

UTC Spotlight

University Transportation Centers Program



U.S. Department of Transportation
Office of the Assistant Secretary for
Research and Technology

This month: October 2017

University of North Carolina at Chapel Hill, with consortium partners Florida Atlantic University; University of California, Berkeley; University of Tennessee, Knoxville; and Duke University

No. 115

NEW SAFETY UTC ENVISIONS SAFE SYSTEMS APPROACH FOR U.S. ROADWAYS

The Collaborative Sciences Center for Road Safety (CSCRS), the new University Transportation Center (UTC) at The University of North Carolina, Chapel Hill (UNC), is taking a fresh approach to road safety.

This national safety UTC is focused on implementing a collaborative, multidisciplinary, safe systems approach to reducing transportation-related injuries and fatalities, and to helping traffic safety become recognized as a public health priority in the United States.



By engaging perspectives from behavioral, engineering, epidemiological, technological, and planning disciplines, CSCRS is implementing new research, education, and professional development activities designed to improve road safety.

Defining a Safe System

Different audiences interpret the term “safe systems” differently. Traditionally, practitioners, engineers, planners, and others within the transportation community look to the safe systems concept that originated in Sweden in the 1990s and has since been adopted in several other countries across the globe.

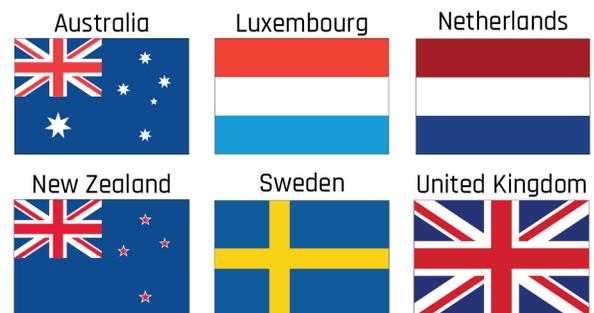
This model envisions safe systems as an outcome, a roadway system (including the built environment and policies that guide and support it) that sends predictable feedback to the road users about safe and appropriate behaviors, and within which people cannot die despite human errors.

This original perspective also acknowledges that a safe system requires a specific method, one that focuses on the role of the built environment and requires a proactive approach to systemically address risk.

Through a different lens, the “systems thinking” or “systems science” concepts from the public health world offers an opportunity to expand upon the safe systems groundwork laid in Sweden and early safe systems adopters.

Did You Know?

6 Countries Have Already Adopted a Safe Systems Approach to Road Safety



Adapted from *ITF (2016), Zero Road Deaths and Serious Injuries; Leading a Paradigm Shift to a Safe System*, OECD Publishing, Paris.
<http://dx.doi.org/10.1787/9789282198955-en>

In public health, systems science is considered an approach requiring collaborative problem-solving and the orientation of new partners to a shared vision or perspective. The public health community has also developed a robust set of qualitative and quantitative tools and methods (e.g., causal loop diagrams, agent-based modeling, and social network analysis) to help understand the elements in a complex system.

Essentially, there are two systems: (1) the roadway system and the policies that guide it, and (2) the system of relationships, organizations, and funding structures that lead to the development of a roadway system.

CSCRS Safe Systems Research in Action

The following three actions are central to CSCRS moving safe systems approaches forward in the United States:

1. establishing a clear and consistent model of what a safe system is and requires;
2. documenting what safe systems look like, why they are needed, and how “portable and scalable” they are to other jurisdictions; and

- utilizing systems science tools and methods to help drive innovation in road safety research, practice, and adoption of safe systems.

Initial CSCRS research projects are looking at the safe systems approach from a foundational level, seeking to further explore how communities are defining safe systems and incorporating public health and systems-thinking approaches.

In one of the eight CSCRS year one research projects, entitled [Safe Systems Synthesis & Summit Phase 1](#), researchers are developing a concrete definition of the safe systems concept for the United States, with buy-in from key stakeholders. Outputs for the project will include a comprehensive literature review and a formal safe systems summit, tentatively scheduled to occur in 2018, to bring together leaders in traffic safety related disciplines to discuss critical issues associated with the adoption of a safe systems approach. [Related research](#) is underway and a focus group is planned at the upcoming National Association of City Transportation Officials conference to engage city officials—an important CSCRS stakeholder group—in the conversation.



CSCRS Executive Board members discuss collaborative, cross-institutional goals and activities for the UTC. (August 10, 2017)

Beyond defining the concept for the nation, other initial steps for CSCRS include clarifying how this approach differs from what is currently done by practitioners in the field, and determining what tools and resources people need to shift to a safe systems model. An imperative piece to the puzzle is also determining who should be involved in developing and implementing these best practices.

In another CSCRS year one project, [Structures of Stakeholder Relationships in Making Road Safety Decisions](#), CSCRS researchers are utilizing systems science tools to help reveal potential new partners for engagement in transportation safety, as well as uncover effective, efficient, and equitable relationship network structures that ultimately result in high-quality transportation safety decisions. (See figure 2 for initial results.)



Figure 2. Road Safety Information Exchange Across the U.S. This map illustrates how and where U.S. road safety professionals (including professionals in engineering, planning, law enforcement, public health, and emergency response) look to their peers across the nation for road safety knowledge and guidance.

The ability to link and utilize safety-related data from these partners is another key component of a safe systems approach. Another related [CSCRS project](#) is exploring ways to link and analyze data from public health and traditional traffic safety sources to foster better safety decision-making.

The Road Ahead

Moving the needle forward on implementing a safe systems approach in the United States requires strategic activities, programs, and tools for practitioners and researchers alike. CSCRS has hit the ground running with goals and objectives to make impactful changes to and within the U.S. transportation field. Many states and cities have adopted zero-fatality initiatives over the past decade. Making that goal a reality requires a new comprehensive approach to our road safety challenges—safe systems can be that approach.

About This Project



The Collaborative Sciences Center for Road Safety is led by the [UNC Highway Safety Research Center](#) in collaboration with the UNC Department of City and Regional Planning and the UNC Injury Prevention Research Center. The national safety UTC unites leading transportation research, planning, public health, data science, robotics and engineering programs at: Duke University; Florida Atlantic University; University of California, Berkeley; University of North Carolina, Chapel Hill; and University of Tennessee, Knoxville. For more information about CSCRS and projects described in this article, and to sign up for the CSCRS newsletter, visit www.roadsafety.unc.edu.

This newsletter highlights some recent accomplishments and products from one University Transportation Center. The views presented are those of the authors and not necessarily the views of the Office of the Assistant Secretary for Research and Technology or the U.S. Department of Transportation.

