

Vulnerable Road Users Safety Plan



**BEST PRACTICES FOR SAFE STREETS,
ROADS, AND PEOPLE**

MetroPlan Flagstaff



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This document is intended to assist MetroPlan regional partners in meeting their travel safety goals, to establish their own policies, design standards, and communications.

The following content provides an overview of the best practices and resources to support and implement Vision Zero. The review focuses on literature and reports over the past 10 years to show how progress and adaptation have taken place to implement a safe and equitable transportation network.

Policy

Adoption of Safe System principles will change the practices of most professionals who work with the road infrastructure, and in the longer term will significantly change the roles of some stakeholders such as law enforcement officers.

Safe System principles need to be incorporated in foundational policy and guidance documents that steer the design and operation of roads. Policies should be developed across multiple levels: 1) Initiation, 2) Development, 3) Execution, 4) Evaluation, and 5) Integration.

Example Recommendations

Change road design practice norms to accommodate the Safe System approach.

- Create ordinances, design standards, or policies that direct agency staff or departments to review programs, projects, and the development of transportation plans to reduce fatalities and serious injuries.
- Integrate the Safe System approach, including setting safe speed limits based on evidence of injury tolerance, in key foundational tools such as the AASHTO Policy on Geometric Design, the Highway Safety Manual, and the Manual on Uniform Traffic Control Devices as well as state and local design and operation manuals.
- Develop and disseminate new training tools to assist local engineers and operators in setting speed limits according to evidence on human injury tolerance

Identify new roles for safety stakeholders—aligned with the Safe System concept.

- Demonstrate roles of additional stakeholders, including law enforcement and community members, in performing safety audits and diagnosing problems with road user interaction with infrastructure.
- Increase engagement of public health professionals in long-range transportation planning.
- Model new professional relationships at the regional and/or local level by establishing a joint resources group that focuses on understanding and improving the interaction of road users with infrastructure to achieve self-enforcing roads.

Resources

Safe System Policy-based Alignment Framework for Policies and Safety Planning Documents (2023)

The Safe System Policy-Based Alignment Framework is a tool to help agencies assess policies and safety planning documents holistically through a Safe System lens. The Policy-based Framework includes seven (7) criteria. The criteria consist of the six (6) Safe System principles, as well as equity. Agencies assess the level of

Safe System alignment considering a series of questions and considerations to determine the level of alignment for each criterion. Among other things, the Policy-based Framework can be used to:

- Benchmark and track progress toward improving the Safe System Approach (SSA) alignment of agency policies and documentation over the long term.
- Raise the level of awareness of SSA-related practices and strategies.
- Identify gaps in existing policy and program efforts.
- Generate strategies to improve SSA alignment in agency policies and procedures.

<https://highways.dot.gov/safety/zero-deaths/safe-system-policy-based-alignment-framework>

Engineering & Design

Safe Systems Approach

The Safe System approach offers a unique opportunity to improve the value of our roads, enhancing their benefits to mobility and reducing their negative consequences. Our current road system is designed to move cars quickly, with other considerations of secondary importance.

Over the past 20 years, a number of nations and cities around the world have adopted the Safe System Approach (SSA). This approach begins with a commitment by state and local jurisdiction to eliminate fatalities and serious injuries among all road users and uses thoughtful road and vehicle design to minimize crashes that occur when people make mistakes and to reduce crash forces so that people are less likely to be injured when crashes occur.

By designing safety into the road system, deaths and serious injuries are engineered out. While the U.S. differs in cultural and historical context from nations with the longest experience with the Safe System approach, their experience bodes well for similar benefits in this country, if we implement the approach in ways that prioritize safety upgrades in areas most in need.¹

Examples of Safe System Fundamentals

There are many specific design elements that can be used to improve roads and create a Safe System, such as roundabouts and road diets, but a Safe System is much more than a checklist of road features. In a Safe System, infrastructure owners and operators focus on their responsibility for the safety of all users of the system, using these tools and others thoughtfully and deliberately to design and operate roads that are self-enforcing, leading people intuitively to safe behavior.

¹ “Recommendations of the Safety System Consortium.” John Hopkins Center for Injury Research and Policy, 2023, <https://publichealth.jhu.edu/sites/default/files/2023-03/recommendations-of-the-safe-system-consortium.pdf>

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1. Anticipate and accommodate predictable human limitations and behavior such as lapses in diligence, perception, and attention, for example...
 - a. **Road Diets** reduce four-lane undivided roads to two thru lanes plus a center turning lane, calming traffic, reducing the consequences of distraction and inattention and cutting crashes by 19-47%²
 - b. **Pedestrian Hybrid Beacons** increase driver awareness of pedestrians crossing mid-block or at unsignalized intersections, overcoming driver inattentiveness or distraction and reducing pedestrian crashes by 55%³
 2. Reduce crash forces to levels that are survivable by reducing impact speeds or changing angle of collision, for example...
 - a. **Roundabouts** slow traffic through dangerous intersections and prevent deadly side impacts, reducing severe crashes by 78–82%.⁴
 - b. **Median Barriers** on rural divided highways reduce high-energy head-on crashes by 97%.⁵

Recommendations

Set expectations for the allocation of funding to advance the Safe System approach.

- Require that Safe System principles be followed when federal, state, and local funds are used for road design and operation.
- Support the adoption of the Safe System approach as the basis for Vision Zero strategies at federal, tribal, state, and local levels, including dedicated funding for evidence-based strategies such as road diets, protected bike lanes, and roundabouts, when used as part of a Safe System.
- Support and prioritize the implementation of projects meeting the Safe System definition. This may be done through a prioritization process of projects within local and regional capital improvement programs.

Stimulate system improvement by leading government-wide change in the attribution of crash causation.

- Increase public awareness of the potential of safe roads and greatly reduced crash deaths.
- Develop and conduct a national Vision Zero/Safe System awareness and education campaign that is culturally sensitive and based on evidence, and monitor effects on traffic safety culture.

² Federal Highway Administration. 2010. Evaluation of Lane Reduction “Road Diet” Measures on Crashes, FHWAHRT-10-053.

³ Zegeer, C., Srinivasan, R., Lan, B., Carter, D., Smith, S., Sundstrom, C., Thirsk, N.J., Zegeer, J., Lyon, C., Ferguson, E., and Van Houten, R. 2017. NCHRP Report 841: Development of Crash Modification Factors for Uncontrolled Pedestrian Crossing Treatments

⁴ American Association of State Highway Transportation Officials. 2010. Highway Safety Manual. First Edition.

⁵ National Cooperative Highway Research Program. 2014. Report 794, Median Cross-Section Design for Rural Divided Highways. National Academy of Sciences

Resources

Safe System Project-Based Alignment Framework - For Project Locations

The Safe System Project-Based Alignment Framework (Project-Based Framework) was developed to assess roadway locations and potential improvements through a Safe System Approach (SSA) lens. The criteria and use of this framework lend itself to infrastructure projects and comparisons among alternatives for specific locations. The Project-Based Framework provides practitioners a means of contrasting those improvements relative to one another through a scoring matrix, which focuses on Exposure, Likelihood, and Severity for both vulnerable road users and motor vehicle occupants. The Project-based Framework also includes prompts that are based on the other SSA Elements (Safe Road Users, Safe Vehicles, Post-Crash Care), as well as Equity. This approach was developed with the SSA Principles in mind, and to be consistent with the Safe System Roadway Design Hierarchy.

This tool provides comparative analysis based on a series of data inputs and risk evaluations. It is an easy-to-use spreadsheet tool that uses inputs and information typically available at the project planning stage, available via online mapping or roadway inventory database systems, or by field review of a given location.

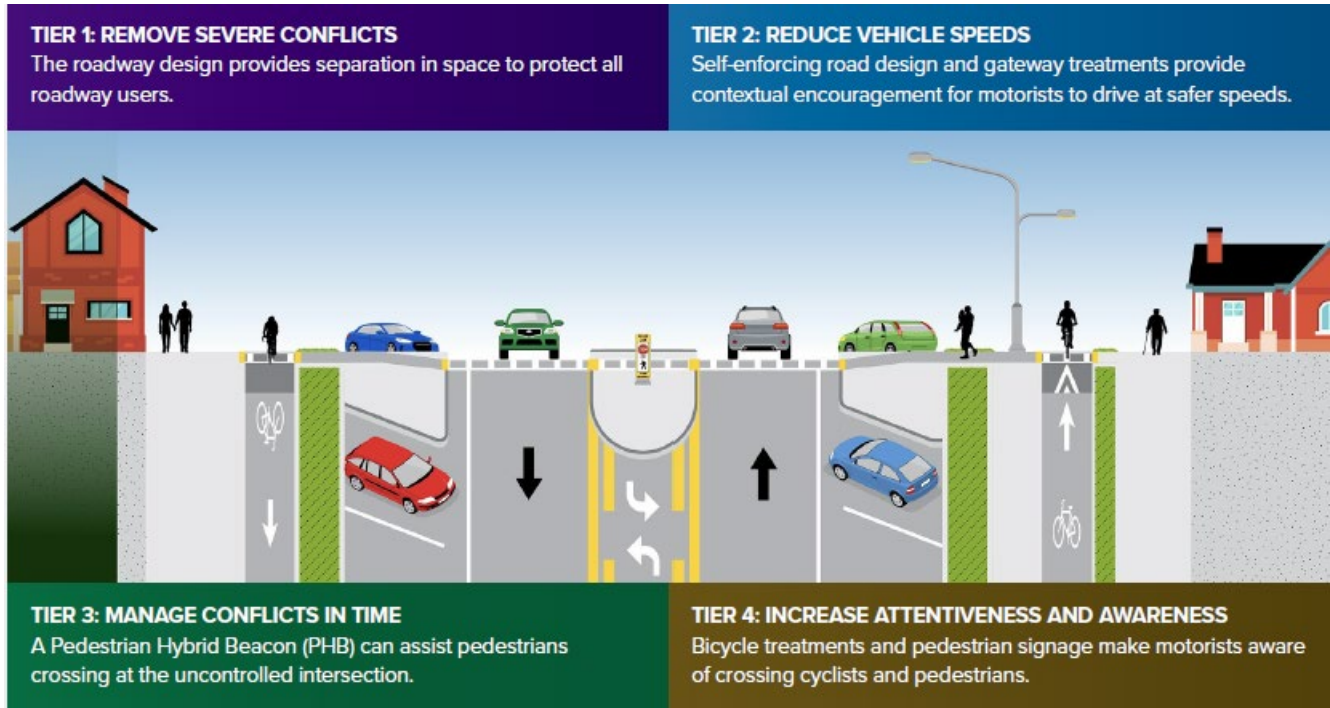
<https://highways.dot.gov/safety/zero-deaths/safe-system-project-based-alignment-framework>

Complete Streets

A Complete Street ensures the safe and adequate accommodation of all transportation system users, including pedestrians, bicyclists, public transportation users, children, older individuals, individuals with disabilities, motorists, and operators of transit and freight vehicles. As an implementation strategy of the [Safe Systems Approach \(SSA\)](#), Complete Streets focuses on creating safe, connected, and equitable networks that fit community needs and context. Two-thirds of the States have adopted Complete Street policies encompassing planning, design, construction, operations, and maintenance to improve network safety.

Complete Streets may apply a wide range of integrated safety elements to develop a system that is safe for all users, such as sidewalks, bicycle lanes, curb extensions, gateway treatments, median refuge islands, road diets, and modified vehicle lanes. “Complete Streets implementation may apply the Safe System Roadway Design Hierarchy to identify safety improvement projects. The figure below shows an example of a Complete Street using a road diet to reconfigure a four-lane highway, aligning the safety improvements within the Safe System Roadway Design Hierarchy⁶”.

⁶ Hopwood, Cory, et al. Safe System Roadway Design Hierarchy: Engineering and Infrastructure-related Countermeasures to Effectively Reduce Roadway Fatalities and Serious Injuries. technical report, FHWA-SA-22-



Source: Image source: Complete Streets Transformations, FHWA: [Complete Streets Transformations \(dot.gov\)](https://www.fhwa.dot.gov/completestreets/).

Recommendations

Make Complete Streets the Default Approach

- Encourage/adopt consistent prioritization of the safety of all users is to make funding and designing Complete Streets the easiest option when designing streets.⁷
- If safety for all users can be incorporated into definitions, guidance, grant awards, and review processes, it would be easier for agencies to take action.
- Context-sensitive design that involves all stakeholders to develop a transportation system that fits its physical setting.

Resources

[Moving to a Complete Streets Design Model \(Report to Congress\)](#) – The Report identifies recent FHWA rules, guidance, and resources that affect safety and access for the users of all surface transportation modes, as well as ongoing opportunities and challenges as FHWA moves ahead with its effort to implement a Complete Streets design model. Explore dozens of key resources and references.

[The Elements of a Complete Streets Policy](#) – Provides explanations of the ten elements of an ideal Complete Streets policy.

⁷ Federal Highway Administration. “Moving to a Complete Streets Design Model: A Report to Congress on Opportunities and Challenges.”

[Context-Sensitive Design](#) – Provides information on a collaborative, interdisciplinary decision-making process and design approach that involves all stakeholders to develop a transportation facility that fits its physical setting.

Equity

“Transportation equity refers to the consideration of racial, economic, and social equity in transportation. A commitment to transportation equity involves creating affordable and accessible transportation options for all people; ensuring fair access to quality jobs, workforce development, and contracting opportunities in the transportation industry; promoting healthy, safe, and inclusive communities; and making equitable investments in transportation infrastructure and planning, especially in low-income areas and communities of color”. — PolicyLink Transportation Equity Caucus

Health

Health equity is an assurance of the conditions for optimal health for all people. Achieving health equity requires valuing all individuals and populations equally, recognizing and rectifying historical injustices, and providing resources according to need. Health disparities will be eliminated when health equity is achieved.

Substantial improvements in safety will require equitable solutions. Individual and community sociodemographic characteristics have shown independent and additive effects on risks of crash death, resulting in concentrations of risk in lower-income neighborhoods where exposure to traffic tends to be higher and investment in safety programs and infrastructure tends to be lower.⁸ Prioritizing these communities for implementation of the Safe System approach, and closing the gap between the highest and lowest-risk neighborhoods, will yield large gains in both safety and equity.

Recommendations

When applied equitably, Safe System investments are made proactively and systemically to prevent serious crashes and reduce crash forces where crashes persist, saving lives, improving mobility, and enhancing access to health determinants across the community.

Set expectations for the allocation of funding to improve equity in road transportation.

- Require that road safety equity that addresses place-based disadvantage and disinvestment be included as a factor in project selection decisions.

⁸ Morency, P., Gauvin, L., Plante, C., Fournier, M., Morency, C. 2012. “Neighborhood Social Inequalities in Road Traffic Injuries: The Influence of Traffic Volume and Road Design”, American Journal of Public Health 102, no. 6 (June 1, 2012): pp. 1112- 1119.

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- Convene a local interagency task force charged with identifying sources of funding to support the implementation of a Safe System in historically underserved communities.

Improve confidence among state, regional, and local agencies in making decisions on Safe System projects that could improve equity.

- Identify or develop and demonstrate a process for assessing gaps in road safety across communities, including the availability of safe walking and cycling facilities.
- Develop guidance on project prioritization schemes that address equity and the Safe System approach.
- Provide education to support investments in the Safe System approach in historically marginalized communities and/or those with high rates of motor vehicle deaths, including American Indian/Alaska Native tribal lands.
- Develop guidance for measuring the full range of benefits from Safe System projects, including benefits to transportation safety, health equity, safety equity, and access to health determinants such as education, employment, and health care services.

Reduce barriers to implementing Safe System projects in historically marginalized communities.

- Require that local transportation decision-makers such as Metropolitan Planning Organizations (MPOs), agency departments, and the state include meaningful engagement of representatives of underserved communities in transportation investment allocation decision processes and policies.
- Require the state of Arizona to collect race and ethnicity data for people involved in crashes and traffic stops using methods based on new federal guidance, as a means for improving knowledge of racial inequities

Education & Programs

Transportation, safety education and programs help people understand safety rules and make better driving, walking, and bicycling decisions. This can help address the root causes of accidents, such as speeding, not yielding, and crossing outside of an intersection or crosswalk. Education and programmatic efforts may include:

- Safe Routes to School
 - This initiative works to make it safe and convenient for children to walk and bike to and from school. The goal is to get more children walking and bicycling to school, improve kids' safety, and increase health and physical activity.
- Safe Routes to Transit
 - Encourages transit stops to address first-last-mile connections along with improved facilities that accommodate a variety of modes.
- Safety Campaigns
 - Creates a culture of understanding the impacts of behaviors and the shared responsibility of the roadway.

- Incentive Programs
 - Safety incentive programs can help create a stronger culture of safety, reduce harmful incidents, and help retain and attract safe drivers.

Recommendations

Create a culture of "Shared responsibility in roadway safety"

- Everyone who uses the road, including drivers, pedestrians, cyclists, and motorcyclists, has a responsibility to follow traffic laws, practice safe driving behaviors, and be aware of others on the road to prevent accidents, creating a collective effort to ensure safety for all road users; essentially, no single party is solely responsible for road safety, but rather it is a shared duty among all participants.

Set expectations for the allocation of funding to improve safety and access to schools and transit

- Require that road safety addresses access to schools and transit stops be included as a factor in project selection decisions.
- Convene a local interagency task force charged with identifying sources of funding to support the implementation of Safe Routes.

Resources

[Safe Routes to Transit: Bicycle and Transit Integration](#): A Practical Transit Agency Guide to Bicycle Integration and Equitable Mobility. This guide includes a series of recommended practices for transit agencies interested in addressing the growing demand for bicycle mobility and connectivity to buses and trains. The recommended practice covers a broad range of subject matter related to bicycles and transit including bike parking near facilities, onboarding procedures and other issues to enhance connectivity and increase ridership.

[Making Strides: 2024 State Report Cards on Support for Walking, Bicycling, and Active Kids and Communities](#): The report cards primarily look at state policy, focusing on four key areas: Complete Streets and Active Transportation Policy and Planning, Federal and State Active Transportation Funding, Safe Routes to School Funding and Supportive Practices, and Active Neighborhoods and Schools.

Reporting

Progress and transparency are a method to measure progress over time after an Action Plan is developed or updated, including outcome data. It's a means to ensure ongoing transparency is established with residents and other relevant stakeholders. The approach must include, at a minimum, annual public and accessible reporting on progress toward reducing roadway fatalities and serious injuries and public posting of the Action Plan online.

Recommendations

Establish Reporting of Performance Measures

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- Develop an annual safety report process that provides a variety of statistics in tracking progress.
 - Annual reporting must fulfill the progress reporting as identified in transportation safety plans.
 - Reporting regularly through detailed annual reports, public dashboards, and data analysis to monitor progress towards the goal of zero traffic fatalities and serious injuries; with a focus on transparency and accountability to stakeholders

Reinforce the Organizational Commitment to Vision Zero

- Reporting must track progress towards Vision Zero Goals.