

Safe System Strategic Plan



Foreword

The Safe System Strategic Plan provides a roadmap for the advancement of the Safe System Approach in the United States (U.S.). It describes the Safe System Approach, discusses the process involved in building the plan, outlines how to advance a Safe System mindset, and describes steps necessary to implement Safe System practices within the transportation community in the U.S. This plan focuses on the role of road system owners and operators in applying the Safe System Approach to design, build, and operate safer roads. However, practitioners and partnerships within other safety disciplines play an important role in helping to advance all elements of the Safe System Approach. This plan aims to educate transportation professionals on the effectiveness of the Safe System Approach while also offering guidance on how to prioritize safety in the U.S. as a means to achieving zero traffic fatalities.

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Background

In 2016, the Road to Zero (RTZ) Coalition was formed to bring together and build a broad coalition of stakeholders working toward a goal of zero fatalities from motor vehicle crashes. The objective was to unify efforts that were being advanced under initiatives such as “Toward Zero Deaths” and “Vision Zero.” In 2018, the RAND Corporation prepared a report for the Road to Zero Coalition titled *The Road to Zero: A Vision for Achieving Zero Roadway Deaths by 2050*. This report articulated a three-prong strategy to reach the goal of zero fatalities from motor vehicle crashes by the year 2050. The three prongs are: Double Down on What Works, Accelerate Advanced Technology, and Prioritize Safety. The Prioritize Safety strategy focuses on methods to facilitate change by “...creating a Safety Culture and adopting a Safe System approach.”¹ The report further references the vital importance of the Safe System Approach as follows:

“...a Safe System approach assumes that people will occasionally, but inevitably, make mistakes behind the wheel and that the overall transportation system should be designed to be forgiving so that these mistakes do not lead to fatal outcomes.”

From the publication of the RTZ Coalition Report, managed by the National Safety Council (NSC), formed three groups to focus on the three prongs in the overall strategy. The Institute of Transportation Engineers (ITE) assumed a leadership role for the Prioritizing Safety effort and a Steering Committee of representatives from national organizations involved in the RTZ Coalition. Beneath the Steering Committee, two working groups were formed to evaluate the state of knowledge and practice regarding a positive Safety Culture and the Safe System Approach.



Figure 1. Structure of the Road to Zero Coalition Prioritizing Safety Steering Committee with Safe System and Safety Culture Working Groups.

Through multiple forums for collaboration, the working groups defined the immediate, near-term, and long-term actions necessary to promote adoption and use of the Safe System Approach and development of a strong Safety Culture in the U.S.

In October 2019, the Safe System Working Group (members listed in Appendix A) conducted an initial survey of practitioners from both the Road to Zero Coalition and ITE public agency and safety members to assess understanding of the Safe System Approach among RTZ Coalition members and transportation professionals. A full summary of the responses to this survey is provided in Appendix B. Of 160 responses received, forty-one percent (41%) of respondents were very familiar with the concept of the Safe System Approach; however, a much smaller percentage regularly practiced Safe System principles.

¹ The RTZ Coalition Report refers to a Safe System approach instead of the Safe System Approach.

The Safe System Working Group also conducted an initial literature review in late 2019 that led to release of a [Safe System Technical Resource Page](#). This resource page provides resources that provide initial guidance for implementing the Safe System Approach in the U.S. Many of the resources are international documents that have guided success towards reducing serious injury and fatalities on roads in other countries. The initial resources were also used to support the development of the [Safe System Explanation](#) and [Safe System Framework](#). While FHWA representatives served as members of the Working Group and the resource page includes links to FHWA resources, the resource page itself does not represent FHWA guidance.



Death/Serious Injury is Unacceptable

While no crashes are desirable, the Safe System approach prioritizes crashes that result in death and serious injuries, since no one should experience either when using the transportation system.



Responsibility is Shared

All stakeholders (transportation system users and managers, vehicle manufacturers, etc.) must ensure that crashes don't lead to fatal or serious injuries.



Humans Make Mistakes

People will inevitably make mistakes that can lead to crashes, but the transportation system can be designed and operated to accommodate human mistakes and injury tolerances and avoid death and serious injuries.



Safety is Proactive

Proactive tools should be used to identify and mitigate latent risks in the transportation system, rather than waiting for crashes to occur and reacting afterwards.



Humans Are Vulnerable

People have limits for tolerating crash forces before death and serious injury occurs; therefore, it is critical to design and operate a transportation system that is human-centric and accommodates human vulnerabilities.



Redundancy is Crucial

Reducing risks requires that all parts of the transportation system are strengthened, so that if one part fails, the other parts still protect people.

Figure 2. Safe System Principles presented in FHWA The Safe System Approach Brochure. Source: FHWA.

Introduction to the Strategic Plan

The purpose of this strategic plan is to create a roadmap for the strategies, focus areas, measures of success, and specific actions that will facilitate adoption of the Safe System Approach by infrastructure owners and operators in the U.S. A principle of the Safe System Approach is that responsibility is shared; and thus, any strategies laid out in this plan will need to be coordinated with numerous partners in a collaborative approach to achieve a goal of zero roadway fatalities in the U.S. The purpose of this plan is to educate decision makers, influencers, and practitioners about Safe System techniques, and how the roadway system can be better planned, designed, and operated. This approach is structured around the idea of changing mindset, scale, and practice.

Special note: Although this plan focuses on infrastructure owners and operators, there is great applicability for all safety professionals to use the plan as a guide for institutionalizing the Safe System Approach. Building on the awareness and implementation of safety culture and the Approach requires the attention of the four E's of the safety (Engineering, Education, Enforcement, and EMS).

- **Changing Mindset** is focused on awareness building of Safety Culture and the Safe System Approach, and how they link to the goal of zero fatalities. It also seeks to create buy-in to the Safe System principles that humans make mistakes and human bodies are fragile. Early efforts, such as the [Safe System Explanation](#) and [Introduction to Safe System webinar](#), provide resources for practitioners to gain basic understanding of Safe System concepts. Throughout this plan, there is continued emphasis on potential strategies and actions that build from early efforts to create a broader awareness within the road safety community about the importance of Prioritizing Safety, specifically the Safe System Approach.

- **Changing Scale** is aimed at building the understanding that achieving a goal of zero fatalities and serious injuries must be at a system scale. The Safe System Approach is more than individual actions; it is a coordinated set of strategies carried out by the many players responsible for delivering safe transportation systems. This starts by embracing the five elements in the [Safe System Wheel](#) working together to create a mutually reinforcing safety net. These elements were adapted to a U.S. context from similar approaches used by countries leading in transportation safety around the world. Achieving

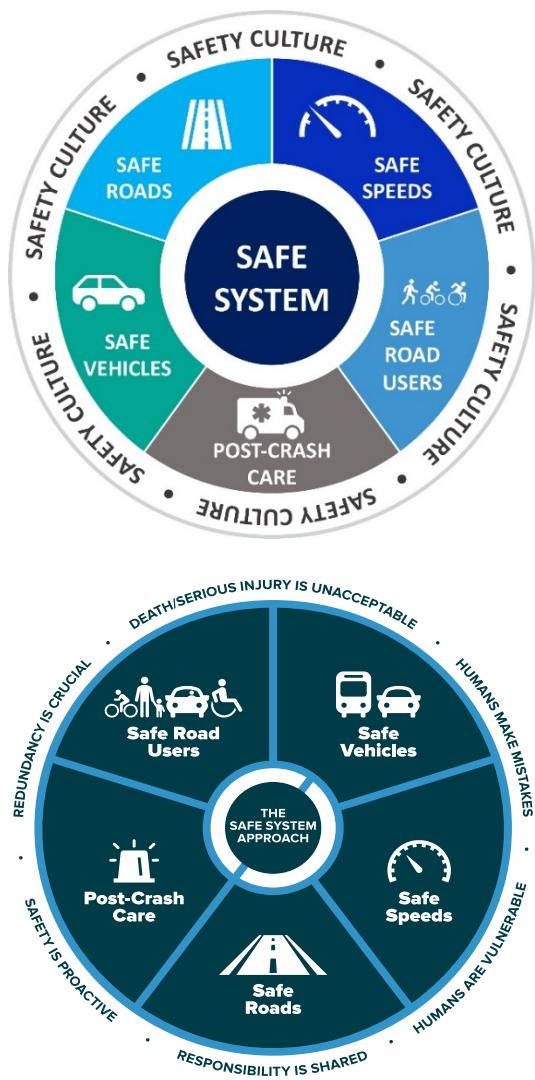


Figure 3. Safe System Wheels showing five elements of a holistic approach to reducing fatalities, one focused on Safety Culture surrounding the Safe System Approach and the other highlighting Safe System principles that affect Safe System elements.

Source: ITE/FHWA.

this safety net includes embracing Safety Culture within organizations and communities, and moves to adopting systems thinking, programs, and practices by those responsible for the different elements and principles of the Safe System Approach. While this plan predominately focuses on the safe roads, safe road users, and safe speed elements, it also outlines the need to involve practitioners and partnerships in the safe vehicles and post-crash care elements to fully achieve the Safe System Approach. This all takes into consideration the Safe System principles that responsibility is shared, and redundancy is crucial to prevent death and serious injury.

- **Changing Practice** is about providing transportation professionals responsible for the planning, design, operation, and other aspects of the road system with tools to make decisions based on the Safe System Approach. The [Safe System Framework](#) provides a starting point for changing practice and structure that can be used to reduce the 36,000 deaths annually. Throughout this plan, foundational documents in the planning, design, and operation of transportation infrastructure have been identified as opportunities for changing practice toward the Safe System Approach. A key goal throughout this plan involves showcasing implementation of the Safe System framework, elements, and principles in roadway projects moving forward. Use of FHWA Proven Safety Countermeasures using the Safe System Approach is another application of changing practice; prioritizing research on new Safe System techniques is also important.

This plan focuses on immediate (one year), near-term (two to five years), and long-term (greater than five years) timelines for actions toward advancing the Safe System Approach in the U.S. with clear measures of success for the transportation profession. The timelines are benchmarks for raising awareness and building support in one year, developing and disseminating resources and tools in two to five years, and institutionalizing practices of Prioritizing Safety using the Safe System Approach and creating a Safety Culture beyond five years. The plan should be carried forward through the broad support of the RTZ Coalition. However, achievement of the goals outlined in this plan require the broader support of the entire safety community and transportation profession.

The Safe System Working Group and Safety Culture Working Group developed an extensive Prioritizing Safety Roadmap, which is shown on the next page. The timelines, focuses, and measures of success are consistent between the Safe System Approach and creating a positive Safety Culture. The strategies and outcomes informed the actions and guidance to build, develop, and institutionalize the Safe System Approach as a means to achieving zero roadway deaths. The following strategies and outcomes were developed to ground this plan:

Strategies	Outcomes
<i>Solidify the vision and build consensus on Prioritizing Safety in U.S.</i>	<i>Consensus on Prioritizing Safety in U.S.</i>
<i>Create pathways for successful adoption</i>	<i>Policies and processes in place to support widespread deployment</i>
<i>Support implementation at community, corridor, and project levels</i>	<i>Examples of successful implementation widely available</i>

The identified actions in this plan can be further explored, developed, and in some cases, implemented by a wide variety of stakeholders. The actions in this plan incorporate the elements and principles outlined in the following FHWA publications on the FHWA [Zero Deaths and Safe System](#) webpage: [The Safe System Approach Brochure](#), [The Safe System Approach Presentation](#), [Integrating the Safe System Approach with the Highway Safety Improvement Program Informational Report](#), and additional forthcoming Safe System resources from FHWA. The RTZ Coalition Prioritizing Safety Roadmap is articulated in the following immediate, near-term, and long-term action tables:

Table 1. Road to Zero Coalition Prioritizing Safety Roadmap for Advancing Safety Culture and the Safe System Approach Immediate Actions.

*Actions in *italic* text with a checkbox icon in Roadmap are considered immediate Safe System actions that are detailed in this Strategic Plan.

Timeline	<u>Immediate</u> Up to one-year	
Focus	Awareness-raising and building support	
Measures of Success	<ol style="list-style-type: none"> 1. Organizations and users introduced to Safety Culture and the Safe System Approach concepts 2. Existing Safety Culture and the Safe System Approach practices identified 3. Key stakeholders onboard 	
Strategies	Immediate Actions*	Outcomes
<i>Solidify the vision and build consensus on Prioritizing Safety in U.S.</i>	<ul style="list-style-type: none"> · Develop Safety Culture principles to support broad engagement and usability of the term Traffic Safety Culture · Convene Safety Culture partners to formalize a mutually understood framework <input type="checkbox"/> <i>Develop talking points and promote concepts of the Safe System Approach and Safety Culture through a variety of media</i> · Develop Safety Culture web pages and resources <input type="checkbox"/> <i>Enhance and refine Safe System Resource Page, Explanation, and Framework</i> <input type="checkbox"/> <i>Identify and engage influencers and leading professional organizations on the Safe System Approach and Safety Culture</i> <input type="checkbox"/> <i>Share Safety Culture and Safe System concepts with leading jurisdictions actively working toward zero transportation fatalities</i> <input type="checkbox"/> <i>Connect Prioritizing Safety and transportation equity</i> 	<i>Consensus on Prioritizing Safety in U.S.</i>
<i>Create pathways for successful adoption</i>	<ul style="list-style-type: none"> <input type="checkbox"/> <i>Identify key elements of a Prioritizing Safety program</i> <input type="checkbox"/> <i>Highlight need for a data-driven approach</i> <input type="checkbox"/> <i>Identify opportunities for implementing Prioritizing Safety</i> · Develop a Safety Culture self-assessment tool · Conduct Safety Culture self-assessments that are reviewed and approved by outside experts <input type="checkbox"/> <i>Develop urban core (area-wide) Prioritizing Safety approach</i> 	<i>Policies and processes in place to support widespread deployment</i>

	<input type="checkbox"/> <i>Develop suburban arterial (corridor) Prioritizing Safety approach</i> <input type="checkbox"/> <i>Develop a rural roads Prioritizing Safety approach</i>	
<i>Support implementation at community, corridor, and project levels</i>	<ul style="list-style-type: none"> · Develop a template for Safety Culture core elements <input type="checkbox"/> <i>Encourage coordination and information sharing on Safety Culture and Safe System efforts at all jurisdictional levels</i> <input type="checkbox"/> <i>Identify and document examples where safety expectations have changed</i> <input type="checkbox"/> <i>Solicit and compile U.S.-based examples of projects successfully applying the Safe System Approach</i> <input type="checkbox"/> <i>Assemble data on safety benefits (and co-benefits) of Safe System applications</i> <input type="checkbox"/> <i>Showcase value of temporary, quick-build, and low-cost projects to test safety improvements and new approaches</i> <input type="checkbox"/> <i>Identify techniques applicable to certain land uses</i>	<i>Examples of successful implementation widely available</i>

Table 2. Road to Zero Coalition Prioritizing Safety Roadmap for Advancing Safety Culture and the Safe System Approach Near-Term Actions.

**Actions in *italic* text with a triangle icon in Roadmap are considered Safe System actions that could be explored as this Strategic Plan advances.

Timeline	<u>Near-Term</u> Two to five years	
Focus	Developing and disseminating resources and tools	
Measures of Success	<ol style="list-style-type: none"> 1. Implementers understand and begin to practice Safety Culture and the Safe System Approach 2. Tools and resources widely available 3. Prioritizing Safety success stories being shared 	
Strategies	Near-Term Actions**	Outcomes
<i>Solidify the vision and build consensus on Prioritizing Safety in U.S.</i>	<ul style="list-style-type: none"> Δ <i>Encourage jurisdictions committed to a goal of zero fatalities to incorporate a Prioritizing Safety approach</i> · Provide Safety Culture case studies for inclusion in Strategic Highway Safety Plans Δ <i>Encourage adoption of Safety Culture and Safe System Frameworks</i> Δ <i>Encourage cross-jurisdiction (State-regional-local) collaboration</i> Δ <i>Highlight success stories</i> 	<i>Consensus on Prioritizing Safety in U.S.</i>
<i>Create pathways for successful adoption</i>	<ul style="list-style-type: none"> Δ <i>Develop a Prioritizing Safety program guide</i> Δ <i>Identify model Prioritizing Safety policies</i> Δ <i>Demonstrate data analysis techniques</i> · Demonstrate and evaluate Safety Culture measurement tools Δ <i>Identify opportunities to integrate Prioritizing Safety into existing guidance, policies, and standards</i> · Share Safety Culture narratives from exemplary studies with partners Δ <i>Integrate Safety Culture and the Safe System Approach in Strategic Highway Safety Plans</i> Δ <i>Convene trainings to assist agencies in implementation of the Safe System Approach and Safety Culture</i> Δ <i>Pilot, test, and evaluate urban core (intersection level, pedestrian, and bicycle users) Prioritizing Safety approach</i> Δ <i>Pilot, test, and evaluate suburban arterial Prioritizing Safety approach</i> Δ <i>Pilot, test, and evaluate rural roads Prioritizing Safety approach</i> 	<i>Policies and processes in place to support widespread deployment</i>

<i>Support implementation at community, corridor, and project levels</i>	Δ <i>Develop cases studies at community, corridor, and project levels</i>	<i>Examples of successful implementation widely available</i>
	Δ <i>Equip stakeholders with data and resources</i>	
	Δ <i>Establish consistent means of providing compelling performance-related feedback</i>	
	Δ <i>Develop a Safe System toolbox, including approaches for faster crash risk identification and for identifying appropriate improvements based on area/corridor/road segment and speed</i>	
	Δ <i>Develop quick-build toolkit for Safe System applications</i>	
	Δ <i>Showcase leverage-based Prioritizing Safety techniques</i>	
	Δ <i>Conduct before and after evaluations of improvements</i>	

Table 3. Road to Zero Coalition Prioritizing Safety Roadmap for Advancing Safety Culture and the Safe System Approach Long-Term Actions.

***Actions in *italic* text with a triangle icon in Roadmap are considered Safe System actions that could be explored as this Strategic Plan advances.

Timeline	<u>Long-Term</u> Greater than five years	
Focus	Institutionalizing practices	
Measures of Success	<ol style="list-style-type: none"> 1. Safety Culture and the Safe System Approach being widely applied 2. Safety Culture and the Safe System Approach integrated into practice 3. Improvements in safety linked to Safety Culture and the Safe System Approach 	
Strategies	<u>Long-Term Actions</u> ***	Outcomes
<i>Solidify the vision and build consensus on Prioritizing Safety in U.S.</i>	<ul style="list-style-type: none"> Δ <i>Institutionalize Prioritizing Safety concepts as part of safety practice in U.S.</i> Δ <i>Implement sustainable frameworks that support increased awareness of Safety Culture and the Safe System Approach</i> · Require safety plans to include effective Safety Culture strategies · Stakeholders required to report indicators of Safety Culture as part of performance management requirements 	<i>Consensus on Prioritizing Safety in U.S.</i>
<i>Create pathways for successful adoption</i>	<ul style="list-style-type: none"> Δ <i>Develop and advance Prioritizing Safety programs and policies</i> Δ <i>Update existing guidance, polices, and standards to integrate a Prioritizing Safety approach</i> · Conduct routine Safety Culture assessments with developed tool Δ <i>Showcase model urban, suburban, and rural implementations</i> Δ <i>Formalize communication and sharing of resources across multi-sector partners</i> 	<i>Policies and processes in place to support widespread deployment</i>
<i>Support implementation at community, corridor, and project levels</i>	<ul style="list-style-type: none"> Δ <i>Provide Safe System implementation resources for use in a wide variety of settings</i> Δ <i>Embed evidence-based traffic safety practices at all jurisdictional levels and with all stakeholders</i> 	<i>Examples of successful implementation widely available</i>

Format of Strategic Plan

The following key outlines headers in the subsequent sections of the Safe System Strategic Plan and are based on the Prioritizing Safety Roadmap:

Strategic goals are shown in **bold underline** text with a check mark icon.

Actions are shown in *italic* text with a checkbox icon.

Callout boxes with italic bold text are some potential [FHWA Proven Safety Countermeasures](#) that could be implemented using the Safe System Approach.

Images throughout represent visual examples of applying the Safe System Approach on projects in the U.S.



Figure 4. Redundancy is key—such as high-visibility crosswalks and bumpouts—in a Safe System application to prevent crashes. Source: Mariah Hewines/Unsplash.

Immediate One-Year Actions that Raise Awareness and Build Support for the Safe System Approach

This section describes immediate actions that can be taken to raise awareness and build support for the Safe System Approach. Each item includes a description and a brief list of relevant resources identified in the literature review.

Measures of Success

- Organizations/users introduced to the Safe System Approach and Safety Culture concepts
- Existing Safe System Approach and Safety Culture practices identified
- Key stakeholders are on board

Solidify the Vision and Build Consensus on Prioritizing Safety in U.S.

Develop Talking Points and Promote Concepts of the Safe System Approach and Safety Culture through a Variety of Media

This action could be accomplished via webinars, conferences, articles, and fact sheets. This action could build on work underway, including a Safe System resource page, Safe System and Safety Culture introduction webinars, Safe System articles and presentations at conferences already released or planned. With the Prioritizing Safety Steering Committee planting the seed, this action could develop boilerplate talking points, brochures, social media campaigns, and a presentation that members of the RTZ Coalition and other organizations could use to carry and spread the Prioritizing Safety message. This material could make it easier to build a consistent understanding and could be used at trainings, conferences, and via membership outreach to raise awareness and build support beyond those currently involved with Safe System efforts. Promotional material content should stress that without a positive safety culture, the Safe System Approach cannot be feasibly implemented. This action could include a discussion forum and should utilize the RTZ Coalition structure to build support.

Existing Resources, Guidance, and Tools: Safe System Explanation, Safe System Framework, FHWA Safe System Approach Brochure, Traffic Safety Culture pooled fund study, FHWA Safe System presentation, and the FHWA Integrating the Safe System Approach with the Highway Safety Improvement Program Report.

Enhance and Refine Safe System Resource Page, Explanation, and Framework

The initial versions of the Safe System resource page, Explanation, and Framework serve as an initial foundation for the Safe System Approach in the U.S. Revisions to existing resources will be necessary and additional resources will need to be developed as the Safe System Approach is more widely applied; this action may focus on ensuring the available resources are added and/or adjusted as the use of the Safe System Approach advances. The focus of these new and updated resources may include new information and guidance drawn from more system-wide use of the Safe System Approach.

Existing Resources, Guidance, and Tools: Safe System Resource Page, Safe System Explanation, Safe System Framework, FHWA Safe System presentation, and the FHWA Integrating the Safe System Approach with the Highway Safety Improvement Program Report, and FHWA Zero Deaths and Safe System webpage.

Identify and Engage Influencers and Leading Professional Organizations on the Safe System Approach and Safety Culture

This action may focus on continuing to build RTZ Coalition support for the Safe System Approach and building a Safety Culture. Identifying and engaging influencers and organizations that have influence in transportation practice and getting the message to their members/stakeholders may be an important step. This action will dovetail with developing talking points and promotion actions noted above, as well as engagement through key organizations and committees as well as individual discussions with influencers. This should continue to build on resources and lessons learned on an international level that could be applied successfully in the U.S. and continue to look at organizations creating foundational documents on the Safe System Approach and practices.

Existing Resources, Guidance, and Tools: World Road Association (PIARC) Road Safety Manual and Towards Zero Foundation The Safe System webpage.

Share Safety Culture and Safe System Concepts with Leading Jurisdictions Actively Working Toward Zero Transportation Fatalities

One way of building understanding for the Safe System Approach is to start with jurisdictions that have already invested in reducing fatalities through adoption of Vision Zero or Toward Zero Deaths initiatives. This action may include sharing information and working with leading programs to include the Safe System Approach to reduce serious injuries and fatalities. Through pilot projects, this action could explore implementing and advancing the Safe System framework as part of a Vision Zero program and measure success and reduction of serious injuries and fatalities in jurisdictions from anticipating human error and accommodating human injury tolerances. This action may lead to an update to the existing Vision Zero Core Elements and TZD Framework by adding an element that includes an expanded emphasis on the Safe System Approach.

Existing Resources, Guidance, and Tools: RTZ Prioritizing Safety resources, Vision Zero Core Elements, TZD Framework, NHTSA Integrated Vehicle-Based Safety Systems (IVBSS), and FHWA Safe System products.

Connect Prioritizing Safety and Transportation Equity

Making a connection between equity and safety in crash data and where resources are focused is a key focus of raising awareness and reducing serious injuries and fatalities on U.S. roads. Equity in transportation is an emerging focus nationally, and in some jurisdictions within Vision Zero programs, but more can be done to understand and reduce crashes that result in fatalities and serious injuries because of transportation inequities. Crashes impact all segments of American society but not always equally. People of color are more likely to be killed in traffic crashes.² Low-income Americans and people of color are overrepresented in crashes involving pedestrians, often because the infrastructure provided in their communities to support safe walking is lacking.³ This effort will encourage more data on ethnicity, income, and neighborhood type for serious injury and fatal crashes. It may also involve developing material that clearly documents the connections between transportation and equity that can be used to educate both decision makers and professional staff on these connections and the need to ensure that investments in improving transportation safety are made in an equitable manner.

² <https://www.governing.com/topics/public-justice-safety/gov-pedestrian-deaths-analysis.html>

³ <https://scholarscompass.vcu.edu/cgi/viewcontent.cgi?article=3983&context=etd>

Existing Resources, Guidance, and Tools: Vision Zero Core Elements, NHTSA Traffic Safety Facts on Race and Ethnicity, NHTSA Fatality Analysis Reporting System (FARS) Data, Center for Disease Control and Prevention National Center for Injury Prevention and Control, NSC Journal of Safety Research, and RTZ Connecting Prioritizing Safety with Transportation Equity webinar.



Figure 5. The Safe System Approach requires a shared responsibility to proactively identify and address risks to protect all road users. Source: Javier de la Maza/Unsplash.

✓ Create Pathways for Successful Adoption

Identify Key Elements of a Prioritizing Safety Program

It is important to identify key elements and principles of Prioritizing Safety that can be incorporated in existing safety plans and programs, such as Strategic Highway Safety Plans (SHSP) and Highway Safety Improvement Programs (HSIP), with a goal of achieving zero fatalities and serious injuries by incorporating a positive Safety Culture and using the Safe System Approach. This action will take the initial work done by the RTZ Coalition, PIARC *Road Safety Manual*, and ongoing work from FHWA around the Safe System Approach to build a more comprehensive approach through State and local plans and programs.

Existing Resources, Guidance, and Tools: Safe System Framework, FHWA The Safe System Approach Brochure, Highway Safety Manual, AASHTO Policy on Geometric Design of Highways and Streets “Green Book,” PIARC Road Safety Manual, HSIP, NHTSA Traffic Safety Facts, and relevant FHWA Office of Safety products.

Highlight Need for a Data-Driven Approach

Safety data is critical to implementing the Safe System Approach and contributes to understanding how to reduce serious injuries and fatalities. A data-driven approach may help practitioners understand the Safe System framework, principles, practices, and elements that are effective in achieving the goal of zero fatalities and serious injuries. This action could develop a data set and template for jurisdictions to use to monitor trends, focus areas/locations, and effectiveness of implementing the Safe System Approach.

Existing Resources, Guidance, and Tools: Safe System Framework, FHWA Safe System Approach Brochure, NHTSA FARS, Data-Driven Safety Analysis (DDSA), and FHWA Every Day Counts (EDC).

Data-Driven Safety Analysis

Data-Driven Safety Analysis exemplifies the Safe System principle of being proactive by implementing countermeasures where crashes are more likely to occur in the future based upon identified risk factors.

Identify Opportunities for Implementing Prioritizing Safety

To complement the above action of identifying key elements of prioritizing a safety program, this action may identify opportunities to incorporate the Safety Culture and Safe System concepts into the tools currently used by practitioners. The two actions combined will help guide efforts to advance these practices in the U.S. at national, State, regional and local levels. Understanding how Safety Culture and the Safe System Approach can be integrated with traditional safety tools and resources may be critical to advance acceptance and adoption. A strengths, weaknesses, opportunities, and threats (SWOT) analysis may be a simple approach to evaluating opportunities to prioritize safety through implementing the Safe System Approach and creating positive Safety Culture. This plan may inform the appropriate sequencing of actions to advance the Safe System Approach in the U.S.

Existing Resources, Guidance, and Tools: Highway Safety Manual, AASHTO Policy on Geometric Design of Highways and Streets (Green Book), Highway Safety Improvement Programs (HSIP), MUTCD, and NHTSA Traffic Safety Facts.

Develop Urban Core (Area-Wide) Prioritizing Safety Approach

This action will be to develop an approach or guide for using the Safe System Approach in an urban core or high-density area at an area-wide scale. This may include downtown areas in highly populated cities. This action may focus on protection of vulnerable road users in urban areas and may include case studies at an urban core and area-wide scale showing the application of the Safe System framework. There is a strong interest to begin understanding how to apply the Safe System Approach starting with the urban core.

Existing Resources, Guidance, and Tools: Highway Safety Manual, AASHTO Green Book, FHWA Proven Safety Countermeasures, MUTCD, HSIP, Data-Driven Safety Analysis (DDSA), Vision Zero Core Elements, NACTO Urban Street Design Guide and Don't Give Up at the Intersection.

Develop Suburban Arterial (Corridor) Prioritizing Safety Approach

This action will develop an approach or guide for using the Safe System Approach on a suburban arterial at a corridor level. Recognizing that suburban arterials are a road type with high crash rates,

this action may provide guidance on how to apply the Safe System Approach to reduce fatalities on arterial road classifications. This may include known corridors with suburban arterials that have effectively reduced their fatal crashes. This action may use the Safe System framework as a basis for the Safe System Approach on a suburban arterial corridor.

Existing Resources, Guidance, and Tools: Safe System Framework, FHWA Safe System Approach Brochure, Highway Safety Manual, AASHTO Green Book, Proven Safety Countermeasures, MUTCD, HSIP, and DDSA.

Leading Pedestrian Intervals

This proven safety countermeasure is an example of separating vulnerable road users in time by giving pedestrians opportunity to enter a signalized intersection crosswalk three to seven seconds before vehicles are given a green indication.

Develop a Rural Roads Prioritizing Safety Approach

This action will develop an approach or guide for using the Safe System Approach on rural roads. This guide may focus on speed management on rural roads and understanding crash causation factors and roadside environment of single vehicle crashes. This may include templates for common crashes and solutions for rural roadways.

Existing Resources, Guidance, and Tools: Highway Safety Manual, AASHTO Green Book, FHWA Proven Safety Countermeasures, MUTCD, HSIP, DDSA, and Speed Management Toolbox for Rural Communities.

✓ Support Implementation at Community, Corridor, and Project Levels

Encourage Coordination and Information Sharing on Safety Culture and Safe System Efforts at all Jurisdictional Levels

This action will build upon learned practices, networking, and learning from promotion and engagement to continue to grow knowledge and support for the Safe System Approach. This action should utilize the RTZ Coalition and benefits of a coalition structure to learn of successful projects and approaches to the Safe System Approach in the U.S. This action will ensure examples of successful implementation are widely available.

Existing Resources, Guidance, and Tools: To be developed.

Identify and Document Examples where Safety Expectations Have Changed

This action could be accomplished via an annual survey to learn if safety practices are changing. This could be done as a follow up to the initial practitioner's survey already conducted and could be managed through the RTZ Coalition. Alternatively, polls could be conducted during meetings, webinars, etc., to gauge change in mindset and practice in the profession. The results could be featured in a RTZ Coalition member profile or meeting focused on safety expectations and how they have changed for the better. This could also include more reporting or connection to safety data trends from the NHTSA Fatal Accident Reporting Systems (FARS).

Existing Resources, Guidance, and Tools: To be developed.

Solicit and Compile U.S.-Based Examples of Projects Successfully Applying the Safe System Approach

A strategy to raise awareness and build support for the Safe System Approach in the U.S. is to show successful projects that applied the Safe System Approach. Criteria for what is deemed to be a successful Safe System project should be developed. The Safe System methodology developed in Australia may be useful in creating selection criteria for Safe System projects in the U.S. This action could result in a Safe System project database with key information on how and where noteworthy Safe System projects exist in the U.S. This Safe System project database could be compiled in the short term and continually updated as more Safe System projects are successfully implemented. The initial projects highlighted in the short term may only implement portions of the Safe System Approach (such as the Carmel, Indiana, U.S. roundabout case study featured on the next page in Figure 6) and may be replaced with more systemic or comprehensive projects in the near- to long-term. This action involves the following three phases: 1) solicitation of case studies, 2) synthesis and analysis of case studies using the Safe System framework, elements, and principles, and 3) publication of completed case studies. This Safe System project database could be updated annually or more frequently to show increased practices of the Safe System Approach. This action is a high priority and will inform a multitude of actions later in the near-term timeline.

Existing Resources, Guidance, and Tools: To be developed.



Figure 6. A protected intersection can be a Safe System application, especially in urban cores, by separating users in space and time. This intersection is located in Chicago, Illinois, U.S. Source: Sarah Abel/ITE.

Assemble Data on Safety Benefits (and Co-Benefits) of Safe System Applications

This action will create statistics and national data on the Safe System Approach's effect on transportation safety. The data collection could be a research study, include FARS data, and involve a survey of transportation professionals. This action could pull statistics from case studies in the

preceding action to show the effect and impact of the Safe System Approach in achieving Vision Zero; this was identified as a top priority in this Strategic Plan.

Existing Resources, Guidance, and Tools: Limited information currently available.

Implementation of Roundabouts Using the Safe System Approach in Carmel, Indiana, U.S.

Since 1997, Carmel, Indiana, U.S. has taken the Safe System Approach to intersection design by installing roundabouts at intersections wherever possible. The city of Carmel took a systemic approach by converting over 125 intersections to roundabouts to improve safety citywide, regardless of crash history. Roundabouts move people through intersections more efficiently and more safely than stop signs or signalized intersections. With roundabouts now at so many of the city's intersections, Carmel has seen serious injury crashes reduced by about 80 percent, and the number of crashes were reduced by about 40 percent. The Mayor of Carmel instituted the comprehensive roundabout program to prioritize safety after learning from European transportation professionals that roundabouts eliminate right angle and head on crashes and reduce pedestrian conflict crashes. In addition, roundabouts slow the speed of vehicles maneuvering through an intersection, thus reducing the kinetic forces and crash severity if a crash occurs. In making these changes, designers addressed the Safe System elements of Safe Road Users, Safe Speeds, and Safe Roads.

The city of Carmel maintains a website about the comprehensive roundabouts program, where additional information is available: <https://www.carmel.in.gov/department-services/engineering/roundabouts>.



Figure 7. Images of a completed roundabout in downtown Carmel, Indiana, U.S. Source: City of Carmel.

Showcase Value of Temporary, Quick-Build, and Low-Cost Projects to Test Safety Improvements and New Approaches

Temporary or quick-build projects may allow for exploration of the Safe System Approach at relatively low cost and measure the level of safety improvement and crash reduction. Using this project delivery method may allow professionals to learn how to apply the Safe System Approach

effectively, easily adjust a project based on data, and understand crash causation and effectiveness of the countermeasure or road design change. Using quick-build projects may also raise awareness within communities of the effectiveness of the Safe System Approach to improve safety. This action could include pilot demonstrations or quick-build installations using the Safe System Approach and require data collection and lessons learned through each project.

Existing Resources, Guidance, and Tools: Highway Safety Manual, AASHTO Green Book, FHWA Proven Safety Countermeasures, HSIP, NACTO Urban Street Design Guide and Don't Give Up the Intersection.

Identify Techniques Applicable to Certain Land Uses

This action could be coupled with urban, suburban, and rural guides to identify key land uses where there could be strong support for efforts focused on eliminating fatalities and where the Safe System Approach could effectively be applied to improve safety, such as schools, hospitals, and mixed uses. From land uses that have a high crash risk to an area with a speed transition zone, a guide or series of technical briefs could be released around these key land uses where the Safe System Approach is important to improving or maintaining safety.

Existing Resources, Guidance, and Tools: Highway Safety Manual, AASHTO Green Book, Proven Safety Countermeasures, MUTCD, and HSIP.



Figure 8. The Safe System Approach aims to eliminate fatal and serious injury crashes for all road users.

Source: Greg Griffin, AICP/PBIC.

Near-Term and Long-Term Actions

The near-term and long-term actions are the future Safe System activities identified in the Prioritizing Safety Roadmap outlined in the Background section. As the U.S. moves forward in advancing the Safe System Approach, stakeholders will monitor progress. Revisiting the foundations of the Safe System Approach, including the elements, principles, and framework, should inform adjustments and details to moving the near-term actions identified in the Prioritizing Safety Roadmap forward. As the profession moves through the timeline and achieves the measures of success through completed actions, the near-term actions will be informed by the completed immediate actions.

When it is time to move toward the long-term goals, the profession should look back at the immediate and near-term action to re-evaluate the clearest path and set of actions toward institutionalizing the Safe System Approach. How the prior actions in this strategic plan have moved the needle on achieving a goal of zero traffic fatalities should be considered. As the near-term measures of success are achieved, the long-term actions can progress.

Conclusion

Internationally, Safe System practices serve as the underpinning of Vision Zero programs and successes. They represent an understanding of the importance of taking a comprehensive system approach to reducing fatalities with mutually reinforcing practices and actions being taken by the wide-range of players involved in roadway safety. They also provide infrastructure owners and operators with the tools needed to support safe roads and safe speeds in the planning, design, and operation of the roadway system.

In the U.S., the awareness, knowledge, and practice of the Safe System Approach is in the early stages. While many infrastructure owners and operators implement some of the actions that could constitute Safe System programs or practices, they are not embraced on a system basis. More effort must be devoted to engaging communities, identifying successful practices, educating practitioners, developing resources, implementing evidence-based solutions, and evaluating the effectiveness of these efforts.

This Strategic Plan presents the following three key strategies: 1) solidifying the vision, 2) creating pathways for adoption, and 3) supporting implementation. For each strategy, immediate, near-term, and long-term actions have been developed that can help make safety a priority, support development of the necessary policies and processes, and provide examples of successful implementation.

Leadership at all levels of government, as well as partnerships among stakeholders, will be critical to achieving zero fatalities and serious injuries on our roadways. This Strategic Plan provides a guide to the steps necessary to build Safe System practices in the U.S. with a particular emphasis on the role of infrastructure owners and operators.

The logical next steps are to begin implementing the immediate one-year actions amongst members of the RTZ Coalition. Funding and member involvement may determine which one-year actions and what level of implementation may move towards applying the Safe System Approach. The RTZ Prioritizing Safety efforts have recently shifted to early implementation of the most pressing goals from this Strategic Plan. Three working groups have been formed to focus on advancing implementation of Safe System examples and benefits, connecting Prioritizing Safety with transportation equity, and elevating safety as a priority.



Figure 9. Center and edge line rumble strips on rural roads can be an effective Safe System application to reduce rural road departure fatal crashes. Source: Jesse Collins/Unsplash.

Appendix A – RTZ Coalition Safe System Working Group

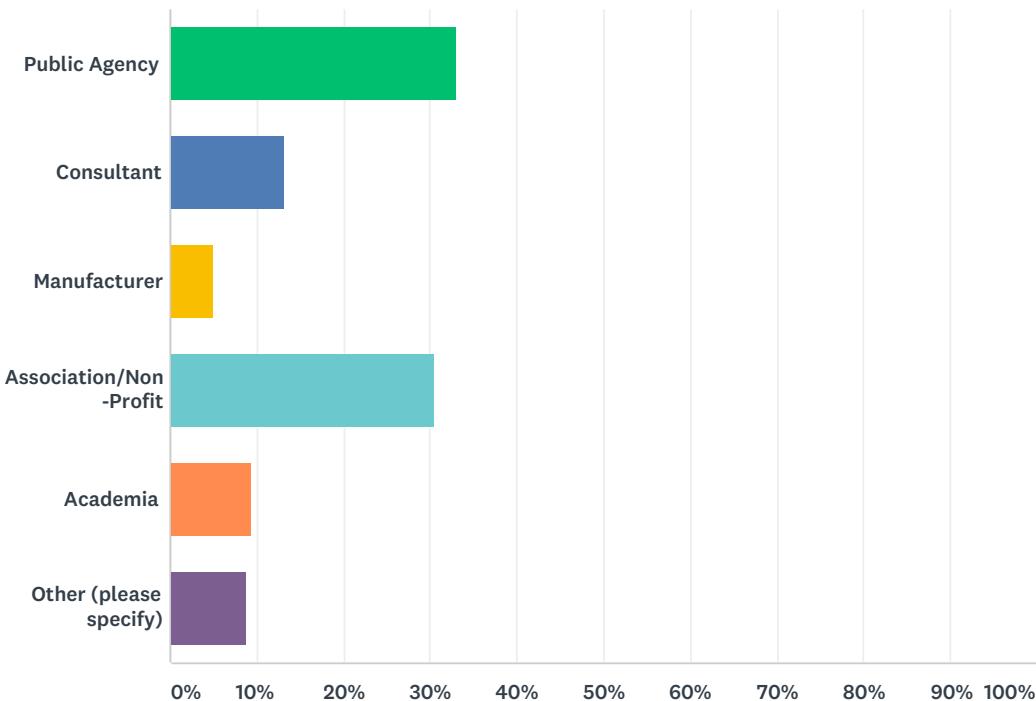
The following organizations were represented on the Safe System Working Group:

*National Safety Council
Road to Zero Coalition
Institute of Transportation Engineers
American Association of Retired Persons
American Association of State Highway Transportation Officials
America Walks
Federal Highway Administration
Highway Safety Research Center
Johns Hopkins University
National Association of City Transportation Officials
National Complete Streets Coalition
National League of Cities
National Highway Traffic Safety Administration
Transportation Research Board
Texas A&M Transportation Institute
Vision Zero Network
Wayne State University
World Bank
World Resources Institute
World Road Association*

Appendix B – Summary of 2019 Safe System Practitioners Survey

Q1 What is your organizational affiliation?

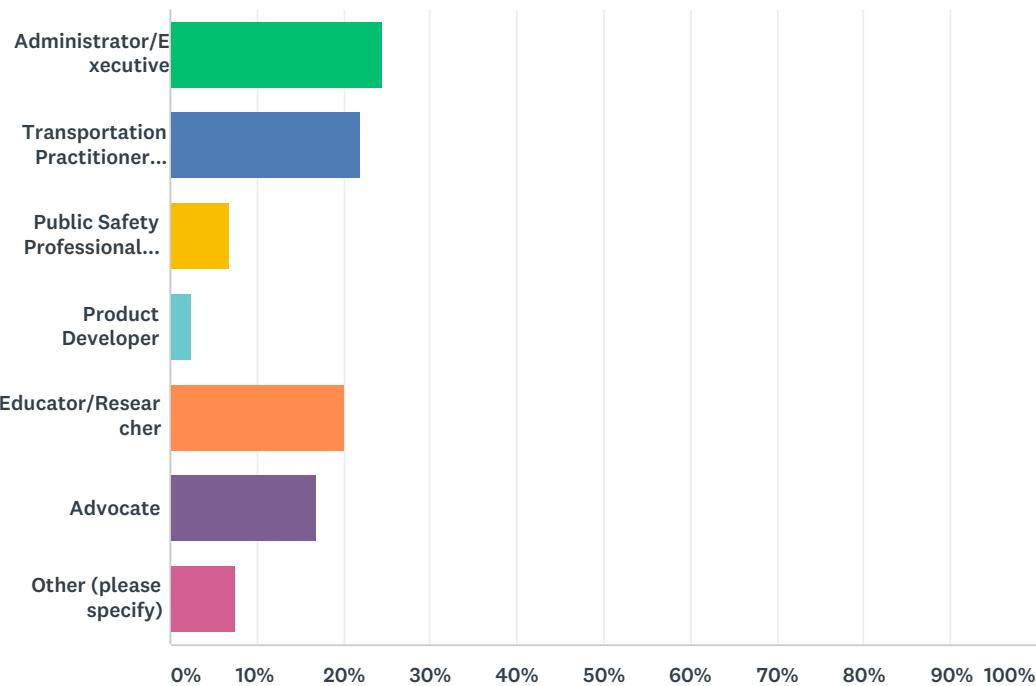
Answered: 160 Skipped: 0



ANSWER CHOICES	RESPONSES	
Public Agency	33.13%	53
Consultant	13.13%	21
Manufacturer	5.00%	8
Association/Non-Profit	30.63%	49
Academia	9.38%	15
Other (please specify)	8.75%	14
TOTAL		160

Q2 What is your role in advancing safety?

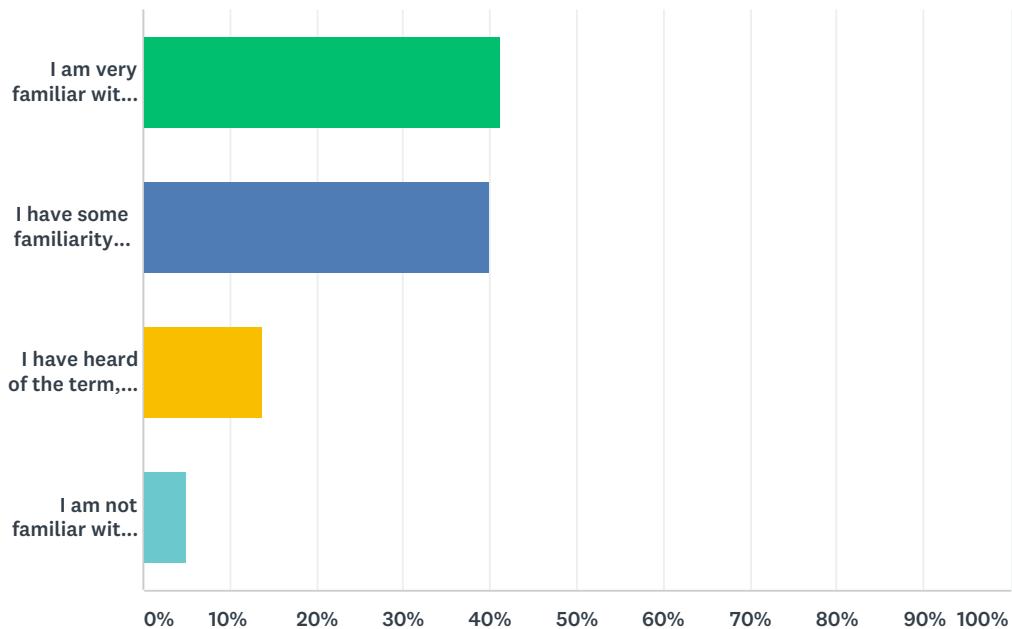
Answered: 160 Skipped: 0



ANSWER CHOICES	RESPONSES	
Administrator/Executive	24.38%	39
Transportation Practitioner (ie: Planner, Engineer, Program Specialist)	21.88%	35
Public Safety Professional (ie: law enforcement, fire, EMS)	6.88%	11
Product Developer	2.50%	4
Educator/Researcher	20.00%	32
Advocate	16.88%	27
Other (please specify)	7.50%	12
TOTAL		160

Q3 What is your level of knowledge and understanding of Safe Systems?

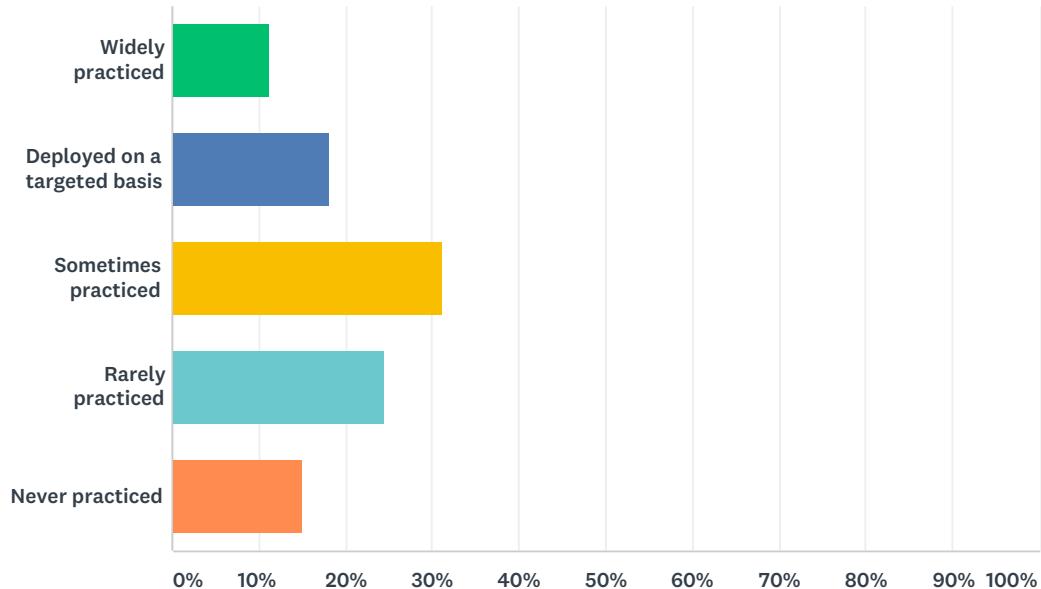
Answered: 160 Skipped: 0



ANSWER CHOICES	RESPONSES	
I am very familiar with the concept and how it can be applied to improve safety	41.25%	66
I have some familiarity with the concept, but limited working knowledge	40.00%	64
I have heard of the term, but need to learn more	13.75%	22
I am not familiar with the concept or its application	5.00%	8
TOTAL		160

Q4 If you work for a public agency, to what degree does your organization practice safe systems? If you do not work for a public agency, to what degree do you observe Safe Systems thinking being employed in the jurisdiction where you live.

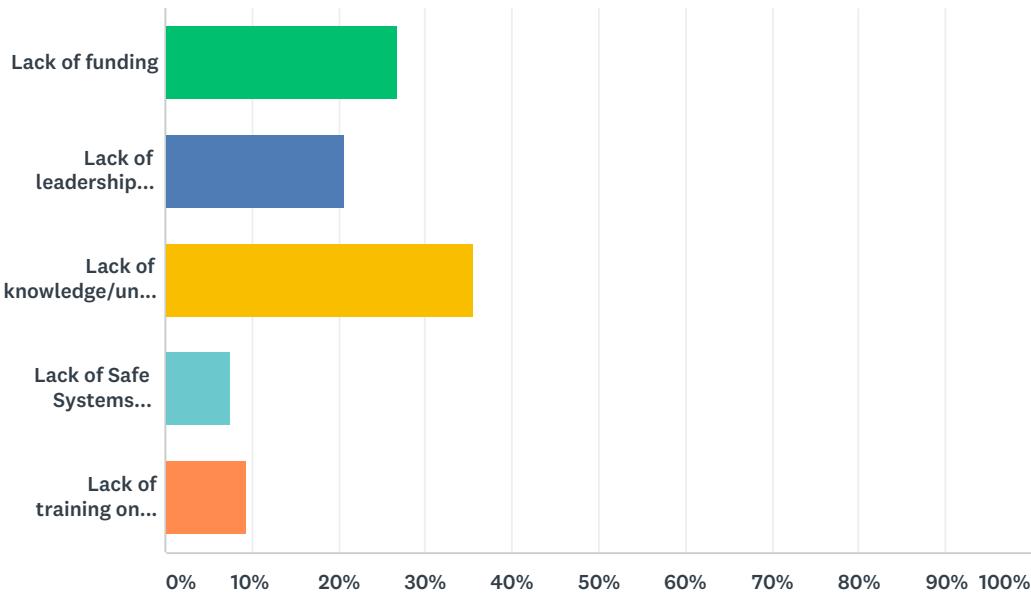
Answered: 160 Skipped: 0



ANSWER CHOICES	RESPONSES
Widely practiced	11.25% 18
Deployed on a targeted basis	18.13% 29
Sometimes practiced	31.25% 50
Rarely practiced	24.38% 39
Never practiced	15.00% 24
TOTAL	160

Q5 What is the biggest hurdle to implementing Safe Systems within the jurisdiction where you work and/or live?

Answered: 160 Skipped: 0



ANSWER CHOICES	RESPONSES	
Lack of funding	26.88%	43
Lack of leadership support	20.63%	33
Lack of knowledge/understanding by practitioners	35.63%	57
Lack of Safe Systems guidance and tools	7.50%	12
Lack of training on Safe Systems	9.38%	15
TOTAL		160

Q6 What policies, resources, guidance, or standards do you need to apply a Safe Systems approach where you work and/or live?

Answered: 160 Skipped: 0

Responses shown are a sampling of total responses.

#	RESPONSES
1	consistent and frequent messages from FHWA and NHTSA, guidance and tools
2	N/A
3	A set of guidelines for the implementation of Safe Sytems approach would be a good first step.
4	Information for everyone that's clear and actionable. Not sure who Safe Systems needs to be in touch with, facilities team or Human Resources?
5	We need to start at the beginning.
6	More guidance on the details of what the safe systems approach is.
7	Safety Countermeasures
8	Complete Streets policies, Federal Complete Streets policy, Vision Zero adoption, wider dissemination of existing FHWA resources, more FHWA training for state and local agencies,
9	Complete streets, vision zero
10	Not sure
11	Unsure
12	sf
13	NA
14	We need a federal initiative/directive/policy to provide guidance to state DOTs since they hold most of the money for state distribution.
15	We are now start some less expensive implementation approaches
16	Processes that allow evaluation of safe systems, such as city code, etc..
17	We use a safe systems approach in applying or manufacturing safety systems but the term "Safe Systems" is not in my vocabulary.
18	We had a consultant come and provide Safe Systems recommendations in our local community. However, we need funding through the township or the state DOT to enact many of the infrastructure-related ones. Also need additional guidance for the community to help garner public support.
19	allocated funding, education
20	Prescriptive guidance
21	N/A
22	Do not know
23	Targeted educational materials with case studies
24	Education
25	Education & advocacy
26	Plain language information to distribute
27	Unsure
28	N/a
29	A dedicated decision to place Vision Zero above other priorities

Q7 How can the RTZ Coalition best help to advance the knowledge and practice of Safe Systems in the US?

Answered: 160 Skipped: 0

Responses shown are a sampling of total responses.

#	RESPONSES
1	keep it in the national dialogue, a topic in all conferences, and provide guidance and tools
2	N/A
3	A set of guidelines for the implementation of Safe Systems approach would be a good first step.
4	Targeted outreach
5	begin with an online guide and/or webinar to provide the basics., then more specific training.
6	Provide more information on this initiative
7	Share information at events such as Lifesavers and GHSA
8	Educate, Create public awareness, Convene stakeholders
9	Continue to provide resources
10	Training/education of relevant agencies
11	Continuing to provide information to the constituencies working to implement Safe Systems
12	educate
13	continuing to reach out to national organizations that can help promote
14	It needs to start at the federal level as an example for states and local municipalities.
15	through webinars
16	Continued outreach efforts
17	Funding
18	How best to leverage existing resources and/or braid funding
19	More public awareness, educating legislators
20	Education/promotion
21	Be vocal and visible to the general public
22	Spread more knowledge, media outreach
23	Publish case studies and practical tech transfer materials to state agency decision makers
24	Community Engagement
25	Continue with mission
26	Provide materials such as PowerPoints and handouts
27	Awareness campaign
28	Advicacy
29	A continued outside the box thinking that would increase the desire of private corporations and government agencies to be a part of the RTZ
30	provide support
31	tbd
32	Model state guideline language would be helpful
33	We need a Safe Systems 101 to get leadership buyin.



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