Implementation Plan
to the
NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Project 17-101: Applying the Safe System Approach to Transportation Planning, Design, and Operations in the United States

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from
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1. Objective of the Implementation Plan

This Implementation Plan is a product of NCHRP 17-101 Project: Applying the Safe System Approach to Transportation Planning, Design, and Operations in the United States. The objectives of this project were to:

- Identify, contextualize and modularize strategies, practices, and policies for implementing a Safe System approach in the US.
- Develop research products that enable a range of professionals and organizations to adopt and implement a truly Safe System approach in their work.

This plan outlines the intended audiences to begin implementing key findings from this research, discerns common barriers to implementation, and proposes a few tasks to overcome these barriers and effectively implement robust, Safe System-aligned practice.

The objectives of this research implementation effort are to:

- Bring the project's implementation guidelines and conduct of research report to the attention of state DOT practitioners and their partners.
- Invite DOT practitioners to try out the guidelines' Safe System self-assessment tool and steps to practice implementation procedures and then reflect on how they can incorporate effective safety practices into their workflows.
- Facilitate the cross-disciplinary sharing of effective safety practice via the hosting of a perennially updated reference resource.
- To foster an accelerated uptake of Safe System-aligned safety strategies and practices featured in the implementation guidelines.

1.1.Implementation Leadership Team

The research team believes the implementation of this plan should be led by TRB's ACS10 Transportation Safety Management Systems Committee leaders and members. ACS10 Committee leaders could coordinate with additional TRB Committees to discuss ways of implementing impactful, yet presently less commonly applied safety practices drawn from the project's implementation guidelines. Example project-identified practices (*and potential TRB Committee partners*) to further experiment with and implement include:

- Implementing speed safety cameras (automated speed enforcement) that use revenues to improve safety infrastructure (*AEP10 Transportation Planning Policy and Processes Committee*).
- Prioritizing injury risk-based (systemic) safety assessments over crash "hot spot" or "black spot" approaches (*AEP15 Transportation Planning Analysis and Application Committee*).
- Converting conventional signalized intersections to single-lane roundabouts (*AKD80 Roundabouts and other Intersection Design and Control Strategies Committee*).
- Requiring alcohol ignition interlocks installed for all drivers convicted of driving under the influence (DUI) (*ACS30 Traffic Law Enforcement Committee*).

ACS10 Committee leaders could also coordinate with Committee members and close affiliates in the following organizations to showcase the project's Safe System-aligned strategies and practices:

- **AASHTO Committees:** Safety, Design, Construction, Planning, Traffic Engineering, and Transportation Systems Operations, and Performance-Based Management
- **State DOTs:** Washington DOT, Massachusetts DOT, Louisiana DOT, Minnesota DOT, Caltrans, District DOT
- **Public Health:** Centers for Disease Control and Prevention (CDC), Association of State and Territorial Health Officials (ASTHO)
- **Regional Policy and Transportation:** Maricopa Association of Governments, Burlington-Graham, NC Metropolitan Planning Organization, Clackamas County, OR
- **National Associations and Non-Profits:** Vision Zero Network, Road to Zero Coalition, Institute of Transportation Engineers (ITE), Association of Pedestrian and Bicycle Professionals (APBP)

1.2.Assumptions/Constraints/Risks

Throughout this research endeavor, team members discovered three common constraints safety practitioners referenced in implementing effective interventions and fostering a Safe System:

1. Those practices that harbor logistical challenges or require coordination across professional sectors—e.g., incorporating road safety audits in project scoping / planning phases; forming a task force or community coalition of law enforcement, transportation, public health, members of the community, and other partners to investigate serious crashes and report findings and proposed changes to the public—will likely only appeal to potential adopters if they can try out the practice with trusted others. We can call this a **Coordination** constraint.
2. More expensive or time-intensive project-recommended practices—e.g., establishing a traffic incident management [TIM] system that documents roadway and incident clearance times, as well as secondary crashes; converting conventional signalized intersections to single-lane roundabouts—will require professional proof they are worth the investment and risk. This **Credibility** constraint can only be addressed by repeated confirmation from trusted colleagues about the practices' utility.
3. Finally, in the focus group phase of this research, participants frequently brought up a lack of funding as a barrier to advancing effective safety intervention. Funding in these discussions pertained to installing specific engineering countermeasures (e.g., roundabouts), and the ability to link and integrate crash report and medical data to garner a deeper understanding of crash injury profiles and prognoses. Let us call this a **Funding Limitation** constraint.

The research team believes ACS10 Committee leadership and partnering TRB Committees can readily respond to the Coordination and Credibility constraints through supporting the web hosting of a continually updated safety practice reference resource and implementation-forward problem statements which can later become cooperative research projects. The Funding Limitation constraint, on the other hand, will likely require additional support from local, state, and federal policymakers and governmental administrations.

2. Implementation Description

This implementation plan features four complementary actions designed to increase the chances project guidelines are adopted and implemented by state DOTs and partners broadly across the United States. These actions are informed by insights from social diffusion research (Dearing and Cox, 2018), empirical research on addressing barriers to implementation (Centola, 2021) and recommendations on producing clear, concise, and credible guidance (Wilson et al., 2010). The actions include: 1) facilitating workshops hosted at the TRB Annual Meeting and related professional conferences; 2) sponsoring problem statements aimed at demonstrating the

implementation of project-recommended safety practices among select state, regional, and local transportation agencies; 3) hosting a safety practice reference resource on the ACS10 Committee Google site; and 4) disseminating information about key findings from the research via TRB newsletters press releases, related publications, and webinars, all of which can be written, organized, and scheduled in alignment with the publication timelines of the NCHRP 17-101 implementation guidelines and final report. Each of these actions are further described in section 2.1.

2.1. Major Tasks

Common knowledge suggests people need to hear something five to seven times before acting. What is often left out of this equation is that most people need to hear these somethings from five to seven people *with whom they have strong ties* before acting (Centola, 2021). This is called "social reinforcement" and is key to behavioral adoption within networks of social contagion (Zhou et al., 2020).

Thus, to foster social reinforcement and a more rapid uptake of project-endorsed safety practice, this implementation plan calls for the implementation team to carry out or otherwise support the following actions:

- Organize implementation-focused workshops at the TRB Annual Meeting and related gatherings (e.g., ITE International Meeting and Exhibition, the AASHTO Committee on Design Annual Meeting). The project's guidelines include proposed steps to implementing effective safety practice in a variety of practice domains (e.g., policy, planning, design, operations and maintenance). Working in small groups, workshop participants could develop plans for how they would proceed through steps to implement an effective though less feasible safety practice. Workshop organizers could evaluate participants' pre- and post-knowledge of key Safe System concepts and their likelihood of implementing reviewed safety strategies and practices.
- Render project-recommended practices more **credible** (and thus more feasible to implement) by identifying state DOTs with strong connections with outside agencies (e.g., other state DOTs, state public health departments, Metropolitan Planning Organizations). Indeed, those DOTs that have built "wide bridges" with partnering agencies represent ideal candidates to seed innovative safety practices and accelerate the uptake of these practices (e.g., see: Cohen et al., 2016; Centola, 2021).
- Develop and market a web-based reference resource that includes project-produced strategies and practices in each of the practice domains (e.g., planning, law enforcement, design). Practitioners could then contribute to the web-based resource when their proposed practice(s) as long as the proposed practices meet certain inclusion criteria, such as being able to articulate a practice's ability to measurably reduce the likelihood road users would be exposed to severe injury-induced crash potential. Such a reference resource would invite safety practitioners to engage with the project's guidelines and expand their pallet of practices to experiment with and implement. The resource page could also host results-focused slide decks for each practice domain, covering how the domain can shift toward a Safe System orientation, explanation of domain-specific strategies and practices, illustration of their safety effectiveness, and insights on how to overcome barriers to strategy implementation.
- Disseminate key implementation findings from the research via TRB newsletter press releases, related publications, and webinars, all of which can be written, organized, and scheduled in alignment with the NCHRP 17-101 implementation guidelines and final report publication dates.

2.2.Target Audience

Table 1. Nine intended audiences for implementation and the expected benefits to each group.

Target audience	Benefits
Policy makers	Policy makers would profit from engaging policy with the guidance, as it can help them craft adaptive policies that can be quickly modified in response to foreseen and unforeseen shifts in funding, climate realities, socio-demographics, etc.
Transportation executives	DOT leaders and transportation agency directors and managers are the primary audience for the project's implementation guidelines. In many cases, they will need to endorse proposed safety strategies and practices and lead their teams in implementing and monitoring the performance of effective practice.
Transportation engineers	Transportation engineers will be critical to include in workshops, as they are tasked with implementing safe road design and facilities that offer road users legible and forgiving environments within and through which to travel.
Transportation and land use planners	Involving transportation and land use planners in workshops on implementing NCHRP 17-101 strategies and practices could bring community development closer to horizontal integration and a decreased incidence of witnessing transportation facilities lacking harmony with surrounding land uses.
Roadway operators	Project guidance is germane to roadway operators, as in a Safe System, these professionals can separate road users of different mass, directions, and speeds in time, and alter signal and maintenance operations in response to changing conditions in social, environmental, and economic dynamics.
Law enforcement officers	Law enforcement officers could benefit from coordinating with road designers and planners, learning about policies that prevent unsafe road using behavior; and leading crash investigation teams to discern factors that contribute to fatal and serious injury crashes.
Public health professionals	Involving public health professionals who are skilled in injury surveillance, behavioral risk identification, safety policy design, and coordinated public health programming (e.g., addictions counseling, reducing the availability of alcohol and prescription drugs in communities) will be critical for fully implementing a Safe System.
EMS professionals	EMS professionals, with their injury diagnosis skills and ability to reduce the severity of crash events, are

Target audience	Benefits
	central to post-crash response within a Safe System, and thus a key audience for project-related workshops and demonstrations.
Transportation and injury prevention researchers	Involving transportation and injury prevention researchers in project-related trainings and workshops will ensure that best practices in injury monitoring, safety countermeasure selection and implementation, and safety-based research design are incorporated into project implementation.

2.3. Additional Support

Members of the original research team could help develop slide decks covering each of the project's practice domains and lead the development of the reference resource page on the ACS10 Committee's Google page.

2.4. Evaluation and Monitoring

Project reach can be discerned by the number of report downloads, citing publications, the number of project-related presentations, number of visitors to the reference resource page, and the number of participants in project-related workshops. **Deeper engagement** with the project's guidelines could be assessed by the frequency and quality with which reference resource page visitors propose additions to the resource. These additions would ideally be less common safety practices and strategies designed to reduce the likelihood road users are exposure to potentially fatal crash forces. **Professional diffusion** of the project's recommendations can be tracked in future NCHRP-sponsored synthesis projects, case studies, and content analyses of states' Strategic Highway Safety Plans, among additional safety artifacts.

3. Final Deliverables

This project's deliverables included a final report which documents all the methods and findings produced throughout the project, and implementation guidelines, which provide Safe System-aligned strategies and practices, as well as methods for effectively implementing context-appropriate practices. Engaging transportation leaders and their cross-sectoral partners with this project's guidance is a desired outcome of this project. Deliverables consistent with professional engagement with this implementation plan include:

- TRB newsletter press releases and professional trade articles featuring the implementation guidelines and their recommendations.
- Publicly accessible webinars featuring the theory underlying the project's guidelines along with practical lessons associated with having experimented with project-recommended safety strategies and practices.
- Presentations on the research findings and implementation guidelines at professional conferences and meetings.
- A web-hosted reference resource featuring project-included safety practices and a process by which site visitors can submit additional practice innovations.
- One or more TRB problem statements focused on leveraging professional networks to accelerate adoption of project-recommended safety practice.

Should this implementation plan prove effective, it can contribute to one or more of the following outcomes:

1. It could translate to higher-than-average numbers of document downloads and references in published reports and presentations from other non-research team professionals.
2. It could lead to a growing number of professionals contributing insights on innovative safety practices to the web-hosted reference resource.
3. It would ideally result in rising numbers of state DOTs, regional, and local agencies adopting, implementing, and performance-monitoring project-recommended strategies and practices.

Outcomes #s 1 and 2 would ideally address the Coordination and Credibility constraints outlined above, especially if guidance downloads, references, and reference resource contributions are visible to others. Realizing the first two outcomes would ideally translate to increasing numbers of state DOTs and their regional and local partners implementing Safe System-aligned practice.

References

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