



NCHRP

NATIONAL
COOPERATIVE
HIGHWAY
RESEARCH
PROGRAM

September 2017

Solving Transportation Challenges Through Research

**NCHRP:
SUPPORTING
TRANSPORTATION
AGENCY
LEADERS**

The National Academies of
SCIENCES • ENGINEERING • MEDICINE



TRANSPORTATION RESEARCH BOARD

NCHRP: YOUR RESEARCH PROGRAM

AASHTO members commit State Planning and Research (SP&R) Program funding to support and oversee NCHRP, which pools the states' research dollars to solve critical transportation challenges identified by the states.

NCHRP is administered by the Transportation Research Board (TRB), part of the National Academies of Sciences, Engineering, and Medicine (NASEM). TRB and NASEM bring trusted objectivity and independence to the administration and conduct of NCHRP research.

***Learn more at
trb.org/nchrp.***



“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*

OF THE STATES, BY THE STATES, FOR THE STATES

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.



Source: Kent Kanouse (CC BY-NC 2.0)

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:

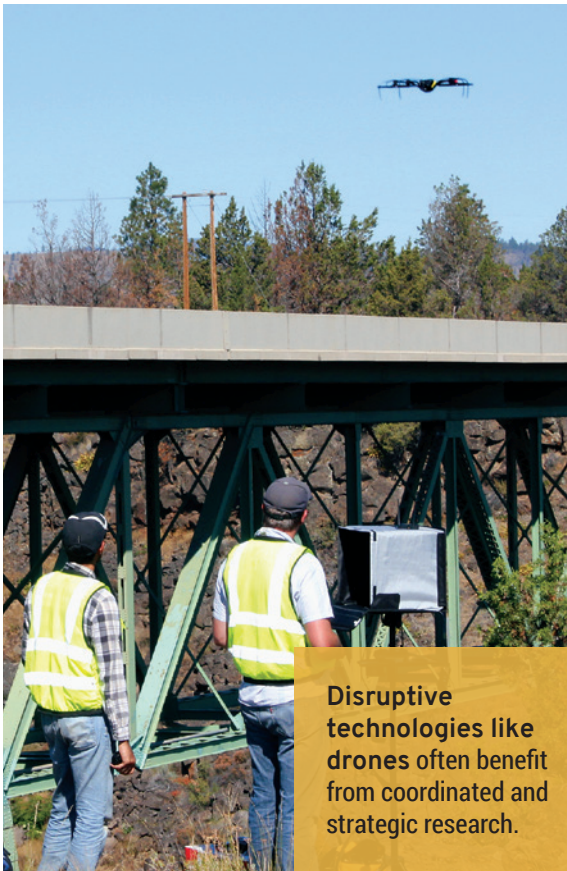
- AASHTO's **Mechanistic-Empirical Pavement Design Guide** (MEPDG) and **DARWin-ME software**, based on NCHRP research, represent a fundamental shift in pavement design that reflects the influences of traffic, climate, and soil composition. NCHRP guidance continues to support states shifting to the MEPDG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

Source: Utah DOT (CC BY-NC-ND 2.0)



LOOKING FORWARD

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.



Source: Oregon DOT (CC BY 2.0)

Disruptive technologies like drones often benefit from coordinated and strategic research.

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.

NCHRP AT A GLANCE

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.



SUMMER

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.



FALL

Problem statements are evaluated by experts from AASHTO, FHWA, and TRB.



WINTER

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.



SPRING

The slate of ranked projects is submitted to the AASHTO Board of Directors for approval.

CONTACT US

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Cover image source: Missouri DOT.

The National Cooperative Highway Research Program (NCHRP) produces ready-to-implement solutions to the challenges facing transportation professionals. NCHRP is sponsored by the individual state departments of transportation of the American Association of State Highway and Transportation Officials (AASHTO), in cooperation with the Federal Highway Administration (FHWA). NCHRP is administered by the Transportation Research Board (TRB), part of the National Academies of Sciences, Engineering, and Medicine. Any opinions and conclusions expressed or implied in resulting research products are those of the individuals and organizations who performed the research and are not necessarily those of TRB; the National Academies of Sciences, Engineering, and Medicine; or NCHRP sponsors.