Solving Transportation Challenges Through Research

NCHRP: SUPPORTING TRANSPORTATION AGENCY LEADERS

The National Academies of
SCIENCES • ENGINEERING • MEDICINE
TRANSPORTATION RESEARCH BOARD
For more than 50 years, the states have trusted the Transportation Research Board to manage the National Cooperative Highway Research Program (NCHRP) and provide state DOTs with practical solutions to the challenges they face every day. Under the direction of the AASHTO Special Committee on Research and Innovation (R&I), TRB ensures that the states’ investment in NCHRP research pays off by finding new and improved ways to deliver transportation services and products that meet society’s needs. We feel a great responsibility to make sure the states get a good return on their investment.

“To this end, we are aided by R&I—the AASHTO committee responsible for oversight of NCHRP. Its members include research managers and executive-level staff in equal numbers. We work together to maintain balance in the program by ensuring that NCHRP focuses on the day-to-day problems faced by DOTs while maintaining alignment with the strategic needs of agency executives.

“As a result of AASHTO’s recent reorganization, more emphasis is being placed on innovation and implementation. We look forward to exploring new opportunities to identify and promote innovations that can assist state DOTs achieve their core missions.”

Christopher Hedges
Director,
Cooperative Research Programs,
Transportation Research Board
The National Cooperative Highway Research Program—NCHRP—has provided research-based solutions to challenges faced by state transportation agencies since 1962. The Board of Directors of the American Association of State Highway and Transportation Officials (AASHTO) sets the direction and focus of research conducted by NCHRP. The Transportation Research Board (TRB) and the U.S. Federal Highway Administration (FHWA) partner with the state DOTs to deliver research results that state DOTs use every day.

NCHRP is...

**Cost-efficient**, yielding a high return on investment for states by pooling research dollars to address common needs and national priorities.

**Relevant**, addressing timely topics that matter most to states. This means staying ahead of emerging and evolving topics—automated vehicles, finance mechanisms, and the role of transportation in public health—while advancing bread-and-butter topics such as pavements, structures, planning, and the environment.

**Practical**, producing results that can be put to use and make an immediate difference to taxpayers and to DOTs’ bottom lines.

**Broad**, addressing how to improve practice in every business area within a modern transportation agency.

**Inclusive**, reflecting the priorities of state DOT leadership and relying on input from state DOT technical experts as well as experts from industry, academia, AASHTO, and FHWA.

**Independent and objective**, conducting evidence-based research that adheres to the highest standards of integrity.

NCHRP has conducted safety research since it began. NCHRP helps states pool their research dollars for mutual benefit, including efforts to ensure highway worker safety, an issue critical to every state.

Source: Arizona DOT (CC BY-NC-ND 2.0)
NCHRP: RESEARCH POWERED BY THE STATES

NCHRP Research Reports, Syntheses of Highway Practice, Legal Research Digests, Innovations Deserving Exploratory Analysis (IDEA), and other research products form a comprehensive body of top-quality guidance relied upon by state DOTs from coast to coast.

Many of the dozens of research products that NCHRP produces each year offer guidance for immediate application: better ways to design, build, and maintain roads and bridges; keep motorists and highway workers safe; and manage a DOT more efficiently and effectively.

NCHRP also conducts strategic and future-focused research to provide transportation leaders with information needed to prepare their agencies for the road ahead. For example, NCHRP Report 750: Strategic Issues Facing Transportation is a six-volume series that examines the long-term implications of freight, climate change, technology, sustainability, energy, and sociodemographics for state DOTs. In addition, NCHRP Project 20-24, Administration of Highway and Transportation Agencies, is used by state DOT CEOs to address emerging, high-priority needs of top management, such as issues related to connected and automated vehicles and infrastructure, asset management, and agency administration and management.

AASHTO, FHWA, and TRB all rely on NCHRP research as the basis for other publications widely used by transportation agencies. Examples include:

- AASHTO’s Mechanistic–Empirical Pavement Design Guide (MEPDG) and DARWin-ME software, based on NCHRP research, represent a fundamental shift in pavement design that reflects the influences of traffic, climate, and soil composition. NCHRP guidance continues to support states shifting to the MEPDG approach.

- A Policy on Geometric Design of Highways and Streets—known as AASHTO’s “Green Book”—contains comprehensive guidance for highway engineers and designers. Updates have incorporated NCHRP research on roadway features, access management, and vehicle types and speeds.

- AASHTO’s Highway Safety Manual provides the best factual information and tools for considering safety implications in roadway planning, design, and operational decisions.

- AASHTO’s load and resistance factor design (LRFD) specifications for structures—including bridges, decks, tunnels, signs, and supports—are a direct output of NCHRP research guided by AASHTO committees.

- FHWA’s Manual on Uniform Traffic Control Devices (MUTCD) relies on NCHRP research to develop standards for signage, road surface markings, and signals.

- TRB’s current Highway Capacity Manual takes an integrated multimodal approach to the analysis and evaluation of urban streets from the perspectives of drivers, transit passengers, and cyclists.

NCHRP’s Foresight Series reports give DOTs tools to plan for the future.

Source: Kent Kanouse (CC BY-NC 2.0)

States work together to solve congestion challenges using NCHRP research.

Source: Utah DOT (CC BY-NC-ND 2.0)
State DOTs—through NCHRP—are important players in the fast-moving transportation policy arenas of Transformational Technologies and disruptive technologies, such as connected and automated vehicles (including shared-use services), unmanned aerial systems (drones), the Internet of Things (including smart cities), and cybersecurity.

To help focus research on the most critical needs in some of these new and evolving policy arenas, NCHRP creates research roadmaps to identify research needs in specific areas. These are particularly effective in helping state DOTs create a strategic approach to research on emerging issues that are not well-defined.

Implementation is the last step in the research process—the benefit of research can’t be realized unless it is put to use. NCHRP has developed a science-based approach called active implementation to help state DOTs put research results into practice.
State DOTs and AASHTO councils and committees identify problems that can be solved with research. The AASHTO Board of Directors—the Chief Executive Officers of each state DOT—approves each year’s program of research. NCHRP relies on technical and policy subject matter experts from state DOTs as well as other experts from academia, industry, and government to provide technical oversight of the research that is conducted by contractors; TRB staff provide day-to-day management of each research project. State DOT staff and other practitioners ultimately take the important step of putting the results into practice.

**NCHRP AT A GLANCE**

**S U M M E R**
AASHTO’s Special Committee on Research and Innovation (R&I) invites research problem statements from DOTs, AASHTO councils and committees, and FHWA. These are due October 15.

**F A L L**
Problem statements are evaluated by experts from AASHTO, FHWA, and TRB.

**W I N T E R**
R&I and its Research Advisory Committee—the state DOT research directors from every state DOT—review the problem statements and the comments from technical reviewers. Each of the committees’ members vote on the problem statements in rank order.

**S P R I N G**
The slate of ranked projects is submitted to the AASHTO Board of Directors for approval.

**CONTACT US**

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HOW CAN I BECOME INVOLVED IN BTSCRP?

There are four ways to become involved in BTSCRP:

(1) Submit a research idea or problem statement. Provide a general description of the problem, including a clear, concise statement of the objectives expected to be met and any anticipated products of the research. Describe the specific research proposed, how it relates to the problem, and, if possible, what approach and tasks are envisioned. Include an estimate of the funds as well as the time needed to complete the research. A problem statement outline can be found on the BTSCRP website at www.trb.org/BTSCRP. Problem statements are typically due in February of each year. The BTSCRP Governing Board meets in June to select projects for the next fiscal year’s program.

(2) Volunteer to participate on a project panel. After it is announced, each project is assigned to a panel that provides technical guidance and counsel throughout the life of the project. TRB normally solicits panel nominations in July for people to serve on project panels for the next fiscal year’s projects. In response to TRB’s solicitation for nominations, any interested person may self-nominate or be nominated for membership on a project panel. Submit a resume and a BTSCRP nomination form, which can be downloaded from the BTSCRP website at www.trb.org/BTSCRP.

(3) Prepare a proposal to conduct research. In response to BTSCRP RFPs, any interested individual, agency, or others who possess extensive, demonstrated capability and proven experience in the problem area may submit a proposal to do the research work. Information on how to prepare and submit a proposal is provided on the BTSCRP website at www.trb.org/BTSCRP.

(4) Use the research results. BTSCRP products are developed in response to problems faced by traffic safety stakeholders. When faced with a traffic safety issue, use BTSCRP products for guidance.

SCOPE OF BTSCRP PROJECTS

BTSCRP can address any behavioral issue faced by traffic safety stakeholders. Particular emphasis areas are alcohol-impaired driving, autonomous vehicles, bicyclists and pedestrians, child passenger safety, distracted driving, drowsy driving, drug-impaired driving, law enforcement, mature drivers, motorcyclist safety, seat belts, speed and red light cameras, speeding and aggressive driving, teen driver safety, and traffic records.

BTSCRP will produce a series of research products that traffic safety stakeholders, government agencies, and other interested parties can consult when addressing traffic safety issues.

TRANSPORTATION RESEARCH BOARD
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WHAT IS BTSCRP?
The Behavioral Traffic Safety Cooperative Research Program (BTSCRP) is a forum for coordinated and collaborative research to address issues integral to the Governors Highway Safety Association (GHSA), the National Highway Traffic Safety Administration (NHTSA), and traffic safety professionals at all levels of government and the private sector. BTSCRP provides practical, ready-to-implement solutions to save lives, prevent injuries, and reduce costs of road traffic crashes associated with unsafe behaviors. BTSCRP is a partnership between GHSA, NHTSA, and the Transportation Research Board (TRB).

HOW IS BTSCRP FUNDED?
BTSCRP, originally named the National Cooperative Research and Evaluation Program (NCREP), was established in the 2012 Moving Ahead for Progress in the 21st Century Act (MAP-21), Subsection 402(c). The program was continued in the 2015 Fixing America’s Surface Transportation (FAST) Act. Funding was set at $2.5 million and is withheld from the Section 402 grant program each federal fiscal year. In October 2017, GHSA entered into an agreement with TRB to manage the research activities. The program name was changed from NCREP to the Behavioral Traffic Safety Cooperative Research Program to clarify its purpose and to distinguish it from other TRB research programs.

HOW IS BTSCRP GOVERNED?
The GHSA Executive Board serves as the Governing Board for BTSCRP. The Board consists of representatives of the 10 NHTSA regions and appoints the GHSA Research Committee, which monitors and facilitates the activities of BTSCRP. Its ultimate goal is to oversee a quality research program that is committed to addressing research issues facing State Highway Safety Offices and to promoting research findings that improve highway safety.

WHERE DO THE RESEARCH IDEAS ORIGINATE?
Anyone can write or contribute to preparing a problem statement. However, problem statements must be endorsed by a State Highway Safety Office, GHSA Executive Board members, a GHSA Committee, or NHTSA to be eligible for consideration. Submitters are strongly encouraged to do a literature search before submitting to ensure the problem hasn’t been solved or isn’t being studied already. An annual request for problem statements will be posted on www.trb.org/BTSCRP.

WHO SELCTS THE RESEARCH TOPICS?
NHTSA and TRB staff will review the submitted research problem statements and provide feedback to the Governing Board. The Governing Board gives final approval of the annual research projects. Emphasis is placed on selecting projects that will result in applied research products that highway safety stakeholders will be able to use immediately upon the completion of the research.

WHAT HAPPENS AFTER RESEARCH TOPICS ARE SELECTED?
TRB follows a cooperative research process that it has used successfully in other programs. First, TRB forms a project panel of diverse individuals with expertise and interest in the topic area. This project panel uses the original problem statement to develop a detailed scope of work that serves as a basis for a request for proposal (RFP). The RFP is then prepared and posted on www.trb.org/BTSCRP. Those previously expressing interest via the BTSCRP website are notified immediately. The weekly TRB E-Newsletter provides a notice also. Individuals and agencies then respond to the RFP by submitting proposals to conduct the research. The project panel reviews the proposals and selects the contractor to conduct the research. The panel then provides technical guidance and reviews deliverables throughout the life of the project.

HOW LARGE ARE PROJECT PANELS AND WHO SERVES ON THEM?
A project panel usually consists of six to eight people from the traffic safety community, academia, state and local governments, and includes federal government liaisons. TRB selects panel members based on their expertise and interest in the research topic and carefully screens panel members for potential conflicts of interest in connection with the particular research project. Panel members serve as individuals, not as representatives of their affiliations.

WHAT IS THE TIME COMMITMENT OF BTSCRP PROJECT PANEL MEMBERS?
A modest time commitment is expected for project panel members. An initial two-day meeting focuses on developing an RFP. A follow-up one-day meeting allows members to discuss their proposal evaluation and select the contractor for the project. An interim one-day meeting may be held during the research phase to bring the project panel together with the research contractor. The remaining work is accomplished remotely and consists of reviewing and providing written comments on draft work products and other deliverables.

ARE PROJECT PANEL MEMBERS COMPENSATED?
Project panel members serve as volunteers without compensation. However, BTSCRP pays for travel costs that panel members incur to attend meetings, including airfare, lodging, meals, and incidentals.

HOW CAN I OBTAIN BTSCRP PRODUCTS?
All BTSCRP products are available on the BTSCRP website at www.trb.org/BTSCRP.