

The National Academies of
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TRANSPORTATION RESEARCH BOARD

NCHRP

NATIONAL COOPERATIVE
HIGHWAY RESEARCH PROGRAM

2021 ANNUAL REPORT



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**Membership as of November 2021.

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HIGHWAY RESEARCH PROGRAM

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REPORT

Research sponsored by the American Association of State Highway and Transportation Officials in
cooperation with the Federal Highway Administration

About the National Academies of Sciences, Engineering, and Medicine (NASEM)

The **National Academy of Sciences** was established in 1863 by an Act of Congress, signed by President Lincoln, as a private, nongovernmental institution to advise the nation on issues related to science and technology. Members are elected by their peers for outstanding contributions to research. Dr. Marcia McNutt is president.

The **National Academy of Engineering** was established in 1964 under the charter of the National Academy of Sciences to bring the practices of engineering to advising the nation. Members are elected by their peers for extraordinary contributions to engineering. Dr. John L. Anderson is president.

The **National Academy of Medicine** (formerly the Institute of Medicine) was established in 1970 under the charter of the National Academy of Sciences to advise the nation on medical and health issues. Members are elected by their peers for distinguished contributions to medicine and health. Dr. Victor J. Dzau is president.

The three Academies work together as the **National Academies of Sciences, Engineering, and Medicine** to provide independent, objective analysis and advice to the nation and conduct other activities to solve complex problems and inform public policy decisions. The National Academies also encourage education and research, recognize outstanding contributions to knowledge, and increase public understanding in matters of science, engineering, and medicine.

Learn more about the National Academies of Sciences, Engineering, and Medicine at www.nationalacademies.org.

The **Transportation Research Board** is one of seven major programs of the National Academies of Sciences, Engineering, and Medicine. The mission of the Transportation Research Board is to provide leadership in transportation improvements and innovation through trusted, timely, impartial, and evidence-based information exchange, research, and advice regarding all modes of transportation. The Board's varied activities annually engage about 8,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation.

Learn more about the Transportation Research Board at www.TRB.org.

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About the National Cooperative Highway Research Program (NCHRP)

Systematic, well-designed, and implementable research is the most effective way to solve many problems facing state departments of transportation (DOTs) administrators and engineers. Often, highway problems are of local or regional interest and can best be studied by state DOTs individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation results in increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

Recognizing this need, the leadership of the American Association of State Highway and Transportation Officials (AASHTO) in 1962 initiated an objective national highway research program using modern scientific techniques—the National Cooperative Highway Research Program (NCHRP). NCHRP is supported on a continuing basis by funds from participating member states of AASHTO and receives the full cooperation and support of the Federal Highway Administration (FHWA), United States Department of Transportation.

The Transportation Research Board (TRB) of the National Academies of Sciences, Engineering, and Medicine was requested by AASHTO to administer the research program because of TRB's recognized objectivity and understanding of modern research practices. TRB is uniquely suited for this purpose for many reasons: TRB maintains an extensive committee structure from which authorities on any highway transportation subject may be drawn; TRB possesses avenues of communications and cooperation with federal, state, and local governmental agencies, universities, and industry; TRB's relationship to the National Academies is an assurance of objectivity; and TRB maintains a full-time staff of specialists in highway transportation matters to bring the findings of research directly to those in a position to use them.

The program is developed on the basis of research needs identified by chief administrators and other staff of the highway and transportation departments, by committees of AASHTO, and by the FHWA. Topics of the highest merit are selected by the AASHTO Special Committee on Research and Innovation (R&I), and each year R&I's recommendations are proposed to the AASHTO Board of Directors and the National Academies. Research projects to address these topics are defined by NCHRP, and qualified research agencies are selected from submitted proposals. Administration and surveillance of research contracts are the responsibilities of the National Academies and TRB.

The needs for highway research are many, and NCHRP can make significant contributions to solving highway transportation problems of mutual concern to many responsible groups. The program, however, is intended to complement, rather than to substitute for or duplicate, other highway research programs.

Message from the NCHRP Manager



Lori Sundstrom

In spite of COVID-19, NCHRP delivered another year of critical research results that state departments of transportation and other transportation organizations depend on. NCHRP staff, our volunteer panel members, and contractor teams adapted project scopes and schedules and generally persevered. COVID-19 sadly touched some in our community this year, and restrictions still hold sway over many of us in terms of how and where we work.

In the latter half of 2021, NCHRP resumed limited in-person meetings and events. It was energizing to once again see and talk with co-workers and colleagues after such a long time. These relationships are an important part of what makes working in transportation research so rewarding and enjoyable for me. Many NCHRP staff attended meetings of AASHTO committees and councils during 2021. I attended AASHTO's Annual Meeting in October, held in-person in San Diego, California. Other NCHRP staff attended the AASHTO Committee on Design's in-person meeting in November in Philadelphia, Pennsylvania. All of us found it rewarding and validating to see the prominence of NCHRP research on the agendas of these meetings. In session after session, NCHRP research was referred to by senior leadership as they made policy and technical decisions on behalf of their agencies.

NCHRP again produced a steady stream of research results on the topics traditionally important to state DOTs, such as bridges, construction, environment, maintenance materials, pavements, planning, operations, safety, and traffic engineering. In recent years, state DOTs have added new topics to the NCHRP research agenda, including active transportation, equity, infrastructure resilience, rural transportation issues, urban land use, and attracting and retaining a highly qualified work force. NCHRP is conducting a lot of exciting research in each of these areas.

The NCHRP Implementation Support Program achieved a first this year. An implementation project based on an NCHRP Domestic Scan conducted a pilot training program on the use of unmanned aerial systems that you can read about on page 22 of this Annual Report. The project produced training materials that AASHTO will convert for use in their online technical training program, thus making the results broadly and continuously accessible. NCHRP and AASHTO are looking for more opportunities to do this with other implementation projects and provide even more value to state DOTs for their research investments.

There is a lot of momentum within research and innovation communities to find effective and sustainable ways to share knowledge. Knowledge management is an emerging discipline that state DOTs are interested in; they recognize that institutional knowledge is an asset that needs to be managed and maintained. Several new NCHRP research projects are examining how state DOTs can do this. It is fascinating to see how research, innovation, implementation, and knowledge management practitioners are identifying common challenges and solutions.

In closing, I want to acknowledge the senior program officers who retired this year: Ray Derr, Larry Goldstein, and Bill Rogers. Andy Lemer and Ed Harrigan will be retiring in January 2022. They each managed large research portfolios involving hundreds of projects during their time with NCHRP. They were all very active in their professional communities, and their contributions are many and lasting. They will be missed.

This Year at NCHRP

This Annual Report provides a concise list of research published in 2021 (Table 1) and a list of all active projects, projects completed in 2021, and projects that were approved in 2021 but are not yet under contract (Table 2). The Annual Report also presents detailed information about how NCHRP operates with oversight by the AASHTO Special Committee on Research and Innovation (R&I).

ACTIVE PROJECTS

512

The full list of active projects is presented in Table 2.

NEW PROJECTS

108

Includes 61 new and continuation projects selected by R&I for FY 2022.

RESEARCH PRODUCTS PUBLISHED

65

The full list of research products published is presented in Table 1.

PANEL MEETINGS AND OTHER EVENTS

320+

ACTIVE PANEL MEMBERS

3,920

Includes over 1,100 female members, and over 800 members of ethnic minorities.

WEBINAR ATTENDEES

5,447

Attended 22 webinars at an average of 248 attendees a webinar.

DOWNLOADS

141,000+

Our research products were downloaded in all 50 states and the District of Columbia, and in countries all over the world.

All data as of November 30, 2021.

New and Continuation Projects

During 2021, NCHRP completed 69 research projects, published 65 research products, and approved 108 new and continuation projects, including 61 new and continuation projects selected by R&I for FY 2022, as shown in Exhibit 1.

A cumulative total of 2,100 research contracts have resulted from all NCHRP yearly programs through 2021.

Funding for the FY 2022 program is expected in early 2022, permitting execution of contracts and initiation of research. R&I will formulate the FY 2023 program in April 2022 based on research problems that were submitted by November 1, 2021, the beginning of another cycle of NCHRP research. An overview of the NCHRP research cycle can be found on [pages 28–30](#) of this report.

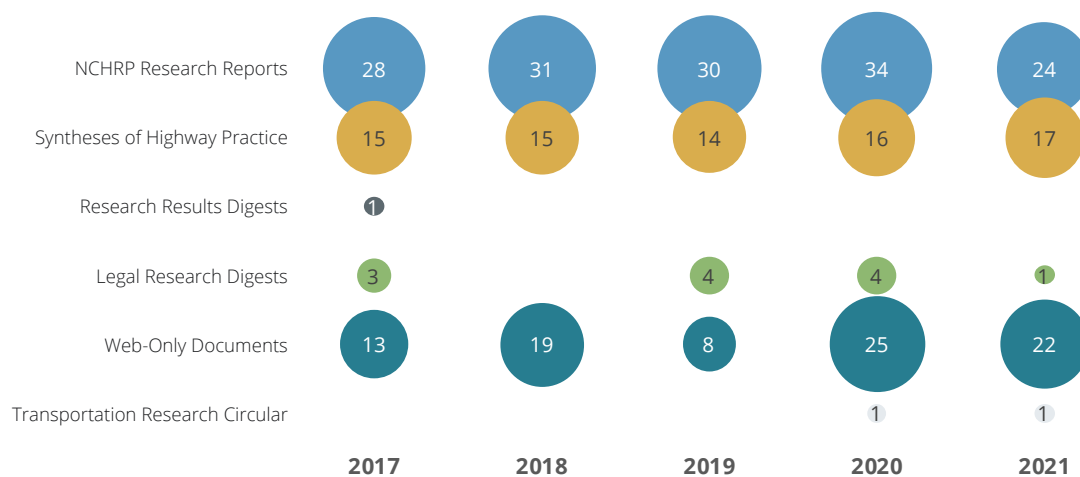
Exhibit 1. Number of Research Projects Selected by R&I, FY 2018 through FY 2022

Projects	2018	2019	2020	2021	2022
Continuation projects	22	11	11	11	12
New projects	42	47	56	47	49
Total projects	64	58	67	58	61
Total project funds	\$35,317,000	\$34,429,000	\$33,330,000	\$31,304,200	\$31,893,000

Research Products

Dissemination of research findings to practitioners is a primary objective of the entire NCHRP research process. Publication of the final report or other deliverables is a key means of dissemination. NCHRP research findings are published in several numbered series, which are listed in Table 1 of this Annual Report. In 2021, NCHRP produced 65 research products, and quantities for these series published over the past 5 years are shown in Exhibit 2.

Exhibit 2. NCHRP Research Products Produced, CY 2017 through CY 2021

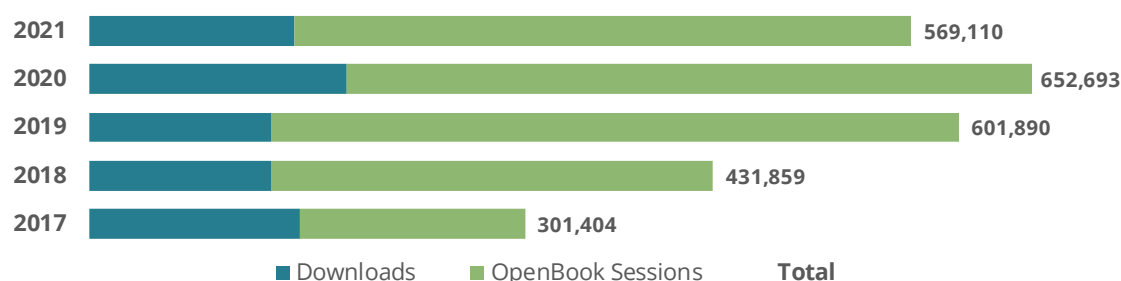


Publications are distributed by TRB online and in print, with print runs for reports ranging from 400 to 700 copies. Downloads and OpenBook Sessions are shown in Exhibit 3. Print copies are mailed to the chief operating officers (CEOs) of state

DOTs, AASHTO staff, panel members, the research contractor, and the following individuals and organizations:

- TRB members who have chosen to receive publications in the particular subject area of the report
- About 100 libraries
- TRB representatives in the state DOTs
- Numerous educational institutions
- Liaison representatives from industry and transportation organizations in other countries
- Relevant TRB panels and committees

Exhibit 3. Downloads and OpenBook Sessions of NCHRP Research, CY 2017 through CY 2021



1. Data for CY 2021 as of November 30, 2021.
2. OpenBook Sessions are the number of times a report has been read online.

Panel Members

NCHRP continues to engage panel members drawn from all walks of professional life, with heavy dependence on practitioners from AASHTO member departments. Exhibit 4 provides a breakdown of the affiliation of new NCHRP panel members since FY 2018.

Exhibit 4. Affiliations of New Panel Members, FY 2018 through FY 2022

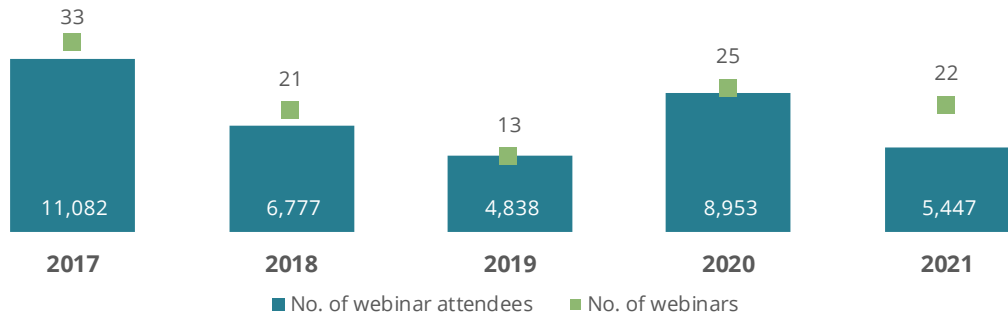
Affiliation	2018	2019	2020	2021	2022
State agencies	397	351	344	227	244
Federal agencies	9	3	8	2	6
Local agencies, transit agencies, MPOs	41	35	9	-	50
Educational institutions	87	63	63	46	76
Industry, consultants, associations	193	84	104	62	161
Other	2	1	15	3	43
All	729	537	543	340	580*

* as of November 30, 2021.

Webinars

NCHRP research results are also frequently the subject of TRB webinars, and the average attendance of these webinars has grown in the last 5 years, as shown in Exhibit 5. In 2021, 22 webinars were held, with 5,447 attendees in total.

Exhibit 5. NCHRP Webinars and Attendees, CY 2017 through CY 2021



Update on NCHRP Continuing Projects

Several continuing projects are carried out within NCHRP. Results may be published in hard copy, delivered in the form of internal reports and presentations to AASHTO committees and councils, available on the TRB website, or made available on request.

NCHRP Project 20-05 – Synthesis of Information Related to Highway Problems

Often, administrators, practicing engineers, and researchers have problems that can be addressed through existing research findings and practices. Unfortunately, this information is often fragmented, scattered, and sometimes overlooked. The NCHRP Synthesis series aims to remedy this lack of awareness of existing solutions by assembling and organizing relevant information, practices, and research for particular highway problems. The program is in its 53rd year and publishes approximately 18 reports annually.

Notable NCHRP Synthesis Reports published in 2021

- *NCHRP Synthesis 561: Use of Vehicle Probe and Cellular GPS Data by State Departments of Transportation*, by Michael L. Pack and Nikola Ivanov, documents how state departments of transportation (DOTs) are applying vehicle probe data and cellular data for a variety of purposes, including real-time traffic and incident monitoring, highway condition, and travel demand management. DOTs are also using vehicle probe and cellular data to inform system planning and investment decisions.
- *NCHRP Synthesis 564: Practices for Selecting Pedestrian and Bicycle Projects*, by Richard Perrin, Brad Huff, Michael Flynn, Colin Brown, and Charlie Vinyl, summarizes state DOT practices for selecting pedestrian and bicycle projects. These projects can be advanced as standalone improvements or incorporated into larger initiatives such as corridor/intersection reconstructions and reallocation of space on existing transportation facilities.

For more information: <http://www.trb.org/SynthesisPrograms/SynthesesNCHRP.aspx>

NCHRP Project 20-06 – Legal Problems Arising out of Highway Programs

State DOTs have an interest in evaluating the operating practices, administrative procedures, and legal issues associated with planning, design, and construction of transportation projects. Individual state legal experiences need to be compared and made available for possible wider application. Begun in 1968, this research project identifies and evaluates courses of action for state DOTs and facilitates the handling of both immediate and long-range needs. The final products of this research are Legal Research Digests (LRDs), available at <http://www.trb.org/Publications/PubsNCHRPLegalResearchDigests.aspx>

NCHRP and TCRP Legal Research Digest jointly published in 2021

The condition of the transportation infrastructure in the United States is an issue of national importance. State DOTs and transit agencies face tough choices as they make decisions about how and when to keep their assets safely open to the public. *TCRP Legal Research Digest 57/NCHRP Legal Research Digest 84: Fix It, Sign It or Close It: State of Good Repair in an Era of Budget Constraints* addresses the legal ramifications to transportation agencies that have to decide whether to repair, improve, or rebuild assets.

For more information: <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=508>

NCHRP Project 20-24 – Research for AASHTO and State DOT Leadership

This project is designed to conduct research focused on issues facing state transportation agency leadership. Reports from this project deliver timely information on such topics as enterprise knowledge management; workforce development; enterprise-level decision-making frameworks; measurement and management of transportation system performance and asset condition; economic and social benefits of transportation system performance; transportation system resilience; and the significance of new technologies and societal trends that are shaping transportation.

The 2021 publication *NCHRP Research Report 980: Attracting, Retaining, and Developing the Transportation Workforce: Transportation Planners* was funded by NCHRP Project 20-24. The report presents an assessment of current and emerging forces that are shaping transportation planning practice and the transportation planning workforce. The project activities included a review of current and emerging trends that will shape the work of transportation planners in the coming decades as well as outreach to transportation planning professionals at differing stages of their careers. These activities informed the development of two downloadable talent profile tools. One, for use by a transportation agency or other employer, is designed to help transportation agencies manage planning talent. The second tool is employee-focused, and is designed to help planners identify the knowledge, skills, abilities, experience, and

education they will need to be prepared for emerging and future challenges in their careers.

NCHRP Project 20-24 also supports events that bring together state DOT leadership to share information and experiences. NCHRP Project 20-24(139): “Into the 2020s: A Peer Exchange Series for State DOT CEOs” will feature a series of peer exchanges for state DOT CEOs in late 2021 and 2022, including two peer exchanges specifically designed for CEOs recently appointed to their positions. In 2021, NCHRP Project 20-24(130): “Support for Development of AASHTO’S 2021-2026 Strategic Plan” will position that organization and its membership to collaborate across disciplines and functional areas to work on issues of common interest.

For more information: <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=560>

NCHRP Project 20-30 – IDEA Program

The Innovations Deserving Exploratory Analysis (IDEA) Program, begun in 1992, funds research into promising but unproven innovations for highway design and construction, materials, operations, maintenance, and other areas of highway systems. A progress report that describes current and completed projects is published annually. Of the 205 projects completed to date, products of 41 projects (20%) have been successfully implemented. Another 45-plus completed or active projects have resulted, or are expected to result, in products with a high implementation potential in the near term, if provided resources for their further development and evaluation. Also, at least 11 AASHTO and ASTM standard test methods or procedures have resulted from NCHRP IDEA research, and several more are expected in the near future.

An NCHRP IDEA product, SEAHIVE, has received national media coverage through the Weather Channel. The product, a novel marine and estuarine seawall structure shoreline protection system, was developed in NCHRP IDEA Project 213 at the University of Miami (PI: Dr. Landolf Rhode-Barbarigos) in collaboration with Florida DOT. SEAHIVE provides an efficient and cost-effective shoreline protection system for locations with high-energy tidal flow while creating an ecofriendly environment for marine life. In addition, it will help generate data about climate change and sea level rise. Construction of the SEAHIVE system at the Wahoo Bay underwater marine park in Pompano Beach, Florida, is expected to start soon.

For more information: <http://www.trb.org/IDEAProgram/IDEAHighway.aspx>

NCHRP Project 20-44 – Implementation Support Program

The NCHRP Implementation Support Program has funding to implement NCHRP research results by state DOTs and other eligible transportation agencies. NCHRP procures and manages consultant services to undertake the implementation projects as required by the applicant, and draws upon panels of experts to oversee the projects. State DOTs, AASHTO committees and councils, and NCHRP

project panels can apply for funding for a range of implementation products and activities, including pilot/demonstration projects, workshops, peer exchanges, training, and briefing materials. Completed NCHRP research results and products, as well as products still in development, are eligible, and there is no maximum amount for funding requests.

In FY 2021, the NCHRP Project 20-44 oversight panel approved seven implementation projects, totaling \$1,720,700.

For more information: <https://www.trb.org/NCHRP/NCHRPImplementationSupportProgram.aspx>

NCHRP Project 20-68 – U.S. Domestic Scan Program

The objective of the U.S. Domestic Scan Program is to facilitate information sharing and technology exchange among the states and other transportation agencies to (1) accelerate the rate of advances in practice and (2) identify actionable items of common interest. Each year, two to three new scan topics are programmed and initiated. Scan duration, from topic selection to completion of the scan-team's report, is typically 2 to 3 years.

The following scans were active or completed in 2021:

- Scan 19-01: "Leading Practices for Detailing Bridge Ends and Approach Pavements to Limit Distress and Deterioration" is exploring practices and tools for selection of appropriate details for use at the ends of bridges to achieve a jointless structure while minimizing the structural distress, maintenance, and repair costs, and improving the performance and durability of jointless bridges.
- Scan 19-02: "Leading Practices in Strategic Workforce Management by Transportation Agencies" is examining innovative strategic workforce management strategies state transportation agencies are implementing, particularly those activities that can be quickly adopted and implemented to recruit, develop, and retain the workforces agencies need today and for the future.
- Scan 20-01: "Successful Approaches to Utilizing Bridge Management Systems (BMS) for Strategic Decision Making in Asset Management Plans" is exploring how agencies effectively integrate BMS data into their transportation asset-management plans (TAMP) to preserve and improve the condition of the assets and the performance of their system.
- Scan 20-02: "Successful Approaches for Facilitating Truck Parking Accommodation along Major Freight Corridors" is examining the roles and actions of transportation agencies, partners, and the public in applying successful strategies, developing emerging practices, and learning useful lessons to help address truck parking issues along major freight corridors within their jurisdictions.
- Scan 21-01: "Lessons of Agency Resilience During Periods of Disruption" seeks to identify the most innovative and beneficial elements of practices adopted by state transportation agencies to maintain their productivity and system performance during disruptions to "normal" operations caused by the

global COVID-19 pandemic or other major events, particularly those practices that have enhanced agency resilience and are likely to strengthen agencies' adaptability if confronted by future disruptions.

- Scan 21-02: "Leading Approaches to Implementing Context-Based Classification of Roadways in Planning and Design" seeks to learn from the experiences of state transportation agencies that have applied the concept of context-based classification of roadways introduced in the 7th edition of the AASHTO *A Policy on Geometric Design of Highways and Streets* (Green Book), to extract lessons learned that may be valuable to others who have not yet implemented context-based classification.
- Scan 21-03: "Successful Approaches to Setting Project Development Budgets" explores the procedures and experience of state transportation agencies with successful procedures for setting project development budgets, to extract lessons that other agencies may adapt to improve budget estimation practices nationwide.

For more information: <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=1570>

NCHRP Project 20-123 – Support for AASHTO Committees and Councils

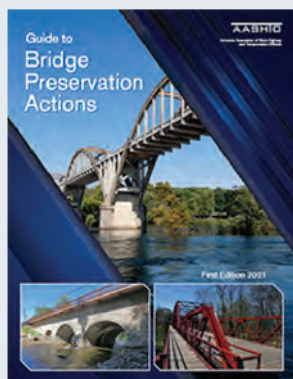
This continuing project provides ongoing support for AASHTO councils and committees for research-related needs. Tasks must result in, or contribute to, the development of high-quality research problem statements that can be submitted to or pursued by individual state transportation research programs, the FHWA pooled fund program, NCHRP, or other interested entities. Tasks may include but are not limited to development of research roadmaps or prioritized lists of specific research needs; updating council or committee strategic plans that include a research component; research scoping studies for narrow research topics; development activities to update specifications and manuals maintained by a committee or council, using previously conducted research and/or convening experts to arrive at a consensus; and convening peer exchanges.

In 2021, AASHTO R&I allocated \$1.5 million to fund requests. Since the project's inception in 2019, funding requests totaling \$2.75 million have been approved.

For more information: <http://www.trb.org/NCHRP/NCHRP20-123.aspx>

RESEARCH SHOWCASE

Development of Guides for Preservation of Highway Bridges



Research under NCHRP Project 14-36: "Proposed AASHTO Guide for Bridge Preservation Actions" was published as *NCHRP Research Report 950: Proposed AASHTO Guides for Bridge Preservation Actions* in 2021. *NCHRP Research Report 950* was used as the basis for AASHTO's *Guide to Bridge Preservation Actions*, 1st Edition.

Research Agency:
University of Colorado - Boulder

Principal Investigator:
George Hearn

NCHRP Project 14-36: "Proposed AASHTO Guide for Bridge Preservation Actions" created a guide to preservation of highway bridges, and a guide to preservation of highway bridge decks. Both guides have been adopted as publications of AASHTO. The guides are based on information collected from state DOTs on preservation policies, preservation actions, and preservation performance. The research effort is presented in *NCHRP Research Report 950: Proposed AASHTO Guides for Bridge Preservation Actions*.

Preservation keeps bridges in good or fair condition. Actions in preservation are applied before conditions of bridges become poor. A practice in bridge preservation seeks broader benefits. Bridges that are candidates for preservation are evaluated by condition, and also by capacity for traffic, robustness in extreme loads, and durability against in-service deterioration. Preservation applies resources to maintain good or fair condition among bridges that have acceptable capacity, robustness, and durability.

Bridge preservation can save agencies costs for bridge service. Cost of service is the combined cost of preservation actions in service plus cost of future replacement of bridges or decks. In concept, a program for preservation is charged with an asset, a bridge or a bridge deck, and will return an equivalent asset in the future.

The project team found that preservation can reduce agency cost of bridge service if preservation begins early in service life. Preservation is not new. Bridge owners have policies to identify candidate bridges and decks, and to select actions in response to current conditions. Bridge owners have practices to refine decisions on candidates and actions in the context of bridge type, bridge age, traffic volume, and route functional class.

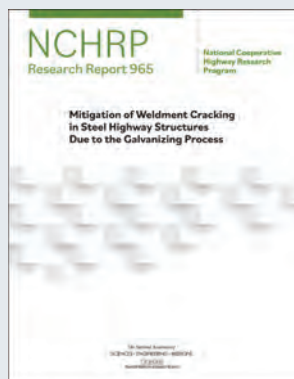
NCHRP Project 14-36 also studied and synthesized bridge owners' current practices in preservation, and collected and distilled data on costs and performance of preservation actions. The project provided a basis for selection of bridge candidates and preservation actions, provided information on costs and performance of preservation actions, and provided a method to evaluate benefits of bridge preservation.

Guides to preservation were written to address preservation candidates, preservation actions and their performance, formation of preservation programs at bridge agencies, use of standard data on condition in preservation programs, and valuation of costs and benefits with typical materials and basic procedures.

The products of NCHRP Project 14-36 are *NCHRP Research Report 950: Proposed AASHTO Guides for Bridge Preservation Actions*; *AASHTO's Guide to Bridge Preservation Actions*; and a guide to preservation of highway bridge decks. The deck guide was adopted by the AASHTO Committee on Bridges and Structures at its 2021 annual meeting.

RESEARCH SHOWCASE

Mitigation of Weldment Cracking of Steel Highway Structures due to the Galvanizing Process



Research under NCHRP Project 10-94: “Mitigation of Weldment Cracking of Steel Highway Structures due to the Galvanizing Process” was published as *NCHRP Research Report 965: Mitigation of Weldment Cracking in Steel Highway Structures Due to the Galvanizing Process* in 2021.

Research Agency:
University of Kansas
Principal Investigator:
Jian Li

NCHRP Project 10-94: “Mitigation of Weldment Cracking of Steel Highway Structures due to the Galvanizing Process” was initiated to identify the factors contributing to cracking of weldment in galvanized steel highway structures. The main goal of the project was to propose improved design, materials, and construction specifications of galvanized steel highway structures to mitigate weldment cracking caused by the galvanizing process. This research was concerned with structural supports for signs, luminaires, traffic signals, and bridge superstructures (other than decks).

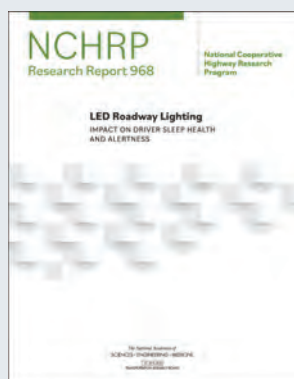
The project was led by the University of Kansas and was carried out in two phases. In Phase I, a literature review was performed to identify factors shown to contribute to cracking of weldments in galvanized steel structures. The relevance of these factors to weldment cracking in steel highway structures was assessed and considered in the context of existing U.S. specifications and guidance documents. Identified factors included thermal effects, galvanizing bath chemistry, steel material, geometric effects, level of cold-working, magnitude of hardness (which can be influenced by cooling rate after welding or cutting processes), and magnitude of residual stresses. To investigate the impact of identified factors and their potential interactions, an experimental investigation and a computational study were performed in Phase II to identify the relative level of impact of the factors and to form the basis for proposed specifications to mitigate weldment cracking caused by the galvanizing process.

During the project, the research team visited several galvanizing facilities to gather information and learn about galvanizers’ experiences with weldment cracking. The team also engaged with several AASHTO committees such as T-12 Committee on Structural Supports and T-14 Committee on Steel Bridges as well as the AASHTO/NSBA Collaboration TG8 Coatings and the American Galvanizers Association, which all provided valuable feedback.

Based on the findings of the investigation, the research team proposed changes to the AASHTO *LRFD Specifications for Structural Supports to Highway Signs, Luminaires, and Traffic Signals*, 1st Edition, and the AASHTO *LRFD Bridge Design Specifications*, 8th Edition. The proposed changes, if implemented, will help mitigate weldment cracking that occurs due to the galvanizing process. This should enable these assets to achieve their intended service life and mitigate related safety concerns.

RESEARCH SHOWCASE

Determining the Impact of LED Roadway Lighting on Driver Sleep Health and Alertness



Research under NCHRP Project 05-23: “Effects of LED Roadway Lighting on Driver Sleep Health and Alertness” was published as *NCHRP Research Report 968: LED Roadway Lighting: Impact on Driver Sleep Health and Alertness* in 2021.

Research Agency:

Virginia Polytechnic Institute and State University

Principal Investigator:

Rajaram Bhagavathula

Light emitting diode (LED) technology has revolutionized the lighting industry. The dimming and instant-on capabilities of these light sources along with their high efficiency have allowed lighting designers to overcome some of the limitations of previous technologies, particularly in roadway lighting environments. However, concerns related to the health effects of LEDs have been raised, specifically regarding the blue content in the LED spectrum and its effect on human sleep health. Contrastingly, some research studies showed that LED lighting can increase alertness and enhance cognitive performance in humans. However, no controlled empirical studies have examined the health or alertness effects of LED roadway lighting under real-world conditions.

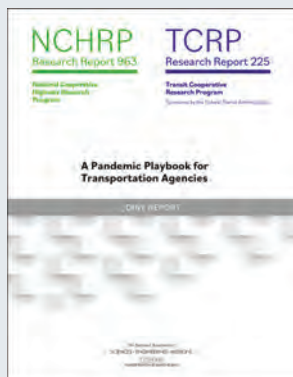
The goal of NCHRP Project 05-23: “Effects of LED Roadway Lighting on Driver Sleep Health and Alertness” was to determine the impact of the LED roadway lighting on driver sleep health and alertness, and to compare the light levels from roadway lighting to that of common consumer electronic devices. Sleep health was evaluated based on melatonin levels in saliva. Driver alertness was measured objectively using driver detection and color recognition distances, percentage of time that a driver’s eyelids are closed over a three-minute segment (PERCLOS) and standard deviation in lane position (SDLP) as well as subjectively using the Karolinska Sleepiness Scale (KSS). The findings of the project included:

- LED roadway lighting, even at light levels that are higher than those specified in the Illuminating Engineering Society (IES) RP-8-18, does not significantly suppress salivary melatonin from 1:00 AM to 3:00 AM in healthy drivers.
- There are no statistical differences in salivary melatonin suppression between LED and high-pressure sodium (HPS) roadway lighting when measured at the same light level (roadway luminance of 1.5 cd/m² or a corneal illuminance of 1.9 lux).
- There were no statistical differences in salivary melatonin suppression between any LED or HPS roadway lighting condition and the no roadway lighting condition.
- No statistically significant differences in any of the roadway lighting conditions (LED or HPS) or no roadway lighting condition were observed for objective measures of driver alertness as measured by detection and color recognition distances (reaction times), PERCLOS, and SDLP.
- There were no statistical differences among the HPS, LED, and the no roadway lighting conditions for the subjective driver alertness measures.
- The potential for melatonin suppression from consumer electronic devices is considerably higher than from LED roadway lighting.

Based on these findings, it was concluded that at the light levels specified in the IES RP-8-18, LED roadway lighting does not affect drivers’ sleep health or alertness. The light levels from roadway lighting are significantly lower than those from common consumer electronic devices like smartphones, tablets, and televisions.

RESEARCH SHOWCASE

Improving Transportation Agency Responses to a Pandemic



Research under NCHRP Project 20-116: “An Emergency Management Playbook for State Transportation Agencies” was published as *NCHRP Research Report 963/TCRP Research Report 225: A Pandemic Playbook for Transportation Agencies*, a joint publication with the Transit Cooperative Research Program (TCRP) in 2021.

Research Agency:
The Louis Berger Group, Inc

Principal Investigator:
Deborah Matherly

Based on successful approaches and lessons learned during the COVID-19 pandemic, *NCHRP Research Report 963/TCRP Research Report 225: A Pandemic Playbook for Transportation Agencies* was developed to improve transportation agency responses to a pandemic. The project was initiated as a quick response supporting NCHRP Project 20-116: “An Emergency Management Playbook for Transportation.” *NCHRP Research Report 963/TCRP Research Report 225* concentrates on what needs to be done, when, and by whom. It summarizes effective practices used by transportation agencies. Plays, approaches, and solutions for key capabilities and activities for pandemics were developed for communications; employee impacts; protective actions for employees for modes, including public transit; multiple-hazard simultaneous events; sustained operations; and others. Understanding pandemics — their impacts to transportation and potential effective response — has become more important, not only for the response to COVID-19, but also if, as the World Health Organization warns, we are now “living in a time of viruses.”

The project included interviews with state DOT, transit leaders, and operational personnel to obtain information about the agency pandemic response when the agencies were in the midst of their COVID-19 challenges. Interviews were supplemented by national and international research on promising practices in pandemic transportation responses. Partnering with the University of Colorado, Natural Hazards Center, for “quick response” primary research filled in some critical gaps involving transporting essential workers, serving minority communities, and communicating with multiple audiences.

In developing the Playbook, the research team recognized the importance of providing a useful operational tool for transportation agencies of all types and sizes. The key take-aways from the Pandemic Playbook include the importance of identifying and providing essential services while visibly demonstrating good public health procedures; demonstrating the emphasis on employee (and public) safety while maintaining (and often improving) transportation infrastructure and supply chains; the need to over-communicate for both agency employees and the public; building on what you have, including personnel, procedures, technology and data; and being flexible and innovative.

Due to the urgency of providing an important resource to the transportation community, the Pandemic Playbook was pre-published by TRB in November 2020. It has been shared widely by NATO, UNESCO, and the International Association of Emergency Managers. Presentations at about a dozen national and international conferences have been well received, and the report is being translated into Mandarin.

RESEARCH SHOWCASE

Developing a Risk Management Strategic Plan and a Research Roadmap

Research under NCHRP Project 20-123(04): “Development of a Risk Management Strategic Plan and a Research Roadmap ” is underway, and will be published in 2022.

Research Agency:
Jacobs Government Services Company

Principal Investigator:
Mara Campbell

NCHRP Project 20-123(04): “Development of a Risk Management Strategic Plan and a Research Roadmap ” was initiated to provide practical guidance on coordinating and aligning risk management activities and research that should take place over the next 5 years, through the production of a comprehensive Risk Management Strategic Approach and Action Plan and a Risk Management Research Roadmap. Led by a research team from Jacobs Government Services Company, AEM Corporation, and Cambridge Systematics, the project includes an in-depth literature review and gap analysis, several engagement events, and workshops. In developing the guidance documents, the research team consulted practitioners about their goals and strategies for implementing risk management and the research needed to help state DOTs embed risk management within their organizations and business processes.

The research team received valuable input from the stakeholder communities during the development of both guidance documents, in particular the AASHTO Committee on Performance Based Management (CPBM) Subcommittee on Risk Management and the AASHTO Committee on Transportation System Security and Resilience (CTSSR) as well as TRB, FHWA, and agency practitioners. The research team held various virtual meetings, including an engagement event, deeper dive webinars, and two interactive workshops.

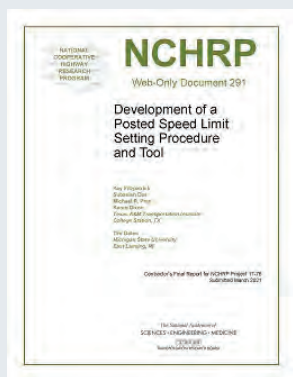
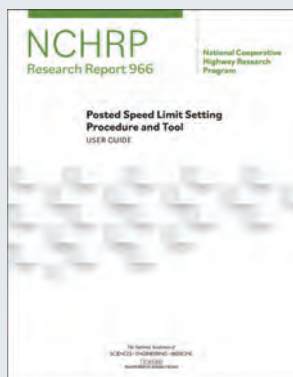
The project provides guidance and tools, laying out an approach and action plan and a research roadmap to better incorporate risk management over the next 5 years. This research project has unveiled the key knowledge gaps within risk management and they include:

- **Measurement and Quantification of Risk:** Critical to most decision-making activities.
- **Data and Tools:** Managing overwhelming amounts of data by using tools and skills as well as incorporating systems for integrating and sharing data.
- **Integration with Existing Processes:** Many methods are already in place and agencies have to adjust to the varying processes available.
- **Coordination and Communication:** Structures and protocols need to be in place to plan for disruptions and ensure coordination between agencies. This includes robust communication media.
- **Retrospective Evaluation:** Learning from past events can help improve and shape future actions.
- **Workforce Capacity and Modernization:** The workforce of the future is constantly evolving, and agencies need to be able to address and handle the risk and opportunity that comes with it.

The final deliverables from this research will consist of two documents: (1) a comprehensive Risk Management Strategic Approach and Action Plan and (2) a Risk Management Research Roadmap. Whether an agency already has a dedicated risk management team or is just starting to incorporate risk and resilience into their organization, the steps and guidance outlined in these final deliverables will assist transportation practitioners as they incorporate risk management practices within their organizations.

RESEARCH SHOWCASE

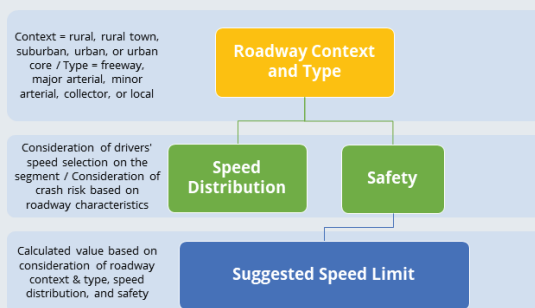
A Tool and Guide to Aid in Identifying Suggested Posted Speed Limits



Several factors are considered within engineering studies when determining the posted speed limit for a speed zone. NCHRP Project 17-76: “Guidance for the Setting of Speed Limits” investigated the factors that influence operating speed and safety and used that knowledge to develop the Speed Limit Setting Procedure (SLS-Procedure) so engineers can make informed decisions about the setting of speed limits. The SLS-Procedure was automated with the Speed Limit Setting Tool (SLS-Tool) using spreadsheet-based software.

The research team considered the breadth of approaches available for the setting of speed limits and the need to develop a methodology that could be used for any roadway type. They selected a decision-rule-based procedure for the SLS-Procedure. Given the increased emphasis on designing for the context of the roadway, the research team decided that the SLS-Procedure should be sensitive to context and use the expanded functional classification scheme available in *NCHRP Research Report 855: An Expanded Functional Classification System for Highways and Streets*. The roadway types and roadway contexts available within the expanded functional classification scheme were collapsed into four Speed Limit Setting Groups (SLSGs): Limited Access, Undeveloped, Developed, and Full Access.

For the SLS-Procedure, the research team recommended using the measured operating speed as a starting point for selecting a posted speed limit with the understanding that the measured operating speed limit would be adjusted based



Overview of procedure to calculate suggested speed limit.

on the roadway conditions and the crash experience on the segment. The SLS-Procedure starts with identifying the roadway segment context and type, which determine the appropriate SLSG. For that SLSG, the roadway characteristics and crash potential for the segment are used to identify the speed distribution that should be considered and whether the closest 5-mph increment value or a rounded-down 5-mph increment value should be used. Unique decision rules were developed for each SLSG.

NCHRP Project 17-76 concluded with the development of *NCHRP Research Report 966: Posted Speed Limit Setting Procedure and Tool: User Guide* and *Web-Only Document 291: Development of a Posted Speed Limit Setting Procedure and Tool*. The SLS-Tool also includes three worksheets:

- **Welcome:** This worksheet provides an overview of the SLS-Tool.
- **Analysis:** This worksheet is used to enter input data and obtain analysis results. Key cells on this worksheet have been color-coded to indicate the type of data entered or displayed.
- **Support Tables:** This worksheet contains several tables that are used in the Analysis calculations. The values can be changed but only if based on agency policy or new knowledge (e.g., new research and extensive local data).

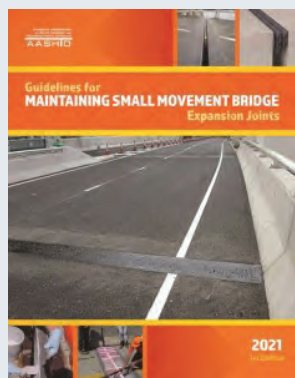
Research under NCHRP Project 17-76: “Guidance for the Setting of Speed Limits” was published as *NCHRP Research Report 966: Posted Speed Limit Setting Procedure and Tool: User Guide and Web-Only Document 291: Development of a Posted Speed Limit Setting Procedure and Tool* in 2021.

Research Agency:
Texas A&M Transportation Institute

Principal Investigator:
Kay Fitzpatrick

RESEARCH SHOWCASE

Developing Guidelines for Maintaining Small Movement Bridge Expansion Joints



Research under NCHRP Project 12-100: “Guidelines for Maintaining Small Movement Bridge Expansion Joints” was published as a contractor final report, and as the *AASHTO Guidelines for Maintaining Small Movement Bridge Expansion Joints*, 1st Edition, in 2021.

Research Agency:
University of Delaware

Principal Investigator:
Harry W. Shenton III

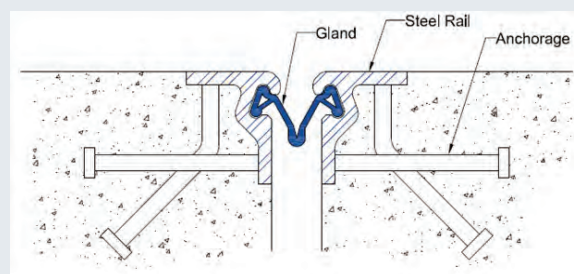
NCHRP Project 12-100: “Guidelines for Maintaining Small Movement Bridge Expansion Joints” was initiated to develop guidelines for maintaining and repairing small movement bridge expansion joints (SMEJ): small movements being defined as 4 inches or less. The key tasks in the project were a literature review; survey of key stakeholder groups; development of procedures for replacing, repairing, and maintaining SMEJs; and, finally, developing draft guidelines that would be suitable for publishing as an AASHTO document.

There are a variety of different types of SMEJs; these include asphalt plug joint, compression and bonded seal joint, strip seal/armored joint, pourable joint, and open/sliding plate/butt joint. Each type is described in the report, presented in schematics, and shown in photographs. Common failure mechanisms are also described and shown in photographs. The literature review provided valuable information on the prior work conducted. It also included a review of state DOT bridge design and maintenance manuals.

The stakeholder survey included bridge owners, consultants, vendors, and contractors. A total of 108 survey responses were obtained, with the largest percentage coming from state owners (37 states responded). The survey responses provided a comprehensive picture of the current state of practice. The research examined best practices through interviews and data gathering from owners and suppliers, performance metrics, life-cycle cost analysis, common material tests of joints, and compression set in closed-cell foam.

Detailed maintenance, repair, and replacement procedures were developed for each type of joint which included evaluating joints; calculating joint movement and sizing the seal; selecting a replacement joint; procedures for repair and replacement of the header; and procedures for replacement, repair, and maintenance of the primary types of SMEJs on the market at the time of writing. A unique feature of the document is most of the steps for maintenance/repair/replacement of a joint are shown in sequences of photographs with descriptions.

The final report is a two-part document: the first part covers the details of the literature review, survey, and other findings, and the second part is a standalone document that is in a form suitable for publication as an AASHTO Guideline. The guideline document was reviewed and approved by the AASHTO Committee on Maintenance’s Bridge Working Group, and recently published as the *AASHTO Guidelines for Maintaining Small Movement Bridge Expansion Joints, 1st Edition*.



Schematic of a typical strip seal.

IDEA SHOWCASE

A Novel Seawall Structure Shoreline Protection System

NCHRP's Innovations Deserving Exploratory Analysis (IDEA) Program awards start-up funding for promising but unproven innovations in transportation practice. NCHRP IDEA Project 213: "SEAHIVE – Sustainable Estuarine and Marine Revetment" was funded in 2018 and is currently active.

Research Agency:
University of Miami

Principal Investigator:
Landolf Rhode-Barbarigos

The impacts of recent hurricanes in the United States and elsewhere have brought to the forefront the need to improve protection of the built environment and infrastructure in coastal communities from hurricane winds, waves and storm-surges by designing more efficient and sustainable shoreline protection systems, such as seawalls. NCHRP IDEA Project 213: "SEAHIVE – Sustainable Estuarine and Marine Revetment" is developing the design of a novel seawall structure system for that purpose.

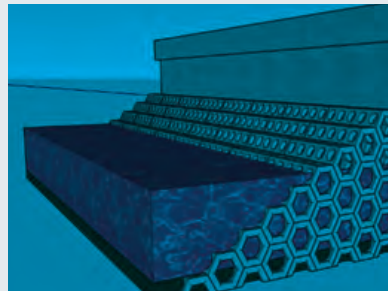
SEAHIVE is being developed through physical testing at the University of Miami's SURge STRUCTure Atmospheric INTERaction (SUSTAIN) facility, an auxiliary material study on biocompatibility and a series of pilot projects. SUSTAIN is a wind-wave tank that can generate waves by means of a 12-paddle system combined with direct wind forces, simulating hurricane conditions up to Category 5 on the Saffir-Simpson scale. The SUSTAIN allows testing of SEAHIVE elements at near full-scale conditions as well as scaled system configurations to help validate system's performance under varying wave conditions and water levels as well as extreme tidal conditions.

The SEAHIVE system offers an efficient and cost-effective shoreline protection system for locations with high energy tidal flow while creating an ecofriendly environment for marine life. Its adaptive features allow its use for various applications and topographical situations. A profile shape design and perforation configuration provide good stability, while increasing wave-energy dissipation capabilities ensure effectiveness at various conditions, including high tidal flow. Element shape tuning and modularity are expected to allow the system to be used for a wide variety of applications, while material selection and structural complexity can ensure good compatibility with the natural environment. Finally, the system can be constructed economically by employing conventional concrete casting technology for element fabrication.

Although the SEAHIVE system is currently under development, the research team has already made significant effort and progress toward product transfer and

implementation by promoting the system and its development process at various professional meetings, such as the 2019 Florida Shore & Beach Preservation Association's Annual Conference. As part of product implementation, three pilot installations in collaboration with Florida DOT and local stakeholders have been planned: as an alternative to traditional rubble riprap at the toe of a newly constructed seawall in North Bay Village,

Florida; a hybrid coral reef offshore of Miami Beach, Florida; and a seawall/mangrove-planter installation in Pompano Beach (Wahoo Bay). All projects/installations are currently in the permitting stage, where, according to the Center for Climate Integrity, costs of basic coastal and tidal protection are expected to reach nearly \$76 billion in the next 20 years.



Illustrations of SEAHIVE system applications.

IMPLEMENTATION SHOWCASE

Implementing a Pilot Training Program on UAS Operations



The scan team report for NCHRP Project 20-68A, Domestic Scan 17-01: “Successful Approaches for the Use of Unmanned Aerial Systems by Surface Transportation Agencies” was published in 2018. The final project report and other deliverables for NCHRP Project 20-44(17): “Implementing the Results of NCHRP Project 20-68A, Domestic Scan 17-01: Successful Approaches for the Use of Unmanned Aerial Systems by Surface Transportation Agencies” will be published in 2022.

Research Agency:
University of Vermont and State Agricultural College

Principal Investigator:
Jarlath O’Neil-Dunne

Unoccupied aircraft systems (UAS) have the potential to revolutionize DOT operations but as with any new technology, integrating UAS into operations poses challenges related to human resources, policies, procedures, and information technology. NCHRP Project 20-44(17): “Implementing the Results of NCHRP Project 20-68A, Domestic Scan 17-01: Successful Approaches for the Use of Unmanned Aerial Systems by Surface Transportation Agencies” aimed to provide tailored UAS training in the areas of safety, risk management, flight operations near structures, night operations, and thermal sensing, for DOT staff from the states of Vermont, Maine, Massachusetts, and New Hampshire, and staff from the Vermont Department of Public Safety.

Led by project teams from the University of Vermont (UVM) and ARE Corp (ARE), a series of 10 online sessions were hosted between October 2020 and June 2021. This series included training on organizational considerations, geospatial integration, UAS photography, UAS sensor and platform selection, flight data management, risk assessment, regulations, operating near structures, night operations, and thermal imagery collection and analysis.

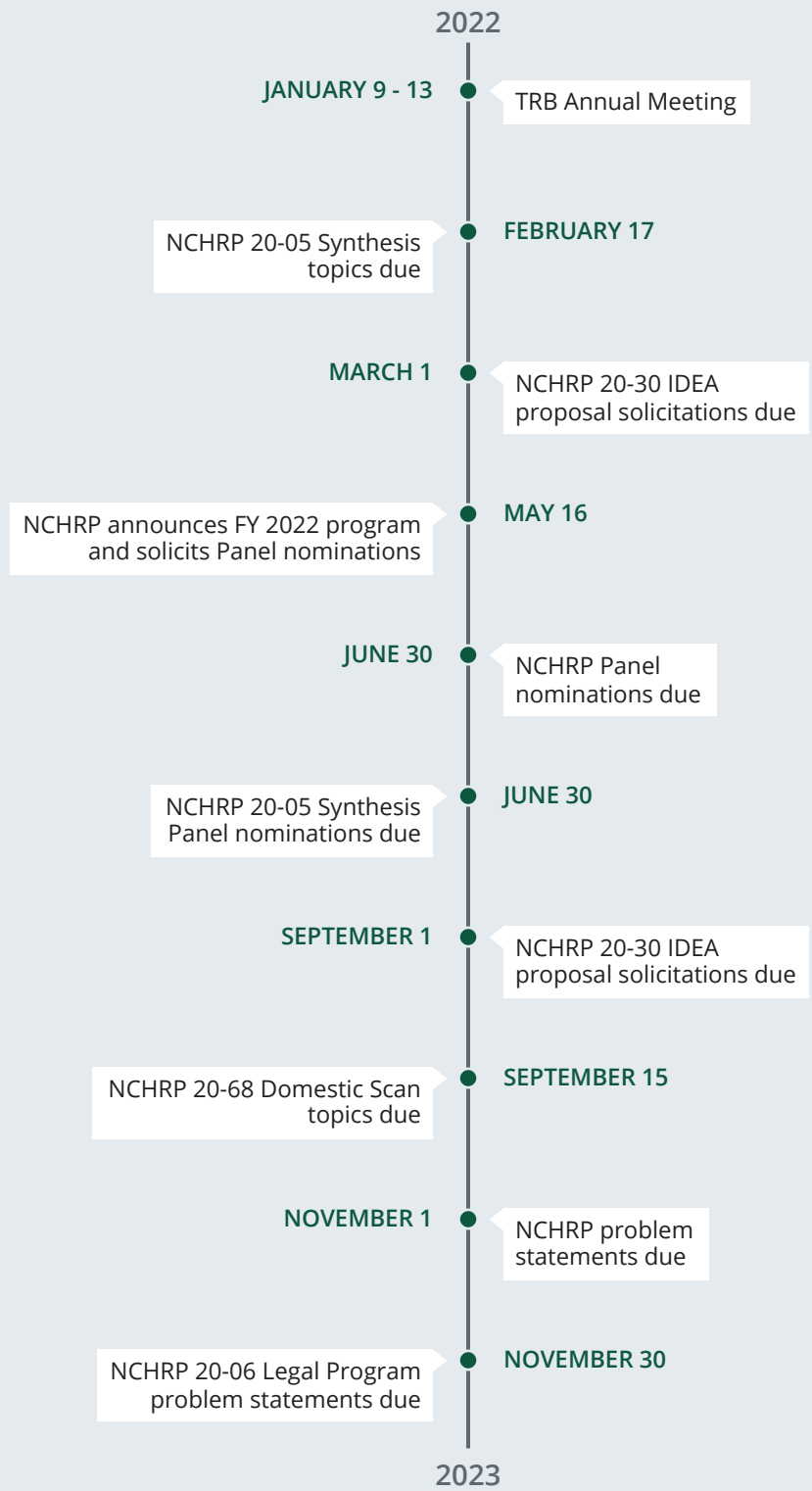
A 5-day in-person workshop was hosted on the UVM campus in August 2021. It was attended by 17 participants who received instruction on risk management, flight planning, barriers to implementing a UAS program, flight operations, and data analytics. Attendees honed their UAS flight skills on the National Institute of Standards and Technology (NIST) Standard Test Methods for Small Unmanned Aircraft Systems test lane, in addition to collecting of UAS imagery for mapping, flying UAS near structures for inspections, and collecting and analyzing thermal imagery. An evening session provided participants with hands-on night operation experience, including search and rescue techniques, thermal imaging, regulatory considerations, and risk assessment for the hazards posed by flying UAS at night. Participants also received an introduction to remote sensing and geospatial analysis and worked through several modules to rapidly process UAS imagery, analyze the resulting geospatial data products, and disseminate the outputs. Through this, they gained a foundational knowledge of a variety of UAS software packages along with end-to-end data collection, processing, and analysis workflows for tasks such as 2D mapping, 3D modeling, volume estimations, and utilizing multispectral imagery.



A slow exposure of a UAS flight at night shows the flight pattern the operator had to execute for the UAS test lane.

The results of this project will aid these agencies in reducing UAS operational liability, maximize UAS potential uses, enable DOT staff to perform UAS operations at a higher level more resourcefully, and shorten the response time for UAS-developed deliverables. Though challenging, the move to virtual training enabled additional training materials to be created to support the goal of integrating the results from this project into AASHTO’s online training platform. Final products for this project include recordings and documentation of the virtual and in-person lectures as well as access to the self-paced UAS workflow modules.

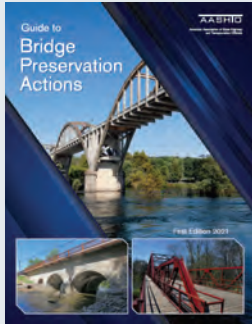
Key Dates for 2022



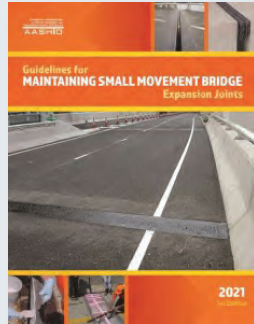
All NCHRP dates are tentative, and are subject to change. Please refer to the NCHRP website at www.trb.org/NCHRP for the latest dates.

NCHRP RESEARCH PRODUCTS CONTRIBUTE TO FORMULATING

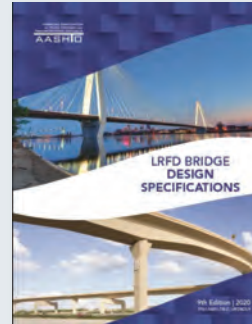
NCHRP research forms the basis for AASHTO publications that are widely used by transportation agencies. The publications serve as industry standards and are often the result of continuous cycles of research conducted under the NCHRP. On this page and the next are some of those publications from the last 15 years that were developed from NCHRP research.



2021 Guide to Bridge Preservation Actions, 1st Ed.



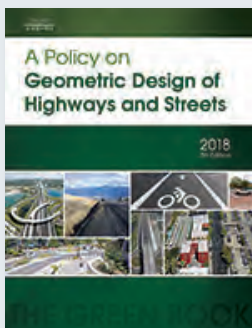
2021 Guidelines for Maintaining Small Movement Bridge Expansion Joints, 1st Ed.



2020 AASHTO LRFD Bridge Design Specifications, 9th Ed.



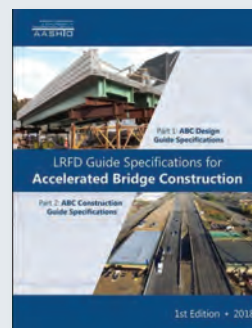
2020 Guide Specification for Service Life Design of Highway Bridges, 1st Ed.



2018 A Policy on Geometric Design of Highways and Streets, 7th Ed.



2018 Guide Specifications for the Design of Concrete Bridge Beams Prestressed with Carbon Fiber-Reinforced Polymer Systems, 1st Ed.



2018 LRFD Guide Specifications for Accelerated Bridge Construction, 1st Ed.



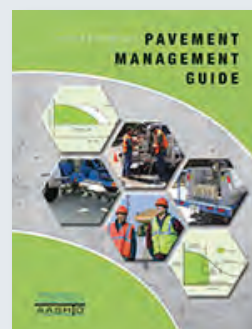
2018 Partnering Handbook 2nd Ed.



2012 Guide Specifications for Design of Bonded FRP Systems for Repair and Strengthening of Concrete Bridge Elements, 1st Ed.



2012 Manual for Emulsion-Based Chip Seals for Pavement Preservation, 1st Ed.

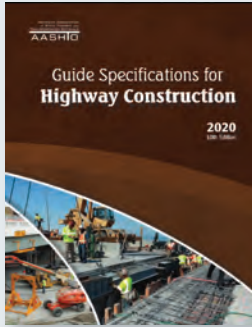


2012 Pavement Management Guide, 2nd Ed.

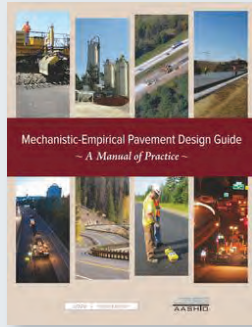


2010 Highway Safety Manual, 1st Ed.

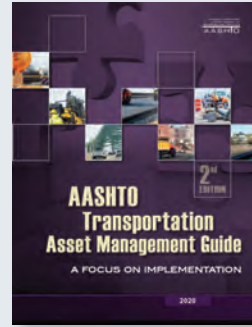
NATIONAL GUIDES, HANDBOOKS, AND MANUALS



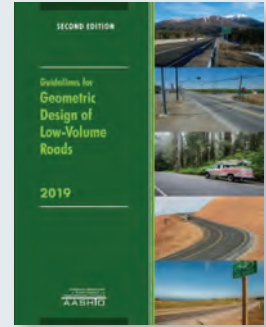
2020 Guide Specifications for Highway Construction, 10th Ed.



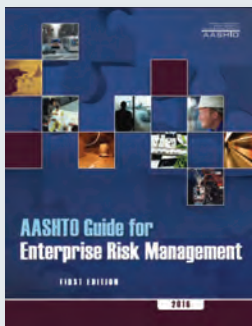
2020 Mechanistic-Empirical Pavement Design Guide: A Manual of Practice, 3rd Ed.



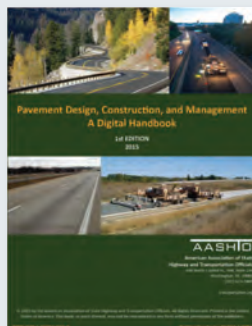
2020 Transportation Asset Management Guide: A Focus on Implementation, 2nd Ed.



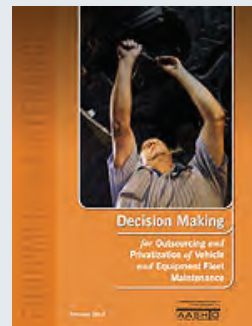
2019 Guidelines for Geometric Design of Low-Volume Roads, 2nd Ed.



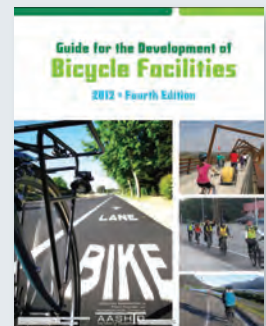
2016 AASHTO Guide for Enterprise Risk Management



2015 Pavement Design, Construction, and Management: A Digital Handbook, 1st Ed.



2012 Decision Making for Outsourcing and Privatization of Vehicle and Equipment Fleet Maintenance



2012 Guide for the Development of Bicycle Facilities, 4th Ed.



2009 Guidelines for the Selection and Application of Warning Lights on Roadway Operations Equipment, 1st Ed.



2008 Guide for Pavement Friction, 1st Ed.



2007 AASHTO Maintenance Manual for Roadways and Bridges, 4th Ed.

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 prejudice. 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 it spends. 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.

The State DOTs' National Highway Research Program

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 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 the National Academies of Sciences, Engineering, and Medicine (NASEM), makes them available for research contracts and for administration of the program by TRB.

Available funds for NCHRP have remained strong during the past 22 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

A YEAR OF NCHRP

Problem Statements Due Nov. 1

Every July, AASHTO R&I invites the submission of research problem statements from state DOTs, AASHTO committee and council chairs, and FHWA. Due November 1 each year, problem statements should explain why the research represents an immediate need. The proposed research should have a high probability of success and should not duplicate other research.

RESOURCES:
[Problem Statement Template](#)
[Resources on Writing Problem Statements](#)

NOV

DEC

JAN

FEB

MAR

Evaluation and Program Formulation

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.

APR

MAY

Program Approval

At its April meeting, R&I allocates funds for new and continuation projects. Once the program is developed, NCHRP sends the selected program to AASHTO; AASHTO prepares a ballot and asks the AASHTO Board of Directors for approval. Each project must receive a yes vote from at least two-thirds of the members of the Board of Directors and must be approved by FHWA and accepted by the National Academies.

JUN

JUL

Panel Formulation

Each research project is assigned to a volunteer panel of experts who provide technical guidance and counsel throughout the research and reporting phases. Panel members do not act as consultants or advisors to project investigators, may not submit proposals for research, and serve without compensation. Panel members are drawn from many disciplines, with dependence on practitioners from state DOTs.

RESOURCES:
[Information for Panel Members](#)
[The Roles of NCHRP Panel Members and Liaisons](#)
[Panel Nominations](#)

AUG

SEP

Research Contractor Selection

Project panels select research contractors after evaluation of all proposals and discussion of proposers' past performance on other research projects administered by NCHRP or others. Selection of a contractor is made by the responsible project panel considering the following factors:

- 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 facilities and equipment.

OCT

NOV

DEC

JAN

FEB

MAR

APR

Proposal Process

Project panels analyze the problem statement, develop the final project scope and objectives, and prepare a request for proposals from qualified research agencies. Requests for proposals are posted on TRB's website, TRB E-Newsletter, and a self-subscription listserv. Proposals must comply with the format outlined in the publication "Information and Instructions for Preparing Proposals."

RESOURCES:
[Information for Proposers](#)
[Information and Instructions for Preparing Proposals Requests for Proposals](#)

Research Phase Begins

Once research starts, NCHRP oversees progress, which includes reviewing monthly progress schedules and quarterly progress reports and maintaining frequent contact with the research contractors. NCHRP also monitors the conduct of the research to ensure consistency with the approved research plan and consults with project panels for technical feedback on the contractor's work.

RESOURCES:
[Information for Contractors](#)
[Procedural Manual for Contractors Conducting Research](#)

16 state DOT members (2 research managers and 2 senior managers 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 subcommittee 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 TRB Weekly, an 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.

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 factors:

- 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.

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

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 administrators and engineers. Problem statements 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 Detering Wrong-Way Movements*, and *NCHRP Research Report 893: Systemic Pedestrian Safety Analysis*.

Table 2 of the Annual Report uses this project numbering system to present information about active, completed, and pending NCHRP projects in 2021. 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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NCHRP Research in 2021

Table 1. Publications of the National Cooperative Highway Research Program, 2021

Research Reports

No.	Proj. No.	Title, Pages, Publication Year
876	15-50	Guidelines for Integrating Safety and Cost-Effectiveness into Resurfacing, Restoration, and Rehabilitation (3R) Projects (& WOD 244), 234 p.
948	07-25	Guide for Pedestrian and Bicycle Safety at Alternative Intersections and Interchanges (All), 220 p.
956	08-115	Guidebook for Data and Information Systems for Transportation Asset Management, 334 p.
957	13-05	Utilization Measurement and Management of Fleet Equipment, 90 p.
958	21-11	Electrochemical Test Methods to Evaluate the Corrosion Potential of Earthen Materials, 88 p.
959	03-113	Diverging Diamond Interchange Informational Guide, 2nd Edition, 248 p.
960	09-62	Proposed AASHTO Practice and Tests for Process Control and Product Acceptance of Asphalt-Treated Cold Recycled Pavements, 158 p.
961	18-17	Entrained Air-Void Systems for Durable Highway Concrete, 80 p.
962	12-113	Proposed Modification to AASHTO Cross-Frame Analysis and Design, 154 p.
963	20-116	A Pandemic Playbook for Transportation Agencies (& TCRP Rep 225), 86 p.
964	10-98	Protocols for Network-Level Macrotexture Measurement, 164 p.
965	10-94	Mitigation of Weldment Cracking in Steel Highway Structures Due to the Galvanizing Process, 94 p.
966	17-76	Posted Speed Limit Setting Procedure and Tool: User Guide, 68 p.
967	09-61	Asphalt Binder Aging Methods to Accurately Reflect Mixture Aging, 226 p.
968	05-23	LED Roadway Lighting: Impact on Driver Sleep Health and Alertness, 70 p.
970	20-117	Mainstreaming System Resilience Concepts into Transportation Agencies: A Guide (& WOD 293), 226 p.
971	24-47	Revised Clear-Water and Live-Bed Contraction Scour Analysis (& WOD 294), 174 p.
973	09-54	Long-Term Aging of Asphalt Mixtures for Performance Testing and Prediction: Phase III Results, 194 p.
974	17-74	Application of Crash Modification Factors for Access Management, Vol. 1: Practitioner's Guide, 190 p.
974	17-74	Application of Crash Modification Factors for Access Management, Vol. 2: Research Overview, 200 p.
975	20-59(54)	Transportation System Resilience: Research Roadmap and White Papers, 110 p.
976	20-59(55)	Resilience Primer for Transportation Executives, 40 p.
978	08-120	Initiating the Systems Engineering Process for Rural Connected Vehicle Corridors, Vol. 1: Research Overview, 88 p.
978	08-120	Initiating the Systems Engineering Process for Rural Connected Vehicle Corridors, Vol. 2: Model Concept of Operations, 136 p.
978	08-120	Initiating the Systems Engineering Process for Rural Connected Vehicle Corridors, Vol. 3: Model System Requirements Specification, 68 p.
980	08-125	Attracting, Retaining, and Developing the Transportation Workforce: Transportation Planners, 122 p.
983	17-78	Reliability of Crash Prediction Models: A Guide for Quantifying and Improving the Reliability of Model Results, 102 p.

Syntheses of Highway Practice (Project 20-05)

No.	Topic No.	Title, Pages, Publication Year
560	51-01	Practices for Construction-Ready Digital Terrain Models, 88 p.
561	51-06	Use of Vehicle Probe and Cellular GPS Data by State Departments of Transportation, 104 p.
562	51-14	Repair and Maintenance of Post-Tensioned Concrete Bridges, 78 p.

No.	Topic No.	Title, Pages, Publication Year
563	51-19	Performance Metrics for Public-Private Partnerships, 116 p.
564	51-04	Practices for Selecting Pedestrian and Bicycle Projects, 130 p.
565	51-16	Maintenance and Surface Preparation Activities Prior to Pavement Preservation Treatments, 104 p.
566	51-02	Practices for Bridge Approach Systems, 210 p.
567	51-15	State DOT Practices for Developing and Implementing TSMO Plans, 152 p.
568	51-09	Portland Cement Concrete Pavement Joint Sealant Practices and Performance, 98 p.
569	51-08	Practice and Performance of Cold In-Place Recycling and Cold Central Plant Recycling, 142 p.
570	51-17	Practices for Closing Out Highway Projects from Substantial Completion to Final Payment, 126 p.
572	51-12	Night and Weekend Movement of Oversize/Overweight Loads, 66 p.
573	51-10	Practices for Integrated Flood Prediction and Response Systems, 246 p.
574	51-03	Temporary Pavement Markings Placement and Removal Practices in Work Zones, 320 p.
575	51-11	Lighting Practices for Isolated Rural Intersections, 68 p.
576	51-18	Practices for Project-Level Analyses for Air Quality, 84 p.
577	51-05	Collaborative Practices for Performance-Based Asset Management Between State Transportation Agencies and Metropolitan Planning Organizations, 100 p.

Legal Research Digests (Project 20-06)

No.	Topic No.	Title, Pages, Publication Year
84	24-05	Fix it, Sign it or Close it: State of Good Repair in an Era of Budget Constraints (& TCRP LRD 57), 32 p.

Web-Only Documents

No.	Proj. No.	Title, Pages, Publication Year
244	15-50	Developing Guidelines for Integrating Safety and Cost-Effectiveness into Resurfacing, Restoration, and Rehabilitation (3R) Projects (& Rep. 876), 165 p.
286	03-124	Principles and Guidance for Presenting Active Traffic Management Information to Drivers, 190 p.
291	17-76	Development of a Posted Speed Limit Setting Procedure and Tool (& Rep. 966), 189 p.
292	20-07/ Task 401	Roadside Hardware Replacement Analysis: User Guide, 30 p.
293	20-117	Deploying Transportation Resilience Practices in State DOTs (& Rep 970), 132 p.
294	24-47	Revised Clear-Water and Live-Bed Contraction Scour Analysis Training Manual (& Rep. 971), 120 p.
295	17-62	Improved Prediction Models for Crash Types and Crash Severities, 138 p.
296	16-05	Guidelines for Cost-Effective Safety Treatment of Roadside Ditches, 282 p.
297	17-68	Intersection Crash Prediction Methods for the Highway Safety Manual, 221 p.
299	20-50(18)	Investigating the Relationship of As-Constructed Asphalt Pavement Air Voids to Pavement Performance, 208 p.
300	15-55	Guidance to Predict and Mitigate Dynamic Hydroplaning on Roadways, 134 p.
302	17-57	Development of a Comprehensive Approach for Serious Traffic Crash Injury Measurement and Reporting Systems, 79 p.
303	17-78	Understanding and Communicating Reliability of Crash Prediction Models, 149 p.
304	22-28	Criteria for Restoration of Longitudinal Barriers, Phase II, 479 p.
305	20-44(18)	Validation of a Performance-Based Mix Design Method for Porous Friction Courses, 33 p.
306	17-45	Safety Prediction Methodology and Analysis Tool for Freeways and Interchanges, 764 p.
307	22-12(03)	Guidelines for the Selection of Test Levels 2 Through 5 Bridge Railings, 213 p.
309	17-89	Safety Performance of Part-Time Shoulder Use on Freeways, Vol. 1: Informational Guide and Safety Evaluation Guidelines, 119 p.

No.	Proj. No.	Title, Pages, Publication Year
309	17-89	Safety Performance of Part-Time Shoulder Use on Freeways, Vol. 2: Conduct of Research Report, 285 p.
310	23-10	Evaluation and Synthesis of Connected Vehicle Communication Technologies, 145 p.
311	25-62	Improving the Efficiency and Consistency of Section 106 Compliance for State DOTs: Strategies for Project-Level Programmatic Agreements, 59 p.
313	15-56	Selecting Ramp Design Speeds, Vol. 1: Guide, 135 p.
313	15-56	Selecting Ramp Design Speeds, Vol. 2: Research Overview, 159 p.
314	12-112	Updating the AASHTO LRFD Movable Highway Bridge Design Specifications, 195 p.

NCHRP Transportation Research Circulars

No.	Proj. No.	Title, Pages, Publication Year
E-C270	2020-01B	Opportunities for Research on Transportation and Equity, 38 p.

Notes:

Publications in parentheses with an ampersand (&) are companion publications.
See Table 2 for project titles. See inside back cover of this document for ordering information.

Table 2. Status (as of 12/31/2021) of Projects Active or Pending During 2021

Project No. and Title	Fiscal Year	Research Agency	Contract Amount	Starting Date	Completion Date	Status	Status Comments
AREA ONE: DESIGN—PAVEMENTS							
NCHRP 01-54A: Guidelines for Limiting Damage to Flexible and Composite Pavements Due to the Presence of Water	2014	Applied Pavement Technology	\$203,699	6/4/19	12/31/21	Completed	Publication decision pending
NCHRP 01-57B: Validating Proposed Definitions for Comparable Pavement Cracking Data	2022		\$500,000			In development	
NCHRP 01-59: Proposed Enhancements to Pavement ME Design: Improved Consideration of the Influence of Subgrade Soils Susceptible to Shrink/Swell and/or Frost Heave on Pavement Performance	2018	Arizona State University	\$500,000	8/15/18	7/29/22	Research in progress	
NCHRP 01-60: Measuring the Characteristics of Pavement Surface Images and Developing Standard Practices for Calibration, Certification, and Verification of Imaging Systems	2018	Georgia Tech Research Corporation	\$593,633	9/10/18	12/9/22	Research in progress	
NCHRP 01-61: Evaluation of Bonded Concrete Overlays on Asphalt Pavements	2018	Nichols Consulting Engineers	\$570,000	2/26/18	10/1/21	Completed	To be published as NCHRP Research Report
AREA TWO: ADMINISTRATION—ECONOMICS							
NCHRP 02-25: Workforce 2030—Attracting, Retaining, and Developing the Transportation Workforce: Design, Construction, and Maintenance	2019	ICF Incorporated	\$700,000	5/16/19	11/30/21	Completed	Publication decision pending
NCHRP 02-26: Implementation of Life-Cycle Planning Analysis in a Transportation Asset Management Framework	2019	WSP USA Inc.	\$499,998	4/5/19	6/30/22	Research in progress	
NCHRP 02-27: Making Targets Matter: Managing Performance to Enhance Decision-Making	2019	High Street Consulting Group	\$529,647	2/11/19	9/30/22	Research in progress	
AREA THREE: TRAFFIC—OPERATIONS AND CONTROL							
NCHRP 03-78C: Training and Technology Transfer for Accessibility Guidelines for Roundabouts and Channelized Turn Lanes	2016	Kittelson & Associates	\$250,000	1/4/17	9/30/20	Completed	Publication decision pending
NCHRP 03-119: Application of MASH Test Criteria to Breakaway Sign and Luminaire Supports and Crashworthy Work Zone Traffic Control Devices	2015	George Mason University	\$599,134	9/28/15	2/9/22	Research in progress	
NCHRP 03-123: Proposed Practices for the Application of Dynamic Lane Use Control	2016	Texas A&M Transportation Institute	\$430,000	7/1/16	4/30/20	Completed	Publication decision pending
NCHRP 03-125: Evaluation of Change and Clearance Intervals Prior to the Flashing Yellow Arrow Permissive Left-Turn Indication	2016	University of Wisconsin - Madison	\$300,000	9/21/16	6/30/22	Research in progress	
NCHRP 03-128: Business Intelligence Techniques for Transportation Agency Decision Making	2018	Applied Engineering Management Corporation	\$395,940	6/20/18	4/1/22	Research in progress	Contractor's draft report under panel review
NCHRP 03-129: Essential Communications: A Guide to Land Mobile Radio (LMR)	2018	CommDEX Consulting LLC	\$536,433	8/1/18	6/30/22	Research in progress	Contractor's final report under review
NCHRP 03-131: Guidance for Planning and Implementing Multimodal, Integrated Corridor Management	2018	Kapsch TrafficCom USA Inc.	\$499,306	5/7/18	6/5/20	Completed	Published as NCHRP Web-Only Document 287

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NCHRP 03-132: Guidance for Safe and Effective of Temporary Traffic Control for Mobile Operations on Two-Lane Two-Way Roadways	2018	Texas A&M Transportation Institute	\$300,000	5/14/18	11/30/22	Research in progress	
NCHRP 03-133: Signal Timing Strategies for Non-Motorized Users	2018	Kittelson & Associates	\$500,000	4/25/18	4/24/20	Completed	To be published as NCHRP Research Report 969
NCHRP 03-134: Determination of Encroachment Conditions in Work Zones	2019	Texas A&M Transportation Institute	\$491,558	6/20/19	9/30/22	Research in progress	
NCHRP 03-135: Wrong-Way Driving Prevention Solutions and Guidance	2019	Auburn University	\$600,000	7/22/19	12/23/22	Research in progress	
NCHRP 03-136: Evaluating the Performance of Right-Turn-On-Red Operation at Signalized Intersections (with single and dual right-turn lanes)	2019	Iowa State University	\$300,000	8/13/19	6/13/22	Research in progress	
NCHRP 03-137: Algorithms to Convert Basic Safety Messages into Traffic Measures	2019	Noblis, Inc.	\$400,000	8/1/19	11/30/21	Completed	Publication decision pending
NCHRP 03-138: Experimental Implementation of Big Data Analytics for Traffic Incident Management	2020	Applied Engineering Management Corporation	\$489,998	7/28/20	10/28/22	Research in progress	
NCHRP 03-139: Next Generation of the USLIMITS2 Speed Limit Setting Expert System	2020	University of North Carolina - Chapel Hill	\$450,000	8/1/20	2/1/23	Research in progress	
NCHRP 03-140: Applications of RFID and Wireless Technologies for Highway Construction	2020	University of Kentucky Research Foundation	\$370,000	8/5/20	2/6/23	Research in progress	
NCHRP 03-142: Evaluating the Impacts of Real-Time Warnings and Variable Speed Limits on Safety and Travel Reliability during Weather Events	2022		\$400,000			In development	
NCHRP 03-143: Warrants for a Pedestrian Traffic Control Signal and for Other Pedestrian Traffic Control Devices	2022		\$600,000			In development	
NCHRP 03-144: Leveraging Existing Traffic Signal Assets to Obtain Quality Traffic Counts	2022		\$450,000			In development	
AREA FOUR: MATERIALS AND CONSTRUCTION—GENERAL MATERIALS							
NCHRP 04-40: Reliability-Based Geotechnical Resistance Factors for Axially-Loaded Micropiles	2017	University of Missouri	\$249,998	9/1/17	5/29/20	Completed	To be published as NCHRP Research Report 989
AREA FIVE: TRAFFIC—ILLUMINATION AND VISIBILITY							
NCHRP 05-22A: Gaps and Emerging Technologies in the Application of SSL in Roadway Lighting	2019	Virginia Polytechnic Institute & State University	\$300,000	9/3/20	12/2/22	Research in progress	
NCHRP 05-23: Effects of LED Roadway Lighting on Driver Sleep Health and Alertness	2018	Virginia Polytechnic Institute & State University	\$399,775	7/1/18	3/31/21	Completed	Published as NCHRP Research Report 968
NCHRP 05-24: Guidelines for Vehicle and Equipment Color, Marking, and Lighting	2018	Texas A&M Transportation Institute	\$600,000	6/1/18	6/30/22	Research in progress	
NCHRP 05-25: Safety Performance of LED and Variable Lighting Systems	2021		\$650,000			In development	
AREA SIX: MAINTENANCE—SNOW AND ICE CONTROL							
NCHRP 06-18: Guide for Snow and Ice Control Operations	2019	Texas A&M Transportation Institute	\$300,000	7/1/19	12/31/21	Completed	Publication decision pending

Project No. and Title	Fiscal Year	Research Agency	Contract Amount	Starting Date	Completion Date	Status	Status Comments
NCHRP 06-19: Guidebook for Mechanical Methods for Snow and Ice Control Operations	2021	Wilfrid A. Nixon & Associates LLC	\$264,269	6/2/21	3/1/23	Research in progress	
AREA SEVEN: TRAFFIC—TRAFFIC PLANNING							
NCHRP 07-23: Access Management in the Vicinity of Interchanges	2013	Texas A&M Transportation Institute	\$900,000	6/20/13	6/22/20	Completed	To be published as NCHRP Research Report 977: Vol. 1 and Vol. 2
NCHRP 07-25: Guide for Pedestrian and Bicycle Safety at Alternative Intersections and Interchanges (All)	2017	Kittelson & Associates	\$400,000	4/12/17	12/31/19	Completed	Published as NCHRP Research Report 948
NCHRP 07-26: Update of Highway Capacity Manual: Merge, Diverge, and Weaving Methodologies	2019	Kittelson & Associates	\$400,000	6/10/19	2/28/22	Research in progress	Contractor's draft report under review
NCHRP 07-27: An Update of the Green Book Design Vehicles	2019	MRIGlobal	\$400,000	5/8/19	4/30/22	Research in progress	
NCHRP 07-28(01): Assessing the Safety Impacts of Right-Turn Lanes on Rural and Suburban Highways	2019	MRIGlobal	\$250,000	5/6/19	2/28/22	Research in progress	
NCHRP 07-28(02): Assessing the Multi-Modal Safety Performance of Turn Lanes	2019		\$400,000			In development	
NCHRP 07-30: Methods for Assigning Short-Duration Traffic Volume Counts to Adjustment Factor Groups for Estimating AADT	2021	Texas A&M Transportation Institute	\$500,000	6/1/21	11/30/23	Research in progress	
NCHRP 07-31: State DOT Usage of Bicycle and Pedestrian Data: Practices, Sources, Needs, and Gaps/Practices and Recommendations in Reporting and Integrating Non-Fatal Injury Data for Active Travel Modes	2021		\$800,000			In development	
NCHRP 07-32: Future-Proofing Automatic Traffic Signal Performance Measurement Systems for Scalability, Transferability, and CAV Integration.	2022		\$500,000			In development	
AREA EIGHT: TRANSPORTATION PLANNING—PLANNING METHODS AND PROCESSES							
NCHRP 08-107: A Guidebook for Emergency Contracting Procedures for Administration of a Regional Emergency	2016	AECOM Consulting Transportation Group	\$249,997	12/15/16	11/30/20	Completed	Publication decision pending
NCHRP 08-112: Guidebook for Implementing Alternative Technical Concepts into All Types of Highway Project Delivery Methods	2017	Gransberg & Associates Inc.	\$450,000	6/1/17	4/19/19	Completed	Published as NCHRP Research Report 937
NCHRP 08-113: Integrating Effective Transportation Performance, Risk, and Asset Management Practices	2018	CH2M Hill	\$666,617	3/15/18	4/15/21	Completed	To be published as NCHRP Research Report 985
NCHRP 08-114A: Systematic Approach for Determining Construction Contract Time: A Guidebook	2018	Texas A&M University	\$500,000	7/27/18	10/30/20	Completed	To be published as NCHRP Research Report 979
NCHRP 08-115: Guidebook for Data and Information Systems for TAM	2018	Spy Pond Partners	\$700,000	8/1/18	7/31/22	Research in progress	Published as NCHRP Research Report 956
NCHRP 08-118: Risk Assessment Techniques for Transportation Asset Management	2019	Starisis Corporation	\$600,000	6/24/19	3/31/22	Research in progress	
NCHRP 08-120: Initiating the Systems Engineering Process for Rural Connected Vehicle Corridors	2019	Noblis, Inc.	\$350,000	8/1/19	1/31/21	Completed	Published as NCHRP Research Report 978: Vol. 1, Vol. 2, and Vol. 3
NCHRP 08-121: Accessibility Measures in Practice: Guidance for Transportation Agencies	2019	University of Texas - Austin	\$499,025	5/31/19	9/29/21	Completed	Publication decision pending
NCHRP 08-122: Metropolitan Planning Organizations: Strategies for Future Success	2019	Metro Analytics PLLC	\$398,930	6/17/19	11/30/21	Completed	To be published as NCHRP Research Report

Project No. and Title	Fiscal Year	Research Agency	Contract Amount	Starting Date	Completion Date	Status	Status Comments
NCHRP 08-123: Census Transportation Data Field Guide for Transportation Applications	2019	Cambridge Systematics	\$499,859	6/1/19	3/31/22	Research in progress	
NCHRP 08-124: Quantifying the Impacts of Corridor Management	2018	Metro Analytics PLLC	\$449,427	6/17/19	1/31/22	Research in progress	
NCHRP 08-125: Attracting, Retaining, and Developing the Transportation Workforce: Transportation Planners	2019	WSP USA Inc.	\$300,000	6/5/19	3/4/21	Completed	Published as NCHRP Research Report 980
NCHRP 08-127: Emerging Issues: Impact of New Disruptive Technologies on the Performance of DOTs	2020	Cambridge Systematics	\$249,731	9/1/20	2/28/22	Research in progress	
NCHRP 08-128: Snapshots of Planning Practices	2020		\$200,000			In development	
NCHRP 08-129: Incorporating Resilience Concepts and Strategies in Transportation Planning Efforts	2020	Applied Engineering Management Corporation	\$299,979	9/10/20	3/9/22	Research in progress	
NCHRP 08-130: Best Practices in Coordination of Public Transit and Ride Sharing	2020		\$250,000			Contract pending	
NCHRP 08-131: Access to Jobs, Economic Opportunities, and Education in Rural Areas	2020	EBP US Inc.	\$249,951	9/1/20	2/28/22	Research in progress	
NCHRP 08-132: Accessing America's Great Outdoors: Understanding Recreational Travel Patterns, Demand, and Future Investment Needs for Transportation Systems	2020	Resource Systems Group, Inc.	\$449,978	8/5/20	8/4/22	Research in progress	
NCHRP 08-133: Development and Implementation of the National Intercity Bus Atlas	2020	Resource Systems Group, Inc.	\$599,994	2/5/21	2/5/23	Research in progress	
NCHRP 08-134: Integrating Freight Movement into 21st Century Communities' Land Use, Design, and Transportation Systems	2020	Cambridge Systematics	\$489,998	12/7/20	3/7/23	Research in progress	
NCHRP 08-135: Reliability and Quality of Service Evaluation Methods for Rural Highways	2020	University of Florida	\$399,960	12/8/20	6/8/23	Research in progress	
NCHRP 08-136: Guidance on Using Performance-Based Management Approaches for Maintenance	2021		\$500,000			In development	
NCHRP 08-137: Updates to the Digital Edition of the AASHTO Transportation Asset Management Guide	2021		\$450,000			In development	
NCHRP 08-138: Connecting Transportation Asset Management (TAM) and Transportation System and Management Operations (TSMO)	2021		\$500,000			In development	
NCHRP 08-139: Guide for Preventing and Mitigating the Risk of Bridge and Tunnel Strikes by Motor Vehicles	2021	Iowa State University	\$500,000	10/1/21	4/1/24	Research in progress	
NCHRP 08-140: National Design and Interoperability Standards for Truck Parking Information Management Systems	2021		\$500,000			In development	
NCHRP 08-141: Guidance for Local Truck Parking Regulations	2021		\$450,000			In development	
NCHRP 08-142: Virtual Public Involvement: A Manual for Effective, Equitable, and Efficient Practices for Transportation Agencies	2021	Rutgers, The State University of New Jersey	\$650,000	9/21/21	3/20/24	Research in progress	
NCHRP 08-143: Impact of Spatial Segmentation on Travel Time Reliability Performance Measures	2021		\$150,000			In development	
NCHRP 08-144: Best Practices in Determining Rural Transit Fleet Size – How to Provide Service for Changing Demographics of Rural Ridership (Right-sizing of Rural Transit Fleets)	2021		\$250,000			In development	

Project No. and Title	Fiscal Year	Research Agency	Contract Amount	Starting Date	Completion Date	Status	Status Comments
NCHRP 08-146: Integrating Resiliency into Transportation System Operations	2021		\$350,000			In development	
NCHRP 08-147: Improving Public Transportation in Rural Areas and Tribal Communities	2021	KFH Group Inc.	\$599,919	8/27/21	2/27/24	Research in progress	
NCHRP 08-148: Utility Abandonment, Out of Service Plant, and Decommissioning without Removal on Public Right of Way	2021		\$300,000			In development	
NCHRP 08-149: Impacts of Active Transportation Network Gaps	2021		\$450,000			In development	
NCHRP 08-150: Valuation of Transportation Equity in Active Transportation and Safety Investments	2022		\$650,000			In development	
NCHRP 08-151: Building Risk-Management Momentum in Agencies	2022		\$350,000			In development	
NCHRP 08-152: Strategies for Advancing Equity in Transportation Planning by Increasing Diversity, Equity, and Inclusiveness in the Transportation Planning Profession	2022		\$350,000			In development	
NCHRP 08-153: Guidance on Improving Truck Traffic Estimates in "Design Traffic" Forecasts	2022		\$425,000			In development	
NCHRP 08-154: Guidance for Agencies to Incorporate Uncertainty into Long-Range Transportation Planning	2022		\$600,000			In development	
NCHRP 08-155: Researching and Responding to Racial Disparities in the Construction of Expressways	2022		\$400,000			In development	
NCHRP 08-156: Planning for the Future of Intermodal Passenger Facilities: Guide and Decision-Making Framework	2022		\$200,000			In development	Jointly funded with Transit Cooperative Research Program Project D-21 and Airport Cooperative Research Program Project A03-64; managed by TCRP Project D-21
NCHRP 08-157: Best Practices for Data Fusion of Probe and Point Detector Data	2022		\$200,000			In development	
NCHRP 08-158: Communicating the Value, Interactions, and Impacts of Freight to Stakeholders	2022		\$350,000			In development	
NCHRP 08-159: Understand How Accessibility to Employment, Health Care, Education, and Other Vital Needs Varies for Different Population Groups in Different Settings, and Methods for Effectively Assessing Mobility and Accessibility Options	2022		\$500,000			In development	
NCHRP 08-160: Understand the Role of Transportation Infrastructure Investment in Gentrification and Displacement and Identify Effective Policies and Strategies to Address These Effects	2022		\$400,000			In development	
NCHRP 08-161: Identify Emerging Approaches for Public Engagement to Meaningfully Involve Minorities, Low-Income, and Other Vulnerable Populations	2022		\$500,000			In development	
NCHRP 08-162: Guidance for Improving Outcomes and Implementing Equitable Transportation Decision Making	2022		\$750,000			In development	

Project No. and Title	Fiscal Year	Research Agency	Contract Amount	Starting Date	Completion Date	Status	Status Comments
AREA NINE: MATERIALS AND CONSTRUCTION—BITUMINOUS MATERIALS							
NCHRP 09-54: Long-Term Aging of Asphalt Mixtures for Performance Testing and Prediction	2013	North Carolina State University	\$950,000	5/21/13	3/31/21	Completed	Published as NCHRP Research Report 973
NCHRP 09-56A: Identifying Influences on and Minimizing the Variability of Ignition Furnace Correction Factors - Phase II	2016	Auburn University	\$250,000	5/12/17	2/28/22	Research in progress	Contractor's draft report under review
NCHRP 09-57A: Ruggedness of Laboratory Tests to Assess Cracking Resistance of Asphalt Mixture	2018	Texas A&M Transportation Institute	\$750,000	6/15/18	7/31/22	Research in progress	Phase III in progress; report of Phases I and II to be published as NCHRP Research Report 987
NCHRP 09-59: Relating Asphalt Binder Fatigue Properties to Asphalt Mixture Fatigue Performance	2015	Advanced Asphalt Technologies, LLC	\$1,000,000	4/20/15	6/30/19	Completed	To be published as NCHRP Research Report 982
NCHRP 09-60: Addressing Impacts of Changes in Asphalt Binder Formulation and Manufacture on Pavement Performance through Changes in Asphalt Binder Specifications	2016	Western Research Institute	\$1,150,000	7/6/16	12/31/22	Research in progress	
NCHRP 09-61: Short- and Long-Term Binder Aging Methods to Accurately Reflect Aging in Asphalt Mixtures	2017	Advanced Asphalt Technologies, LLC	\$749,976	3/2/17	3/31/21	Completed	Published as NCHRP Research Report 967
NCHRP 09-62: Rapid Tests and Specifications for Construction of Asphalt-Treated Cold Recycled Pavements	2017	Virginia Department of Transportation	\$999,751	6/1/17	5/31/22	Research in progress	Phase IV in progress; report of Phases I, II, and III published as NCHRP Research Report 960
NCHRP 09-63: A Calibrated and Validated National Performance-Related Specification for Emulsified Asphalt Binder	2019	Asphalt Institute	\$499,679	5/1/19	5/1/23	Research in progress	
NCHRP 09-64: Developing Laboratory Methods and Specifications to Test Tack Coat Materials	2020	University of Nevada - Reno	\$500,000	4/15/20	10/15/22	Research in progress	
NCHRP 09-65: Capturing Durability of High Recycled Binder Ratio (RBR) Asphalt Mixture	2021	Texas A&M Transportation Institute	\$750,000	3/26/21	3/26/24	Research in progress	
NCHRP 09-66: Performance Properties of Laboratory Produced Recycled Plastic Modified (RPM) Asphalt Binders and Mixtures	2021	Auburn University	\$500,000	4/30/21	10/30/23	Research in progress	
NCHRP 09-68: Considering Binder Availability of Recycled Asphalt Materials	2022		\$500,000			Contract pending	
NCHRP 09-69: Verifying Quantities of Materials Used in Asphalt Mixtures at Production Facilities	2022		\$400,000			In development	
AREA TEN: MATERIALS AND CONSTRUCTION—SPECIFICATIONS, PROCEDURES, AND PRACTICES							
NCHRP 10-94: Mitigation of Weldment Cracking of Highway Steel Structures due to the Galvanizing Process	2014	University of Kansas	\$499,975	7/1/14	3/31/20	Completed	Published as NCHRP Research Report 965
NCHRP 10-95A: Toughness Requirements for Heat-Affected Zones of Welded Structural Steels for Highway Bridges	2014	University of Kansas	\$425,000	9/19/16	4/29/22	Research in progress	
NCHRP 10-98: Protocols for Network-Level Macrottexture Measurement	2016	Virginia Polytechnic Institute & State University	\$500,000	9/6/16	3/5/20	Completed	Published as NCHRP Research Report 964

Project No. and Title	Fiscal Year	Research Agency	Contract Amount	Starting Date	Completion Date	Status	Status Comments
NCHRP 10-99: Guidebook for Implementing Constructability Across the Entire Project Development Process: NEPA to Final Design	2017	University of Florida	\$450,000	5/24/18	2/25/22	Research in progress	
NCHRP 10-101: Improving Mid-Term, Intermediate, and Long-Range Cost Forecasting: Guidance for State Departments of Transportation	2018	Auburn University	\$250,000	5/1/18	4/30/20	Completed	Published as NCHRP Research Report 953
NCHRP 10-102: A Guidebook for Risk-Based Construction Inspection	2019	HKA Global Inc.	\$415,719	6/18/19	7/17/22	Research in progress	
NCHRP 10-103: Improving Guidance of AASHTO R 80/ASTM C 1778 for Alkali-Silica Reactivity (ASR) Potential and Mitigation	2019	University of Texas - Austin	\$648,500	6/15/19	6/14/22	Research in progress	
NCHRP 10-104: Recommendations for Revision of AASHTO M 295 Standard Specification to Include Marginal and Unconventional Source Coal Fly Ashes	2019	South Dakota School of Mines and Technology	\$600,000	8/1/19	7/31/22	Research in progress	
NCHRP 10-105: Verification of Traffic Speed Deflection Devices' (TSDD) Measurements	2020	Wood Environment & Infrastructure Solutions, Inc.	\$399,989	8/3/20	2/2/23	Research in progress	
NCHRP 10-106: Update of AASHTO Standard Practice for Certification of Inertial Profiling Systems (R 56)	2020	Wood Environment & Infrastructure Solutions, Inc.	\$249,984	8/3/20	8/31/22	Research in progress	
NCHRP 10-107: Guide for Implementing Performance Specifications	2020	Applied Research Associates	\$600,000	3/5/20	8/31/22	Research in progress	
NCHRP 10-108: Manual for Incorporating NDT in Quality Assurance	2020	Applied Research Associates	\$250,000	10/1/20	9/30/22	Research in progress	
NCHRP 10-109: Modern Solutions to Safe and Efficient Work Zone Travel	2021	Virginia Polytechnic Institute & State University	\$600,000	5/4/21	5/4/24	Research in progress	
NCHRP 10-110: 3D Modeling Guide for Construction Inspection	2021	Greenman-Pedersen, Inc.	\$299,748	6/24/21	6/24/23	Research in progress	
NCHRP 10-111: Evaluation and Selection of 3D Model Viewers for Construction Inspection	2022		\$400,000			In development	
NCHRP 10-112: Guidelines for Digital Technologies and Systems for Remote Construction Inspection for Highway Infrastructure Projects	2022		\$500,000			In development	
NCHRP 10-113: Design Review and 3D Model Quality Management for Model-Based Design and Construction	2022		\$450,000			In development	
NCHRP 10-114: Improving Performance and Safety of Rejuvenating Seals	2022		\$300,000			In development	
AREA ELEVEN: ADMINISTRATION—LAW							
NCHRP 11-08: Improving Rights-of-Way Acquisition and Compensation Practices for Utility Relocations	2019	Texas A&M Transportation Institute	\$400,000	4/1/19	1/7/22	Research in progress	
AREA TWELVE: DESIGN—BRIDGES							
NCHRP 12-95A: Proposed AASHTO Guidelines for Adjacent Precast Concrete Box Beam Bridge Systems	2013	University of Cincinnati	\$399,516	7/17/18	7/15/22	Research in progress	
NCHRP 12-102A: AASHTO Guide Specification for ABC Design and Construction-- Implementation Workshops	2014	CME Associates Inc.	\$261,106	12/10/19	6/8/22	Research in progress	

Project No. and Title	Fiscal Year	Research Agency	Contract Amount	Starting Date	Completion Date	Status	Status Comments
NCHRP 12-109: Use of 0.7-in. Diameter Strands in Precast Pretensioned Girders	2016	University of Cincinnati	\$550,000	11/16/16	12/15/21	Completed	To be published as NCHRP Research Report 994
NCHRP 12-111: Evaluating the Effectiveness of Vibration-Mitigation Devices for Structural Supports of Signs, Luminaires, and Traffic Signals	2016	University of Connecticut	\$400,000	4/3/17	1/31/22	Research in progress	
NCHRP 12-112: Update of the AASHTO LRFD Movable Highway Bridge Design Specifications	2017	Modjeski & Masters	\$449,927	7/28/17	8/31/21	Completed	Published as NCHRP Web-Only Document 314
NCHRP 12-113: Proposed Modification to AASHTO Cross-Frame Analysis and Design	2017	University of Texas - Austin	\$749,950	6/1/17	3/30/22	Research in progress	Phase I published as NCHRP Research Report 962
NCHRP 12-114: Guidance on Seismic Site Response Analysis with Pore Water Pressure Generation	2018	GeoLogic Associates Inc.	\$639,989	11/8/18	8/7/22	Research in progress	
NCHRP 12-115: Guidelines for Risk-Based Inspection and Strength Evaluation of Suspension Bridge Main Cable Systems	2018	Modjeski & Masters	\$365,899	8/14/18	6/30/22	Research in progress	
NCHRP 12-116A: Design Specifications for the Static and Seismic Design of Piles for Downdrag	2019	University of Arkansas	\$419,999	10/15/20	7/14/23	Research in progress	
NCHRP 12-117: Guidelines for Corrosion Protection of Steel Bridges Using Duplex Coating Systems	2019	Elzly Technology Corporation	\$397,854	5/16/19	3/15/22	Research in progress	
NCHRP 12-118: Design and Construction Specifications for Bonded and Unbonded Post-Tensioned Concrete Bridge Elements	2019	Purdue University	\$800,000	9/1/19	8/31/22	Research in progress	
NCHRP 12-119: Bridge Deck Overhangs with MASH-Compliant Railings	2020	University of Nebraska - Lincoln	\$440,000	8/17/20	2/17/23	Research in progress	
NCHRP 12-120: Stainless Steel Strands for Prestressed Concrete Bridge Elements	2020	University of Houston	\$600,000	9/1/20	4/30/23	Research in progress	
NCHRP 12-121: Guidelines for the Design of Prestressed Concrete Bridge Girders Using FRP Auxiliary Reinforcement	2021	University of Houston	\$540,000	4/19/21	4/19/24	Research in progress	
NCHRP 12-122: Proposed AASHTO Guidelines for Applications of Unmanned Aerial Systems Technologies for Element-Level Bridge Inspection	2021	Michael Baker International	\$340,000	5/11/21	11/11/23	Research in progress	
NCHRP 12-123: Proposed AASHTO Guideline for Load Rating of Segmental Bridges	2021	Auburn University	\$300,000	4/30/21	10/30/23	Research in progress	
NCHRP 12-124: Improved Demand Predictions on Shear Studs for Composite Steel Bridge Design	2022		\$900,000			In development	
AREA THIRTEEN: MAINTENANCE—EQUIPMENT							
NCHRP 13-05: Guide for Utilization Measurement and Management of Fleet Equipment	2015	Washington State University	\$399,998	6/1/15	1/31/20	Completed	Published as NCHRP Research Report 957
NCHRP 13-06A: Guide for the Formulation of Long-Range Plans and Budgets for Replacement of Highway Operations Equipment	2017	North Carolina State University	\$324,998	5/18/20	2/17/22	Research in progress	Contractor's final report under review
NCHRP 13-08: Guideline for Decision-Making for Repair vs. Replacement of Highway Maintenance Equipment	2019	The Cadmus Group LLC	\$350,000	1/28/21	7/27/22	Research in progress	
NCHRP 13-09: Guide to Maximize Vehicle and Equipment Surplus Values	2021	The Kercher Group, Inc.	\$299,991	8/16/21	6/15/23	Research in progress	

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AREA FOURTEEN: MAINTENANCE—MAINTENANCE OF WAY AND STRUCTURES							
NCHRP 14-36: Proposed AASHTO Guide for Bridge Preservation Actions	2011	University of Colorado - Boulder	\$609,887	11/13/15	3/31/20	Completed	Published as NCHRP Research Report 950
NCHRP 14-39: Using Vegetated Compost Blankets to Achieve Highway Runoff Volume and Pollutant Reduction	2017	University of Maryland	\$499,999	4/27/17	1/26/22	Research in progress	
NCHRP 14-40: Comparison of Cost, Safety, and Environmental Benefits of Routine Mowing and Managed Succession of Roadside Vegetation	2017	Texas A&M Transportation Institute	\$300,000	9/5/17	11/15/20	Completed	Publication decision pending
NCHRP 14-41: Permanent Vegetation Control Treatments for Roadsides	2018	Texas A&M Transportation Institute	\$200,000	5/23/18	8/31/20	Completed	Publication decision pending
NCHRP 14-42: Determining the Impact of Connected and Automated Vehicle Technology on State DOT Maintenance Programs	2019	Iowa State University	\$300,000	6/6/19	1/14/22	Research in progress	
NCHRP 14-43: Construction Guide Specifications for Cold Central Plant Recycling and Cold In-Place Recycling	2020	Auburn University	\$250,000	5/26/20	3/31/22	Research in progress	
NCHRP 14-44: Guide Specifications for the Construction of Slurry Seals, Scrub Seals, and Tack Coats	2020	University of Arkansas	\$175,000	9/2/20	3/1/22	Research in progress	Contractor's final report under review
NCHRP 14-45: Guidelines for Response Planning, Assessment, and Rapid Restoration of Service of Bridges in Extreme Events	2020	Oregon State University	\$400,000	8/6/20	11/7/22	Research in progress	
NCHRP 14-46: Guidelines for the Maintenance and Construction of Rumble Strips	2021	Texas A&M Transportation Institute	\$449,441	6/1/21	11/30/23	Research in progress	
NCHRP 14-47: Tools and Technology for Roadside Landscape Asset Management	2022		\$350,000			In development	
NCHRP 14-48: Construction Guide Specifications for Pavement Treatments - Sand Seals and Ultra-thin Bonded Surface Treatments	2022		\$200,000			In development	
AREA FIFTEEN: DESIGN—GENERAL DESIGN							
NCHRP 15-53: Roadside Design for Conflicts in Proximity to Bridge Ends and Intersecting Roadways	2014	KLS Engineering LLC	\$744,767	8/25/14	11/23/21	Completed	To be published as NCHRP Research Report
NCHRP 15-55: Guidance to Predict and Mitigate Dynamic Hydroplaning on Roadways	2015	Virginia Polytechnic Institute & State University	\$499,992	6/17/15	3/31/21	Completed	Published as NCHRP Web-Only Document 300
NCHRP 15-56: Guidelines for Selecting Ramp Design Speeds	2015	MRIGlobal	\$400,000	11/10/15	6/9/21	Completed	Published as NCHRP Web-Only Document 313: Vol. 1 and Vol. 2
NCHRP 15-61A: Updates to the Design Practices Guide for Applying Climate Change Information to Hydrologic and Coastal Design of Transportation Infrastructure	2020		\$400,000			In development	
NCHRP 15-63: Guidance to Improve Pedestrian and Bicycle Safety at Intersections	2016	University of North Carolina - Chapel Hill	\$500,000	7/19/16	4/30/19	Completed	Published as NCHRP Research Report 926
NCHRP 15-66: Arterial Weaving on Conventional and Alternative Intersections	2017	University of Florida	\$749,922	11/16/20	5/16/23	Research in progress	Contractor's draft report pending
NCHRP 15-67: Wind Drag Coefficients for Highway Signs and Support Structures	2018	University of Iowa	\$358,197	11/7/18	31/1/2022	Research in progress	
NCHRP 15-68(01): Effective Low-Noise Rumble Strips	2018	Illingworth & Rodkin, Inc.	\$330,359	8/19/21	8/15/22	Research in progress	

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NCHRP 15-68: Effective Low-Noise Rumble Strips	2018	Illingworth & Rodkin, Inc.	\$699,828	7/25/18	1/24/21	Terminated	See NCHRP Project 15-68(01) for follow-on activity
NCHRP 15-69: Utility Conflict Impacts During Highway Construction	2020	Texas A&M Transportation Institute	\$600,000	6/19/20	8/18/23	Research in progress	
NCHRP 15-70: Valuation of Permitting Utility and Communications Installations in Public ROW	2020	Iowa State University	\$330,748	8/17/20	8/17/22	Research in progress	
NCHRP 15-71: Contingency Factors to Account for Risk in Early Construction Cost Estimates for Transportation Infrastructure Projects	2020	Texas A&M Transportation Institute	\$250,000	7/8/20	4/7/22	Research in progress	
NCHRP 15-72: Identification of AASHTO Context Classifications	2020	University of Kentucky Research Foundation	\$300,000	7/29/20	3/28/22	Research in progress	
NCHRP 15-73: Design Options to Reduce Turning Motor Vehicle–Bicycle Conflicts at Intersections	2020	Toole Design Group	\$600,000	10/2/20	10/2/23	Research in progress	
NCHRP 15-74: Safety Evaluation of On-Street Bicycle Facility Design Features	2020	Texas A&M Transportation Institute	\$600,000	9/1/20	8/31/23	Research in progress	
NCHRP 15-75: Update of the Policy on Geometric Design of Highways and Streets Guidance on Acceleration/Deceleration and Stopping Sight Distance Criteria	2020	Michigan State University	\$500,000	9/1/20	2/28/23	Research in progress	
NCHRP 15-76: Designing for Target Speed	2020	Texas A&M Transportation Institute	\$750,000	7/16/20	1/16/23	Research in progress	
NCHRP 15-78: Guidance for Urban and Suburban Roadway Cross-Sectional Reallocation	2020	Kittelson & Associates	\$600,000	3/25/20	9/30/22	Research in progress	
NCHRP 15-79: Development of Guidance for Non-Standard Roadside Hardware Installations	2021		\$400,000			Contract pending	
NCHRP 15-80: Design Guidance and Standards for Resilience	2021	ICF Incorporated	\$734,960	6/17/21	8/17/24	Research in progress	
NCHRP 15-81: Guideline for Depicting Existing and Proposed Utility Facilities in Design Plans	2022		\$550,000			In development	
AREA SIXTEEN: DESIGN—ROADSIDE DEVELOPMENT							
NCHRP 16-05: Guidelines for Cost-Effective Safety Treatments of Roadside Ditches	2010	Texas A&M Research Foundation	\$400,000	5/14/10	9/30/20	Completed	Published as NCHRP Web-Only Document 296
AREA SEVENTEEN: TRAFFIC—SAFETY							
NCHRP 17-11(02): Development of Clear Recovery Area Guidelines	2005	Texas A&M University	\$270,000	9/7/08	5/31/21	Terminated	See Project 17-11(03) for follow-on activity
NCHRP 17-11(03): Development of Clear Recovery Area Guidelines	2020	Texas A&M Transportation Institute	\$132,571	8/4/21	4/4/23	Research in progress	Contractor's draft report pending
NCHRP 17-43: Long-Term Roadside Crash Data Collection Program	2008	Virginia Polytechnic Institute & State University	\$1,000,000	4/27/10	9/30/21	Completed	Publication decision pending
NCHRP 17-64: Guidance for the Implementation of the Toward Zero Deaths National Strategy on Highway Safety	2013	University of Minnesota	\$496,810	3/4/16	3/31/20	Completed	Publication decision pending
NCHRP 17-66: Guidance for Selection of Appropriate Countermeasures for Opposite Direction Crashes	2014	Texas A&M Transportation Institute	\$350,000	8/27/14	4/30/20	Completed	To be published as NCHRP Research Report

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NCHRP 17-68: Intersection Crash Prediction Methods for the Highway Safety Manual	2014	MRIGlobal	\$750,000	9/1/14	12/31/19	Completed	Published as NCHRP Web-Only Document 297
NCHRP 17-71A: Proposed Highway Safety Manual, Second Edition	2015	Texas A&M Transportation Institute	\$480,000	1/21/21	1/21/23	Research in progress	
NCHRP 17-74: Developing Crash Modification Factors for Corridor Access Management	2016	Vanasse Hangen Brustlin, Inc.	\$450,000	10/24/16	10/30/20	Completed	Published as NCHRP Research Report 974: Vol. 1 and Vol. 2
NCHRP 17-76: Guidance for the Setting of Speed Limits	2016	Texas A&M Transportation Institute	\$500,000	10/7/16	3/31/20	Completed	Published as NCHRP Research Report 966 and NCHRP Web-Only Document 291
NCHRP 17-78: Understanding and Communicating Reliability of Crash Prediction Models	2016	University of North Carolina - Chapel Hill	\$300,000	9/20/16	8/31/20	Completed	Published as NCHRP Research Report 983 and NCHRP Web-Only Document 303
NCHRP 17-79: Safety Effects of Raising Speed Limits to 75 mph and Higher	2016	Texas A&M Transportation Institute	\$500,000	9/19/16	12/31/21	Research in progress	Contractor's draft report under review
NCHRP 17-80: Expansion of Human Factors Guidelines for Road Systems, Second Edition	2016	Battelle Memorial Institute	\$499,914	11/9/16	9/30/20	Completed	To be published as NCHRP Web-Only Document 316
NCHRP 17-81: Proposed Macro-Level Safety Planning Analysis Chapter for the Highway Safety Manual	2017	Vanasse Hangen Brustlin, Inc.	\$400,000	10/26/17	1/31/22	Completed	To be published as NCHRP Research Report
NCHRP 17-82: Proposed Guidance for Fixed Objects in the Roadside Design Guide	2017	MRIGlobal	\$500,000	12/12/17	3/31/22	Research in progress	Contractor's draft report pending
NCHRP 17-84: Pedestrian and Bicycle Safety Performance Functions for the Highway Safety Manual	2017	MRIGlobal	\$820,000	3/27/17	5/27/22	Research in progress	Contractor's draft report pending review
NCHRP 17-85: Development and Application of Crash Severity Models for the Highway Safety Manual	2018	University of Connecticut	\$600,000	1/10/19	6/30/22	Research in progress	Contractor's draft report pending
NCHRP 17-86: Estimating Effectiveness of Safety Treatments in the Absence of Crash Data	2018	Vanasse Hangen Brustlin, Inc.	\$599,567	10/22/18	1/22/22	Research in progress	Contractor's draft report pending
NCHRP 17-87: Enhancing Pedestrian Volume Estimation and Developing HCM Pedestrian Methodologies for Safe and Sustainable Communities	2018	Kittelson & Associates	\$690,000	4/20/18	4/20/20	Completed	To be published as NCHRP Web-Only Document 312 and NCHRP Research Report 992
NCHRP 17-88: Roadside Encroachment Database Development and Analysis	2018	Virginia Polytechnic Institute & State University	\$675,000	6/19/18	6/18/22	Research in progress	
NCHRP 17-89: Safety Performance of Part-Time Shoulder Use on Freeways	2018	Kittelson & Associates	\$400,000	6/15/18	6/30/21	Completed	Published as NCHRP Web-Only Document 309: Vol. 1 and Vol. 2
NCHRP 17-89A: HOV/HOT Freeway Crash Prediction Method for the Highway Safety Manual	2018	Vanasse Hangen Brustlin, Inc.	\$299,998	7/10/18	12/31/21	Completed	Publication decision pending
NCHRP 17-90: Evaluation of Roadside Crash Injury Metrics in MASH	2019	Virginia Polytechnic Institute & State University	\$400,000	7/8/19	12/31/22	Research in progress	Contractor's draft report under review

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NCHRP 17-91: Assessing the Impacts of Automated Driving Systems (ADS) on the Future of Transportation Safety	2019	Booz-Allen & Hamilton	\$764,997	5/24/19	11/23/21	Completed	Publication decision pending
NCHRP 17-92: Developing Safety Performance Functions for Rural Two-Lane Highways that Incorporate Speed Measures	2019	Texas A&M Transportation Institute	\$500,000	4/24/19	4/23/22	Research in progress	
NCHRP 17-93: Updating Safety Performance Functions for Data-Driven Safety Analysis	2019	University of North Carolina - Chapel Hill	\$500,000	7/1/19	12/31/22	Research in progress	
NCHRP 17-95: Crash Modification Factors for Intelligent Transportation Systems (ITS) Applications	2020	University of North Carolina - Chapel Hill	\$400,000	6/1/20	9/1/22	Research in progress	
NCHRP 17-96: Traffic Safety Culture Research Roadmap	2021	University of North Carolina - Chapel Hill	\$374,589	8/31/21	8/31/23	Research in progress	
NCHRP 17-97: Strategies to Improve Pedestrian Safety at Night	2021	Toole Design Group, LLC	\$500,000	10/1/21	9/30/24	Research in progress	
NCHRP 17-98: Guide for Intersection Control Evaluation	2021	Kittelson & Associates	\$400,000	5/17/21	5/16/23	Research in progress	
NCHRP 17-99: Safety Effectiveness Assessment of Advanced Highway-Rail Grade Crossing Improvements	2021		\$500,000			In development	
NCHRP 17-100: Leveraging Artificial Intelligence and Big Data to Enhance Safety Analysis	2021		\$650,000			Contract pending	
NCHRP 17-101: Safe Systems in the U.S. – Developing a Roadmap for Transportation Road Designers, Planners, and Engineers	2021		\$450,000			In development	
NCHRP 17-102: Safety Performance for Active Transportation Modes using Exposure Models	2022		\$700,000			In development	
NCHRP 17-103: Developing Multidisciplinary Safety Strategies from Understanding Roadway Fatality Trends During the New Millennium	2022		\$500,000			In development	
NCHRP 17-104: Enhancement of Roadside Design Features Safety Performance Models for the Highway Safety Manual	2022		\$500,000			In development	
NCHRP 17-106: Motorist behavior and safety impacts on bicyclists from centerline and shoulder rumble strips on high-speed two-lane highways	2022		\$400,000			In development	
NCHRP 17-107: Work Zone Intrusion Frequency and Characteristics	2022		\$600,000			In development	
NCHRP 17-108: Develop Crash Modification Factors (CMFs) for Alternative Intersections, Including Displaced Left-Turn (DLT), Median U-Turn (MUT), and Restricted Crossing U-Turn (RCUT).	2022		\$600,000			In development	
NCHRP 17-109: Crash Modification Factors (CMFs) for Automated Traffic Signal Performance Measures (ATSPMs)	2022		\$400,000			In development	
AREA EIGHTEEN: MATERIALS AND CONSTRUCTION—CONCRETE MATERIALS							
NCHRP 18-18: Design and Construction of Deck Bulb Tee Girder Bridges with UHPC	2017	Ohio University	\$478,125	7/3/17	11/15/21	Completed	To be published as NCHRP Research Report
NCHRP 18-19: Rating Concrete Water Permeability Based on Resistivity Measurements	2019	University of Florida	\$600,000	8/12/19	8/11/22	Research in progress	
NCHRP 18-20: Structural Design Methodology for Cured In Place Pipe (CIPP) Liners In Gravity Stormwater Conveyance Conduits	2020	Golder Associates Inc.	\$370,000	8/21/20	5/21/23	Research in progress	

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AREA NINETEEN: ADMINISTRATION—FINANCE							
NCHRP 19-15: Guidebook for Effective Policies and Practices for Managing Surface Transportation Debt	2018	WSP USA Inc.	\$300,000	6/25/18	4/15/21	Completed	Publication decision pending
NCHRP 19-16: Federal Funding Uncertainty in State, Local, and Regional Departments of Transportation: Impacts, Responses, and Adaptation	2019	WSP USA Inc.	\$400,000	5/22/19	3/1/22	Research in progress	
NCHRP 19-17: The Application of Federal Funding Flexibility at the State DOTs	2020	AECOM Technical Services, Inc	\$400,000	5/20/20	6/30/22	Research in progress	
NCHRP 19-18: Transitioning Fuel Tax Assessments to a Road Usage Charge	2021	Milestone Solutions LLP	\$599,932	5/25/21	5/25/23	Research in progress	
NCHRP 19-19: Sustaining a Zero Fare Public Transportation Program in a Post COVID-19 World	2022		\$300,000			In development	
NCHRP 19-20: Interdependence of Federal, State, and Local Transportation Funding and Ownership	2022		\$450,000			In development	
AREA TWENTY: SPECIAL PROJECTS							
NCHRP 20-05/Topic 51-01: Practices for Construction Ready Digital Terrain Models	2019	University of Kentucky Research Foundation	\$45,000	11/12/2019	5/12/21	Completed	Published as NCHRP Synthesis 560
NCHRP 20-05/Topic 51-02: Practices for Bridge Approach Systems	2019	Wiss Janey Elstner	\$45,000	11/12/19	5/12/21	Completed	Published as NCHRP Synthesis 566
NCHRP 20-05/Topic 51-03: Temporary Pavement Markings Placement and Removal Practices in Work Zones	2019	Curators of the University of Missouri	\$45,000	11/6/19	5/6/21	Completed	Published as NCHRP Synthesis 574
NCHRP 20-05/Topic 51-04: Practices for Selecting Pedestrian and Bicycle Projects	2019	T.Y. Lin International Eng, Arch & Land Surv	\$45,000	11/25/19	5/25/21	Completed	Published as NCHRP Synthesis 564
NCHRP 20-05/Topic 51-04: Practices for Selecting Pedestrian and Bicycle Projects delete duplicate entry?	2019	T.Y. Lin International Eng, Arch & Land Surv	\$45,000	11/25/2019	5/12/21	Completed	Published as NCHRP Synthesis 564
NCHRP 20-05/Topic 51-05: Collaborative Practices for Performance-Based Asset Management Between State DOTs and MPOs	2019	Spy Pond Partners	\$45,000	10/31/19	4/30/21	Completed	Published as NCHRP Synthesis 577
NCHRP 20-05/Topic 51-06: State DOT Use of Vehicle Probe and Cellular GPS Data	2019	Michael L. Pack, LLC	\$45,000	10/18/2019	4/19/21	Completed	Published as NCHRP Synthesis 561
NCHRP 20-05/Topic 51-07: Practices for Assessing and Mitigating the Moisture Susceptibility of Asphalt Pavements	2019	Purdue University	\$45,000	1/14/20	12/31/22	Research in progress	Contractor's final report under review
NCHRP 20-05/Topic 51-08: Practice and Performance of Cold In-Place Recycling and Cold Central Plant Recycling	2019	Gardiner Technical Services	\$45,000	10/23/19	4/23/21	Completed	Published as NCHRP Synthesis 569
NCHRP 20-05/Topic 51-09: Concrete Pavements Joint Sealant Practices and Performance	2019	Texas A&M Transportation Institute	\$45,000	11/14/19	5/14/21	Completed	Published as NCHRP Synthesis 568
NCHRP 20-05/Topic 51-10: Flood Resiliency and Adaptation Through Integrated Storm Prediction and Response Systems	2019	Villanova University	\$45,000	12/9/19	5/10/21	Completed	Published as NCHRP Synthesis 573
NCHRP 20-05/Topic 51-11: Design Practices and Solutions for Rural Intersection Lighting	2019	Rensselaer Polytechnic Institute	\$45,000	11/6/2019	5/6/21	Completed	Published as NCHRP Synthesis 575

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NCHRP 20-05/Topic 51-12: Night Movement of Oversize/Overweight Loads	2019	Applied Research Associates	\$45,000	10/25/21	4/25/21	Completed	Published as NCHRP Synthesis 572
NCHRP 20-05/Topic 51-13: Load Rating of Bridges with Missing As-Built Plans	2019	University of Delaware	\$45,000	11/7/19	5/7/21	Completed	To be published as NCHRP Synthesis 571
NCHRP 20-05/Topic 51-14: Repair and Maintenance of Post-Tensioned Concrete Bridges	2019	Ohio State University	\$45,000	11/8/19	5/10/21	Completed	Published as NCHRP Synthesis 562
NCHRP 20-05/Topic 51-15: State DOT Practice for Developing and Implementing TSMO Plans	2019	Texas A&M Transportation Institute	\$45,000	11/20/19	5/20/21	Completed	Published as NCHRP Synthesis 567
NCHRP 20-05/Topic 51-16: Maintenance and Surface Preparation Activities Prior to Pavement Preservation	2019	Applied Pavement Technology, Inc.	\$45,000	10/17/19	4/19/21	Completed	Published as NCHRP Synthesis 565
NCHRP 20-05/Topic 51-17: Practices for Closing Out Highway Projects from Substantial Completion to Final Document Receipt	2019	Colorado State University	\$45,000	12/4/19	5/4/21	Completed	Published as NCHRP Synthesis 570
NCHRP 20-05/Topic 51-18: Practices for Project-Level Analyses for Air Quality	2019	Zamurs & Associates	\$45,000	11/4/19	5/4/21	Completed	Published as NCHRP Synthesis 576
NCHRP 20-05/Topic 51-19: Performance Metrics for Public-Private Partnerships	2019	Gransberg & Associates Inc.	\$45,000	11/13/2019	5/13/21	Completed	Published as NCHRP Synthesis 563
NCHRP 20-05/Topic 52-01: Highway Infrastructure Inspection Practices for the Digital Age	2021	Tran and Associates, LLC (ePro)	\$45,000	11/1/20	4/30/22	Research in progress	Contractor's final report under review
NCHRP 20-05/Topic 52-02: Bridge Element Data and Use	2021	Basak Bektas	\$45,000	10/1/20	3/31/22	Research in progress	Contractor's final report under review
NCHRP 20-05/Topic 52-03: Practices for Ensuring Bridge Surface Smoothness	2021	Soil and Materials Engineers Inc.	\$45,000	12/14/20	6/14/22	Research in progress	Contractor's final report under review
NCHRP 20-05/Topic 52-04: Use of Unmanned Aircraft Systems for Highway Construction	2021	Oregon State University	\$45,000	12/23/20	6/23/22	Research in progress	Contractor's final report under review
NCHRP 20-05/Topic 52-05: Implementation of Subsurface Utility Engineering for Highway Design and Construction	2021	Iowa State University	\$45,000	11/16/20	5/16/22	Research in progress	Contractor's final report under review
NCHRP 20-05/Topic 52-06: Agency Use of Quality Control Plans for Administering Quality Assurance Specifications	2021	Tran and Associates LLC (ePro)	\$45,000	11/1/20	4/30/22	Research in progress	Publication decision pending
NCHRP 20-05/Topic 52-07: Use of Pavement Data Collection Technology for Pavement Data Quality Management and MAP-21 Reporting	2021	Nichols Consulting Engineers	\$45,000	12/15/20	6/15/22	Research in progress	Contractor's final report under review
NCHRP 20-05/Topic 52-08: Practices for Balancing Safety Investments in a Comprehensive Safety Program	2021	Vanasse Hangen Brustlin, Inc.	\$45,000	12/4/20	6/4/22	Research in progress	Publication decision pending
NCHRP 20-05/Topic 52-09: Use of Safety Management Systems in Managing Highway Maintenance Worker Safety	2021	Blue Hardhat Consulting LLC (ePro)	\$45,000	11/1/20	4/30/22	Research in progress	Publication decision pending
NCHRP 20-05/Topic 52-10: Subsurface Drainage Practices in Pavement Design, Construction, and Maintenance	2021	Kathleen T. Hall (ePro)	\$45,000	12/15/20	6/15/22	Research in progress	Contractor's final report under review
NCHRP 20-05/Topic 52-11: Use of Smart Work Zone Technologies for Improving Work Zone Safety	2021	University of Missouri	\$45,000	12/8/20	6/8/22	Research in progress	Contractor's final report under review
NCHRP 20-05/Topic 52-12: Rehabilitation of Culverts and Buried Storm Drain Pipes	2021	Halil Sezen DBA SE Consulting (ePro)	\$45,000	12/15/20	6/15/22	Research in progress	Contractor's final report under review

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NCHRP 20-05/Topic 52-13: Micromobility Policies, Permits, and Practices	2021	University of South Florida	\$45,000	2/23/21	8/23/22	Research in progress	
NCHRP 20-05/Topic 52-14: 3D Digital Models as Highway Construction Contract Documents	2021	University of Kentucky Research Foundation	\$45,000	11/20/20	5/20/22	Research in progress	Contractor's final report under review
NCHRP 20-05/Topic 52-15: Measuring Investments in Active Transportation When Accomplished as Part of Other Transportation Projects	2021	Toole Design Group LLC	\$45,000	1/11/21	7/11/22	Research in progress	
NCHRP 20-05/Topic 52-16: Visualization of Highway Performance Measures	2021	Metro Analytics LLC	\$45,000	12/4/20	6/4/22	Research in progress	Contractor's final report under review
NCHRP 20-05/Topic 52-17: Use of Recycling Agents in Asphalt Concrete Mixtures	2021	University of New Hampshire	\$45,000	12/14/20	6/14/22	Research in progress	Contractor's final report under review
NCHRP 20-05/Topic 52-18: Design Practices for Rock Slopes and Rockfall Management	2021	Landslide Techology	\$45,000	12/2/20	6/2/22	Research in progress	Contractor's final report under review
NCHRP 20-05/Topic 52-19: Technological Capabilities of DOTs for Digital Project Management and Delivery	2021	University of Kentucky Research Foundation	\$45,000	12/16/20	5/31/22	Research in progress	Contractor's final report under review
NCHRP 20-05/Topic 53-01: DOT Practices to Promote Equity in Transportation Funding	2022		\$45,000			Contract pending	
NCHRP 20-05/Topic 53-02: Practices to Motivate Safe Behaviors with Highway Construction and Maintenance Crews	2022		\$45,000			In development	
NCHRP 20-05/Topic 53-03: Practices Leveraging Social Media Data for Emergency Preparedness and Response	2022		\$45,000			In development	
NCHRP 20-05/Topic 53-04: Practices for the Collection, Use, and Management of Utility As-Built Information	2022	University of Kentucky Research Foundation	\$45,000	11/1/21	5/2/23	Research in progress	
NCHRP 20-05/Topic 53-05: Practices for Bioretention Stormwater Control Measures	2022		\$45,000			Contract pending	
NCHRP 20-05/Topic 53-06: Local Calibration of LRFD Geotechnical Resistance Factors	2022		\$45,000			Contract pending	
NCHRP 20-05/Topic 53-07: Curing Practices for Concrete Pavement	2022		\$45,000			Contract pending	
NCHRP 20-05/Topic 53-08: DOT Strategies and Programs for Electric Vehicle Charging	2022		\$45,000			In development	
NCHRP 20-05/Topic 53-09: Use of Unmanned Aerial Systems for Highway Stormwater Inspections	2022		\$45,000			In development	
NCHRP 20-05/Topic 53-10: Practices for Contrast Pavement Markings	2022		\$45,000			In development	
NCHRP 20-05/Topic 53-11: Resilient Design with Distributed Rainfall Modeling	2022		\$45,000			Contract pending	
NCHRP 20-05/Topic 53-12: Practices for Adding Bicycle and Pedestrians Access on Existing Vehicle Bridges	2022		\$45,000			In development	
NCHRP 20-05/Topic 53-13: Practices for Steel Bridge Fabrication and Erection Tolerances	2022	Medlock LLC	\$45,000	11/1/21	4/30/23	Research in progress	
NCHRP 20-05/Topic 53-14: Use of Probe Data for Freight Planning and Operations	2022		\$45,000			In development	

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NCHRP 20-05/Topic 53-15: Coordination of Upgrades and Installation of New Software Required by Traffic Operations and Maintenance	2022		\$45,000			Canceled	
NCHRP 20-05/Topic 53-16: Critical Findings for Tunnel Functional Systems	2022		\$45,000			Contract pending	
NCHRP 20-05/Topic 53-17: Integrating Freight and Active Transportation into Policies, Programs, Plans, and Project Development	2022		\$45,000			In development	
NCHRP 20-05/Topic 53-18: Moisture Measurement for Foundations and Slopes	2022		\$45,000			Contract pending	
NCHRP 20-05/Topic 53-19: State DOT Product Evaluation Processes	2022		\$45,000			In development	
NCHRP 20-06/Topic 25-01: Public Liabilities Relating to Driveway Permits	2018	University of Kentucky Research Foundation	\$50,000	2/25/20	6/30/21	Completed	Publication decision pending
NCHRP 20-06/Topic 25-03: Managing Enhanced Risk in the Mega Project Era	2018	Cal Poly Pomona Foundation, Inc.	\$150,000	5/13/20	9/30/21	Completed	Publication decision pending
NCHRP 20-06/Topic 25-04: Laws Governing Homeless Encampments in Transportation Rights of Way	2018	Texas A&M Transportation Institute	\$75,000	11/19/20	3/1/22	Research in progress	
NCHRP 20-06/Topic 25-05: The Legal Issues Associated with Consequential Damages Provisions in Construction Contracts	2018	Kaplan Kirsch Rockwell, LLP	\$74,625	2/6/20	1/31/22	Research in progress	
NCHRP 20-06/Topic 25-06: Legal Aspects and Strategies of Best-Value Procurement for Highway Construction (Update)	2018	Colorado State University	\$100,000	1/14/21	1/14/22	Research in progress	
NCHRP 20-06/Topic 25-07: Review of Statutory and Case Law on Planning and Environmental Linkages	2018	Beveridge & Diamond PC	\$50,000	4/20/20	4/20/22	Research in progress	
NCHRP 20-06/Topic 26-01: Effects of Indian Treaties on Development and Operation of Transportation Facilities	2021		\$100,000			In development	
NCHRP 20-06/Topic 26-02: Analysis of Arbitration and Holdings in Construction Disputes	2021		\$100,000			In development	
NCHRP 20-06/Topic 26-03: Multistate Coordination and Harmonization for AV Legislation	2021		\$100,000			In development	
NCHRP 20-06/Topic 26-04: Pandemics and Contractual Issues	2021		\$100,000			In development	
NCHRP 20-07/Task 334: Primer on the Joint Use of the HSM and HFG	2013	Battelle Memorial Institute	\$199,971	7/27/16	8/31/20	Completed	Agency report posted on project webpage
NCHRP 20-07/Task 358: Reducing Risks to Worker Safety in Work Zones Due to Distracted Drivers	2014	Texas A&M Transportation Institute	\$100,000	3/1/21	9/1/22	Research in progress	Contractor's draft report pending
NCHRP 20-07/Task 368: Development of a Roadmap for Use of SHRP2 Safety Data to Enhance Existing Publications	2015	Texas A&M Transportation Institute	\$100,000	4/17/19	2/26/21	Completed	Agency report posted on project webpage
NCHRP 20-07/Task 372: Evaluation of MASH Test Vehicles	2015	University of Nebraska - Lincoln	\$90,000	9/27/18	12/26/19	Completed	Agency report posted on project webpage
NCHRP 20-07/Task 383: Review and Update of the AASHTO Roadside Design Guide	2016	Leidos Inc.	\$220,000	6/27/16	11/30/22	Research in progress	Contractor's draft report pending
NCHRP 20-07/Task 384: Core Competencies for Key Safety Analyses	2016	Texas A&M Transportation Institute	\$75,000	6/17/19	6/30/21	Completed	Agency report posted on project webpage

Project No. and Title	Fiscal Year	Research Agency	Contract Amount	Starting Date	Completion Date	Status	Status Comments
NCHRP 20-07/Task 401: Addressing Roadside Safety: A Systemic Approach to Hardware Replacement Analysis to Support MASH Implementation	2017	Roadsafe LLC	\$100,000	1/4/19	9/4/20	Completed	Published as NCHRP Web-Only Document 292
NCHRP 20-07/Task 407: Utility Coordination Efficiency, Safety, Cost, and Schedule Impacts Using Various Contracting Methods	2017	University of Kentucky Research Foundation	\$100,000	10/4/18	6/30/20	Completed	Agency report posted on project webpage
NCHRP 20-07/Task 414: Benefits of Adaptive Traffic Control Deployments -- A Review of Evaluation Studies	2018	Florida Atlantic University	\$99,912	5/24/18	7/23/19	Completed	Agency report posted on project webpage
NCHRP 20-07/Task 416: Alternative Technologies for Mitigating the Risk of Injuries and Deaths in the Work Zone	2018	Oregon State University	\$75,000	8/25/20	8/25/21	Completed	Publication decision pending
NCHRP 20-07/Task 418: An Impact and Value Analysis of Requiring Geo-spatial Locations for Utility Installation As-builts	2018	Utility Mapping Services, Inc.	\$100,000	2/8/19	6/30/20	Completed	Agency report posted on project webpage
NCHRP 20-07/Task 421: Review and Update of AASHTO Standard Methods of Test T27 and T30	2018	University of Arkansas	\$18,695	4/29/19	4/29/20	Completed	Project discontinued after Phase I
NCHRP 20-07/Task 426: Update to NCHRP 20-7/Task 309, Challenges and Opportunities: A Strategic Plan for Equipment Management Research	2018	Mercury Associates Inc.	\$85,000	5/1/20	3/31/22	Research in progress	
NCHRP 20-07/Task 428: Update of the 2012 AASHTO Guide Specifications for Design of Bonded FRP Systems for Repair and Strengthening of Concrete Bridge Elements	2018	University of Kentucky Research Foundation	\$130,000	9/3/19	7/30/21	Completed	Publication decision pending
NCHRP 20-24(115): Development of Strategic Plan for Transportation Workforce Planning and Development	2017		\$100,000			Canceled	See NCHRP Project 20-24(95)A for follow-on activity
NCHRP 20-24(127): Performance Management Implementation Concerns, Issues and Challenges	2019	Spy Pond Partners	\$224,977	6/10/19	3/31/22	Research in progress	
NCHRP 20-24(128): State-of-the-Art Review of Cooperative Automated Transportation (CAT) Systems	2019	WSP USA Inc.	\$699,998	7/16/19	10/31/22	Research in progress	
NCHRP 20-24(129): CEO Peer Exchange, 2019	2019		\$250,000	10/10/19	6/9/20	Completed	Agency report posted on project webpage
NCHRP 20-24(130): Support for AASHTO Strategic Plan, 2020	2019	Spy Pond Partners	\$450,000	5/7/20	1/6/22	Research in progress	
NCHRP 20-24(131): Mapping the Common Interests of AASHTO Committees	2020	Spy Pond Partners	\$250,000	10/23/20	11/22/22	Research in progress	
NCHRP 20-24(133): Update to Transportation Governance: A 50-State Review of State Legislatures and Departments of Transportation	2020	J.R. Rall Consulting LLC	\$200,000	8/30/21	2/28/23	Research in progress	
NCHRP 20-24(137): Assessing and Communicating the Economic and Quality of Life Benefits of Transportation Infrastructure Investments: Message Testing	2020	WSP USA Inc.	\$150,000	11/8/21	11/7/22	Research in progress	
NCHRP 20-24(138): Collective and Individual Actions for State Departments of Transportation Envisioning and Realizing the Next Era of America's Transportation Infrastructure	2021	Cambridge Systematics	\$400,000	10/12/21	10/11/22	Research in progress	
NCHRP 20-24(139): Into the 2020s: A Peer Exchange Series for State DOT CEOs	2022		\$900,000			In development	

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NCHRP 20-24(141): The Art of Decision-Making	2022		\$300,000			In development	
NCHRP 20-24(85): Scoping Support for New NCHRP 20-24 Projects	2012		\$20,000			In development	
NCHRP 20-30/IDEA 196: Smart Installation and Monitoring System for Large Anchor Bolts of Support Structure of Highway Signs, Luminaires, and Traffic Signals	2016	Iowa State University	\$140,000	1/23/17	4/30/22	Research in progress	
NCHRP 20-30/IDEA 205: MRI Bridge Analysis and Multi-Modal Imaging Using Optimal Multi-Coil Resonant Coupling	2017	Power Polymer, LLC	\$45,000	10/1/20	3/31/22	Research in progress	
NCHRP 20-30/IDEA 206: From Location Tracking to Continuous Interpretation: Rule-Based Automated Safety Monitoring Systems for Highway Work Zone Safety	2017	University of Houston	\$139,915	5/1/18	4/30/22	Research in progress	
NCHRP 20-30/IDEA 209: An Automated System for Pedestrian Facility Data Collection from Aerial Images	2018	University of Southern Mississippi	\$129,954	11/7/18	2/6/22	Research in progress	
NCHRP 20-30/IDEA 210: Material Characteristics of Cu-Based Superelastic Alloys for Applications in Bridge Columns to Improve Seismic Performance	2018	University of Southern California	\$130,000	10/26/18	1/25/22	Research in progress	
NCHRP 20-30/IDEA 211: Reducing Stormwater Runoff and Pollutant Loading with Biochar Addition to Highway Greenways	2017	University of Delaware	\$100,000	10/18/18	10/31/21	Completed	Agency report posted on project webpage
NCHRP 20-30/IDEA 213: SEAHIVE -- Sustainable Estuarine and Marine Revetment	2018	University of Miami	\$119,174	10/24/18	4/30/22	Research in progress	
NCHRP 20-30/IDEA 214: An Enhanced Network-Level Curve Safety Assessment and Monitoring Using Mobile Devices	2018	Georgia Institute of Technology	\$99,963	11/15/18	11/14/21	Completed	Agency report posted on project webpage
NCHRP 20-30/IDEA 215: Achieving Resilient Multi-Span Bridges by Using Buckling-Restrained Braces	2018	University at Buffalo	\$99,997	4/1/19	12/31/22	Research in progress	
NCHRP 20-30/IDEA 216: The Portable Single Lane Traffic Counting Device	2018	Leetron Vision, LLC	\$137,000	4/24/19	12/31/21	Completed	Agency report posted on project webpage
NCHRP 20-30/IDEA 217: Real-Time Proactive Intersection Safety Monitoring and Visualization System Based on Radar Sensor Data	2018	University of Louisville	\$137,000	7/1/19	3/31/22	Research in progress	
NCHRP 20-30/IDEA 218: Determination of a Fast and Cost Effective Asphalt Mixture Test System	2018	Michigan State University	\$130,000	10/4/19	3/31/22	Research in progress	
NCHRP 20-30/IDEA 219: A Novel Durable, Healable and Conveniently Removable Pavement Marking Material Suitable for Both Permanent and Temporary Marking Uses	2018	North Dakota State University	\$129,999	10/25/19	8/31/22	Research in progress	
NCHRP 20-30/IDEA 220: Bridge Deck Sealant Monitor: Thermal Sealcheck	2019	Fuchs Consulting, Inc.	\$125,000	10/1/19	12/31/21	Completed	Agency report posted on project webpage
NCHRP 20-30/IDEA 221: Development of In-Situ Cyclic Borehole Shear Soil Test Device	2019	Iowa State University	\$130,000	1/1/20	9/30/22	Research in progress	
NCHRP 20-30/IDEA 222: Mixed Reality Infrastructure Inspections	2019	University of Central Florida Board of Trustees	\$135,000	4/1/20	3/31/22	Research in progress	
NCHRP 20-30/IDEA 223: Fatigue Crack Inspection Using Computer Vision and Augmented Reality	2019	University of Kansas Center for Research	\$135,000	1/1/21	12/31/22	Research in progress	

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NCHRP 20-30/IDEA 224: Development of an Automated and Rapid Conditioning and Testing Device for Cracking and Rutting	2019	Texas A&M Transportation Institute	\$135,000	1/1/21	12/31/22	Research in progress	
NCHRP 20-30/IDEA 225: An Automated System for Large-Scale Intersection Marking Data Collection and Condition Assessment	2019	Old Dominion University Research Foundation	\$135,000	1/1/21	12/31/22	Research in progress	
NCHRP 20-30/IDEA 226: A Smart IoT Proximity System for Highway Work Zone Safety	2020	Georgia Institute of Technology	\$100,000	1/19/21	1/18/23	Research in progress	
NCHRP 20-30/IDEA 227: Adjustable Cross-frames for the Erection of Steel Girder Bridges	2020	University of Notre Dame	\$135,000	7/1/21	6/30/23	Research in progress	
NCHRP 20-30/IDEA 228: A Retroreflective Road Lane Marking Tape 1,000X Brighter Than Existing Technology	2020	Mark O'Neill LLC	\$129,267	1/1/21	3/31/22	Research in progress	
NCHRP 20-30/IDEA 229: Lab Dielectric Measurement System for Asphalt Mixture Bulk Specific Gravity Determination	2020	University of New Hampshire	\$135,422	1/1/21	12/31/22	Research in progress	
NCHRP 20-30/IDEA 230: Automated Data and Feature Extraction from Bridge Plans	2020	Iowa State University	\$134,638	7/1/21	6/30/23	Research in progress	
NCHRP 20-30/IDEA 231: AI Analyzer for Revealing Insights of Traffic Crashes	2020	University of Nevada-Las Vegas	\$82,899	7/1/21	6/30/23	Research in progress	
NCHRP 20-30/IDEA 232: Measuring Concrete Permeability with CHIP	2020	Oklahoma State University	\$100,000	7/1/21	6/30/23	Research in progress	
NCHRP 20-30/IDEA 233: Development of an Innovative Bio-Mediated Self-Healing Concrete Technology	2020	Case Western Reserve University	\$135,000	10/1/21	9/30/23	Research in progress	
NCHRP 20-30/IDEA 234: Field Test and Evaluation of a Solar Snow Fence	2021	Longboard Power, LLC	\$99,430	10/1/21	5/31/23	Research in progress	
NCHRP 20-30/IDEA 235: High Bond Steel Fibers for Ultra High Performance Concrete (UHPC)	2021	HiPer Fiber, LLC	\$99,971	10/1/21	9/30/22	Research in progress	
NCHRP 20-30/IDEA 236: A Practical Method to Determine Reclaimed Asphalt Pavement Binder Availability	2021	North Carolina State University	\$134,995	10/1/21	3/31/23	Research in progress	
NCHRP 20-30/IDEA 237: Machine Learning-Based Tool to Predict the Retroreflectivity of Pavement Markings in the U.S.	2021	Louisiana State University A&M College	\$100,000	1/1/22	12/31/23	Research in progress	
NCHRP 20-44(02): Implementation of the AASHTO Guide for Enterprise Risk Management	2017	Starisis Corporation	\$299,997	4/2/18	3/31/21	Completed	To be published as NCHRP Research Report 986
NCHRP 20-44(04): Implementing Products from NCHRP Research on Adhesive Anchor Systems	2016	Prestressed Concrete Institute	\$100,000	1/22/19	9/30/20	Completed	Agency report posted on project webpage
NCHRP 20-44(09): Quantitative and Qualitative Methods for Capturing the Impacts and Value of NCHRP Research	2018	Texas A&M Transportation Institute	\$446,630	5/10/19	10/31/21	Completed	Agency report posted on project webpage
NCHRP 20-44(12): Building Capacity for Self-Assessment of Data Effectiveness for Agency Business Needs	2019	Spy Pond Partners	\$220,000	11/10/20	2/9/22	Research in progress	Agency report posted on project webpage
NCHRP 20-44(13): Implementation of NCHRP Research Report 893: The Oregon DOT Statewide Pedestrian and Bicycle Plan	2019	Kittelson & Associates	\$154,000	8/5/19	11/30/20	Completed	Agency report posted on project webpage
NCHRP 20-44(15): Consultant Support for Implementation of Design Hydrology for Stream Restoration and Channel Stability at Stream Crossings	2019	University of Georgia	\$99,990	5/1/19	2/28/21	Completed	Agency report posted on project webpage
NCHRP 20-44(16): Implementation of IDEAL Cracking Test for Asphalt Mix Design QC/QA	2019	Texas A&M Transportation Institute	\$119,645	8/1/19	10/31/21	Completed	Agency report posted on project webpage

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NCHRP 20-44(17): Successful Approaches for the Use of Unmanned Aerial System by Surface Transportation Agencies	2019	University of Vermont and State Agricultural College	\$173,500	4/28/20	4/27/22	Research in progress	
NCHRP 20-44(18): Validation of Performance-Based Mix Design of Porous Friction Courses	2019	Auburn University	\$85,000	9/1/19	6/30/21	Completed	Published as NCHRP Web-Only Document 305
NCHRP 20-44(19): Implementation of Proposed AASHTO Standards for Asphalt Binders and Mixtures	2019	Asphalt Institute	\$119,866	5/1/20	5/1/22	Research in progress	
NCHRP 20-44(22): Right Sizing Transportation Investments	2019	Metro Analytics PLLC	\$384,260	8/15/19	12/31/21	Completed	Agency report posted on project webpage
NCHRP 20-44(23): Pilot Test of Climate Change Design Practices Guide for Hydrology and Hydraulics	2020	Dewberry Engineers Inc.	\$247,547	9/30/20	8/31/22	Research in progress	
NCHRP 20-44(24): Pilot Test of Proposed Standard Practice for Recycling Agents in Asphalt Mixtures Incorporating RAP and RAS	2020	Texas A&M Transportation Institute	\$150,000	12/19/19	12/15/22	Research in progress	
NCHRP 20-44(25): Workshop to Introduce Proposed Changes to AASHTO M 320 and M 332 to Key Stakeholder Groups	2020	D'Angelo Consulting LLC	\$49,900	2/1/20	10/15/20	Completed	Agency final deliverables sent to NCHRP Project 09-60 panel
NCHRP 20-44(26): Implementing Guide Specifications for the Construction of Chip Seals, Micro Surfacing, Fog Seals	2020	Michigan State University	\$200,000	9/24/20	9/25/23	Research in progress	
NCHRP 20-44(27): Facilitating Balanced Mix Design Implementation	2021	Auburn University	\$195,000	9/9/20	9/9/22	Research in progress	
NCHRP 20-44(28): Development of a Technology Transfer Plan for State Departments of Transportation Research Programs	2020	CTC & Associates LLC	\$159,960	11/30/20	11/29/22	Research in progress	
NCHRP 20-44(29): Training for Highway Construction Noise Prediction Model-RCNM2.0	2020	Gannett Fleming Inc.	\$15,840	6/21/21	4/14/22	Research in progress	
NCHRP 20-44(30): Measuring the Effectiveness of Public Involvement in Transportation Planning and Project Delivery	2020	PRR Inc.	\$199,952	11/11/20	4/29/22	Research in progress	
NCHRP 20-44(31): Implementation of NCHRP Research Report 923 & the Electronic Workforce Optimization Workbook (e-WOW) for Transportation Projects	2021		\$200,000			Contract pending	
NCHRP 20-44(32): Guidelines for Selecting Travel Forecasting Methods and Techniques	2020	Resource Systems Group, Inc.	\$375,878	9/21/20	9/20/22	Research in progress	
NCHRP 20-44(33): Evaluating the Suitability of Roadway Corridors for Use by Monarch Butterflies	2020	Monarch Joint Venture	\$162,800	2/10/21	8/10/22	Research in progress	
NCHRP 20-44(34): Successful Practices for State Transportation Research Office's Complying with 2 CFR 200	2020	Applied Research Associates Inc.	\$190,000	4/26/21	10/26/22	Research in progress	
NCHRP 20-44(35): Implementation of NCHRP Report 948: Guide for Pedestrian and Bicycle Safety at Alternative Intersections and Interchanges	2020		\$250,000			Contract pending	
NCHRP 20-44(36): Workshops on Long-Range Strategic Issues Affecting Preservation, Maintenance, and Renewal of Highway Infrastructure	2020		\$280,000			In development	

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NCHRP 20-44(37): Workshops on Performance Measures in Snow and Ice Control Operations	2020		\$225,000			In development	
NCHRP 20-44(39): Guidebook for Managing Data from Emerging Technologies for Transportation	2020	Applied Engineering Management Corporation	\$365,700	4/21/21	12/20/22	Research in progress	
NCHRP 20-44(40): Ensuring Essential Capability for the Future Transportation Agency	2020		\$300,000			In development	
NCHRP 20-44(41): Deploying Transportation Resilience Practices in State DOTs	2021		\$180,000			In development	
NCHRP 20-44(42): Agency Implementation of the Design-Build and Contract Manager/ General Contractor Guidebooks for Post-Award Contract Administration	2021		\$250,000			Contract pending	
NCHRP 20-50(18): LTPP Data Analysis: Significance of As-Constructed Asphalt Pavement Air Voids to Pavement Performance	2018	Auburn University	\$425,000	4/1/18	6/30/20	Completed	Published as NCHRP Web-Only Document 299
NCHRP 20-50(20): LTPP Data Analysis: Develop Practical Tools and Procedures to Improve WIM Data Quality	2018	Applied Research Associates	\$469,998	10/1/18	12/30/22	Research in progress	
NCHRP 20-50(21): Enhancements of Climatic Inputs and Related Models for Pavement ME Using LTPP Climate Tool (MERRA-2)	2018	Applied Research Associates	\$350,000	8/24/18	7/1/22	Research in progress	
NCHRP 20-50(22): LTPP Data Analysis: Feasibility of Using LTPP Data to Improve Use of FWD and Longitudinal Profile Measurements	2018	Michigan State University	\$100,000	9/3/19	10/30/20	Completed	Agency report posted on project webpage
NCHRP 20-50(22)A: LTPP Data Analysis: Guidelines to Improve Use of FWD and Longitudinal Profile Measurements	2019		\$350,000			Contract pending	
NCHRP 20-59(30)A: Train-the-Trainer Regional Workshops for Incident Command System (ICS) Training for Field Level Transportation Supervisors and Staff	2017	San Jose State University	\$450,000	7/11/17	9/30/22	Research in progress	
NCHRP 20-59(33)A: A Pre-Event Recovery Planning Guide for Transportation (Update)	2014		\$0			Combined	See Project NCHRP 20-116
NCHRP 20-59(53): FloodCast: A Framework for Enhanced Flood Event Decision Making for Transportation Resilience	2014	Dewberry Engineers Inc.	\$650,000	6/27/19	6/30/22	Completed	To be published as NCHRP Research Report
NCHRP 20-59(55): Transportation System Resilience: CEO Primer and Engagement	2016	WSP USA Solutions Inc.	\$449,000	3/1/17	3/31/22	Research in progress	Resilience Primer for Transportation Executives published as NCHRP Research Report 976. Contractor's final report under review
NCHRP 20-59(56): Support for State DOT Transportation Systems Resilience and All-Hazards Programs	2018	WSP USA Inc.	\$250,000	5/6/19	8/5/20	Completed	Agency report posted on project webpage
NCHRP 20-65/Task 78: Impact of Decline in Volunteerism on Rural Transit Systems	2018	AECOM Technical Services, Inc.	\$99,943	8/24/19	2/28/22	Research in progress	
NCHRP 20-65/Task 79: Program Management Insights for the 5310 Program (Including Sub-Grantee Consolidation and Urban 5310)	2018	ICF Incorporated	\$124,955	7/12/19	12/30/21	Completed	Publication decision pending
NCHRP 20-65/Task 80: Capacity Building Options for DOT Transit Staff	2018	ICF Incorporated	\$100,000	7/23/19	3/31/22	Research in progress	

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NCHRP 20-65/Task 81: Best Practices in Rural Service Assessment	2018	AECOM Technical Services, Inc.	\$75,000	7/10/19	2/28/22	Research in progress	
NCHRP 20-65/Task 82: Issues Associated with Providing Customized, Client-Based Transportation Services	2018	AECOM Technical Services, Inc	\$149,998	11/7/19	2/28/22	Research in progress	
NCHRP 20-68D: US Domestic Scan Program	2020	Arora and Associates, P.C.	\$1,800,000	4/3/19	4/2/22	Research in progress	
NCHRP 20-102(11): Mobility-on-Demand and Automated Driving Systems: A Framework for Public-Sector Assessment	2017	Booz-Allen & Hamilton	\$300,000	5/17/18	9/30/20	Completed	Publication decision pending
NCHRP 20-102(12): Business Models to Facilitate Deployment of CV Infrastructure to Support AV Operations	2017	WSP USA Inc.	\$400,000	7/11/17	7/15/20	Completed	Published as NCHRP Web-Only Document 289
NCHRP 20-102(20): Workforce Capability Strategies for State and Local Agencies	2019		\$300,000			In development	
NCHRP 20-102(22): State and Local Impacts of Automated Freight Transportation Systems	2019	The Tioga Group	\$339,990	9/16/19	2/28/22	Research in progress	Contractor's draft report under review
NCHRP 20-102(24): Infrastructure Enablers for Connected and Automated Vehicles and Shared Mobility--Near-Term and Mid-Term	2019		\$0			Combined	See Project NCHRP 20-102(21)
NCHRP 20-102(26): Dynamic Curbside Management: Keeping Pace with New and Emerging Mobility and Technology in the Public Right of Way	2020	Fehr & Peers	\$249,923	2/16/21	5/15/22	Research in progress	
NCHRP 20-102(27): Realistic Timing Estimates for Automated Vehicle Implementation	2020	WSP USA Inc.	\$149,874	6/29/21	9/29/22	Research in progress	
NCHRP 20-102(28): Best Practices in Work Zones for AVs and CVs	2020	Virginia Polytechnic Institute and State University	\$250,000	10/21/20	7/21/22	Research in progress	
NCHRP 20-102(29): Incorporating New Mobility Options into Transportation Demand Modeling	2020		\$125,000			In development	
NCHRP 20-102(33): Safety of Vulnerable Road Users in a C/AV Future	2020		\$150,000			In development	
NCHRP 20-102(34): Land Use Impacts of Shared and Private AVs	2020		\$450,000			In development	
NCHRP 20-109A: Enhancement of the Transportation Research Thesaurus	2016		\$99,833			In development	
NCHRP 20-111J: Successful Practices for State Transportation Research Office's Complying with 2 CFR 200	2017	Applied Research Associates	\$100,000	5/15/18	9/30/19	Completed	Agency report posted on project webpage
NCHRP 20-116: An Emergency Management Playbook for State Transportation Agencies	2017	WSP USA Solutions, Inc.	\$800,000	1/28/20	7/27/22	Research in progress	Pandemic Playbook published as NCHRP Research Report 963/TCRP Research Project 225.
NCHRP 20-117: Deploying Transportation Resilience Practices in State DOTs	2017	WSP USA Inc.	\$1,076,200	6/16/17	9/30/20	Completed	Published as NCHRP Research Report 970 and NCHRP Web-Only Document 293
NCHRP 20-117A: TR News Articles Related to Highway Tunnel Resilience	2019	Western Management & Consulting LLC	\$7,800	4/8/20	6/30/20	Completed	Published in TRNews Number 327
NCHRP 20-121: State DOT Contributions to the Study, Investigation, and Interdiction of Human Trafficking	2018	Project Performance Corporation	\$299,883	5/31/18	3/30/20	Completed	Publication decision pending

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NCHRP 20-121A: Countering Human Trafficking: A Toolkit for State DOTs	2018		\$450,000			Contract pending	
NCHRP 20-122: Rural Transportation Issues: Research Roadmap	2019	Montana State University	\$140,000	10/9/18	3/31/21	Completed	To be published as NCHRP Research Report 988
NCHRP 20-123(01): Transportation Asset Management Strategic Planning and Research Roadmap Development	2019	Spy Pond Partners	\$220,000	9/12/19	3/31/22	Research in progress	
NCHRP 20-123(02): Research Roadmap for the AASHTO Council on Active Transportation	2019	Portland State University	\$250,000	3/4/20	7/15/21	Completed	Agency report posted on project webpage
NCHRP 20-123(04): Development of a Risk Management Strategic Plan and a Research Roadmap	2020	Jacobs Government Services Company	\$224,869	7/2/20	1/1/22	Research in progress	
NCHRP 20-123(06): Merging and Updating AASHTO Policy on the Accommodation of Utilities within Freeway Right-of-Way and AASHTO Guide for Accommodating Utilities within Highway Right-of-Way	2020	Texas A&M Transportation Institute	\$75,000	5/5/21	11/5/22	Research in progress	
NCHRP 20-123(09): Feasibility Study for a Platform to Capture Innovations from State Departments of Transportation	2020	Public Knowledge LLC	\$99,865	1/4/21	10/29/21	Completed	Agency report posted on project webpage
NCHRP 20-123(10): AASHTO Committee on Bridges and Structures Strategic Plan, Operating Guidelines, and Research Roadmap Development	2020	Clough, Harbor & Associates LLP	\$119,940	6/7/21	6/7/22	Research in progress	
NCHRP 20-123(12): System Mobility and Emerging Technologies (SMET): Strategic Planning Session and Research Roadmap Development	2021		\$225,000			In development	
NCHRP 20-123(13): Transportation Planning Strategic Planning and Research Roadmap Development	2021		\$250,000			In development	
NCHRP 20-123(14): Scoping Study for the Development of a Platform for AASHTO Committee Surveys	2021		\$200,000			Contract pending	
NCHRP 20-123(16): Roadmap for AASHTO Bridge Railing MASH Updates to Support Future Vehicle Fleet Transformation	2021		\$150,000			In development	
NCHRP 20-123: Support for AASHTO Committees and Councils	2019		\$895,000			In development	
NCHRP 20-124: Deploying Transportation Security Practices in State DOTs	2019	Critical Ops LLC	\$698,636	1/22/20	7/21/22	Research in progress	
NCHRP 20-125: Strategies for Incorporating Resilience into Transportation Networks	2019	Metro Analytics PLLC	\$599,679	12/30/19	3/29/22	Research in progress	
NCHRP 20-126(01): Programmatic Strategies for State Transportation Agencies Dealing with Issues of Future System Performance	2020	WSP USA Inc.	\$350,000	10/1/20	3/31/22	Research in progress	
NCHRP 20-126(02): State Transportation Agency Multifaceted Decision-Making for Future System Performance	2020	Metro Analytics PLLC	\$348,929	1/27/21	4/26/22	Research in progress	
NCHRP 20-126(03): Advancing Practices of In Situ Nondestructive Evaluation of Highway System Asset Foundational Condition and Capability	2020	Applied Research Associates, Inc.	\$150,000	5/4/21	5/3/22	Research in progress	
NCHRP 20-127: Development of Business Case and Communication Strategies for a State DOT Resilience Program	2020	Cambridge Systematics	\$349,704	12/15/20	12/15/22	Research in progress	

Project No. and Title	Fiscal Year	Research Agency	Contract Amount	Starting Date	Completion Date	Status	Status Comments
NCHRP 20-128: Organizational and Operational Models Used by State DOTs for Emergency Response	2020	WSP USA Inc.	\$400,000	2/1/21	2/1/23	Research in progress	
NCHRP 20-129: Best Management Practices to Address Encampments on State Highway Rights of Way	2022		\$350,000			In development	
AREA TWENTY-ONE: SOILS AND GEOLOGY—TESTING AND EVALUATION OF SOILS							
NCHRP 21-11: Improved Test Methods and Practices for Characterizing Steel Corrosion Potential of Earthen Materials	2016	McMahon & Mann Consulting Engineers PC	\$400,000	7/5/16	6/30/20	Completed	Published as NCHRP Research Report 958
AREA TWENTY-TWO: DESIGN—VEHICLE BARRIER SYSTEMS							
NCHRP 22-26: Identification of Factors Related to Serious Injury and Fatal Motorcycle Crashes into Traffic Barriers	2009	Virginia Polytechnic Institute and State University	\$500,000	5/1/09	11/30/20	Completed	Publication decision pending
NCHRP 22-29B: Evaluating the Performance of Longitudinal Barriers on Curved, Superelevated Off-Ramps	2018	George Mason University	\$249,867	1/29/19	6/30/22	Research in progress	
NCHRP 22-31: Recommended Guidelines for the Selection and Placement of Test Levels 2 through 5 Median Barriers	2015	Roadsafe LLC	\$577,000	9/28/15	11/30/20	Completed	To be published as NCHRP Research Report
NCHRP 22-32A: Development of Methods to Evaluate Side Impacts with Roadside Safety Features	2017		\$534,031			In development	
NCHRP 22-33: Multi-State In-Service Performance Evaluations of Roadside Safety Hardware	2017	Roadsafe LLC	\$650,000	1/2/18	12/31/21	Research in progress	Contractor's final report under review
NCHRP 22-34: Determination of Zone of Intrusion Envelopes under MASH Impact Conditions for Barrier Attachments	2018	University of Nebraska - Lincoln	\$400,000	6/20/18	12/31/21	Completed	Publication decision pending.
NCHRP 22-35: Evaluation of Bridge Rail Systems to Confirm AASHTO MASH Compliance	2018	Texas A&M Transportation Institute	\$500,000	6/1/18	6/1/22	Research in progress	
NCHRP 22-37: Development of a MASH Barrier to Shield Pedestrians, Bicyclists, and Other Vulnerable Users from Motor Vehicles	2019	Texas A&M Transportation Institute	\$499,819	5/3/19	7/29/22	Research in progress	
NCHRP 22-38: Development of MASH TL-3 Deflection Reduction Guidance for 31-inch Guardrail	2019	Texas A&M Transportation Institute	\$499,429	7/8/19	1/8/22	Research in progress	Contractor's draft report pending
NCHRP 22-39: Guardrail Performance at Various Offsets from Curb for MASH TL-3 Applications	2019	University of Nebraska - Lincoln	\$600,000	6/3/19	6/2/22	Research in progress	
NCHRP 22-40: Update to AASHTO M 180-18 and Associated Highway Guardrail Specification	2019	Roadsafe LLC	\$300,000	7/1/19	1/7/22	Research in progress	
NCHRP 22-41: Proposed Modification to AASHTO LRFD Bridge Design Specifications, Section 13—Railing	2019	Modjeski & Masters	\$229,996	6/6/19	12/5/22	Research in progress	
NCHRP 22-42: Impact Performance Assessment of Barrier Performance at High Speeds	2020		\$600,000			In development	
NCHRP 22-43: Proposed AASHTO Guidelines for Implementation of MASH for Sign Supports, Breakaway Poles, and Work Zone Traffic Control Devices	2020	University of Nebraska - Lincoln	\$500,000	8/13/20	5/13/23	Research in progress	
NCHRP 22-44: A Transportation Agency Data Collection Practice for Use with In-Service Performance Evaluations (ISPEs)	2020	Roadsafe LLC	\$400,000	8/3/20	2/2/23	Research in progress	

Project No. and Title	Fiscal Year	Research Agency	Contract Amount	Starting Date	Completion Date	Status	Status Comments
NCHRP 22-45: Informing the Selection of Countermeasures by Evaluating, Analyzing, and Diagnosing Contributing Factors That Lead to Crashes	2020	Exponent Inc.	\$689,900	10/5/20	10/4/23	Research in progress	
NCHRP 22-46: Human Factors Guidelines for Road Systems, Proposed 4th Edition.	2020	Exponent Inc.	\$549,963	6/1/21	5/31/24	Research in progress	
NCHRP 22-47: Incorporating Driver Behavior Considerations in Safety Performance Estimates of Infrastructure Improvements	2020	University of North Carolina - Chapel Hill	\$600,000	9/1/20	3/1/23	Research in progress	
NCHRP 22-48: Development of Crash Prediction Models for Short-Term Durations	2020	University of Central Florida Board of Trustees	\$650,000	7/15/20	1/16/23	Research in progress	
NCHRP 22-49: The Effect of Vehicle Mix on Crash Frequency and Crash Severity	2020	University of Central Florida Board of Trustees	\$400,000	9/3/20	3/3/23	Research in progress	
NCHRP 22-50: Crashworthiness of Roadside Hardware on Curbed Roadways	2021		\$400,000			Contract pending	
NCHRP 22-51: Evaluation of MASH 2016 Soil Specifications and Procedures	2021		\$250,000			In development	
NCHRP 22-52: Development of a Crashworthy Tangent End Treatment for Low Speed Curbed Roadways	2022		\$750,000			In development	
NCHRP 22-53: Development of Guidance for Enhanced Delineation of Barriers and other Roadside Safety Hardware, Slopes, and Hazards	2022		\$450,000			In development	
NCHRP 22-54: MASH Hardware Evaluation with New Proposed Test Vehicles	2022		\$1,000,000			In development	
NCHRP 22-55: Develop, Fabricate, and Test Surrogate Bogey Vehicles and Pendulum Masses with Noses for Evaluating MASH Breakaway Performance of Luminaire Poles, Signs, and Work Zone Devices	2022		\$850,000			In development	
NCHRP 22-56: Development of Prefabricated Concrete Barrier Systems for Accelerated Bridge Construction	2022		\$1,000,000			In development	
AREA TWENTY-THREE: ADMINISTRATION—AGENCY ADMINISTRATION							
NCHRP 23-02: Secure Information Environments for Collaboration and Knowledge Sharing: Guidance for State DOTs	2020	Southwest Research Institute	\$350,000	7/9/20	7/8/22	Research in progress	Contractor's draft report pending review
NCHRP 23-03: Targeted Guidance and Information Support to State DOT CEOs on Cybersecurity Issues and Protection Strategies	2020	Southwest Research Institute	\$350,000	6/1/20	6/1/22	Research in progress	
NCHRP 23-04: Statewide Insurance Pooling for Public Transit	2020	AECOM Technical Services Inc.	\$300,000	8/31/21	8/30/23	Research in progress	
NCHRP 23-05: Guidance for Training and Certification of Construction Inspectors for Transportation Infrastructure	2020	Colorado State University	\$450,000	7/22/20	7/21/22	Research in progress	
NCHRP 23-06: Developing an AASHTO Guide to System-Level Asset Valuation in Support of Transportation Asset Management Decision Making	2020	Spy Pond Partners	\$600,000	8/20/20	2/19/22	Research in progress	
NCHRP 23-07: Effective Methods for Setting Transportation Performance Targets	2020	ICF Incorporated	\$500,000	6/12/20	9/11/22	Research in progress	
NCHRP 23-08: Guidelines for Incorporating Maintenance Costs into a Transportation Asset Management Plan	2020	Applied Pavement Technology	\$349,976	8/20/20	2/19/22	Research in progress	

Project No. and Title	Fiscal Year	Research Agency	Contract Amount	Starting Date	Completion Date	Status	Status Comments
NCHRP 23-09: Scoping Study to Develop the Basis for a Highway Standard to Conduct an All-Hazards Risk and Resilience Analysis	2019	Applied Engineering Management Corporation	\$249,998	10/20/20	4/20/22	Research in progress	Contractor's draft report pending review
NCHRP 23-10: Evaluation and Synthesis of Connected Vehicle Communication Technologies	2020	WSP USA Inc.	\$349,743	2/24/20	6/1/21	Completed	Published as NCHRP Web-Only Document 310
NCHRP 23-11: Transportation Emergency/ Security Summit and Exchange	2020		\$250,000			In development	
NCHRP 23-12: Artificial Intelligence Opportunities for State and Local DOTs – A Research Roadmap	2020	Virginia Polytechnic Institute and State University	\$200,000	11/2/21	5/1/23	Research in progress	
NCHRP 23-13(01): Effective Tools and Practices for Measuring Telecommuting Employee Performance	2021		\$150,000			In development	
NCHRP 23-13(02): Guide for Protecting Transportation Employees and the Traveling Public from Air-Borne Diseases	2021		\$200,000			In development	Combined with Transit Cooperative Research Program Project F-30
NCHRP 23-13(03): Guidance for State DOTs on Truck Rest and Service Areas for Critical Supply Chain Delivery	2021		\$180,000			In development	
NCHRP 23-13(04): Scoping Supply Chain Challenges and Solutions amid COVID-19	2021		\$150,000			In development	
NCHRP 23-13(05): Regulatory Relief of Commercial Vehicle Weight Requirements for Emergency Transportation of Critical Commodities	2021		\$180,000			In development	
NCHRP 23-13(06): Analyzing the Shifts from Brick and Mortar Businesses to Home Delivery	2021		\$250,000			In development	
NCHRP 23-14: Research Roadmap for Knowledge Management	2021		\$300,000			In development	
NCHRP 23-16: Implementing and Leveraging Machine Learning at Departments of Transportation	2021		\$348,585			Contract pending	
NCHRP 23-17: Assessing and Measuring the Business Value of Knowledge Management	2021		\$350,000			In development	
NCHRP 23-18: Incorporating Knowledge Management into DOT Business Practices	2020		\$200,000			In development	
NCHRP 23-19: Practices for Transportation Agency Procurement and Management of Advanced Technologies	2020		\$225,000			In development	
NCHRP 23-20: Operational Oversight of Drones - UAS Development and Deployment: Jurisdictional Issues and Options	2020		\$300,000			In development	
NCHRP 23-21: Enabling Knowledge Management through Leadership Strategy and Culture	2020		\$400,000			In development	
NCHRP 23-22: Increasing Competition on Projects Delivered by Alternative Methods by Defining and Assessing Contractual Risk Profiles	2022		\$500,000			In development	
NCHRP 23-23: Data Governance Design and Implementation - Links Between Governance Approaches and Performance Effects in DOTs	2022		\$350,000			In development	
NCHRP 23-24: Develop Methods to Allow Agencies to Incorporate Quantitative Risk Assessment at Project and Network Level	2022		\$500,000			In development	

Project No. and Title	Fiscal Year	Research Agency	Contract Amount	Starting Date	Completion Date	Status	Status Comments
NCHRP 23-25: Interstate Information Sharing of State Truck Regulatory Requirements	2022		\$400,000			In development	
NCHRP 23-26: Measuring Impacts and Performance of State DOT Resilience Efforts	2022		\$300,000			In development	
NCHRP 23-27: Strategies to Strengthen Data Driven Decision Making	2022		\$300,000			In development	
NCHRP 23-28: Changes to 4.9 Ghz Spectrum Access and Authorization – What You Need to Know	2022		\$250,000			In development	
AREA TWENTY-FOUR: SOILS AND GEOLOGY—FOUNDATIONS AND SCOUR							
NCHRP 24-43: Relationship between Erodibility and Properties of Soils	2015	Texas A&M Transportation Institute	\$300,000	8/11/15	11/30/18	Completed	Published as NCHRP Research Report 915
NCHRP 24-45: Evaluating Mechanical Properties of Earth Material During Intelligent Compaction	2015	University of Texas - El Paso	\$499,514	7/27/15	3/31/20	Completed	Published as NCHRP Research Report 933
NCHRP 24-47: Revised Clear-Water and Live-Bed Contraction Scour Analysis	2016	Ayres Associates	\$500,000	10/6/16	6/30/20	Completed	Published as NCHRP Research Report 971 and NCHRP Web-Only Document 294
NCHRP 24-48: Develop a Formula for Determining Scour Depth around Structures in Gravel-bed Rivers	2018	University of Idaho	\$600,000	1/11/19	1/10/22	Research in progress	
NCHRP 24-49: Guidance on the Selection and Use of Flow Resistance Values in Two-Dimensional (2D) Hydraulic Models	2020	Pennsylvania State University	\$495,254	8/21/20	2/21/23	Research in progress	
NCHRP 24-50: Rewrite of the AASHTO Drainage Manual	2021	Ayres Associates	\$600,000	8/9/21	8/9/24	Research in progress	
NCHRP 24-51: Effects of Construction Installation Methods on the Design and Performance of Drilled Shaft Foundations	2021		\$600,000			In development	
AREA TWENTY-FIVE: TRANSPORTATION PLANNING—HUMAN AND NATURAL ENVIRONMENT							
NCHRP 25-47: How to Measure and Communicate the Value of Access Management	2014	University of South Florida	\$600,000	5/17/18	3/31/21	Completed	Publication decision pending
NCHRP 25-55: Assessment of Regulatory Air Pollution Dispersion Models to Quantify the Impacts of Transportation Sector Emissions	2018	ICF Incorporated	\$700,000	6/4/18	9/30/22	Research in progress	
NCHRP 25-56: Methods for State DOTs to Reduce Greenhouse Gas Emissions from the Transportation Sector	2018	Cambridge Systematics	\$600,000	5/1/18	3/16/21	Completed	To be published as NCHRP WebResource 1
NCHRP 25-57: Breaking Barriers: Alternative Approaches to Avoiding and Reducing Highway Traffic Noise Impacts	2019	Cross-Spectrum Acoustics Inc.	\$249,963	4/23/19	4/22/21	Completed	To be published as NCHRP Research Report 984
NCHRP 25-59: Pollinator Habitat Conservation Along Roadways	2019	ICF Jones & Stokes	\$489,978	8/1/19	1/18/23	Research in progress	
NCHRP 25-60: Watershed Approach to Mitigating Hydrologic Impacts of Transportation Projects	2019	Kilgore Consulting and Management	\$500,000	6/15/19	1/31/22	Research in progress	Contractor's draft report under review
NCHRP 25-61: Effective On-Bridge Treatment of Stormwater	2020	GeoSyntec Consultants	\$495,724	9/14/20	9/14/23	Research in progress	
NCHRP 25-62: Improving the Efficiency and Consistency of Section 106 Compliance for State DOTs: Strategies for Project-Level Programmatic Agreements and Postwar Commercial Properties	2020	Mead & Hunt Inc.	\$499,896	4/15/20	4/14/23	Research in progress	Phase I report published as NCHRP Web-Only Document 311

Project No. and Title	Fiscal Year	Research Agency	Contract Amount	Starting Date	Completion Date	Status	Status Comments
NCHRP 25-63: Handbook on Deterring and Excluding Bats from Transportation Structures	2021	Environmental Solutions & Innovations, Inc.	\$499,965	11/15/21	1/14/25	Research in progress	
NCHRP 25-64: Considering Greenhouse Gas Emissions and Climate Change in Environmental Reviews: Resources for State DOTs	2021	Cambridge Systematics	\$375,000	7/27/21	10/26/23	Research in progress	
NCHRP 25-65: Successful Approaches in Preparing Convincing Section 106 Effect Determinations	2022		\$150,000			In development	

Finding Information on the TRB/NCHRP Websites

There are many points of entry to the TRB and NCHRP websites, depending on the kind of information you're looking for. For a general search of all TRB activities on a given topic, enter keywords related to that topic in the search box on the home page of the TRB website at www.trb.org.

To find specific projects, use the "Find a Project" option in the navigation bar at www.trb.org/NCHRP. You can restrict your search to NCHRP research by selecting NCHRP in the "Program" dropdown menu, or select "All" to include projects from our transit, aviation, freight, hazardous materials, rail, and strategic highway research programs. Enter keywords from the title, a project number, or the staff officer's name in the appropriate box. The "Research Area" dropdown menu lets you view all projects in any of 25 subject areas. If you select "All Projects" in the menu bar, you will see NCHRP projects categorized by subject area dating back to 1988 when our systems were first digitized. A summary of NCHRP projects from 1962 through 1988 is available online as NCHRP Web Document 7 and can be accessed through a link on the NCHRP home page or by going to <http://tinyurl.com/NCHRPWebDoc7>.

If you are interested in publications in a specific series, such as NCHRP Reports or Syntheses of Practice, direct links are provided on the NCHRP home page. The home page also includes links to our quick-response series of projects supporting AASHTO committees.

To search all TRB publications, you can visit the TRB Online Bookstore at www.mytrb.org/store.

Finally, the most comprehensive source of information on transportation research globally is the TRID database, available at trid.trb.org.

TRID is the world's largest bibliographic transportation database, which combines the records of TRB's Transportation Research Information Services (TRIS) and the Organization for Economic Cooperation and Development's Joint Transport Research Centre's International Transport Research Documentation. The Research in Progress (RIP) database allows a person to check the research in progress.

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Items Available on Request

Some research agencies' final reports, manuals, videotapes, etc. that are identified in the project summaries are available upon written request to:

Cooperative Research Programs
Transportation Research Board
500 Fifth Street NW
Washington, DC 20001

Summary of Progress Through 1988—Special Edition

A summary of NCHRP projects from 1962 through 1988 is available online as NCHRP Web Document 7. This document can be accessed through the link on the NCHRP home page (www.trb.org/NCHRP) or by going to <http://tinyurl.com/NCHRPWebDoc7>.

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