PERSPECTIVE

The National Cooperative Highway Research Program Works to Move Concrete Bridges Forward

by Ahmad Abu-Hawash, National Academies of Sciences, Engineering, and Medicine

In my role with the National Cooperative Highway Research Program (NCHRP), I am often asked about what we do and how the NCHRP fits into the broader research ecosystem. From refining technical specifications to enabling the adoption of cutting-edge materials and methods, NCHRP helps shape the future of concrete bridge engineering. The program's collaborative and expert-driven approach ensures that research translates into practice, facilitating the building of a safer, longer-lasting, and more innovative infrastructure nationwide.

NCHRP's Contributions to Concrete Bridges

NCHRP has a long history of supporting innovations in concrete bridge research. This research has provided the technical foundation for several sections in many editions of the American Association of State Highway and Transportation Officials' *AASHTO LRFD Bridge Design Specifications*.[1] As illustrated by the publications and projects listed in **Tables 1** and **2**, NCHRP research covers a wide range of concrete innovations such as ultra-high-performance concrete (UHPC), accelerated bridge construction (ABC), precast and prestressed concrete bridge elements, and tensioning elements (0.7-in.-diameter strand, stainless steel strand, fiber-reinforced polymer strand).

The National Academies

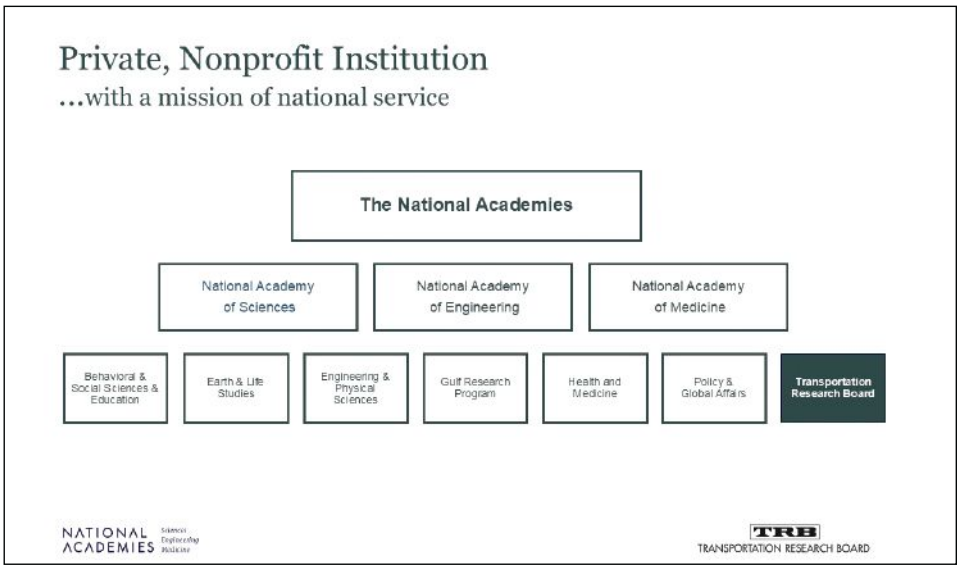
The National Academies of Sciences, Engineering, and Medicine began in 1863, when the National Academy of Sciences was established by an act of Congress signed by President Abraham Lincoln. The National Academies are private, nonprofit organizations, whose primary function is to advise the United States on issues related to science and technology to help solve complex problems and inform public policy decisions. Under the umbrella of the National Academies, the Transportation Research Board (TRB) is the unit that is responsible for transportation research.

Table 1. Selected National Cooperative Highway Research Program (NCHRP) publications

Publication	Project
NCHRP Research Report 906: *LRFD Minimum Flexural Reinforcement Requirements* (https://doi.org/10.17226/25527)	**12-94**
NCHRP Research Report 1026: *Guidelines for Adjacent Precast Concrete Box Beam Bridge Systems* (https://doi.org/10.17226/27029)	**12-95A**
NCHRP Research Report 895: *Simplified Full-Depth Precast Concrete Deck Panel Systems* (https://doi.org/10.17226/25562)	**12-96**
NCHRP Research Report 907: *Design of Concrete Bridge Beams Prestressed with CFRP Systems* (https://doi.org/10.17226/25582)	**12-97**
NCHRP Research Report 935: *Proposed AASHTO Seismic Specifications for ABC Column Connections* (https://doi.org/10.17226/25803)	**12-105**
NCHRP Research Report 994: *Use of 0.7-in. Diameter Strands in Precast Pretensioned Girders* (https://doi.org/10.17226/26677)	**12-109**
NCHRP Research Report 1139: *Considerations for the Design and Construction of Bonded and Unbonded Post-Tensioned Concrete Bridge Elements* (https://doi.org/10.17226/29033) NCHRP Web-Only Document 417: *Background and Resources for the Design and Construction of Bonded and Unbonded Post-Tensioned Concrete Bridge Elements* (https://doi.org/10.17226/29032)	**12-118**
NCHRP Research Report 1161: *Stainless Steel Strands for Prestressed Concrete Bridge Elements* (forthcoming)	**12-120**
NCHRP Research Report 1128: *Load Rating of Segmental Bridges* (https://doi.org/10.17226/28597)	**12-123**
NCHRP Research Report 999: *Design and Construction of Deck Bulb Tee Girder Bridges with UHPC Connections* (https://doi.org/10.17226/26644)	**18-18**

Table 2. Selected in-progress and anticipated National Cooperative Highway Research Program projects

Project	Title	Status
12-121	Guidelines for the Design of Prestressed Concrete Bridge Girders Using FRP Auxiliary Reinforcement	In progress
12-129	Evaluating Concrete Girders with Noncompliant Shear Details	Contract pending
12-130	Holistic Re-evaluation of Service III Limit State for Prestressed Concrete Bridge Members	Anticipated
20-123(20)	Roadmap to Update Bridge Deck Design Requirements	In progress
22-56	Development of Non-proprietary Prefabricated Solutions for Concrete Barrier Systems for Accelerated Bridge Construction	In progress



Organization of the National Academies of Sciences, Engineering, and Medicine. All Figures: National Cooperative Highway Research Program.

TRB has three divisions:

- Technical Activities, which is responsible for the TRB standing committees, annual meetings, papers, workshops, webinars, and other technical activities
- Consensus and Advisory Studies, which is responsible for research on complex and controversial transportation issues at the request of the U.S. Congress, executive branch agencies, states, and other sponsors
- Cooperative Research Programs (CRP), which is focused on research to address the toughest transportation challenges in the United States

To cover most modes of transportation, CRP has four programs. NCHRP is responsible for highway research while the other three focus on traffic safety, airports, and transit. In partnership with AASHTO, NCHRP is focused on applied research that is important to state transportation agencies with national and shared interests. Each year, state departments of transportation (DOTs) voluntarily contribute 5.5% of the State Planning and Research portion of their Federal-Aid Highway funds to support NCHRP research. The transfer of funds is administered by the Federal Highway Administration (FHWA).

The NCHRP Process

Problem statements for NCHRP projects are conceived through collaboration among state DOTs, AASHTO committees and councils, industry stakeholders, and academic institutions to address specific needs such as helping AASHTO develop new design and construction methods or enhance existing methods. While many practitioners from industry and academia participate in developing problem statements, only state DOTs, AASHTO committees and councils, and FHWA may formally submit them. NCHRP, AASHTO, and FHWA staff review the submissions and provide comments and questions to the submitters. Submitters have an opportunity to respond to those questions, but problem statements may not be revised and resubmitted. In other words, the comments and the submitters' responses will be noted with the problem statement to help reviewers in the evaluation process, but the original submission cannot be changed. Problem statements are always due on November 1.

Every April, the AASHTO Special Committee on Research and Innovation (R&I) selects problem statements for funding and forwards them to the AASHTO Board of Directors for approval. Each problem statement is evaluated based on specific criteria, including the following:

- Does the statement represent a current and relevant problem?
- Is the problem shared among many DOTs?
- Is the problem appropriate for NCHRP, or should it be addressed by another program or entity?

For fiscal year 2026, of the 123 problem statements submitted, 60 were selected for funding, including 10 related to bridges and structures.

The journey does not end once problem statements are selected for funding. Assembling project panels, developing clear and actionable requests for proposals, and selecting a team to carry out each project are subsequent parts of the process.

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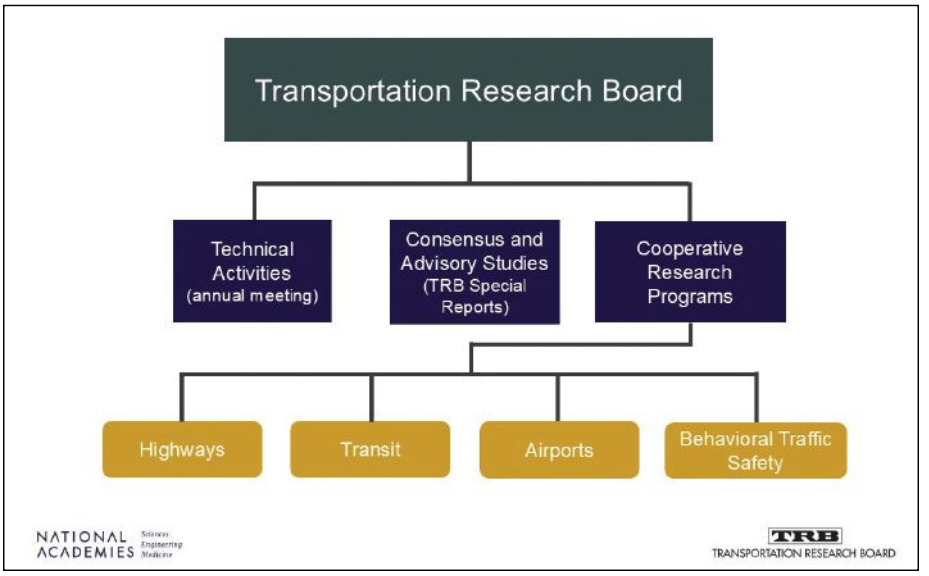

Each project panel includes six to eight expert volunteers representing all AASHTO regions and includes representatives from industry and academia. These panels are managed by an NCHRP senior program officer and include a liaison from FHWA and AASHTO.

A Culture of Service

As a former state DOT engineer, I relied on the research NCHRP produces and I served as a panelist on many NCHRP projects. That experience allowed me to see firsthand the impact NCHRP has on the state of practice. It also gave me a deeper understanding of AASHTO specifications, many of which are based on NCHRP research, and the collaborative process that shaped them.

Serving on a project panel is a unique opportunity to both contribute and learn. Panel members are selected for their technical expertise—but we look for more than just technical expertise. At NCHRP, we strive to form well-balanced and objective panels. We also aim for broad representation in terms of geography and organization types (for example, public and private agencies, universities, associations, local and state governments). I can say from experience, being a panel member is one of the most impactful ways to stay engaged with the profession and help shape the future of transportation.

If you are interested in joining a panel, visit the TRB website for information about the nomination process: https://www.trb.org/NCHRP/CRPInfoPanelMembers.aspx.

Final Thoughts

Bringing together professionals from across the United States and across sectors helps ensure that NCHRP research is widely respected and broadly applicable. The research reflects the real-world challenges and insights of those working in transportation every day.

Having participated in the NCHRP program, first as a state DOT engineer and now as part of the team that spearheads it, I remain proud to be part of work that truly moves our profession forward.

Reference

1. American Association of State Highway and Transportation Officials (AASHTO). 2024. *AASHTO LRFD Bridge Design Specifications*. 10th ed. Washington, DC: AASHTO.