

WHY NCHRP WORKS

An effective model for our stakeholders

A MODEL FOR COOPERATIVE RESEARCH

The cooperative research model developed for NCHRP has functioned effectively since 1962 and served as the foundation for other successful applied cooperative research programs managed by TRB. TRB manages or has managed national cooperative research programs in the fields of highways, transit, airports, hazardous materials, freight, rail transportation, and behavioral traffic safety. Many of the research programs in state DOTs use procedures modeled on NCHRP. From other units of the National Academies, to industry associations in a variety of fields, experts approach NCHRP for advice on how best to manage cooperative research.

Stakeholders Drive Success

What makes this model so effective? One of the key success factors is stakeholder involvement. Those who ultimately benefit from the research are involved from beginning to end, starting with the identification of research ideas that might address their day-to-day problems. Once these ideas are identified, stakeholders review them and select and prioritize projects that will provide the greatest benefit. When projects are selected, stakeholders help to craft requests for proposals, and then provide technical guidance throughout the project to ensure that the research results will be practical, beneficial, and implementable.

An Objective Eye

Another key element in the NCHRP model is objectivity. NCHRP does not own roads, make laws, or set policy. Instead, it provides a neutral forum for objective research without bias or prejudgment. NCHRP conducts evidence-based research that adheres to the highest standards of integrity. NCHRP panels bring diverse stakeholder groups together with a common interest for a common objective.

Investing Wisely in Research

The program is not intended to be “all things to all people.” NCHRP research is effective because each project is directly targeted at a current problem shared by a majority of state DOTs.

NCHRP works on shared national problems and issues, and is designed to seek solutions effectively and sufficiently. A comprehensive research program coordinated and funded by all the states allows every state to leverage its budget and receive far more value for the research dollars they spend. By joining forces to solve common problems, state DOTs are able to produce solutions to important problems that might otherwise be beyond the ability of any single state.

The NCHRP process is designed to maximize efficiency while producing the highest quality research results. These results will help state DOTs to effectively plan, design, construct, operate, and maintain their surface transportation network while keeping workers and the traveling public safe, providing or improving mobility, and contributing to the economic vitality of communities and the nation.

Competitive Investigator Selection

The competitive process used by NCHRP to select research contractors is another aspect of the program that contributes to its success. Each project panel develops a request for proposals that is typically publicly advertised. Successful proposers are selected based on the qualifications of their team members and their research approach.

THE STATE DOTs' NATIONAL HIGHWAY RESEARCH PROGRAM

The Critical Role of State DOTs

The members of AASHTO – the 50 state DOTs and the District of Columbia – come together every year to fund, select, and oversee NCHRP research projects aimed at providing research-based solutions that address the state DOTs' most critical challenges. The state DOTs are the sole sponsors of NCHRP and continue to be the driving force behind NCHRP research. The program is administered by TRB under a cooperative agreement with FHWA and in partnership with AASHTO.

States Provide the Funding for NCHRP

Each year, state DOTs voluntarily commit to NCHRP research 5.5 percent of the State Planning and Research (SPR) portion of their Federal-Aid-Highway funds. FHWA requests and pools these state contributions and, under a cooperative agreement with NAS, makes them available for research contracts and for administration of the program by TRB.

Available funds for NCHRP have remained strong during the past 21 years, rising along with increases in the Federal-Aid-Highway funds provided by Congress and the growth of SPR funds. The Intermodal Surface Transportation Efficiency Act (ISTEA) resulted in a funding level of approximately \$17 million for NCHRP for fiscal years 1992 through 1997. This was increased by more than 50 percent on average in fiscal years 1998 through 2003 by the Transportation Equity Act for the 21st Century (TEA-21), which Congress extended, resulting in \$35.4 million for FY 2004.

The last two federal highway acts – the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and the Moving Ahead for Progress in the 21st Century Act (MAP-21) – resulted in an average of \$42 million available annually for fiscal years 2014 through 2018. A slight increase was experienced as a result of the Fixing America's Surface Transportation (FAST) Act, signed into law on December 4, 2015.

State DOTs Select NCHRP Research Projects

A thorough process of consultation and review by subject matter experts from the state DOTs, AASHTO, FHWA, and TRB ensures that each proposed research project is vetted prior to being considered for funding. The process is led by AASHTO R&I, which serves as NCHRP's governing body. R&I membership includes 16 state DOT members (four from each of the four AASHTO regions), plus ex officio members from FHWA and other federal agencies. In addition, the R&I chair must be the CEO of one of the state DOTs, and the vice-chair is the chair of the AASHTO Research Advisory Committee (RAC), a sub-committee of R&I, and composed of research directors from every state DOT.

In July of every year, R&I invites the submission of research problem statements from three authorized sources: (1) state DOTs, (2) the chairs of AASHTO's committees and councils, and (3) FHWA.

Problem statements are due November 1 each year and should explain why the research represents an immediate need and is of interest to the majority of states. The proposed research should have a high probability of success and should not duplicate other research. Submitters are asked to search the relevant literature in the Transport Research International Documentation (TRID) database and the Research in Progress (RIP) database to determine if similar efforts are already underway or if satisfactory answers are already available.

From November through February, NCHRP receives comments on the problem statements from AASHTO, FHWA, and NCHRP staff. In February, NCHRP sends these comments and the problem statements to AASHTO R&I and RAC for review. Those committees rate each of the candidates according to need, value, and appropriateness. The results help establish a preliminary ranking to structure the discussion of candidates by R&I at its April meeting.

At its April meeting, R&I allocates funds (based on expected funding for the next fiscal year) for new and continuation projects. Once the program is developed, AASHTO sends a report to the AASHTO Board of Directors (CEOs of the state DOTs) requesting final approval. Each project must receive a yes vote from at least two-thirds of the members of the Board of Directors. In addition, each year's program must be approved by FHWA and accepted by the National Academies.

An average of 120 problem statements and 15 requests for project continuations are received each year. Continuation projects include research carried out under NCHRP subprograms, such as the Synthesis of Practice series, the IDEA program, and the U.S. Domestic Scan Program, and projects from previous years that request additional funds. In recent years, R&I has funded approximately 100 new projects each year.

State DOTs Help Guide NCHRP Research Projects

Each research project is assigned to a volunteer panel of subject matter experts who will provide technical guidance and counsel throughout the research and reporting phases. Panel members do not act as consultants or advisors to project investigators; they may not submit proposals for research. All members serve without compensation, and their total yearly contribution to the program adds up to thousands of staff-hours. The panel members are drawn from many disciplines, with heavy dependence on practitioners from state DOTs. A broad search is made for these individuals, and TRB usually receives about four to five times as many nominees as are needed.

Panel members assume a number of key responsibilities for helping ensure the quality of NCHRP research. Project panels analyze the initial problem statement, develop the final project scope and objectives, and prepare a formal request for proposals from qualified research agencies. The panels review the research proposals, recommend contract awards, and provide counsel to the NCHRP staff responsible for management of the research contracts. Finally, the panels review final reports for acceptability and for accomplishment of the approved research plan.

SELECTING THE BEST INVESTIGATORS

A Rigorous, Competitive Process

NCHRP does not award grants for research. Rather, the program invites competing proposals from prospective investigators who can demonstrate relevant capability and experience in the problem area. Eligible organizations include private-sector organizations, academic institutions, and nonprofit entities. Throughout its history, NCHRP has awarded research contracts to entities headquartered in a majority of the 50 states, as well as the District of Columbia, Canada, and England. Contractors selected to conduct NCHRP research principally fall into two categories—private sector and university/research institute.

Requests for proposals are posted on TRB's website, announced through the weekly TRB E-Newsletter, and distributed to a self-subscription listserv. Proposals must comply with the format outlined in the publication *Information and Instructions for Preparing Proposals for the Transportation Research Board's Cooperative Research Programs*, available on the NCHRP webpage.

The proposed budget total is established in advance and is not a factor in selecting an investigator. Because the funds available for research are announced in the project statement, proposers instead provide a research plan that is achievable with the available funds.

The project panels select investigating agencies after evaluation of all proposals and discussion of proposers' past performance on other research projects conducted by NCHRP or others. The successful proposals are retained by panel members for use in monitoring the research. Proposals, panel deliberations, and meeting notes are considered to be privileged information for use by the project panel and are not released.

NCHRP will provide a debriefing, if requested, to unsuccessful proposers to discuss the areas in which their proposals were judged to have weaknesses or deficiencies that were factors in not being selected.

Selection of an agency is made by the responsible project panel considering the following factors¹:

- The proposer's demonstrated understanding of the problem;
- The merit of the proposed research approach and methodology;
- Experience, qualifications, and objectivity of the research team in the same or closely related problem area;
- The plan for ensuring application of results;
- The proposer's Diversity and Inclusion Plan; and
- The adequacy of the facilities and equipment.

NCHRP RESEARCH AREAS

Topics Across the Spectrum of Highway Concerns

The subject matter of NCHRP projects extends across the full spectrum of concerns within the state DOTs and demonstrates AASHTO's interest in acquiring answers to the many acute problems facing state DOT

¹ From *Information and Instructions for Preparing Proposals for the Transportation Research Board's Cooperative Research Programs*, available online at the NCHRP webpage.

administrators and engineers. Problems submitted as candidates for funding each year are given a unique identification number based on the NCHRP Classification System for problem areas.

This identification number is part of the number that identifies a research project throughout its life cycle, until the project is given an NCHRP publication number when the final deliverable is published. For example, NCHRP Project 03-117 identifies the 117th project in Area 3 (Operations and Control). NCHRP Project 17-73 identifies the 73rd project in Area 17 (Safety). Once research was completed, final reports for these projects were published, respectively, as *NCHRP Research Report 881 – Traffic Control Devices and Measures for Deterring Wrong-Way Movements*, and *NCHRP Research Report 893 - Systemic Pedestrian Safety Analysis*.

The projects are grouped sequentially from Area 1: Pavements through Area 25: Human & Natural Environment.

1. Pavements
2. Economics
3. Operations and Control
4. General Materials
5. Illumination and Visibility
6. Snow and Ice Control
7. Traffic Planning
8. Planning Methods & Processes
9. Bituminous Materials
10. Specifications, Procedures, and Practices
11. Law
12. Bridges
13. Equipment
14. Maintenance of Way and Structures
15. General Design
16. Roadside Development
17. Safety
18. Concrete Materials
19. Finance
20. Special Projects
21. Testing and Evaluation of Soils
22. Vehicle Barrier Systems
23. Agency Administration
24. Foundations and Scour
25. Human & Natural Environment

THE CENTRAL ROLE OF NCHRP STAFF

Once research starts, administrative and technical oversight of progress is performed by NCHRP staff. In addition to reviewing monthly progress schedules and quarterly progress reports, the project managers maintain frequent contact with the research contractors. They monitor the conduct of the research to ensure it is consistent with the approved research plan, and they consult with project panels for technical feedback on the contractor's work. Project managers provide guidance to the research contractor's principal investigator in all technical and administrative matters.

The principal investigator is responsible for managing the project budget consistent with the approved work plan, and in no case can the costs exceed the available budget. Any major changes to account for promising new research leads or unproductive lines of study must be approved in advance by NCHRP and the project panel and are authorized through a contract amendment. Contractor invoices are checked by the staff. Finally, the NCHRP project manager and panel evaluate the final research results to determine their acceptability and suitability for publication.

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