a post-implementation assessment for the first diverging diamond intersection in the

State. Both State DOTs mentioned ongoing analysis for high friction surface treatment applications, as it is a lesser proven countermeasure.

There were two additional methods of determining when to complete a post-implementation assessment that were only mentioned once. Florida DOT reported maintaining a dashboard to monitor crash reduction for HSIP projects and is prototyping one to report benefit-cost ratios and percent changes in injury and fatal crashes. Texas DOT noted their agency randomly picks projects to evaluate safety performance after implementation of countermeasures.

### **7.2.2 Applicability of Post-Implementation Assessments**

Respondents indicated they use results of previous safety analyses to influence current projects. State DOTs mentioned using the results of internal before-and-after studies, research projects, and national project evaluations to influence project decisions. Georgia DOT noted the use of outcomes to update manuals, policies, and guidelines when warranted. Also, no responses made mention of a formal tracking process to ensure the results are used in a consistent and efficient manner.

Five State DOTs shared that they used network analysis to track improvements and results. These network screenings were commonly used to determine if there was a decrease in crashes and determine future safety strategies and systemic improvements.

Lastly, three State DOTs provided responses on the use of post-implementation safety assessments to develop CMFs, and two of those mentioned creating CMFs to represent State and local conditions. The other agency noted developing CMFs for unique geometry configurations.

Respondents reported learning from their projects using real-time data (i.e., speed data) and annual crash reviews even without formal post-implementation safety assessments, then applying the results to new projects. Due to the often three to five-year timeline it takes to collect data to complete a formal before and after study, there is often a lag in incorporating innovative designs into standards and guidelines.

## **7.3 Project Decision Making**

Respondents to Question 22 provided information about how safety informs their project prioritization process. Questions in this section focused on how safety performance assessments are used to inform project decision making and how safety is weighed in project development. Respondents also provided information on any requirements they have in place concerning the inclusion of countermeasures or evaluation of alternatives that are expected to increase safety performance.

Out of 29 respondents, 16 said safety was one of many factors used in project decision making. Of those 16 respondents, 12 said safety was a highly weighted factor. Other factors respondents stated using in project development included environmental impacts, traffic congestion, cost, and right-of-way. Responses were split on if there was a formal or consistent procedure used to

determine the weighting of factors: 14 respondents mentioned a procedure or policy, 12 respondents did not mention such policy, and 3 specifically indicated there was no formal policy to be followed when making the decision of how factors are weighted.

Of the respondents that indicated there was a formal process for using safety assessments to influence project decision making, the processes generally fell into two categories: (1) national processes and (2) internal processes. For national processes, four State DOTs referred to HSIP and two State DOTs referred to NEPA as the way agencies included safety analysis in their alternative development process. For internal processes, State DOT respondents mentioned internal processes or policies that governed how factors were weighted in project prioritization. Some of the internal processes mentioned included:

- ICE processes (Georgia DOT and MassDOT).
- Design Variance Request processes (Michigan DOT).
- SMART SCALE (Virginia DOT).
- Strategic Transportation Investments Program (North Carolina DOT).
- Planning to Programming (Arizona DOT).

Most respondents mentioned the extent to which safety assessment plays a role in decision making is highly project sensitive, regardless of whether there is a formal analysis process or not. Respondents stated that how safety is weighted among other project factors is dependent on the purpose and need of the specific project. Respondents noted a preference to retain the flexibility they currently have to use their local knowledge and discretion in setting their assessment process.

Several advocacy organizations and local agencies voiced their concerns that safety is not weighted highly enough in the project decision making process. They made note that vehicle throughput remains a top priority, even when it compromises vulnerable road user safety. Advocacy organizations argued that safety assessments should be considered at the same point in the project development process as level of service to ensure safety is a focal point from the beginning.

A handful of respondents provided information related to requirements to include countermeasures or evaluations of alternative designs that are expected to improve safety performance. While a few mentioned formal policies that require the implementation of various systemic safety countermeasures on high-risk roads, most assessed the need for safety countermeasures on a project specific basis. As safety needs were identified in the limits of a project, agencies stated they used engineering judgement to determine which countermeasures could be implemented to mitigate the concern.

## 7.4 Key Takeaways

The following summarizes the key takeaways from the RFI questions focused on safety performance assessment processes and evaluation outcomes:

- State DOTs and Local and Regional agencies listed similar metrics when discussing indicators and measures commonly used in safety performance assessments.
- Safety is one of many factors considered in project decision making and is typically highly weighted.
- The extent to which safety assessment plays a role in decision making is highly project sensitive. Some respondents pushed to retain the flexibility they currently have to use their local knowledge and discretion in setting their assessment process.
- Post-implementation safety evaluation analysis is generally limited to HSIP requirements and is not common for other project types, except in limited circumstances.

# 8 Safety Performance Assessment

## Implementation Considerations

This chapter focuses on Questions 23 through 27 of the RFI, which focused on safety performance assessment implementation considerations and included the following:

- What challenges or concerns does your agency see with possible Federal requirements for safety performance assessments on certain Federal-aid projects?
- What challenges or concerns does your agency see with possible Federal requirements for implementing cost-effective safety improvements resulting from safety performance assessments?
- What benefits does your agency see with possible Federal requirements for safety performance assessments on certain Federal-aid projects where safety may not be the sole motivation for the project? What benefits does your agency see for any Federal requirements for cost-effective safety improvements resulting from the assessments?
- What criteria, thresholds, characteristics, or other factors should States consider when determining when to conduct a project-specific safety performance assessment or analysis for projects on the Federal-aid highway system?
- What additional resources (i.e., staff, guidance, tools, budget, etc.) would be necessary to adequately assess the expected safety performance of Federal-aid projects?

This section received 145 responses, with each of the three questions receiving between 25 and 34 responses. State, Regional, and Local agencies provided the most responses, while 4 Advocacy groups, 6 Industry groups, and 2 Concerned Citizens also provided input on this topic.

### 8.1 Federal Requirements for Safety Performance Assessments

The section below summarizes responses to questions 23 through 27, which pertain to the possible Federal requirements for safety performance assessments on Federal-Aid projects. Specifically, the benefits and challenges or concerns respondents saw with the possible addition of safety assessment requirements.

#### 8.1.1 Benefits of Safety Performance Assessments

This subsection summarizes responses to Question 25 regarding the benefits that could be realized from Federal requirements for safety performance assessments on certain Federal-aid projects.

State DOTs and regional agencies commonly cited the following benefits:

- Supporting flexibility in project selection by providing funding to non-safety projects that might otherwise not have been prioritized.
- Growing library of reliable studies and noteworthy practices.



- Creating overall better, safer solutions.
- Ensuring State-to-State consistency in reporting and the standardization of metrics, making it easier to learn from other jurisdictions.
- Requiring consideration for the safety of vulnerable road users in all projects.
- Expanding staff expertise in safety.

Advocacy groups emphasized the benefit of ensuring State-to-State consistency in reporting and the standardization of metrics. Industry organizations also reported that benefit, as well as expanding staff expertise in safety. Omaha-Council Bluffs Metropolitan Area Planning Agency cited overall better, safer solutions as a benefit of safety performance assessments.

The most mentioned benefit was that having Federal safety assessment requirements for all projects could support flexibility in project selection by providing funding to non-safety projects that might otherwise not have been prioritized. This was the most popular response among State DOTs and mentioned by one Regional agency. The second most common response from Advocacy groups and Regional organizations was additional requirements providing an opportunity to consider the safety of vulnerable road users in all projects.

### **8.1.2 Challenges and Concerns related to Safety Performance Assessments**

This subsection summarizes responses, primarily from State DOTs, related to common challenges and concerns associated with possible Federal requirements for safety performance assessments on Federal-aid projects.

- **Analysis tools.** Existing analysis tools, including the HSM, are either out of date, or time and data intensive to use. Additionally, current tools are lacking in effectively addressing multimodal safety. Agencies are also concerned that if the requirements apply to all projects, then a facility type might not be included in tools traditionally used for safety analysis.
- **Funding.** State DOTs expressed concern about the increased costs of a project that would occur with additional Federal assessment requirements and how this would impact the number of projects able to be implemented.
- **Inclusion of all modes.** Several groups are concerned that new Federal requirements will not be developed with a multimodal focus, and not appropriately address the safety of vulnerable road users.
- **Lack of data.** A concern stemmed from agencies not having data or models to perform full safety assessments on non-safety projects.
- **Limiting agency flexibility.** Regional agencies and State DOTs expressed concern that additional Federal regulations will limit their flexibility in addressing the specific needs of the communities they serve and want to ensure they maintain a degree of flexibility and discretion.
- **Project implementation delays.** Additional Federal safety assessment requirements are anticipated to extend timelines of projects, causing implementation delays.

- **Redirect time from other efforts.** There are concerns that additional Federal requirements will take time away from other planning and implementation efforts.
- **Staff concerns.** Many organizations are concerned about the additional workload safety assessment requirements will cause and how that will impact already understaffed agencies. Additionally, some are concerned about having people with the expertise needed to complete the assessments.

## 8.2 Criteria, Thresholds, and Characteristics

This section summarizes Question 26 of the RFI which also sought to learn about what agencies consider when determining when to conduct project-specific safety performance assessments.

The most cited metric for determining when a safety analysis is warranted was existing safety data, with respondents emphasizing it was a data-driven process determined on a project-by-project basis. Respondents also commonly noted using screening of crash history, crash rates, crash severity, crash diagrams, and benefit-cost ratios to determine if a more in-depth safety analysis is needed. Several respondents also noted the need to ensure agencies are taking a proactive approach to safety, and not just addressing areas where the data shows high crash frequency. Respondents stated that a proactive approach would include risk data in screening for safety assessments, like near-miss data. The argument was also made that using a proactive approach would ensure vulnerable road users are considered, as there is a lack of data about active transportation. The Kentucky Transportation Cabinet also reported using public comment and feedback about local issues to determine when a safety analysis is needed.

Respondents also discussed the types of projects that warrant additional safety analysis. Commonly mentioned project types included the following:

- Projects in an area that had been identified as part of a systemic network screening, like in a high injury network.
- Projects with design exceptions.
- Projects completed with local partners to ensure all local safety priorities are being addressed.
- Projects that were eligible for HSIP funding.
- Projects near a new development that warranted a traffic impact analysis.

State DOTs also stated that safety analysis should be less of a function of project type, but a function of assessment methodologies. This included determining on a project-by-project basis what data are available and if applicable analysis tools exist can be calibrated to local conditions.

Respondents expressed a general concern that imposing new Federal requirements may limit the existing discretion and concerns over a lack of data availability, which could make it difficult for some jurisdictions to meet Federal reporting requirements.

## 8.3 Federal Requirements for Implementing Cost-Effective Safety Improvements

This section summarizes responses to possible Federal requirements for implementing cost-effective safety improvements (Questions 24 and 25). Specifically, both benefits and challenges or concerns respondents saw with the possible addition of these requirements.

### 8.3.1 Benefits of Implementing Cost-Effective Safety Improvements

The second part of Question 25 focused on the benefits that could be realized from Federal requirements for cost-effective safety improvements. Responses to this question mirrored those noted in Section 8.1.1, with the exception that staff expertise was not noted in this section.

The most popular benefits for introducing Federal requirements to implement cost-effective countermeasures were allowing for flexibility in project selection and creating overall better and safer alternatives. Each of these benefits make up 26 percent of the total responses for this topic.

### 8.3.2 Challenges and Concerns related to Implementing Cost-Effective Safety Improvements

This subsection summarizes responses related to challenges or concerns with possible Federal requirements for safety performance assessments on certain Federal-aid projects. State DOTs noted the following concerns:

- Maintaining State flexibility and discretion.
- Defining “cost-effective” and how that will impact project budgets, scope, and funding.
- Impacting project timeline and deliverability.
- Making data and analysis tools available to support countermeasure implementation.
- Staffing to support this effort.

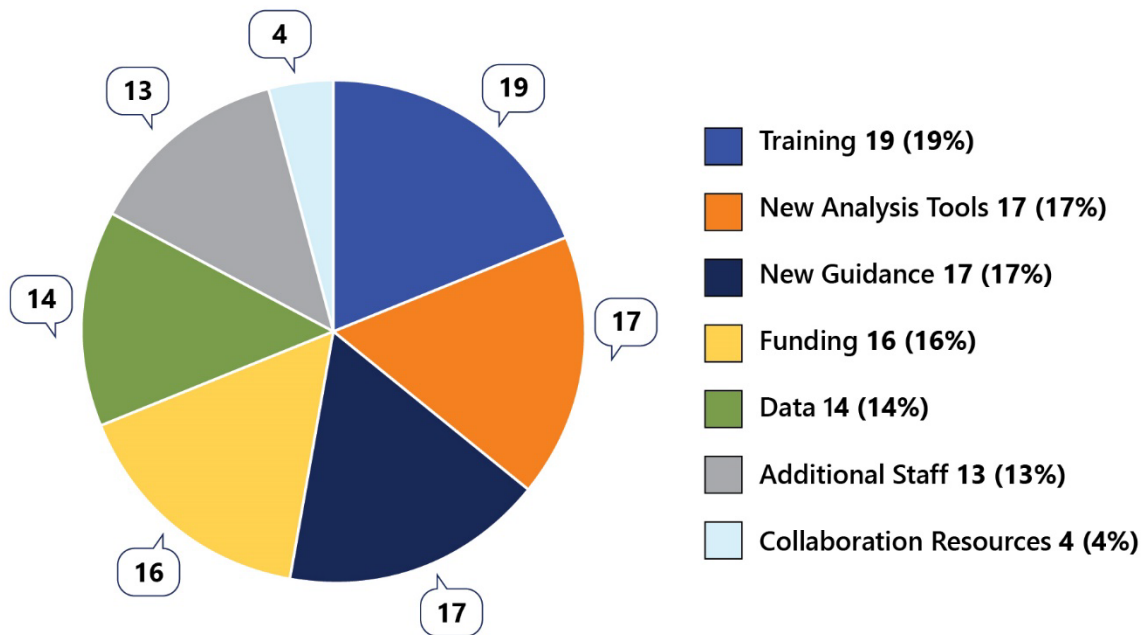
Maintaining State flexibility and discretion was also noted by one Advocacy group, one Regional agency, and one Local agency. Regional agencies also echoed the State DOT concerns regarding the definition of “cost effective”, impacts to project timelines, and availability of data and analysis tools. One Industry organization expressed similar concerns regarding the impacts to timelines, data and analysis tools availability, and staff to support the effort.

The definition of “cost-effective” countermeasures and the impact to project budgets, scopes, and funding was the most prominent concern for all respondents and State DOTs. Respondents also noted staffing concerns and the ability of the States to maintain flexibility in their project decision-making process.

## 8.4 Additional Resources

This section summarizes additional resources that respondents stated would be necessary to adequately assess the expected safety performance of Federal-aid projects (Question 27). Figure 11 summarizes the types of resources respondents brought up. The most requested resource was

training for existing and new staff (19 percent). Specifically, the responses noted the training should inform agencies on the importance of considering safety for all road users, the relevance of active transportation, and include guidance on using the HSM. Respondents stated that training should also provide technical assistance for staff on how to use analysis tools to successfully and efficiently complete safety performance assessments. The least common resource identified in the responses (4 percent) was the need for additional coordination resources. Responses mentioned the need for encouraging coordination on safety projects between sectors, modal agencies, and project owners. Another response stressed the need for promoting coordination within departments at the same agency to efficiently assess the expected safety performance of Federal-aid projects.



**Figure 11. Chart. Additional resources needed.**

New analysis tools and new guidance were the second-most requested resources (17 percent). Respondents suggested that new software tools for analysis should be developed for State DOTs to perform safety assessments if they are to be required on Federal-Aid projects. These respondents stated that the tools should not only aid in technical analysis, but also support data collection and potentially the use of big data, and that the analysis tools should also ensure they are specifically considering fatal and serious injury crashes, and vulnerable road user safety, while promoting consistent application throughout the project development process.

Some respondents noted specific tool names, including:

- Alternative Design Evaluation Framework.
- Benefit-cost calculators.
- CMF workbooks.
- Geoprocessing tools.

- HSM analysis.
- National Public Health Assessment Model.

Different sectors of respondents had different resource priorities. The top needs for State DOTs included training, software analysis tools, and funding. Regional agencies prioritized data and software analysis tools. Local agencies noted needs for training, data, and new guidance documents. Industry requested data and guidance documents. The top needs for Advocacy groups were training and new guidance documents. The priorities for Concerned Citizens were training, data, and new guidance documents.

## **8.5 Key Takeaways**

The following are the key takeaways regarding RFI questions that address challenges and benefits of Federal safety performance assessment requirements and the implementation of cost-effective safety improvements:

- The most common sentiment from State DOTs was concerns about Federal safety performance assessment requirements for both safety and non-safety projects. They primarily expressed concerns with funding, though they noted encouraging safety in non-safety driven projects was a benefit of the requirements.
- Other States did not directly express opposition to additional requirements, as they believe their internal policies and processes meet the intent of the safety assessments.
- Industry and advocacy groups tended to see additional requirements as an opportunity to ensure safety, especially of vulnerable road users, is being considered in all projects. While these groups did note potential challenges with implementation, they were in favor of additional safety assessment requirements.
- Respondents noted potential benefits of new assessments as requiring consideration of all users in all projects, State-to-State consistency in reporting and the standardization of metrics, and supporting flexibility in project selection.

## 9 Overarching Themes

This section highlights overarching themes that appeared throughout the RFI responses and notes general sentiments related to Complete Streets implementation, highway design standards, safety performance assessments, and other actions to improve safety of all road users.

Overarching themes included the following:

- **Updating and Strengthening Regulations:** Most respondents expressed interest in additional requirements and emphasizing the importance of safety in existing regulations, though others noted they preferred flexibility and less stringent requirements.
- **Adopting Additional Publications as Standards:** Respondents provided suggested documents for inclusion and reference within the regulations. The suggested providing additional guidance or noteworthy practices on many related practices, policies, and tools.
- **Making “Including Design Features that Provide Safety Benefits for All Users” the Default:** Respondents stated that not enough is being done to address safety for all users. Respondents suggested ways to enhance safety in all projects.
- **Retaining flexibility in determining their safety assessment process:** Practices for assessing safety performance vary by State (e.g., types of projects, tools and methods used)—and most State DOTs expressed a preference to retain flexibility in determining their safety assessment process. Respondents noted conducting post-implementation evaluations primarily on HSIP-funded projects. Respondents encouraged conducting safety assessments at the planning/project development and design stage. Industry and advocacy respondents supported additional requirements for safety assessments on all projects. Others did not express opposition to such requirements, as they believed their internal policies and processes meet the intent of the safety assessments.
- **Providing Context:** Many respondents noted the need for guidance to identify appropriate contexts and safety improvements.
- **Addressing Speed:** Respondents frequently noted the need for updated speed setting strategies.
- **Incorporating Equity:** Respondents noted the importance of considering equity in Complete Streets implementation. Few respondents provided example strategies, though those that did noted addressing equity through data analysis.
- **Addressing Benefits and Barriers:** Many of the benefits of Complete Streets presented by respondents were also noted by other respondents as a perceived barrier. For example, some respondents said that it is easier to coordinate projects under a common policy or mission, like a Complete Streets Policy. However, others noted challenges with coordinating agencies on the municipal, county, regional, and State level to consistently implement or adopt the Complete Streets policies.

- **Prioritizing Safety:** Safety was one of many factors in the project decision making process and was noted as a priority for respondents. State DOTs also reported seeing the benefit of integrating safety considerations in non-safety projects.
- **Varying Needs at the Jurisdiction Level:** State DOTs and Local and Regional agency respondents reported developing plans, policies, and guidance to improve safety for all users. Yet, the specific needs vary depending on the jurisdiction level. Regional and local level respondents expressed challenges with project development, design exceptions, and general project delivery costs and timelines. State DOTs expressed more challenges or concerns associated with additional Federal requirements for safety assessments.
- **Emphasizing Multimodal Transportation:** In consideration of all the users included in BIL's definition of Complete Streets, respondents noted several opportunities to update regulations that emphasize vehicle traffic. They identified specific language, guidance, analysis methods, and data collection methods, among others, that could be expanded to be more inclusive of all roadway users.
- **Providing Example Practices:** Respondents in all response categories provided examples of practical tools and information that could be useful for other agencies. This includes policies, practices, analysis methods, internally developed tools, and guidance documents.

## 10 Appendix A: List of RFI Respondents

Industry respondents represent agencies related to advancing technical research, professional organizations, and other transportation-specific agencies.

- American Association of State Highway and Transportation Officials (AASHTO)
- American Road & Transportation Builders Association (ARTBA)
- American Society of Civil Engineers (ASCE)
- American Society of Safety Professionals
- Centers for Disease Control and Prevention (CDC)
- GOBike Buffalo
- Insurance Institute for Highway Safety (IIHS)
- Institute of Transportation Engineers
- National Association of City Transportation Officials (NACTO)
- National Association of Mutual Insurance Companies
- National Committee on Uniform Traffic Control Devices (NCUTCD)
- National Safety Council
- Vision Zero Network

Advocacy respondents were groups or individuals representing specific road user needs, grassroots groups, or entities that otherwise identified as an advocacy group.

- AARP
- Accessible Design for the Blind
- Action Committee for Transit
- American Motorcyclist Association (AMA)
- Association of Pedestrian and Bicycle Professionals
- Bike Colorado Springs
- BikeWalkKC
- Families for Safe Streets
- FIA Foundation
- In Control Family Foundation
- ITS America
- League of American Bicyclists
- Marc Soloway
- Pennsylvania Downtown Center
- PeopleForBikes
- Soft Lights Foundation
- Southern Environmental Law Center
- The League of American Bicyclists
- Transportation for America



State respondents were State Departments of Transportation (DOTs).

- Alaska DOT
- California DOT
- Delaware DOT
- Florida DOT
- Georgia DOT
- Idaho DOT
- Kentucky Transportation Cabinet
- Maine DOT
- Massachusetts DOT
- Michigan DOT
- Minnesota DOT
- Missouri DOT
- Montana DOT
- New Jersey DOT
- New York State DOT
- North Dakota DOT
- Oklahoma DOT
- Pennsylvania DOT
- South Carolina DOT
- South Dakota DOT
- Texas DOT
- Virginia DOT
- Wyoming DOT

Regional respondents were regional transportation agencies, such as MPOs.

- Centre County MPO
- Chicago Metropolitan Agency for Planning (CMAP)
- Denver Regional Council of Governments
- Greater Nashville Regional Council
- Knoxville Regional Transportation Planning Organization
- Mid-Ohio Regional Planning Commission (MORPC)
- New York State Association of Metropolitan Planning Organizations
- Omaha-Council Bluffs Metropolitan Area Planning Agency
- San Diego Association of Governments

Local respondents were cities, towns, or other planning jurisdictions.

- Austin, TX
- Belle Plaine, IA
- Chicago, IL

- City and County of Honolulu, HI
- Houston, TX
- Kent, OH
- Minneapolis, MN
- New York City, NY
- Philadelphia, PA
- Portland, OR

Concerned Citizen respondents were individuals not affiliated with a transportation agency, advocacy group, or industry group. Respondents who left their name as either 'unknown' or 'anonymous' were categorized as a Concerned Citizen.

- Alecia McClintock
- Anthony Hicks
- Cheryl Zalenski
- Christen Thompson
- Concerned Grandparents
- Connie Gorder
- Dale McKeel
- Dane Miller
- Darren Conly
- Deb Artman
- Eli Ferrari
- Elizabeth DeLaBarre
- Eric Kraan
- Eugene Russell
- Gregory Shill
- Ingrid Cordasco
- Isabella Pham
- Jeff Sobczyk
- Jessica Stroope
- Jonathan French
- Justin Dyer
- Konrad Kornmann
- Lauren Johnson
- Lindsay Inger
- Livingstone Imonitie
- Mark Martin
- Matthew Penniman
- Megan Maloney
- Mike McCarthy
- Mitchell Henke

- Murray Bodin
- Nicholas Ward-Bopp
- Pete Joachim
- Petr Pospisil
- Rebecca Feldman
- Sarah Lagpacan
- Scott Brody
- Scott Sharpe
- Seth Chalmers
- Seth Lumnah

Other respondents represented individuals from consulting agencies and businesses:

- Evari GIS Consulting, Inc.
- Moeurineering PLLC

## 11 Appendix B: Number of RFI Responses by Question

| Question Section                           | RFI # | RFI Question  | Total Responses |
|--|-------|---|-----------------|
| <b>Improving Road Safety for All Users</b> | 0_1   | Responses regarding the improvement of road safety for all users that do not specifically answer a question asked within this section.  | 16              |
|  | 1     | What steps are being taken by your agency (if you are commenting on behalf of an agency) or an agency you are familiar with to improve safety for all roadway users, including pedestrians, bicyclists, public transportation users, children, older individuals, individuals with disabilities, motorists, and freight vehicles? How are equity and demographic data considered?   | 48              |
|  | 2     | For agencies that have adopted Complete Streets standards or policies (or similar policies), what benefits does your agency see in developing Complete Streets? Provide examples and citations to relevant regulations, policies, procedures, performance measures, or other materials where possible.  | 38              |
|  | 3     | For agencies that have adopted Complete Streets standards or policies (or similar policies), what challenges has your agency experienced when implementing your Complete Streets policy?  | 39              |
|  | 4     | For agencies that have adopted Complete Streets standards or policies (or similar policies), but have not adopted an alternative classification system, how do you identify the appropriate context(s) for the application of a Complete Streets design model? Under what types of circumstances have you found the development of Complete Streets to be inappropriate?  | 30              |
|  | 5     | To inform decisions on street design, some agencies have adopted modal hierarchies, or alternative street classification systems, that prioritize pedestrians, bicyclists, or others on certain street types based on context. Has your agency incorporated such a hierarchy, or classification into agency policies, and if so, what benefits have been realized? Please provide a link to your documents for reference. | 41              |
|  | 0_2   | Responses regarding design standards for the NHS that do not specifically answer a question asked within this section.  | 12              |

| Question Section                                   | RFI # | RFI Question   | Total Responses |
|--|-------|--|-----------------|
| <b>Design Standards for the NHS</b>                | 6     | How could the FHWA regulations governing Design Standards for Highways (Part 625) be revised to consistently support prioritization of the safety of all users across all project types?   | 43              |
|  | 7     | What changes to other FHWA regulations codified at Title 23, CFR are needed to equitably improve safety for people of all ages and abilities who use urban and suburban streets?   | 41              |
|  | 8     | What changes to other FHWA regulations codified at Title 23, CFR are needed to equitably improve safety for people of all ages and abilities who use rural roadways, including in rural towns?   | 38              |
|  | 9     | What, if any, elements of design are not adequately covered by the existing design standards in Part 625?  | 40              |
|  | 10    | What specific provisions of Part 625 present an obstacle to equitably improving safety for people outside of vehicles, and why?  | 31              |
|  | 11    | Are there additional documents that FHWA should incorporate by reference in Part 625 to better facilitate the context-sensitive design of streets that safely serve all users? Please identify the documents and describe why they should be referenced in the regulation. | 35              |
|  | 12    | Does Part 625 create any impediments to developing projects that meet the goals of your agency? If so, what goals are impeded, what are the impediments, and how would you suggest the regulation be revised?  | 27              |
| <b>Safety Performance Assessment Applicability</b> | 0_3   | Responses regarding safety performance applicability that do not specifically answer a question asked within this section.   | 2               |
|  | 13    | For which current projects (i.e., by improvement type, funding program/level, facility type, etc.) are safety performance assessments or analyses conducted in your State?   | 29              |
|  | 14    | To what extent is the safety performance assessed on non-HSIP funded projects?   | 28              |
|  | 15    | What policies or procedures on conducting project-specific safety performance assessments and analyses does your agency have? Provide examples and citations to relevant laws, regulations, policies, procedures, or other materials where possible.                       | 27              |
| <b>Conducting a Safety</b>                         | 0_4   | Responses regarding the conduction of a safety performance assessment that do not specifically answer a question asked within this section.  | 3               |

| Question Section   | RFI # | RFI Question  | Total Responses |
|--|-------|---|-----------------|
| <b>Performance Assessment</b>  | 16    | What methods, tools, and types of safety performance assessments are used to analyze project-specific safety performance? What are the minimum data and analysis requirements that should be considered on how to conduct a safety performance assessment?  | 34              |
|  | 17    | With whom do States engage (i.e., counties, cities, MPOs, rural planning organizations, and other political subdivisions) when assessing safety performance? How do States engage the public or use the safety performance assessment results to communicate to the public using inclusive and representative processes?  | 29              |
|  | 18    | How are safety performance assessments integrated into the overall project development cycle? At which stage(s) of the project development process (e.g., planning and programming, environmental analysis, design, operations and maintenance) are project-specific safety performance assessments conducted? Are evaluations conducted after the project has been implemented? Responses may include examples of projects where safety performance assessments were conducted and how they informed the final project deliverables.                               | 27              |
|  | 19    | How is safety performance assessed or considered at the system level planning or early transportation project identification/prioritization stage? How is network screening used to inform project decision making?   | 31              |
| <b>Safety Performance Assessment Process Evaluation and Outcomes</b> | 0_5   | Responses regarding the safety performance assessment process evaluation and outcomes that do not specifically answer a question asked within this section.   | 1               |
|  | 20    | What indicators or measures have been used to determine the effectiveness of safety performance assessments?  | 26              |
|  | 21    | To what extent is the safety performance assessment or analysis used to inform project decision making? How is safety performance weighted in relation to factors such as environmental impact or traffic congestion? Are there requirements to include countermeasures or evaluation of alternative designs that are expected to improve safety performance? If yes, please provide examples of the requirements or projects where the safety performance assessment led to the implementation of countermeasures and strategies that improved safety performance. | 28              |

| Question Section   | RFI # | RFI Question   | Total Responses |
|--|-------|--|-----------------|
|  | 22    | How is safety performance evaluated after the project is implemented? To what extent are countermeasures, alternative designs, or strategies to improve safety performance replicated on other projects, based on past project evaluations?  | 27              |
| <b>Safety Performance Assessment Implementation Considerations</b> | 0_6   | Responses regarding the safety performance assessment process implementation considerations that do not specifically answer a question asked within this section.  | 1               |
|  | 23    | What challenges or concerns does your agency see with possible Federal requirements for safety performance assessments on certain Federal-aid projects?  | 29              |
|  | 24    | What challenges or concerns does your agency see with possible Federal requirements for implementing cost-effective safety improvements resulting from safety performance assessments?   | 29              |
|  | 25    | What benefits does your agency see with possible Federal requirements for safety performance assessments on certain Federal-aid projects where safety may not be the sole motivation for the project? What benefits does your agency see for any Federal requirements for cost-effective safety improvements resulting from the assessments? | 27              |
|  | 26    | What criteria, thresholds, characteristics, or other factors should States consider when determining when to conduct a project-specific safety performance assessment or analysis for projects on the Federal-aid highway system?  | 25              |
|  | 27    | What additional resources (i.e., staff, guidance, tools, budget, etc.) would be necessary to adequately assess the expected safety performance of Federal-aid projects?  | 34              |
| <b>Total</b>   |       |  | <b>1,030</b>    |

# 12 Appendix C: Suggested Documents for Inclusion in Part 625

Agencies suggested the following documents be incorporated by reference in Part 625:

- [Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts](#) (FHWA) FHWA-HEP-16-055, August 2016
- ADAAG Manual: [A Guide to the Americans with Disabilities Act Accessibility Guidelines \(ADAAG\)](#) U.S. Architectural and Transportation Barriers Compliance Board, July 1998
- [A Guide for Achieving Flexibility in Highway Design 1<sup>st</sup> Edition](#) (AASHTO) American Association of State and Highway Transportation Officials, May 2004
- [A Safe System-Based Framework and Analytical Methodology for Assessing Intersections](#) (FHWA) FHWA-SA-21-008, January 2021
- [Better Streets Plan: Policies and Guidelines for the Pedestrian Realm](#) (San Francisco) San Francisco Board of Supervisors, December 2010
- [Bikeway Design Standards](#) (FDOT) FDOT Roadway Design Office, January 2022
- [Bikeway Selection Guide](#) (FHWA) FHWA-SA-18-077, February 2019
- [City Limits – Setting Safe Speed Limits on Urban Streets](#) (NACTO) National Association of City Transportation Officials, Summer 2020
- [Context Classification Guide](#) (FDOT) Florida Department of Transportation, July 2020
- [Context Sensitive Solutions and Design](#) (FHWA) Federal Highway Administration, April 2020
- [Design Bulletin on Designing for Level of Traffic Stress](#) (Washington State DOT) Development Division: Multimodal Development and Delivery, November 2022
- [Design Manual for Bicycle Traffic](#) (CROW) CROW, 2017
- [Designing for All Ages and Abilities: Contextual Guidance for High-Comfort Bicycle Facilities](#) (NACTO) National Association of City Transportation Officials, December 2017
- [Don't Give Up at the Intersection](#) (NACTO) National Association of City Transportation Officials, May 2019
- [Global Street Design Guide](#) (NACTO) Global Designing Cities Initiative, October 2016
- [Guide for Geometric Design of Transit Facilities on Highways and Streets, 1<sup>st</sup> Edition](#) (AASHTO), July 2014
- [Guide for Multimodal Mobility Analysis 7<sup>th</sup> Edition](#) (NASEM and TRB) National Academies of Sciences, Engineering, and Medicine, 2022
- [Guide for Park and Ride Facilities 2<sup>nd</sup> Edition](#) (AASHTO) Task Force on Public Transportation Facilities Design, October 2004
- [Guide for Planning, Design, and Operation of Pedestrian Facilities 2<sup>nd</sup> Edition](#) (AASHTO) American Association of State and Highway Transportation Officials, December 2021



- [Guide for the Development of Bicycle Facilities 4<sup>th</sup> Edition](#) (AASHTO) American Association of State and Highway Transportation Officials, 2012
- [Guide to Vertical Deflection Speed Reduction Techniques – Planning and Design of Speed Humps, Speed Tables and Other Related Measures](#) (ITE) Institute of Transportation Engineers, December 2022
- [Highway Safety Manual](#) (AASHTO) American Association of State and Highway Transportation Officials, 2024
- [Implementing Context Sensitive Design Handbook](#) (ITE) IR-145-E, November 2017
- [Improving Intersections for Pedestrians and Bicyclists Informational Guide](#) (FHWA) FHWA-SA-22-017, April 2022
- [Integrating the Safe System Approach with the Highway Safety Improvement Program: An Informational Report](#) (FHWA) FHWA-SA-20-018, October 2020
- [Memo on Complete Streets Implementation](#) (Washington State DOT) Washington State Department of Transportation, June 2022
- [Micromobility Facility Design Guide](#) (ITE) IR-149-E, April 2021
- [Multimodal Design Guide](#) (Ohio DOT) Ohio Department of Transportation, January 2024
- [MUTCD 11<sup>th</sup> Edition](#) (FHWA) 23 Code of Federal Regulations (CFR), Part 655, Subpart F, December 2023
- [NCHRP Research Report 855: An Expanded Functional Classification System for Highways and Streets](#) (NCHRP) National Academies of Sciences, Engineering, and Medicine, January 2018
- [NCHRP Research Report 1022: Context Classification Application: A Guide](#) (NCHRP) National Academies of Sciences, Engineering, and Medicine, 2022
- [NCHRP 1036: Roadway Cross-Section Reallocation Methodology](#) (NCHRP) National Academies of Sciences, Engineering, and Medicine, October 2023
- [Primer on Safe System Approach for Pedestrians and Bicyclists](#) (FHWA) FHWA-SA-21-065, May 2021
- [Proven Safety Countermeasures](#) (FHWA) Federal Highway Administration, 2024
- [Public Rights-of-Way Accessibility Guidelines](#) (U.S. Access Board) U.S. Access Board, August 2023
- [Recommendations of the Safe System Consortium](#) (ITE) Johns Hopkins Bloomberg School of Public Health Center for Injury Research and Policy, 2021
- [Recommended Practice: Lighting Roadway and Parking Facilities](#) (Illuminating Engineering Society) Approved American National Standard, 2022
- [Roadside Design Guide 4<sup>th</sup> Edition](#) (AASHTO) American Association of State and Highway Transportation Officials, 2011
- [Salt Lake City Street & Intersection Typologies Design Guide](#) (Salt Lake City Transportation) Salt Lake City, 2020
- [Separated Bike Lane Planning and Design Guide](#) (FHWA) FHWA-HEP-15-025, May 2015
- [Separated Bike Lane Planning & Design Guide](#) (MassDOT) Commonwealth of Massachusetts, 2015

- [Small Town and Rural Multimodal Networks Guide](#) (FHWA) FHWA-HEP-17-024, December 2016
- [Speed Management Manual](#) (World Health Organization) Global Road Safety Partnership, 2008
- [Sustainable Safety 3<sup>rd</sup> Edition](#) (Dutch SWOV) SWOV, 2018
- [Transit Street Guidance](#) (NACTO) National Association of City Transportation Officials, 2016
- [Urban Bikeway Design Guide 2<sup>nd</sup> Edition](#) (NACTO) National Association of City Transportation Officials, 2014
- [Urban Street Design Guide](#) (NACTO) National Association of City Transportation Officials, 2013
- [Walkable Urban Throughfares Guide](#) (ITE) Institute of Transportation Engineers, March 2013