# CSCRS

# DRAFT Strategic Roadmap

## 2017 - 2021

## Last revised: October 24, 2018

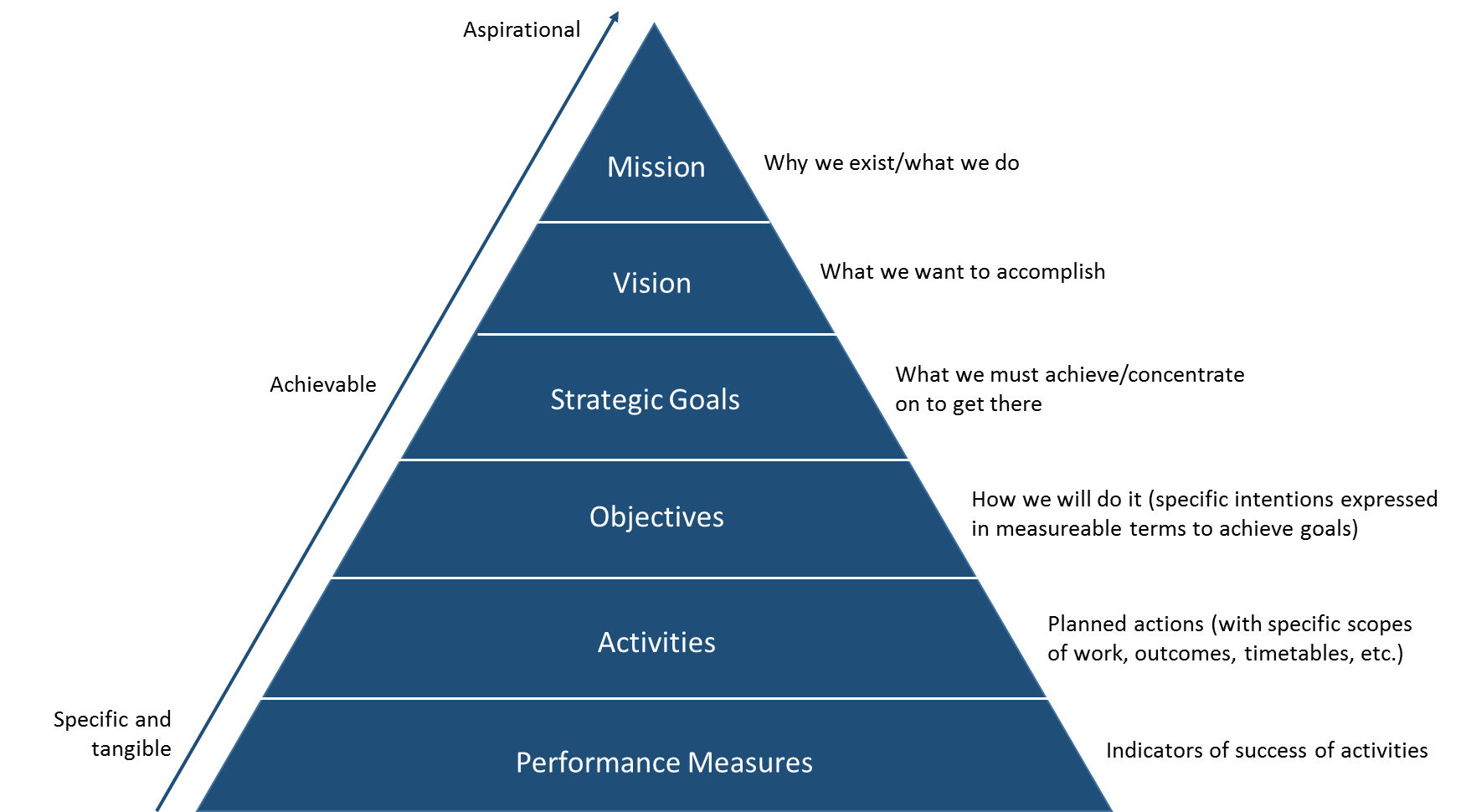
# Document Purpose

The aim of this Strategic Roadmap is to provide background on the mission/vision of CSCRS and strategic goals and related efforts and performance measures, as well as a summary of the process for project selection and background material relevant to current projects. It is intended to be a living document to support decision-making and collaboration amongst CSCRS consortium members.

# Strategic Roadmap Terminology

Core elements of the Strategic Roadmap are described using the following terms and concepts, which are illustrated in Figure 1:

* **Mission and Vision:** the mission is a short and simple statement to quickly describe our core purpose/what we do; this statement will be used in many places (website, newsletter, print pieces). The vision can elaborate a little bit more on what we’re trying to accomplish (even beyond the 5-year time frame of the roadmap).
* **Goal**: what we must achieve in order to be successful; not necessarily measurable but helps us focus on the priority areas needed to move toward the vision. Described as end-states.
* **Objective**: these are specific intentions expressed in measurable terms to achieve our stated goals; there might be multiple objectives for each goal, and each objective should be easily connected to one or more CSCRS current or future activity (described in Appendix A and B).
* **Activities**: planned actions to achieve objectives; each of these should be connected to a specific goal and/or objective and may relate to one or more performance measures.
* **Performance measures**: are indicators of success in completing planned activities (and perhaps achieving measurable objectives); this relates to what CSCRS reports to USDOT; below this in the pyramid, there are theoretical “outcomes” of this work, though measurement of these is beyond the scope of CSCRS.

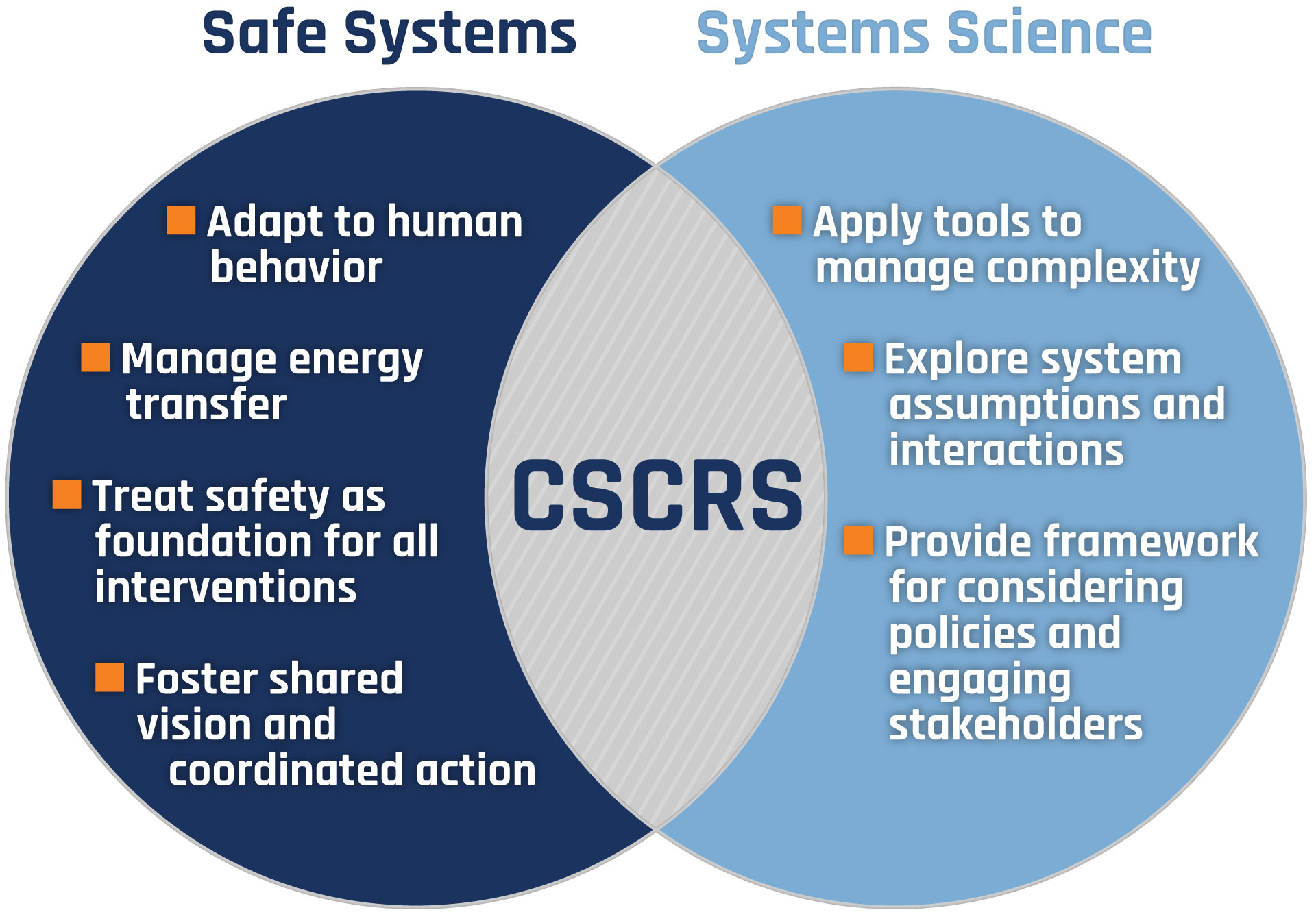
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**Figure 1. Key Terms and Relationships Used in the CSCRS Strategic Plan.**

# Defining Safe Systems and the role of systems science

The terms “Safe Systems” and systems science are used throughout this roadmap.

A major goal of the Collaborative Sciences Center for Road Safety (CSCRS) is to share and develop a stronger understanding of principles of **Safe Systems** and **systems science** that can be applied to our collective work in reducing traffic injuries and fatalities. Following is a brief introduction to core elements of these two paradigms, shown in the figure below, which are open to expansion and further refinement as CSCRS research progresses.



## What is a Safe Systems approach?

**Safe Systems** refers to a transportation safety paradigm that fosters a holistic perspective and strives to create a transportation system that ensures that no crash results in death or serious injury. Several countries have formally adopted versions of this approach, including Sweden, the Netherlands, Australia, and New Zealand. Many other transportation agencies, within and outside the US, have applied the principles of Safe Systems, without referencing this term. Through CSCRS-sponsored research, we have identified several core principles that underpin, to varying degrees, the Safe Systems approach used in different locations. Safe Systems:

1. **Adapt the structure and function of the system to the complexities of human behavior:** Many factors influence human behavior, including social environments (e.g., laws and social norms), physical environments, as well as habits, expectations, and time affluence. A better understanding of human learning, decision-making, state awareness, and behavior in different environments is central to designing Safe Systems. Roadway, vehicle, and other transportation-related systems can be designed to reduce the likelihood of human mistakes, mitigate the consequences of such mistakes, and adapt to changing human behaviors. If the transportation system is designed to work only for alert, compliant, and expert road users, then the system will fail. Further, as the role of humans in controlling vehicles fundamentally changes with new automated technologies, consideration of human behavior adaptation to new systems will be critical.
2. **Manage the kinetic energy transferred among road users:** There are many ways to effectively reduce the energy forces that get transferred in a crash between two or more road users. In many countries, regulation and testing of vehicles has led to safer vehicle designs, both for vehicle occupants and, increasingly, non-occupants. Roadway design can also affect travel speeds and speed or angle at impact, which relate to energy transfer. The Dutch Safe Systems approach emphasizes homogeneity of road user mass and/or speed, or increased separation of travel mode when this cannot be achieved. Managing exposure to high kinetic energy forces by shifting the population to safer, more sustainable methods of travel (through transit investment, transportation demand management programs, pricing policies, etc.) is another approach. Enforcement, automated or otherwise, has also been tested and may be appropriate in some situations, but can also be challenging if not in alignment with other Safe Systems principles.
3. **Treat road user safety as the foundation of all system interventions**: Road safety for all humans is a fundamental necessity, and it travels hand-in-hand with mobility, access, equity, and other transportation values. In the U.S., we often still view safety and mobility as a tradeoff, inherently in conflict. We even structure our organizations to work separately on these issues. For example, departments of transportation often have safety divisions separate from mobility divisions, and in many cases, there are large power and funding imbalances between the two. Places taking a Safe Systems approach have figured out how to provide multiple mobility options while ensuring safety for users of every option. These places recognize that if the safest choice isn’t the most convenient, people may not choose it, and if the most convenient choice isn’t safe for everyone, then fatalities will occur. A Safe Systems approach must acknowledge the tension and interrelation between safety, mobility, and other traveler needs, and define a hierarchy that is aligned with community values. This often requires greater investment in safety and the evidence-based interventions that provide lasting safety effectiveness.
4. **Foster the creation of a shared vision and coordinated action:** Too often, roadway or safety decisions are made in siloed environments, with little consideration for consequences in other areas of the system. For example, a safety target may be met by one stakeholder of the road safety system, at the expense of the safety of another. There is a need for greater vertical and horizontal integration of the systems that influence safety, and a need to work holistically and proactively to prevent unintended consequences and to recognize the implications of policy making in other areas of the transportation system.

In short, the Safe Systems approach offers an injury prevention framework based upon established, evidence-based principles and can be seen as a call to appreciate sometimes subtle but important nuances about safety management principles.

## What is systems science?

Systems science is a multidisciplinary approach to solving persistent problems in health, transportation, and other areas. It is a field of study that originated outside of the transportation discipline and has been used in many areas, including ecology and cybernetics. It offers a wide spectrum of tools that can complement and enrich the Safe Systems approach, or any other transportation safety approach. Systems science methods can be used to:

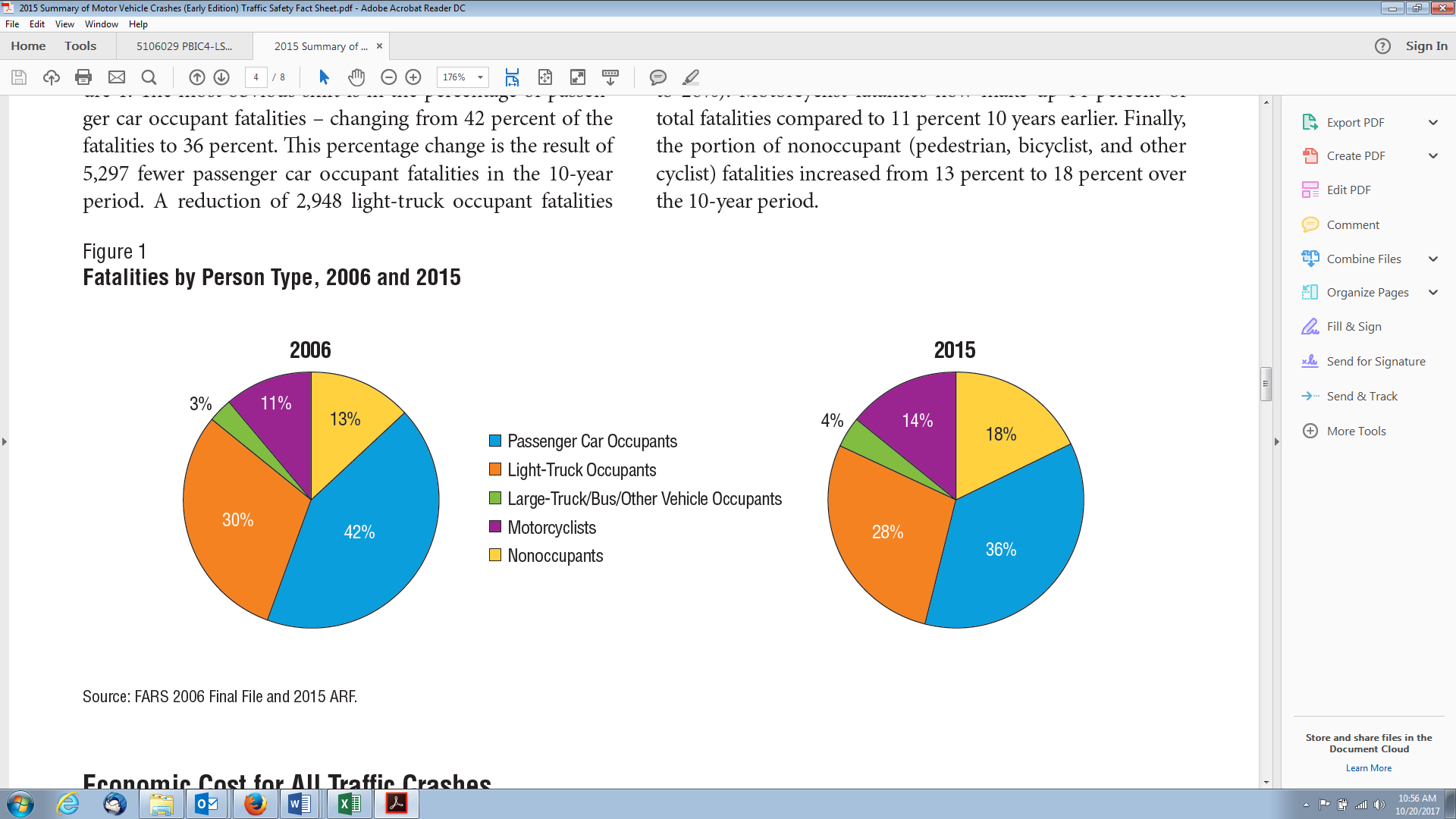
1. **Apply tools to manage complexity:** Systems science offers formal tools, both qualitative and quantitative, to help recognize and manage the complexity of persistent challenges as well as to identify solutions. These tools are particularly useful in contexts that require collaborative problem-solving and orienting new partners to a shared vision, such as Safe Systems and how it can be applied to address the complex issue of roadway fatalities.
2. **Explore systems assumptions and interactions**: Systems science fosters thinking about the underlying structures of systems that are driving problems, and offers ways to explore assumptions and interactions between system elements. In the transportation context, this approach is needed to help shape a more refined approach to Safe Systems, prompting thinking about the underlying transportation system structures that lead to traffic fatalities, surfacing assumptions and values, and clarifying the relationships between the components of the system and how they can or should interact.
3. **Provide a framework for considering policies and engaging stakeholders:** System science approaches can help develop shared approaches for policy and intervention, using effective tools to foster multidisciplinary engagement. They can support strategic planning by offering insights into how to leverage system dynamics to maximize policy impact and/or sustainability, enrich policy discussions around Safe Systems, offer ways to examine the unintended consequences of Safe Systems policies and practices, and simulate the synergistic effects of different scenarios. Systems science methods can also be used to improve public engagement around Safe Systems through group consensus building and systems modeling as a communication tool. This can promote agency coordination to get buy-in from all jurisdictions responsible for the safety of the system.

There is much to learn about the Safe Systems approach, and how systems science tools can be introduced and applied in transportation safety contexts. Our aim is to continue refining our understanding of these approaches, tools, methods, and applications through the course of CSCRS activities and research, which are guided by the goals and objectives outlined in this document.

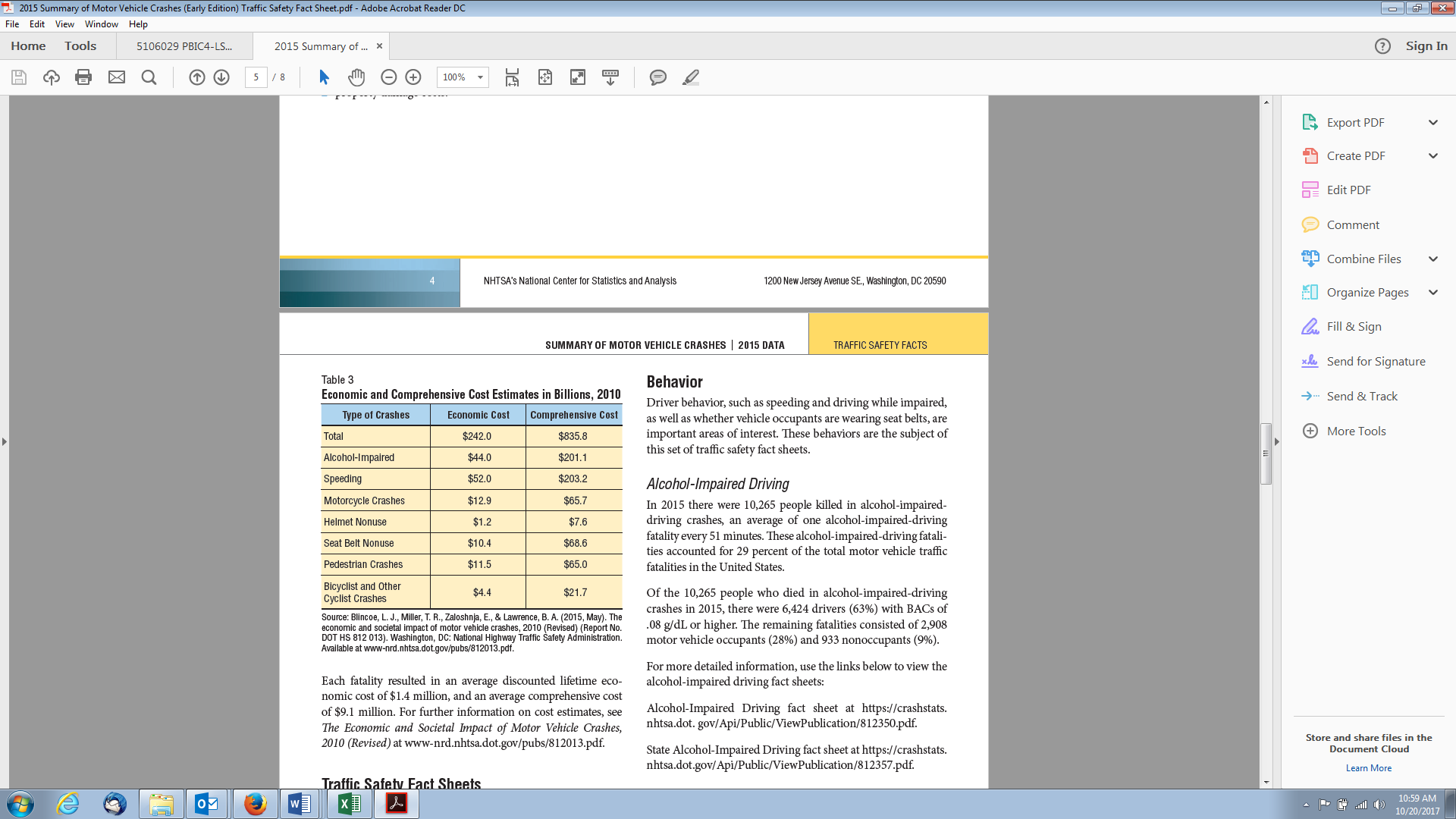
# Traffic Safety Snapshot

It is important to keep in mind the core safety challenges that need to be addressed through the research and activities put forward in this roadmap. Crash data are one way to reflect upon these issues. Below, drawn from the October 2017 National Highway Traffic Safety Administration [*Traffic Safety Facts*](https://crashstats.nhtsa.dot.gov/#/DocumentTypeList/11) report, are some key statistics about road safety crashes and fatalities, based on the most recently available national data sources (2015 data from the Fatality Analysis Reporting System and the General Estimates System).

* In 2015, there were 32K fatal crashes (.5% of all crashes), 1.72M injury crashes (27% of all crashes), and 6.3M property damage only crashes (72% of all crashes). From 2006 to 2015, fatal crashes had been on a largely downward trend until 2015.
* Motor vehicle crashes were the leading cause of death for children age 10 and young people 16 to 23 in 2015 (NHTSA cites WISQARS data). Children (age 14 and younger) represented 3% of the fatalities in 2015.
* Seniors made up 18% of all fatalities and 10% of all people injured, and 18% of all licensed drivers. The senior population has increased 29% in the past decade, though fatalities in crashes involving senior drivers has increased only 3% in this time.
* While young drivers accounted for 5.4% of all licensed drivers, they accounted for 9% of all drivers in fatal crashes.
* Seat belt use has increased in the past decade to 88.5% and the proportion of unrestrained passengers killed in vehicle crashes has decreased. However, in fatal crashes where restraint use was known, 48% were unrestrained.
* There has been a rise in fatalities and severe injuries among vulnerable road users in the past decade, particularly motorcyclists and pedestrians/bicyclist (see Figure 2).
* The economic cost of alcohol-impaired and speed-related crashes constitute nearly 40% of total economic costs (see Figure 3). Out of all fatalities, 29% involved impaired drivers and 27% involved speeding.
* Among fatal crashes, 49% occurred in rural areas (though only 19% of the US population resides in rural areas) and 44% occurred in urban areas.



**Figure 2. Fatalities by Person Type, 2006 and 2015 (source: extracted from NHTSA Traffic Safety Facts).**



**Figure 3. Economic and Comprehensive Cost Estimates in Billions, 2010**

**(source: extracted from NHTSA Traffic Safety Facts).**

To show traffic-related deaths within the context of all causes of death in the US, below are the number of deaths in 2015 per leading cause of death ([from CDC](https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm)). Also, there is a growing body of evidence showing how traffic-related exposure (e.g., to air pollution) or transportation mode (e.g., active travel vs sedentary travel) can contribute to these other sources of mortality/morbidity:

* + Heart disease: 633,842
  + Cancer: 595,930
  + Chronic lower respiratory diseases: 155,041
  + **Accidents (unintentional injuries): 146,571 (traffic-related fatalities are captured within this figure)**
  + Stroke (cerebrovascular diseases): 140,323
  + Alzheimer’s disease: 110,561
  + Diabetes: 79,535
  + Influenza and pneumonia: 57,062
  + Nephritis, nephrotic syndrome, and nephrosis: 49,959
  + Intentional self-harm (suicide): 44,193

# CSCRS Strategic Roadmap Overview

## Mission

To create and exchange knowledge to advance transportation safety through a multidisciplinary, systems-based approach.

## Vision

To unite perspectives ​from ​planning, ​engineering, ​public ​health, ​data ​science, ​and ​robotics in ways that advance road safety research and equip professionals and the public at large with cutting-edge tools, data, and resources to address the systems that impact transportation safety.

## Goals and Objectives

The following sections expand upon the goals, objectives, and related activities. Appendix A provides more detail on current funded projects; Appendix B provides more detail on CSCRS project funding processes.

### **Strategic Goal #1**: Safe Systems *and* systems science principles and approaches are shared, understood, and adopted by traffic safety professionals (traditional and nontraditional) and stakeholders.

**Objective 1-1:** Conduct research to generate a model(s) for what a Safe Systems approach, enhanced with systems science tools, can look like now and in the future and identify promising policies/practices that can be adopted to reduce fatalities and serious injuries.

**Objective 1-2:** Lead training, outreach, and professional development related to Safe Systems approach and related policies and practices.

**Objective 1-3:** Integrate Safe Systems principles into other road safety/public health/planning initiatives.

**Objective 1-4:** Facilitate states and cities in implementing a Safe Systems approach in different contexts, utilizing the tools and research from CSCRS.

#### Goal 1 Performance Measures:

* Number of events/seminars held; number of people enrolled in continuing education opportunities or webinar or seminar attendees; number of views/downloads of online materials
* Number of articles published related to safe systems principles/approaches
* Number of presentations given related to safe systems principles/approaches
* Number of consultations with elected officials and practitioners
* Number of joint safety activities with external safety partners, stakeholders, and other UTCs
* Number of appointments to executive and advisory boards with a transportation or safe systems component
* Number of appointments to safety committees within TRB, AASHTO, state/local DOT committees, and others where consortium members can influence safe systems approaches
* Number of joint safety activities with external safety partners, stakeholders, and other UTCs (at least two states and/or municipalities)
* Number of measurable actions taken by State and City leaders to embrace a safe systems approach to address fatal and serious injury crashes (e.g., number and nature of policy and practice changes resulting from CSCRS collaboration/demonstration efforts)

### Strategic Goal #2: Cutting-edge research, tools, data, and resources—compatible with a Safe Systems approach—are developed and utilized by professionals and the public at large to better understand and address existing and emerging road safety issues.

**Objective 2-1:** Perform road safety research that explores core safety issues and transformational changes (i.e., from technology, ride-sharing services, etc.) and integrates public health concepts and methods.

**Objective 2-2:** Develop research-driven tools, resources, and data sets to support problem identification and understanding.

**Objective 2-3:** Translate research knowledge to support the development of comprehensive programs, policies, and practices that are proven to reduce fatalities and severe injuries.

**Objective 2-4:** Broadly disseminate research products and findings, with emphasis on reaching new and non-traditional audiences.

#### Performance Measures:

* Number of proposals received, and number of projects funded (and amount awarded); number and value of projects that a) develop fundamental safety knowledge or b) produce translation-ready results for practitioners and policy makers
* Number of technical reports, peer-reviewed articles developed from research outcomes
  + Number of cross-institutional research projects, products, and publications
* Number of presentations given on research outcomes
* Number of people downloading/using tools (if we can capture use) or “touched” via newsletter and social media
* Number of media contacts
* Number of consultations with elected officials and practitioners

### **Strategic Goal #3**: A growing body of students and future leaders are engaged and well-trained in road safety principles, Safe Systems approaches, and systems science methods.

**Objective 3-1:** Develop and deliver courses at consortium member universities that integrate CSCRS concepts to help students analyze and evaluate road safety issues, principles, processes/procedures; understand their role in a multidisciplinary, Safe Systems approach; and apply innovative tools, methods, and solutions.

**Objective 3-2:** Engage students at all consortium member campuses through student-directed activities and professional opportunities.

**Objective 3-3:** Develop mentorship and internship opportunities for students to engage in critical thinking about road safety issues from a variety of disciplinary perspectives and connect with traditional and non-traditional partners.

**Objective 3-4:** Provide exposure to road safety principles in K-12 settings, to enhance early interest in traffic safety work.

#### Goal 3 Performance Measures:

* Number of courses taught/students enrolled; number of visits to websites with curricular material; number of transportation-related degree programs that use CSCRS funds to support grad students
* Number of scholarships awarded
* Number of student papers published
* Number of student presentations given
* Number of students involved in funded research projects
* Number of career-related seminars and workshops
* Number of students in road-safety related internships

# Appendix A: Funded CSCRS Projects by Goal

## Research: 2017 / Year One

| ID # | Univ. Affiliation | PI Last Name | Title and Brief Description | Collaborator Org(s) | Goal(s) |
| --- | --- | --- | --- | --- | --- |
| R1 | UNC | LaJeunesse | **Structures of Stakeholder Relationships in Making Road Safety Decisions**  The purpose of this project is to reveal potential new partners for engagement in transportation safety, as well as uncover effective, efficient, and equitable relationship network structures that ultimately result in relatively high-quality transportation safety decisions. | IPRC, HSRC | 1, 2 |
| R2 | UCB | Grembek | **An Enhanced Systemic Approach to Safety**  This study will develop a prototype tool for conducting a systemic safety analysis for a scalable area. | None | 2 |
| R3 | FAU | Dumbaugh | **Safe Systems Synthesis & Summit Phase 1**  This effort will entail a review of the literature on safe systems and a leadership summit to engage key stakeholders in the development of a single, working definition of the safe systems concept. | UNC | 1 |
| R4 | UTK | Cherry | **Completing the Picture of Traffic Injuries: Understanding Data Needs and Opportunities for Road Safety**  To complete the picture of crashes and determine which elements of data that exist outside of conventional crash data can contribute to this picture, and to identify innovative statistical, probabilistic, and big data visualization tools to link crashes with other records. | UCB, UNC | 2 |
| R5 | FAU | Dumbaugh | **Identifying the Safety Information Needs of Major Cities in the U.S.**  This study seeks to understand how cities in the U.S. address the issue of traffic safety, as well as to identify the research, information, and guidance they view as being most essential to advancing their safety needs. | None | 2 |
| R6 | UNC  (DCRP) | McDonald | **Advanced Analytics for Vulnerable Road User Scenarios**  This study seeks to assess the current and future landscape of pedestrian and vehicle conflicts, identify how vehicle technology, planning policies, and data analytics can provide systemic solutions to pedestrian-vehicle conflicts, and use big data analytics from vehicle-to-pedestrian, vehicle-to-vehicle, and vehicle-to-infrastructure communications to identify dangerous pre-crash behaviors**.** | FAU, UCB | 2 |
| R7 | Duke | Cummings | **Development/Evaluation of Vehicle to Pedestrian Safety Interventions**  This project aims to develop a prototype Android mobile app that will alert pedestrians when they are near areas of high traffic density, including the presence of autonomous vehicles, and advise pedestrians when it is unsafe to cross a street. | UNC | 2 |
| R8 | UNC (HSRC) | Goodwin | **A Comprehensive System to Support Parents of New Teen Drivers**  The objective of this two-year project is to develop, test, and implement a comprehensive program to provide guidance to parents of new drivers in North Carolina. | None | 2 |

## Research: 2018 / Year Two

| ID # | Univ. Affiliation | PI Last Name | Title and Brief Description | Collaborator Org(s) | Goal(s) |
| --- | --- | --- | --- | --- | --- |
| R9 | Duke | Cummings | **Concept of Operations for an Autonomous Vehicle Dispatch Center**  The goal of this project will be to develop a concept of operations (CONOPS) for an autonomous vehicle (AV) remote operations center where human operators will perform supervisory tasks that maintain AV traffic flow and address safety concerns. Development of the CONOPS will require comprehensive analysis of dispatch systems and the effect of AV deployment on safe and efficient traffic flow. The completed CONOPS will directly address how a remote observation center can be used to manage traffic during the broader deployment of AVs and will serve as a reference for AV developers that supports understanding of AV deployment challenges that can be reduced through the inclusion of supervisory control. | None | 3 |
| R10 | Duke | Cummings | **Machine Learning Tools for Informing Transportation Technology Design**  This study will introduce a novel machine learning approach for analyzing crash data to inform the design of vehicle technology. Machine learning models will be developed to analyze existing crash data to identify relationships among data fields that may not be evident through traditional statistical tools. This pattern-based approach is expected to reveal combinations of hazardous conditions or contributing factors that we can address through technology-based countermeasures. In this respect, the resulting models can be used by automation designers to develop vehicle safety features (e.g., behaviors, warnings) that improve safety by addressing multiple risk factors. | None | 3 |
| R11 | FAU | Li | **Understanding the Crash Risk Exposure of Low-income Neighborhoods and TANF Recipients**  There is little information available to provide practitioners with guidance on how to address the safety needs of lower-income populations. This study directly addresses Roadmap Goal 1: making safe systems principles understood by practitioners and Roadmap Goal 2: Cutting-edge research, tools, data, and resources—compatible with a Safe Systems approach—are developed and utilized by professionals and the public at large to better understand and address existing and emerging road safety issues. By providing a much-needed evidence base on which professional guidance can be based, the project serves as a foundation for later advancing Goal 3: A growing body of students and future leaders are engaged and well-trained in road safety principles and Safe Systems approaches and methods. | None | 1, 2, 3 |
| R12 | UCB | Ragland | **Linking Crash and Post-Crash Data**  This project, which builds on existing effort to perform road safety research that explores core safety issues, addresses post-crash issues by considering EMS, ED, and hospital data. It will support the development of data sets, i.e., linked crash and medical data, which are designed to clarify the true burden of traffic crashes and improve post-crash management of injury. The results of the proposed research will have a direct impact on programs, policies, and practices by providing a fuller picture of traffic injures which in turn should motivate traffic crash reduction efforts, and by providing information to improve post-crash injury management. | UTK | 2 |
| R13 | UNC (DCRP) | McDonald | **Shared Mobility and Road Safety**  The purpose of this project is to explore addressing one of the most critical emerging questions in road safety research – how will technology-induced changes in travel impact road safety? This question is important to planning and public health practitioners but also of interest to a much wider public and policy audience that are engaged with new mobility options and their regulation. Work on this topic will assist CSCRS in reaching new and non-traditional audiences. | None | 2 |
| R14 | UNC (HSRC) | Nordback | **CSCRS Safety Data Clearinghouse, Phase I: Inventory & Framework**  The long-term goal of the project is to create an online CSCRS centralized data clearinghouse for bicycle and pedestrian safety-related data as a national resource for safety researchers to expedite research on this topic. The goal of this first phase of the project is to create a prioritized framework for the creation of a CSCRS online pedestrian and bicycle safety data resource clearinghouse. | UCB | 2 |
| R15 | UTK | Cherry | **Integrating Spatial Safety Data into Planning Processes**  This research proposal will aim to use several datasets to develop a new index to evaluate road safety and contribute that index in transportation planning to evaluate safety impacts of transportation system alternatives. This study uses conventional crash records with personal identifiers information. We will geocode the addresses of the individuals and will use them to develop a new index to evaluate safety based on the home address of the individuals (i.e., Home-Based approach). We will link the findings to Tennessee State Travel Demand Model, Knoxville Travel Demand Model, and Highway Performance Monitoring System. Linking Home-Based approach (HBA) and travel demand models provides insight into the evaluation of the safety impacts of proposed alternatives to the transportation planning. The findings will help planners and policymakers to provide appropriate countermeasures to improve safety. | FAU | 1, 2 |
| R16 | UTK | Cherry | **Opioids at the Health and Transportation Safety Nexus**  This research will use two datasets to develop a safe systems approach to the role of opioids in traffic crashes and the feedback loop from crash contribution to increased opioid prescription for pain management and back to increased risk of injury crashes. This work will explore merging conventional crash records with data from the Controlled Substance Monitoring Database. | UNC | 1, 2 |
| R17 | UNC  (IPRC) | Evenson | **Strengthening Existing and Facilitating New Vision Zero Plans**  The purpose of this project is to conduct research to identify Safe Systems approaches, policies, and practices. This project will focus on approaches outlined in Vision Zero plans to identify elements of high quality plans. | FAU, UCB | 1, 2, 3 |
| R18 | FAU | Dumbaugh | **Examining the Safety Effects of the Introduction of Light Rail Transit on Arterial Thoroughfares**  This study will provide a detailed analysis of the safety impacts of two recently-developed light rail systems in the U.S.: Orlando SunRail and Charlotte Lynx. | UTK | 1, 2, 3 |
| R19 | UTK | Khattak | **Developing a Taxonomy of Human Errors & Violations that Lead to Crashes**  This project will develop key elements of a Safe Systems framework by analyzing human errors and violations and their contributions to crashes; bringing together and analyzing behavioral, infrastructure/built environment, and vehicle, and data analytic features to find ways to reduce crashes and prevent injuries. | FAU, UNC | 1, 2 |
| R20 | UTK | Khattak | **Vulnerability of Motorcyclists to Crashes and Injury**  This study will focus on analyzing a unique database of motorcycle crashes, exploring how key risk factors vary by demographics and from one context to another, i.e., the settings in which motorcycle travel takes place. | UNC | 2 |
| RR1 | UNC | Sandt | **Explaining the Rise in Pedestrian Fatalities: A Systems Approach**  This project will develop system maps to support the generation of hypotheses around macro-level factors contributing to the recent rise in pedestrian fatalities in the US. It will examine existing data sources available to test such hypotheses and generate a research and data agenda for subsequent CSCRS research. | UNC HSRC, IPRC | 1, 2 |

## Non-Research: 2017 / Year One

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ID # | Univ. Affiliation | Title of Activity | Collaborator Org(s) | Goal(s) |
| PD-1 | UNC (HSRC) | **CSCRS Annual Meeting/Symposium**  This Annual Meeting, which will take place in Spring 2018, will bring together researchers, faculty, students, regional practitioners and elected officials to showcase student and faculty work from the CSCRS and discuss important transportation safety issues. | (all) | 1 |
| PD-2 | UNC (HSRC) | **Webinar Series on Systems Safety**  The purpose of this webinar series is to explore core concepts related to safe systems thinking and to highlight case studies and examples from various jurisdictions. This series will also highlight preliminary research findings from CSCRS ongoing efforts and provide a forum for discussing existing and needed research in the area of safe systems. The series will be geared to practitioners and will actively engage both traditional and non-traditional audiences through webinar panels and post-presentation discussions. | (all) | 1, 2 |
| PD-3 | FAU | **Safe Streets Lecture Series**  In Fall 2017, CSCRS consortium member FAU will host a public lecture series on emerging issues in traffic safety. The purpose of the lecture series will be to advance the discussion of traffic safety issues that affect the South Florida Metropolitan Region, and will be offered in partnership with the Palm Beach Planning Congress, the local chapters of the American Planning Association and the Institute of Traffic Engineers, the Women’s Transportation Seminar (WTS), as well as FAU’s Center for Urban and Environmental Solutions and the Planning Society at FAU (a student planning organization). | Palm Beach Planning Congress**,** local chapters of APA and ITE, WTS, and the Planning Society at FAU | 1, 2 |
| PD-4 | UNC  (IPRC) | **Public Health Professional Development Series**  The goal of this project is to 1) identify cross-sector teams with representatives from public health, engineering, and planning to participate in a systems approach training and implementation project, 2) ground public health, engineering, and planning professionals with the ideas and methods of systems thinking, 3) provide examples of systems approach initiatives that group participants can initiate in their own contexts, 4) gather feedback from participants about opportunities and challenges of using a systems approach, 5) Use information from participant experience and feedback to shape further projects, and 6) provide structured peer learning forum for teams to share opportunities, challenges, and solutions to improve projects that take a systems approach. | None | 1 |
| PD-5 | (all) | **Engagement at Conferences**  Staff from all consortium members will attend conferences to engage the transportation community and exchange ideas and research findings at venues such as TRB, AVS, Urban Street Symposium, RSS, NACTO, etc. | (all) | 1 |
| E-1 | UNC (HSRC) | **North Carolina Brown Bag Seminar (became Coffee and Conversations)**  This discussion series will bring together faculty, staff, and students from universities across the Triangle, NC region and provide a forum for networking and discussing critical issues in transportation safety and systems thinking. | IPRC, DCRP, Duke | 1, 3 |
| E-2 | UNC (HSRC) | **Market Research for K-12 Activities**  Perform web-based research, interviews, or potentially surveys to identify evidence-based programs that could be conducive for integrating transportation issues and/or replication with future UTC funds. | None | 3 |
| E-3 | Duke | **Robotics Student Symposium**  The Duke Robotics Student Symposium was held on April 14, 2017, coinciding with National Robotics Week. The Symposium was an opportunity for robotics students from a variety of backgrounds to showcase their work and network with regional peers. | None | 3 |
| E-4 | UTK | **Crash Scene Investigation Camp**  This camp geared for middle school students is designed to engage young minds around traffic safety issues through the reconstruction of a vehicle crash. The CSI team will use science, engineering, math, research, logic, and “eye witness” interviews to investigate a mock crash scene and think about what occurred and why and how it happened. | None | 3 |
| E-5 | UTK | **Weekly Transportation Safety Seminar Series**  This for-credit transportation seminar, held weekly on the campus of UT-K, will provide an opportunity for students to engage with faculty and invited safety experts on key issues in transportation safety. The seminars will be recorded and broadcast to remote audiences. | None | 3 |
| E-6 | (most) | **Student Scholarships**  Innovations PhD fellow and literature review scholars will be selected at UC-B; Duke students working on research projects will be designated as fellows; UT-K will make five student awards; UNC-DCRP will make one award for a safety student; travel funds will also be available for student conference participation; most of these awards will result in papers or presentations. | N/A | 3 |
| E-7 | (most) | **Support Course Development/Teaching**  UC-B, UNC-DCRP, and UT-K will all be involved in teaching graduate level transportation courses and sharing course outputs. | (all) | 1, 3 |

*\*Shaded activities gray did not take place in Year One, although planning may have started in Year One.*

## Non-Research: 2018 / Year Two

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ID # | Univ. Affiliation | Title of Activity | Collaborator Org(s) | Goal(s) |
| PD-6 | FAU | **Safe Streets lecture series, Year 2**  This effort will continue the lecture series begun during year 1 of the CSCRC. Each academic semester, FAU will host a public lecture on emerging issues in traffic safety. The purpose of the lecture series will be to advance the discussion of traffic safety issues that affect the South Florida Metropolitan Region, and will be offered in partnership with the Palm Beach Planning Congress, the local chapters of the American Planning Association and the Institute of Traffic Engineers, the Women’s Transportation Seminar (WTS), and the Planning Society at FAU (our student planning organization). | Palm Beach Planning Congress, local chapters of APA and ITE, WTS, and the Planning Society at FAU | 1, 3 |
| PD-7 | UCB | **Student fellowship and research grants**  UCB is offering several fellowship and research grant opportunities for UC Berkeley graduate students conducting research relevant to traffic and road safety. They are open to graduate students from any department across campus and support CSCRS’s mission to accelerate progress in reducing traffic injuries or fatalities by utilizing a systems approach to bring perspectives from planning, engineering, public health, data science, and robotics to the road safety field. | None | 2, 3 |
| PD-8 | UNC (DCRP) | **Pilot workshops on road safety for planners in NC**  The goal of this activity is to pilot a training program aimed at land use planners to inform them about how their work connects to road safety and demonstrate how land use planners can incorporate road safety into the issues they consider during planning processes. This activity will conduct 3-4 pilot workshops in North Carolina to create a model workshop that can be delivered to planners nationally. | None | 1, 2 |
| PD-9 | UNC (IPRC) | **CSCRS web-based repository of systems thinking resources**  Develop a webpage on the CSCRS website to provide a “one-stop” web location for people can go to learn about systems science broadly and specifically as it relates to transportation safety. All materials will either 1) directly relate to the CSCRS mission of systems-thinking in relation to transportation safety, or 2) will be accompanied by explanatory text that emphasizes the connection to transportation safety. | None | 2, 3 |
| PD-10 | UNC (IPRC) | **Public Health travel scholarships for Safe Systems Summit**  To promote collaboration between researchers and the practice communities, and encourage participation in the Safe Systems Summit by thought leaders in the public health practice community, we propose travel scholarships for up to 10 public health leaders who will be selected using a competitive peer-review application process. | CDC, NPLT | 2 |
| PD-11 | UNC (IPRC) | **Systems thinking workshop focused on pedestrian safety**  Building from the rapid response project with key subject matter experts, we will conduct a systems thinking workshop with community members/pedestrians regularly exposed to pedestrian travel risks. We envision conducting a workshop that includes perspectives from minority and economically disadvantaged populations. | TRB Ped Committee, USDOT, America Walks, Vision Zero Network | 1, 2 |
| PD-12 | UTK | **CSCRS student-focused meeting/conference**  A CSCRS student-focused meeting (or conference). The University of Tennessee can host a student, staff, and faculty meeting/conference for CSCRS member universities. Attendees will also include community college students and staff, and public sector professionals and private sector participants involved in data science and robotics. This one-day or two-day event can feature a keynote speaker, student and faculty paper and poster presentations, state DOT panel on their research needs (and match), a WTS session, and an ITE/APA student session. | MobilityLab | 1 |
| PD-13 | UTK | **Traffic Signal Academy course development**  Dr. Khattak will work with Dr. Airton Kohls (staff in UTK Center for Transportation Research) to develop and offer modules focusing on intersection safety in the Traffic Signal Academy courses. | None | 3 |
| PD-14 | UTK | **TTAP online traffic safety course**  Dr. Khattak will develop and teach a short course on safety in Tennessee Transportation Assistance Program (TTAP)-part of a nationwide Local Technical Assistance Program (LTAP) financed jointly by the Federal Highway Administration (FHWA), Tennessee Department of Transportation (TDOT), and the University of Tennessee. This activity will incorporate new developments and deliver an online safety course intended for traffic engineers and traffic engineering technicians with a broad range of traffic engineering and highway safety responsibilities. | TTAP, LTAP, FHWA, TDOT | 3 |
| PD-15 | UTK | **Weekly transportation seminar and webinar speaker series**  This is a weekly seminar series, with broadcasting some seminars and archiving them online. High level safety and transportation experts will be invited to speak at the weekly UT Transportation Seminar. | None | 3 |
| E-8 | FAU | **Safe Systems education and outreach program**  This effort will consist of three components: a research element to identify best practices in reducing traffic-related death and injury, the development of a stand-alone “short course” on Safe Systems that will be made available on the web, and the introduction of the concept of Safe Systems as part of the South Florida Safe Streets Summit, scheduled for January of 2019. | Miami Dade TPO, the Broward MPO, and the Palm Beach MPO | 1, 2, 3 |
| E-9 | UCB | **Injury Prevention and Control course**  The Traffic Safety and Injury Control course (CEE C265) will examine principles of engineering and behavioral science relevant to preventing traffic collisions and subsequent injury. Human behavior, vehicle design, and roadway design will be considered as components of a Safe Systems approach to preventing traffic crashes and injuries. Safety of vulnerable road users (primarily pedestrians and bicyclists) will be covered extensively. Given the rapid emergence of technology—self-driving vehicles, crash avoidance systems, vehicle-infrastructure integration—we will have a two-week module on the implications for safety (for all modes) of these emerging technologies. | None | 3 |
| E-10 | UCB | **Traffic Safety and Injury Control course**  The Traffic Safety and Injury Control course (CEE C265) will examine principles of engineering and behavioral science relevant to preventing traffic collisions and subsequent injury. Human behavior, vehicle design, and roadway design will be considered as components of a Safe Systems approach to preventing traffic crashes and injuries. Safety of vulnerable road users (primarily pedestrians and bicyclists) will be covered extensively. Given the rapid emergence of technology—self-driving vehicles, crash avoidance systems, vehicle-infrastructure integration—we will have a two-week module on the implications for safety (for all modes) of these emerging technologies. | None | 3 |
| E-11 | UCB | **Traffic Safety YouTube video series**  We will produce short, educational YouTube videos about road safety that highlight the research work conducted by CSCRS scholars and researchers at UCB. The target audience will be the general public and practitioners. The purpose of the videos is to disseminate knowledge generated by CSCRS researchers to highlight the relevant, important work done at CSCRS. Videos will be five to ten minutes long and presented in an engaging, non-technical format. | None | 2 |
| E-12 | UNC (DCRP) | **Community Planning Month engagement with Chapel Hill elementary students**  Town of Chapel Hill staff regularly interact with local 4th and 5th grade students as part of October’s National Community Planning Month. We will work with local experts and CSCRS Road Safety Scholars to develop a set of transportation planning-focused safe systems activities aimed at a 4th/5th grade audience. CSCRS Road Safety Scholars will then accompany town staff to local schools to engage students in those activities during Community Planning Month activities. This effort will be a pilot to develop materials that can be distributed to a national audience. | Town of Chapel Hill staff | 3 |
| E-13 | UNC (DCRP) | **Continuation of CSCRS Road Safety Scholars program**  UNC DCRP will continue and further developing the CSCRS Road Safety Scholars program by working toward the following objectives (1) develop mentorship pathways between scholars and HSRC staff, (2) provide opportunities for scholar involvement on HSRC research projects, (3) enhance scholars’ understanding of relevance and connections among Coffee & Conversation lecture topics, and (4) introduce road safety concepts to a broader cross-section of students. | None | 2, 3 |
| E-14 | UNC (DCRP) | **Teach Complete, Safe, Equitable Systems UNC course**  Continue to offer the graduate level Complete, Safe, Equitable Systems course. In its first iteration, the course has 23 students (10 planning masters students, 1 public health masters student, 12 undergraduates across various majors). The course includes sections on policy frameworks for complete streets, complete streets as safe systems, considerations for accommodating various safety, security, and accessibility needs of different users of streets, physical street design, and connecting design to policy. The course’s major project requires students to work in teams, under guidance from Mary Elbech (local expert in innovative street design), Eric Davis (landscape architect and expert in context sensitive streetscapes), Town of Chapel Hill planning staff, and the course instructor, to develop a complete streets retrofit plan for an existing neighborhood in Chapel Hill. | Town of Chapel Hill planning staff | 3 |
| E-15 | UTK | **Crash Scene Investigation Camp**  Building upon Year 1 efforts, the Crash Scene Investigation – Highway (CSI-Highway) Camp will be delivered to middle school students during Summer 2018 and 2019. Second year funding will focus on refining the camp material based on lessons learned from the 2018 camp and packaging the lesson plans and supply lists for distribution to other agencies, colleges, universities interested in offering the camp. | None | 3 |
| E-16 | UTK | **UTK student scholar awards**  UTK will select and provide student scholar awards, estimated at 5 at $1000 each, to be given to students that produce research papers, synthesis of studies, and/or journal articles for CSCRS. | None | 3 |

# Appendix B: CSCRS Project Selection Process

There is an annual research funding process by which CSCRS activities and projects are funded. Calls for researchers to initiate research projects areintended to provide an open and transparent opportunity to invite research ideas from across all consortium member universities and departments; these may be in support of specific center-directed initiatives or be developed in response to evolving needs of the center. This process is designed to be flexible in accommodating a range of project types and activities, including:

* Seed grants: These would typically be under $15K and are intended to provide startup funds for pilot testing, feasibility studies, validating a technique, etc.
* Young investigator grants: These would typically be for $25K or less and are intended to support new researchers (need to set parameters)
* General research: Typical research projects (that are not seed grants or young investigator grants) are usually funded for a year at a time and may range in funding from $50K to $500K, depending on the scope. So, multi-year proposals can be submitted but must be submitted one phase/year at a time.

In addition, a **quick response process** sets aside a small amount of projectfunding for consortium members to be able to access (within 30 days of application) for time-sensitive or important emerging issues that need to be addressed out of the typical award cycle for center-directed or investigator-initiated processes. The process and timelines for the two primary project funding mechanisms are described below.

This table maps out the key differences between the two processes and (potential) projects.

|  |  |  |
| --- | --- | --- |
|  | **CSCRS Annual Call for Proposals**  **(annual)** | **CSCRS Rapid Response Submission Process (ad hoc)** |
| *How to Submit Ideas* | * Submit required proposal information during regular call for proposals (instructions at [www.roadsafety.unc.edu/reporting](http://www.roadsafety.unc.edu/reporting)) * Must be submitted by due date for current call (e.g., December 20XX) | * Submit Rapid Response project info sheet at any time (e.g., out of cycle) * Email to [info@roadsafety.unc.edu](mailto:info@roadsafety.unc.edu) and to CSCRS Director, Laura Sandt, [sandt@hsrc.unc.edu](mailto:sandt@hsrc.unc.edu), to initiate official discussion/consideration |
| *Review Process* | * Review and decision process takes an average of 4.5 months * Peer reviewed by 2 external reviewers and one CSCRS Associate Director | * Review and decision made within one month (30 days) * Peer reviewed by CSCRS director, one CSCRS Associate Director (outside of UNC-CH), and CSCRS research program coordinator |
| *Project Funding Level* | * Varies | * Less than $75K |
| *Project Duration* | * Varies, usually 1-2 years | * Short-term projects (e.g., 6-9 months) * All aspects of the project must be completed within 12 months. |
| *Project Eligibility* | * Must show relation to CSCRS Strategic Roadmap goals and/or objectives | * Must show relation to CSCRS Strategic Roadmap goals and/or objectives * AND demonstrate time-sensitivity (i.e., related to when data collection is needed, response to agency request, etc.) |
| *Required CSCRS Project Materials\** | * Work plan * Data management plan (and project final dataset(s)) * Draft and final report * Summary PowerPoints | * Work plan * Data management plan (and project final dataset(s)) * Draft and final report * Summary PowerPoints |
| *No-Cost Time Extensions* | * Possible, on a case by case basis * Must be requested 30 days before the initial project end date | * No, not possible |

\*See CSCRS Project Closeout Guidance document, [www.roadsafety.unc.edu/reporting](http://www.roadsafety.unc.edu/reporting), for more information.