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NATIONAL
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HIGHWAY
RESEARCH
PROGRAM

2014 Summary of Progress



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NCHRP

**NATIONAL
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HIGHWAY
RESEARCH
PROGRAM**

2014 Summary of Progress

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

TRANSPORTATION RESEARCH BOARD

WASHINGTON, D.C.
2014
www.trb.org

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Systematic, well-designed research provides the most effective approach to the solution of many problems facing highway administrators and engineers. Often, highway problems are of local interest and can best be studied by highway departments individually or in cooperation with their state universities and others. More predominantly, however, the need for more efficient, economical, and safer highway transportation and the importance of meshing with other modes and other societal concerns lead to national problems of increasing complexity. A coordinated program of high-quality cooperative research provides a highly effective approach to such problems.

In recognition of these needs, the highway administrators of the American Association of State Highway and Transportation Officials (AASHTO) initiated in 1962 an objective national highway research program employing modern scientific techniques. AASHTO's program is supported on a continuing basis by funds from participating member states of the Association and receives the full cooperation and support of the Federal Highway Administration, United States Department of Transportation.

The Transportation Research Board of the National Academies was requested by the Association to administer AASHTO's research program because of the Board's recognized objectivity and understanding of modern research practices. The Board is uniquely suited for this purpose: it maintains an extensive committee structure from which authorities on any highway transportation subject may be drawn; it possesses avenues of communications and cooperation with federal, state, and local governmental agencies, universities, and industry; its relationship to its parent organization, the National Academies, a private, nonprofit institution, is an insurance of objectivity; and it maintains a full-time research correlation staff of specialists in highway transportation matters to bring the findings of research directly to those who are in a position to use them.

Research programs are developed annually by AASHTO on the basis of research needs identified by the highway and transportation departments, by committees of AASHTO, and by the Federal Highway Administrator. The programs are then referred for administration through the Transportation Research Board, and research projects addressing the specific needs are defined by the Board on the basis of the AASHTO problem statements. The projects are advertised widely for proposals, and qualified agencies are selected on the basis of research plans offering the greatest probabilities of success. The research is carried out under contract, and administration and surveillance are responsibilities of a Board-appointed staff.

The needs for highway research are many, and the National Cooperative Highway Research Program is an efficient mechanism for providing timely solutions to 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.

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The **National Academy of Sciences** is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. Upon the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal government on scientific and technical matters. Dr. Ralph J. Cicerone is president of the National Academy of Sciences.

The **National Academy of Engineering** was established in 1964, under the charter of the National Academy of Sciences, as a parallel organization of outstanding engineers. It is autonomous in its administration and in the selection of its members, sharing with the National Academy of Sciences the responsibility for advising the federal government. The National Academy of Engineering also sponsors engineering programs aimed at meeting national needs, encourages education and research, and recognizes the superior achievements of engineers. Dr. C. D. Mote, Jr., is president of the National Academy of Engineering.

The **Institute of Medicine** was established in 1970 by the National Academy of Sciences to secure the services of eminent members of appropriate professions in the examination of policy matters pertaining to the health of the public. The Institute acts under the responsibility given to the National Academy of Sciences by its congressional charter to be an adviser to the federal government and, upon its own initiative, to identify issues of medical care, research, and education. Dr. Victor J. Dzau is president of the Institute of Medicine.

The **National Research Council** was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and advising the federal government. Functioning in accordance with general policies determined by the Academy, the Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. The Council is administered jointly by both Academies and the Institute of Medicine. Dr. Ralph J. Cicerone and Dr. C. D. Mote, Jr., are chair and vice chair, respectively, of the National Research Council.

The **Transportation Research Board** is one of six major divisions of the National Research Council. The mission of the Transportation Research Board is to provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Board's varied activities annually engage about 7,000 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. www.TRB.org

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CONTENTS

Preface, ix

Summary of Progress, 1

Introduction, 1

The States' Highway Research Program: The critical role of state DOTs, 3

Why NCHRP Works: A model for cooperative research, 6

NCHRP Research Areas: Topics across the spectrum of highway concerns, 8

Selecting the Best Investigators: A rigorous, competitive process, 10

Managing the Program: The central role of NCHRP professionals, 12

Research Products: Disseminating research and documenting success, 13

Publications of the National Cooperative Highway Research Program, 22

Reports, 22

Syntheses of Highway Practice, 41

Research Results Digests, 51

Legal Research Digests, 61

Web-Only Documents, 62

CRP CD-ROMs, 68

Status of Projects (as of 12/31/2014) for FY 1963 Through FY 2015, 71

How to Obtain Publications and Other Materials, inside back cover

PREFACE

By Christopher Hedges

Manager

National Cooperative Highway Research Program

The Transportation Research Board's most recent edition of *Critical Issues in Transportation* highlights the lack of reliability and resilience of our transportation systems. Many of our highway systems in urban areas are operating at capacity for much of the day. Our population and economy continue to grow and traffic volumes are at record levels, but transportation agencies are unable to keep up with the rising demand for the movement of people and goods. Travel times and delays have increased, as have the prices of goods shipped by truck. Traffic congestion exacerbates air quality problems and inhibits emergency evacuations. Departments of transportation (DOTs) are under growing pressure to improve efficiencies and find needed revenue sources.

This year's cover design highlights one of the strategies being employed to reduce traffic congestion. Over the past few decades, the concept of managed lanes has matured as a way to improve the efficiency of our transportation systems. Managed lanes allow DOTs to control the use of traffic lanes by restricting them to certain kinds of vehicles at certain times of the day or by charging a fee for the use of those lanes. High-occupancy vehicle (HOV) lanes are one of the oldest forms of managed lanes, which is readily apparent from the vehicles in the lower photo on the cover. Bus-only and truck-only lanes have been implemented in many jurisdictions.

However, since they were introduced in the mid-1990s, high-occupancy toll (HOT) lanes have captured the attention of transportation agencies and the general public. Using HOT lanes, DOTs can vary toll fees based on factors such as the time of day and number of vehicle occupants. HOT lanes are becoming more and more prevalent, due in part to federal policies encouraging the use of congestion pricing, and the development of technologies that facilitate their implementation, such as electronic toll collection, variable message signs, variable speed limit signs, and closed-circuit monitoring. HOT lanes have been implemented in California (I-15 and SR-91), Illinois (I-55), Houston (I-10 and US-290), Denver (I-25), Minneapolis (I-394), Washington, D.C. (I-95), and many more states. HOT lanes have proven successful in reducing annual travel time, improving reliability, saving fuel, and reducing emissions. As the use of HOT lanes continues to grow, they will generate

new questions and new issues for DOTs: financial strategies, revenue distribution, road user equity, multi-agency planning, interoperability, and so on. Very soon, connected and automated vehicles will create a whole new set of opportunities and challenges to control the flow of traffic on our nation's streets and highways.

The National Cooperative Highway Research Program (NCHRP) has been asked to provide guidance to the states on this high-priority topic. Guidelines for implementing managed lanes are being developed under NCHRP Project 15-49 and should be ready for distribution in 2015. Previous NCHRP research has analyzed the performance of managed lanes and the results have been incorporated into the *Highway Capacity Manual*.

Of course, guidance for managed lanes is only one example of current research under way at NCHRP. In 2014, NCHRP delivered practical guidance on planning for extreme weather events and disasters, bridge redundancy and safety, accelerating innovation, contract delivery, environmental sustainability, knowledge management, pavement design, and many other topics. NCHRP has also released six volumes in a series addressing long-term strategic issues facing the transportation industry.

The success of NCHRP depends largely on the volunteers that guide our work from problem identification, project selection, solicitation and selection of contractors, and monitoring progress to implementing the results. We owe a deep debt of gratitude to the more than 2,600 volunteers on our project panels, as well as the members and staff of our governing body and sponsoring agencies who contribute in one way or another to the program. We hope that NCHRP's body of work helps you to fulfill your agency's mission and goals, and we look forward to serving the U.S. transportation community into the future.

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

SUMMARY *of* PROGRESS

.....
December 31

2014
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INTRODUCTION

The National Cooperative Highway Research Program (NCHRP) is a unique contract research effort designed to respond to the practical needs of state departments of transportation (DOTs). The Transportation Research Board (TRB) administers the program, for which the state DOTs fund, select, and oversee the research. NCHRP is an applied research program, and every possible effort is made to help administrators and practitioners put the findings to early use in the form of policies, procedures, specifications, and standards.



During 2014 NCHRP completed 141 research projects, launched 50 new projects, continued 15 projects, and approved 58 new and continuation projects for 2015. This *Summary of Progress* provides, in Tables 1 through 6, concise lists of published research and, in Table 7, a list of the 2,870 projects undertaken since 1962. The *Summary of Progress* also presents detailed information about the operation of NCHRP through the Standing Committee on Research (SCOR) of the American Association of State Highway and Transportation Officials (AASHTO).

The following descriptions explain the organization and purpose of each of the tables within this Summary of Progress.

TABLE 1. Reports

Final reports and deliverables of NCHRP research projects that are published in the Report series are listed with titles and number of pages in Table 1, beginning with Report 1, published in 1964, and ending with

Report 796, published in 2014. To the right of the report number is the project number, which identifies the research project from the time it is funded. The project number, which references the research problem area (see NCHRP Classification System on page 9), can be cross-referenced to Table 7 to obtain further information about the project (research agency, contract amount, start date, end date, and status).

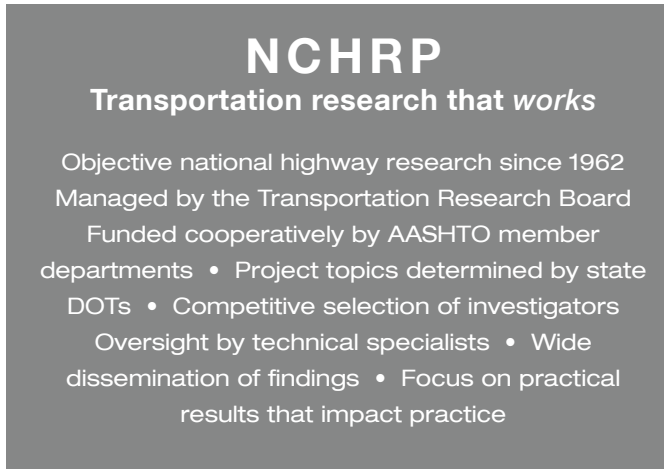


TABLE 2. Synthesis Reports

Final reports of NCHRP Syntheses of Highway Practice are listed with titles and number of pages in Table 2, beginning with Synthesis 1, published in 1969, and ending with Synthesis 466, published in 2014. Synthesis projects are produced under Continuation Project 20-05. The topic number identifying the project from the time it is funded does not reference the NCHRP problem area and is not cross-referenced to Table 7.

TABLE 3. Research Results Digests

Research Results Digests of NCHRP project findings are published to summarize specific findings and encourage implementation. Table 3 lists digests with titles and number of pages, beginning with Digest 1, published in 1968, and ending with Digest 390, published in 2014. The project number, which references the research problem area (see NCHRP Classification System on page 9), can be cross-referenced to Table 7 to obtain further information about the project.

TABLE 4. Legal Research Digests

Legal Research Digests are listed with titles and number of pages in Table 4, beginning with No. 1, published in 1988, and ending with No. 63, published in 2014. Legal research projects are produced under Continuation Project 20-06, established in 1968 to assemble, analyze, and evaluate operating practices, administrative procedures, and legal issues associated with highway and transportation projects. These digests are not cross-referenced to Table 7.

TABLE 5. Web-Only Documents

Some contractor-prepared reports or supporting materials are made available as web-only PDF files. Table 5 lists these documents, beginning with No. 1, published in 1997, and ending with No. 208, published in 2014. The project number can be cross-referenced to Table 7 to obtain further information about the project.

TABLE 6. CD-ROMs

This table lists CD-ROMs containing stand-alone publications and supplemental materials to selected research reports. The project numbers may be cross-referenced to Table 7 for additional information.

TABLE 7. Project Status, FY 1963 through FY 2015

This table lists the status (completed or in progress) of most NCHRP projects initiated from the beginning of the program through FY 2015 (as of December 31, 2014). Also listed are the research agency, contract amount, starting date, and completion date. Projects are grouped in problem area order and listed chronologically within each problem area; see the NCHRP Classification System on page 9. Table 7 includes research projects that have been completed and published as NCHRP Reports (Table 1), Research Results Digests (Table 3), Web-Only Documents (Table 5), and CD-ROMs (Table 6).

The critical role of state DOTs

The state DOTs created NCHRP in 1962 to find answers to common problems in highway planning, design, construction, operation, and maintenance. The state DOTs, through AASHTO, are the sole sponsors of NCHRP. The program is operated in cooperation with the Federal Highway Administration (FHWA) and is administered through the Transportation Research Board of the National Academies.

Fifty-two years after the program's creation, state DOTs continue to be the driving force behind NCHRP research. The members of AASHTO—the DOTs of the 50 states and the District of Columbia—come together every year to fund, select, and oversee NCHRP research projects aimed at addressing the states' most critical research needs.

“NCHRP is highly leveraged, and it makes sense to look there first to find solutions to our transportation challenges.”

*David Jared,
Chief of Research and Development Branch,
Georgia DOT*

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, makes them available for research contracts and for administration of the program through TRB.

Available funds for NCHRP have remained strong during the past 20 years, rising along with increases in the Federal-Aid-Highway funds provided by Congress and the corresponding 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 most recent federal legislation—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 \$40 million being programmed for fiscal years 2011 through 2015. See Exhibit S-1.

Exhibit S-1. Budget Allocations for NCHRP, FY 2011 to FY 2015

Allocations	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
New projects and continuation projects	\$26,534,246	\$31,470,000	\$26,465,000	\$29,916,000	\$28,630,000
Administration, technical direction, panels, and publications	\$11,049,185	\$10,521,969	\$11,121,473	\$11,300,600	\$12,064,000
Total	\$37,583,431	\$41,991,969	\$37,586,473	\$41,216,600	\$40,694,000

States select NCHRP research projects

A thorough process of consultation and review gives states a strong voice in selecting NCHRP research projects. The process is led by AASHTO SCOR, which provides oversight to NCHRP. SCOR is composed of 16 state DOT members (four from each of the four AASHTO regions) plus ex officio members from FHWA and other federal agencies. In addition, the SCOR 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), composed of research directors from all AASHTO member departments.

In July of every year, SCOR invites the submission of research problem statements from three authorized sources: (1) AASHTO member transportation departments, (2) the chairs of AASHTO's committees and subcommittees, and (3) FHWA.

Research in Progress



Searching TRB databases helps submitters of problem statements avoid duplicating research.

Individuals from the three sources have until September 15 to submit their ideas, describing why the research they are proposing represents an immediate need and is of interest to the majority of states. The problem must be one that can be handled effectively under a cooperative program and have a high probability of success. Submitters are asked to search the relevant literature in TRID—a database that combines the records of TRB's Transportation Research Information Services (TRIS) and the Organization for Economic Cooperation and Development (OECD) Joint Transport Research Centre's International Transport Research

Documentation—and the Research in Progress (RiP) database to determine if similar efforts are already under way or if satisfactory answers are already available.

NCHRP and FHWA staff and other technical experts review all problem statements for technical merit and request clarification from submitters when appropriate. At the same time, NCHRP panels and staff also prepare recommendations for continuation of projects begun in earlier years.

In December, NCHRP prepares a report of proposed continuation projects and new problem candidates. This report is sent to members of SCOR and RAC as a ballot for rating each of the candidates according to need, value, and appropriateness. The ballot results are used to establish a preliminary ranking to help structure the discussion of candidates by SCOR at its March meeting.

In March, based on expected funding for the next fiscal year, SCOR allocates funds for new and continuation projects. Once the program is developed, SCOR sends a report to the AASHTO Board of Directors (CEOs of each of the member departments) requesting final approval. A favorable vote of at least two-thirds of the member departments is required. In addition, each year's program must be approved by FHWA and accepted by the National Academies.

“[NCHRP Report 590] will dramatically improve our method for optimizing bridge projects.”

*Todd Thompson,
Bridge Management Engineer,
South Dakota DOT*

In each of the last several years, approximately 120 problem statements and 20 requests for continuation have been balloted. SCOR typically funds a number of requests for continuation projects each year. These include quick-response research for AASHTO committees; research carried out under NCHRP subprograms, such as the Synthesis series, the IDEA program, and the domestic scan program; and projects from previous years

that request additional funds to build on their success with additional research. In recent years, SCOR has funded approximately 40 new projects each year.

A cumulative total of 2,870 research contracts have resulted from all NCHRP yearly programs through 2014. The FY 2015 program will add another 46 new contracts and 12 continuations. See Exhibit S-2.

Exhibit S-2. Number of Research Projects Selected by SCOR, FY 2011 to FY 2015

Projects	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Continuation projects	18	18	17	15	12
New projects	40	46	41	50	46
Total projects	58	64	58	65	58
Total project funds	\$26,534,246	\$31,470,000	\$26,465,000	\$29,916,000	\$28,630,000

Funding for the FY 2015 program is expected in early 2015, permitting execution of contracts and initiation of research. SCOR will formulate the FY 2016 program in March 2015 based on proposals solicited in July 2014, the beginning of another cycle of NCHRP research.

States help guide NCHRP research projects

Each research project is assigned to a panel of subject experts who are very knowledgeable in the project area and who are looked to for technical guidance and counsel throughout the research and reporting phases. A broad search is made for these individuals, and TRB usually receives about four to five times as many nominees as can be used in the available panel positions.

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-days. The panel members are drawn from all walks of professional life, with heavy dependence on practitioners from AASHTO member departments. See Exhibit S-3.

Exhibit S-3. Affiliations of Panel Members on Active Projects
(Current number of active projects = 353)

Affiliation	Panel Members*	
	Number	Percentage
State agencies	1,246	58
Federal agencies	79	4
Local, transit agencies, MPOs	130	6
Educational institutions	246	12
Industry, consultants, associations	432	20
All	2,133	100

* Does not include liaison representatives.

Panel members assume a number of key responsibilities for helping ensure the quality of NCHRP research. The project panel analyzes the initial problem that was submitted, develops a final project scope and objectives, and then prepares a formal research project statement by which proposals are solicited from qualified research agencies. The panels review the research proposals, recommend contract awards, and provide counsel to the NCHRP staff members responsible for management of the research contracts. Finally, the panels review final reports for acceptability and for accomplishment of the approved research plan.

A model for cooperative research

The model developed for NCHRP not only has functioned effectively for more than 50 years but also has served as the foundation for five other successful applied research programs managed by TRB. TRB now has national cooperative research programs in the fields of highways, transit, airports, hazardous materials, freight, and rail transportation. Beyond the walls of TRB, much of the research community looks to NCHRP as a model of what works. Many of the research programs in state departments of transportation 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.



NCHRP works closely with transportation stakeholders and consumers of research—such as state bridge engineers through AASHTO’s Highway Subcommittee on Bridges and Structures—to better understand and meet their research needs.

Stakeholders drive success

What makes this model so effective? Why has NCHRP been supported by voluntary contributions for 50 years? One of the key success factors is stakeholder involvement. Those who will 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 will provide practical, beneficial, and implementable results. When an NCHRP research project is completed, every step has been taken along the way to make sure the research product will address a real need in the real world.

An objective eye

Another key element in the NCHRP model is objectivity. Operating within the structure and guidelines of the nonprofit National Academies, the NCHRP does not own roads, make laws,

or set policy. It provides a neutral forum for objective research without bias or prejudice. NCHRP does not bend to changing political whims or a need to generate profit. NCHRP panels bring diverse stakeholder groups together with a common interest for a common objective.

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. When a project is completed, there is an audience waiting to implement the results.

Investing wisely in research

Further, by working on shared, national problems and issues, the NCHRP model is designed to seek solutions effectively and efficiently. Every dollar spent on NCHRP research is a dollar saved by each of the state and local agencies that would need to seek independent solutions to its problems in the absence of a coordinated, national program. The reduction of duplication allows all stakeholders to leverage their funds for a common goal and provides them a body of knowledge far in excess of what they could achieve on their own.

The NCHRP model is designed to spend its stakeholders' dollars wisely and to save them time, money, and lives. Transportation research helps in a variety of ways—for example, minimizing the time wasted by the travelling public due to roadway congestion, keeping down vehicle costs and commuting times, improving the efficiency and cost effectiveness of government programs, reducing vehicle crashes, and lessening the tragic loss of life and its impacts on families and communities. NCHRP fosters innovation in design, construction, and materials that results in better-performing, longer-lasting products and savings for road users.

Competitive investigator selection

Finally, one of the most significant success factors is the competitive process used to select NCHRP contractors. Each project panel develops a request for proposals that is posted publicly and can be responded to by any private firm or academic institution. Contractors are selected based on the qualifications of their team members and the merit of their research approach.

“We can see how many millions of dollars of high-priority research is being funded given our state's contribution to NCHRP. It's a huge value.”

*Cameron Kergaye,
Director of Research, Utah DOT*

Topics across the spectrum of highway concerns

The subject matter of NCHRP projects extends across the full spectrum of concerns within the highway industry and demonstrates AASHTO's interest in acquiring answers to the many acute problems facing DOT administrators and engineers. Problems submitted as candidates for funding each year are given a unique identification number based on the NCHRP Classification System. See Exhibit S-4.

This identification number, corresponding to the specific problem area addressed, 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 08-78 identifies a project in Area 8 (Forecasting). NCHRP Project 25-40 identifies a project in Area 25 (Impact Analysis). Once research was completed, final reports for these projects were published, respectively, as *NCHRP Report 770: Estimating Bicycling and Walking for Planning and Project Development: A Guidebook* and *NCHRP Report 792: Long-Term Performance and Life-Cycle Costs of Stormwater Best Management Practices*.

Table 7 of the *Summary of Progress* uses this project numbering system to present information about every NCHRP project from FY 1963 through FY 2015. The projects are grouped sequentially from Area 1: Design—Pavements through Area 25: Transportation Planning—Impact Analysis.



Methods used across the United States for analyzing bicyclist and pedestrian traffic informed NCHRP Project 08-78, which led to the publication of *NCHRP Report 770: Estimating Bicycling and Walking for Planning and Project Development: A Guidebook*.



NCHRP Project 25-40 led to the publication of *NCHRP Report 792: Long-Term Performance and Life-Cycle Costs of Stormwater Best Management Practices*, which assesses such techniques as vegetated swales that trap particulate pollutants, promote infiltration, and slow stormwater runoff.

NCHRP Classification System

Exhibit S-4. Problem Areas

1	Pavements
2	Economics
3	Operations and Control
4	General Materials
5	Illumination and Visibility
6	Snow and Ice Control
7	Traffic Planning
8	Forecasting
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 Instrumentation
22	Vehicle Barrier Systems
23	Properties
24	Mechanics and Foundations
25	Impact Analysis (Social, Environmental, Economic, Energy)



“[NCHRP Report 577] is commonly referenced in other research designed to reduce the impacts of winter maintenance practices on the environment.”

*Michael Fitch, Associate Principal Research Scientist,
Virginia Center for Transportation Innovation and Research*

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 capability and experience in the problem area to be researched. Eligible organizations can be from either the public or private sector and include universities, nonprofit institutions, consulting and commercial firms, and individual consultants. Throughout its history, NCHRP has awarded research contracts to agencies headquartered in 47 states, the District of Columbia, Canada, and England. Agencies selected to conduct NCHRP research fall, principally, into two categories—industry/consultant and university/research institute—as shown in Exhibit S-5.

Exhibit S-5. Agency Distribution Across Contracts

Contractor Type	FY 2011		FY 2012		FY 2013		FY 2014		FY 1963 - FY 2014	
	No.*	%	No.*	%	No.*	%	No.*	%	No.*	%
Industry/consultant	36	65	35	59	27	57	33	91	918	55
University/research institute	19	35	23	39	20	43	2	6	684	41
Other	0	0	1	2	0	0	1	3	60	4
Total	55	100%	59	100%	47	100%	36	100%	1,662	100%

* Contract totals do not include the individual topics and tasks for Projects 08-36, 20-07, 20-65, and 25-25 (quick-response research for AASHTO committees); 20-05; 20-06; 20-30; 20-36; 20-44; and 20-68.

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

The proposed budget total is not a primary factor in selecting an investigator because the funds available for research are announced in the project statement. Specific budget items in the proposal are reviewed to determine staff allocations and distribution of resources. When the proposed cost exceeds the funds stated to be available, the proposal is rejected on receipt.

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

“NCHRP helps us come up with the solutions to provide safer, longer lasting roads, whether we’re talking about design, construction, rehabilitation—any of the challenges that we’re facing.”

*Sandra Larson, Systems Operations
Bureau Director, Iowa DOT*

To support AASHTO's interests, needs, and capital investments, a contract is not signed with the selected agency until the NCHRP staff and project panel are satisfied that the proposed scope of work provides the best probability for a successful outcome. Furthermore, soon after contract execution, the investigating agency is required to submit a Working Plan (an amplified version of the research plan), against which project progress is monitored by the staff and project panel.

NCHRP will provide a debriefing, if requested, to unsuccessful proposers to indicate the technical 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*:

- (1) the proposer's demonstrated understanding of the problem;
- (2) the merit of the proposed research approach and methodology;
- (3) experience, qualifications, and objectivity of the research team in the same or closely related problem area;
- (4) the plan for ensuring application of results;
- (5) the proposer's plan for participation by Disadvantaged Business Enterprises—small firms owned and controlled by minorities or women; and
- (6) the adequacy of the facilities and equipment.

*From *Information and Instructions for Preparing Proposals for the Transportation Research Board's Cooperative Research Programs*



“[NCHRP Project 03-65, Applying Roundabouts in the United States] was a practitioner-oriented project with very useful results that were bound to change practice.”

*Mark Doctor,
Safety and Design Engineer,
Federal Highway Administration*

The central role of NCHRP professionals

TRB is headquartered at the Keck Center of the National Academies, 500 Fifth St. NW, Washington, D.C.

Once research starts, administrative and technical oversight of progress is performed by NCHRP staff. In-depth oversight by project managers with wide-ranging expertise is an important factor contributing to project success.

In addition to reviewing monthly progress schedules and quarterly progress

reports, the project managers maintain frequent contact with the research agencies throughout the contract periods. They review the project's status to learn whether the research is being pursued in line with the approved research plan, and they provide guidance to the investigator in all technical and administrative matters. They also serve as liaisons to the project panels to keep them abreast of progress and to acquire panel guidance and counsel in technical matters, particularly regarding the needs of the DOT practitioner.

The principal investigator has flexibility in managing the project budget up to the point of not materially departing from the approved research plan or exceeding the contract's maximum allowable cost. Any major changes to account for promising new research leads or unproductive lines of study must be approved in advance by the staff and project panel and are authorized through a contract amendment. Agency invoices are checked by the staff for deviations from the approved budget. Based on

all oversight activities, the staff members update project status on the NCHRP website. Finally, the staff and panels evaluate the completed research to determine the degree of technical compliance with the contract so that recommendations for contract close-out can be made.

NCHRP project managers encourage research agencies to present results in a form that is directly usable by practitioners in AASHTO member departments.



Members of the panel for NCHRP Project 20-103, "Guidance for Development and Management of Sustainable Information Portals." Clockwise: Hua Xiang, Loren Turner, Cain Williamson, Asregedew Woldesenbet, Gale Smith, and Andrew Lemer.

RESEARCH PRODUCTS

Disseminating research and documenting success

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 a number of series, which are listed in Tables 1 through 6 of this *Summary of Progress*. Quantities for these series published over the past five years are shown in Exhibit S-6. Some NCHRP publications produced this year are:



- *NCHRP Report 777: A Guide to Regional Transportation Planning for Disasters, Emergencies, and Significant Events* presents foundational planning principles and uses case studies, tips, and tools to explain the implementation of these principles in transportation planning for potential multijurisdictional disasters, emergencies, and other major events. [Project 20-59(42)]



- *NCHRP Report 785: Performance-Based Analysis of Geometric Design of Highways and Streets* presents ways to incorporate performance-based analysis in the project development process. Geometric design decisions that can influence desired project multimodal outcomes are identified as well as analysis tools that can be used to estimate the impacts of those decisions. (Project 15-34A)



- *NCHRP Synthesis 455: Alternative Technical Concepts for Contract Delivery Methods* documents various methods by which agencies have successfully implemented alternative technical concepts (requests made by proposers specifically for gaining competitive benefit during the bidding or proposal process) during the highway contracting process and identifies methods that promote transparency and fairness, while protecting the industry's right to confidentiality. (Project 20-05/Topic 44-09)



- *NCHRP Legal Research Digest 62: Eminent Domain and Fair Market Value in a Depressed Real Estate Market* addresses such issues as (1) how condemning agencies and the courts resolve the problem of just compensation in light of declining property values caused by financial calamities beyond the control of property owners and lienholders; (2) what statutory remedies exist; (3) whether the courts have created judicial exceptions to the fair market rule for just compensation; and (4) whether depression-era precedents or other administrative policies provide any guide to condemning agencies and the courts to resolve this problem. (Project 20-06)

Exhibit S-6. Number of NCHRP Publications, 2010 to 2014

Publication Series	2010	2011	2012	2013	2014 (est.)
<i>NCHRP Reports</i>	33	34	31	25	38
<i>NCHRP Syntheses of Highway Practice</i>	9	13	14	14	15
<i>NCHRP Research Results Digests</i>	9	14	13	9	5
<i>NCHRP Legal Research Digests</i>	2	1	2	4	2
Web-Only Documents	18	16	10	8	9
CD-ROMs	5	3	3	4	9
Total	76	81	73	64	78

Publications are distributed widely by NCHRP and through TRB's distribution process, with print runs for reports ranging from 1,300 to 3,000 copies. Print copies are mailed to AASHTO, the CEOs of state DOTs, 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
- Appropriate TRB panels and committees

NCHRP subprograms

Several "subprograms" are carried out within NCHRP. Results may be published in hard copy, delivered in the form of internal reports and presentations, published on the TRB website, or made available upon request.

Synthesis of Information Related to Highway Problems (Project 20-05)

Administrators, practicing engineers, and researchers continually face highway problems on which much information already exists, either in documented form or in terms of undocumented experience and practice. Unfortunately, this information is often fragmented and scattered, and therefore 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.

Legal Problems Arising out of Highway Programs (Project 20-06)

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. This research identifies and evaluates legal options for DOTs, which facilitate the handling of both immediate and long-range needs.

Research for AASHTO and State DOT Leadership (Project 20-24)

NCHRP conducts focused research that addresses and responds to the evolving challenges facing state DOT decisionmakers. Reports from this project deliver timely information on topics including asset management, innovative financing and contracting, performance measures, and e-business, as well as emerging topics such as connected automated vehicles.

NCHRP IDEA Program (Project 20-30)

The Innovations Deserving Exploratory Analysis (IDEA) program 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. A high percentage of products funded by the IDEA program have been successfully implemented.

International Highway Research and Technology (Project 20-36)

The International Highway Research and Technology program provides a coordinated approach to international information sharing and technology exchange. The program's overall objective is to improve highway safety, development, maintenance, and operations through dissemination of innovative technology and successful policies and practices from around the globe.

Domestic Scan Program (Project 20-68)

The NCHRP Domestic Scan Program is broad, considering any innovative practices of high-performing transportation agencies that could be beneficially adopted by other interested agencies. The purpose of each scan and of the program as a whole is to facilitate information sharing and technology exchange among the states and other transportation agencies and to identify actionable items of common interest.

Long-Range Strategic Issues Facing the Transportation Industry (Project 20-83)

AASHTO has invested \$7 million to examine strategic issues, both global and domestic, that will likely affect state DOTs over the next 30 to 40 years. Issues examined include potential changes in goods movement and freight; advance adoption of new technologies; preservation, maintenance, and renewal of highway infrastructure; changing transportation energy supplies and alternative fuel sources; and potential impacts of climate change on transportation infrastructure and operations.



The research conducted in NCHRP Project 20-83 has yielded six volumes, published as *NCHRP Report 750: Strategic Issues Facing Transportation*, that cover long-range planning for various transportation issues.

Quick-response research for AASHTO committees

- **Standing Committee on Highways (Project 20-07)**

Through this project, the Standing Committee on Highways obtains guidance on an accelerated schedule through a continuing research program geared to the needs of the committee in the development of guides, standards, policies, and other AASHTO activities.

- **Standing Committee on Planning (Project 08-36)**

The objective of this project is to provide a flexible, ongoing program of quick-response research for the Standing Committee on Planning to improve analytical methods, decision support tools, procedures, and techniques employed by practitioners to support statewide and metropolitan transportation planning, programming, and development.

- **Standing Committee on the Environment (Project 25-25)**

This project provides flexible, ongoing, quick-response research to the Standing Committee on the Environment. The research is focused on environmental analysis, streamlining, stewardship, and planning to respond effectively to program delivery and project development issues.

- **Standing Committee on Public Transportation (Project 20-65)**

This project comprises quick-response research tasks to assist in the fulfillment of Standing Committee on Public Transportation responsibilities. Research is carried out on transit planning, operations, transit delivery, and related matters as state involvement in public transportation continues to grow.

The final report

As an applied research program, NCHRP expects final research reports to be presented in language understandable to both administrators and practitioners and in a format that permits easy assimilation and application. The detailed research techniques and analyses in which a researcher would be interested are generally presented in appendixes. NCHRP specifies the style and organization of all reports to guide the researchers in their writing so that AASHTO member departments may obtain the greatest benefit.

NCHRP staff write a foreword to each published report that (1) identifies the fields of specialty of those likely to be most interested in the results and (2) suggests how the results fit into present knowledge and practice. All published reports are offered for sale through TRB's Publications Office. Since 2001, published reports also have been made available electronically on TRB's website. For ready availability to interested parties, unpublished reports are available in hard copy or electronically.

Promoting useful results before publication

NCHRP undertakes a number of activities before formal publication of the final reports to increase the probability that results will be applied:

- Initial research proposals are required to state how the anticipated results can be used to improve practice.
- Panel members—who not only are experts in the particular problem area, but also have a good understanding of practitioner needs—define the research problem and its objectives. Experts from state DOTs play a major role in this task.
- Investigators are selected both for the clarity of their research objectives and the likelihood that the research will be usable and readily implementable.
- Staff and panel members establish agreement with the investigator on what is expected from the project and the researchers in order to meet the needs of the practitioner.
- Project oversight aims to keep the research in line with the approved research plan and ensure that all project developments through final reporting center on practitioner needs.

Implementing research results

Over the years, NCHRP staff and various AASHTO committees have worked together to structure research findings into the best possible form for immediate use by the practitioner. Such joint efforts have facilitated implementation of the findings. AASHTO has provided NCHRP with frequent opportunities for staff and project researchers to go before the association's various committees to present their findings and recommendations directly to the user community. At the request of project panels, NCHRP will provide additional funding to accelerate the implementation of promising products through workshops, presentations, and demonstration projects.

Documenting success

For the past several years, NCHRP has addressed the challenge of documenting or showcasing successful research products. Several approaches are being used, and NCHRP will continue to explore new and better ways to meet this challenge.

Every four years, NCHRP surveys panel members from completed projects to identify known applications of research results. Feedback from these surveys enables NCHRP to confirm high usage and application of research results, to improve the implementation of future research results, and to identify successful applications of research.

These successful applications of NCHRP research are showcased in a series of case studies, “Impacts on Practice,” based on interviews with DOT practitioners. More than 30 of these case studies are posted on the TRB website.

In addition, the interviews with DOT practitioners have identified the various ways that states implement NCHRP research results. NCHRP documents some of these implementation efforts and methods in the “Paths to Practice” series. Two examples are included in the following pages.

- Updating the Authoritative Guide on Capacity
- Safer Intersections for Rural Highways

Updating the Authoritative Guide on Capacity

The *Highway Capacity Manual* is the go-to source for information about evaluating the capacity of transportation facilities. The latest edition provides practitioners with the most up-to-date analytical tools by incorporating more than \$5 million in NCHRP research and drawing on a broad collaborative effort by the transportation community.

Responding to Evolving Practices

For more than 60 years, the Transportation Research Board's *Highway Capacity Manual* (HCM) has provided engineers with state-of-the-art techniques for analyzing the capacity and level of service for transportation facilities, including roadways, intersections, and roundabouts. The HCM is the definitive guide for transportation engineers worldwide who wish to determine how much traffic a transportation facility can safely accommodate at a prescribed level of service, defined by such performance measures as average traffic speed and travel time.

However, as methods for evaluating capacity and level of service evolve, updates to the HCM are needed to provide transportation practitioners with the best available analytical tools. Since its first publication in 1950, the HCM has seen five editions, the most recent issued in 2010 (www.trb.org/Main/Blurbs/164718.aspx). TRB's 2010 update to the HCM:

- For the first time, provides users with a method for an integrated multimodal analysis of urban streets.
- Addresses active traffic management such as managed lanes and smart lanes.
- Gives planners the tools to quickly determine the size of future facilities.
- Includes an electronic volume with comprehensive case studies.

Paths to Practice

Incorporating a broad range of NCHRP research findings

The 2010 HCM was a major undertaking, incorporating more than \$5 million in

research from 10 NCHRP projects and two FHWA projects.

One of these projects, NCHRP Project 03-82, improved default values for analyzing capacity and level of service. Engineers use default input values—pedestrian and road and signal geometries—when there is insufficient local field data for an analysis. The defaults in the previous edition of the HCM did not fully reflect the variety of traffic conditions across the United States and sometimes yielded analyses of limited usefulness.

“NCHRP 03-82 helped improve the accuracy of the most significant default values for the HCM by revising them based on field data from around the United States,” says John Zegeer,

principal investigator for NCHRP 03-82, and senior principal engineer at Kittelson & Associates. “This makes analyses of capacity and level of service much more reliable.”

“NCHRP 03-82 helped improve the accuracy of the most significant default values for the HCM.”

Another project, NCHRP 03-64, developed a companion guide to the HCM to show how to apply its methodologies to real-world problems. “Prior to the 2000 edition, the HCM only provided simple example problems to illustrate methodologies,” says Tom

“The HCM's new multimodal analysis tools look at the urban environment from the point of view not just of traffic engineers but of travelers.”

Creasey, transportation planning manager with Stantec. Creasey chaired the NCHRP 03-64 panel and is secretary of the TRB Highway Capacity and Quality of Service (HCQS) Committee, which oversees the HCM. “The companion guide educates users on how to use the HCM for complex problems that require more than plugging numbers into formulas,” Creasey says.

Creasey was also a member of the panel for NCHRP 03-70, which incorporated

(continued)

Implementation Strategies AT A GLANCE

- **Cooperative National Effort:** Updating the Highway Capacity Manual involved broad collaboration among TRB, AASHTO, FHWA, and other transportation stakeholders.
- **An Ongoing Research Commitment:** Refining and building on previous work facilitated the implementation of past successful research.
- **Keeping Users in Mind:** Transportation practitioners were consulted at multiple stages of the revision process to make sure the new HCM would meet their needs.
- **Dissemination through Partners:** TRB's capacity committee and the Institute of Transportation Engineers used webinars and other channels to share updates and facilitate use of the new HCM.

NCHRP — Transportation research that works

Objective national highway research since 1962 • Focused on practical problems of state DOTs • Contract researchers competitively selected • Overseen by balanced panels of technical experts • Reviewed by TRB highway specialists

methods for the multimodal analysis of urban streets. “The HCM’s new multimodal analysis tools look at the urban environment from the point of view not just of traffic engineers but of travelers,” he says. “The mathematical models were created based on how drivers, pedestrians, bicyclists, and transit users rated their experience of trips.” The update will make the HCM far more useful to planners, helping them to evaluate the trade-offs involved in how various modes share an urban street.

“The manual is larger than any one committee.”

A collaborative effort by the transportation community

The HCM is a definitive guide that embodies decades of research. Updating it was an enormous effort that involved the cooperation of TRB, AASHTO, and FHWA over a number of years. “The manual is larger than any one committee,” says Ray Derr,

NCHRP and FHWA Research for the 2010 HCM Update

- NCHRP Project 03-60, Capacity and Quality of Service of Interchange Ramp Terminals
- NCHRP Project 03-60A, Validation and Enhancement of the *Highway Capacity Manual's* Interchange Ramp Terminal Methodology
- NCHRP Project 03-64, *Highway Capacity Manual* Applications Guide
- NCHRP Project 03-65, Applying Roundabouts in the United States
- NCHRP Project 03-70, Multimodal Level of Service Analysis for Urban Streets
- NCHRP Project 03-75, Analysis of Freeway Weaving Sections
- NCHRP Project 03-79, Measuring and Predicting the Performance of Automobile Traffic on Urban Streets
- NCHRP Project 03-82, Default Values for Capacity and Quality of Service Analyses
- NCHRP Project 03-85, Guidance for the Use of Alternative Traffic Analysis Tools in Highway Capacity Analyses
- NCHRP Project 03-92, Production of the Year 2010 *Highway Capacity Manual*
- Two FHWA projects: Evaluation of Safety, Design, and Operation of Shared-Use Paths; and Active Traffic Management Measures for Increasing Capacity and Improving Performance

TRB senior program officer on NCHRP 03-92, the umbrella project for updating the manual. “Updating it required extensive involvement from the transportation community as a whole.”

Part of that effort involved consulting transportation professionals to make sure the 2010 update would meet their needs. As part of project 03-92, researchers conducted focus groups with HCM users in Florida, Maryland, and Oregon. “These focus groups provided critical insights into the content and organization of the manual,” Derr says.

As it was completed, the HCM was also vetted in a yearlong review process by more than 300 TRB professionals and TRB HCQS Committee members. “The HCQS Committee reviewed results of each project and made an independent determination as to whether they were valid and should be included,” Zegeer says. “Their oversight was critical.” The HCQS also obtained feedback through joint summer meetings with the Institute of Transportation Engineers (ITE) as well as focus groups sponsored by the ITE.

The HCM has a wide reach

Derr, Creasey, and Zegeer agree that the impact of the HCM on transportation infrastructure in the United States cannot be emphasized enough. Its methods are used to determine everything from the number of lanes on streets to the timing of traffic signals. It is also highly influential on the content of capacity manuals worldwide.

“This manual has a huge amount of weight, setting the commonly accepted standards for level of service,” Derr says. “It’s widely used by both local agencies and state DOTs to determine how to keep traffic moving. It is also frequently cited in local regulations.”

To ensure the HCM’s continued relevance, the HCQS was very active in sharing the results of the 2010 update. That included numerous webinars, several of which were

“Focus groups provided critical insights into the content and organization of the manual.”



Among many other updates, the 2010 *Highway Capacity Manual* gives users tools to incorporate bicycle and pedestrian planning into their traffic engineering decisions.

co-hosted by ITE, as well as ITE meetings, according to Derr. “The HCQS is a very busy committee,” he says. “Dissemination is a big part of their job.”

“This manual has a huge amount of weight.... It’s widely used by both local agencies and state DOTs to determine how to keep traffic moving.”

Another major route for the impact of the HCM is companion software developed and maintained by the University of Florida’s McTrans Center. “The Highway Capacity Software is frequently updated and faithfully implements HCM procedures,” Derr says, “giving transportation professionals an important tool for applying HCM methodologies.”

Implementation Success

Because of its wide use and impact on transportation professionals worldwide, the HCM is a standout example of a successful implementation of NCHRP research. “It would be hard to think of a better implemented project than the HCM,” Creasey says. “Not only does it meet a demonstrated need, but it has met the challenge of accommodating more and more needs in response to feedback from the user community.”

The result is a manual that is increasingly useful to engineers with each update. “This latest edition significantly changes how engineers evaluate the possible effects of highway projects,” says Zegeer. “It gives them better tools than ever for evaluating capacity and quality of service.”

ACKNOWLEDGEMENT OF SPONSORSHIP Work was sponsored by the American Association of State Highway and Transportation Officials, in cooperation with the Federal Highway Administration, and was conducted in the National Cooperative Highway Research Program, which is administered by the Transportation Research Board of the National Academies.

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Safer Intersections for Rural Highways

Right-angle crashes are a problem on median-separated highways, but the most typical solutions for this problem—constructing an interchange or installing traffic signals—are not always the most effective. NCHRP managed research on safer median intersections that led to the expanded use of innovative designs by state transportation agencies. The effects on safety have been dramatic.

Intersections on Rural Highways: A Serious Safety Risk

Median-separated highways provide distinct advantages over undivided roadways by separating traffic, providing a recovery or stopping area for vehicles, and providing space for left-turn vehicles. In many cases, they also provide the same safety and travel time benefits as rural interstates at a lower cost. However, these safety benefits can be diminished by an increase in the frequency and severity of intersection crashes, especially right-angle crashes that occur while a vehicle from a minor road is making a left turn through the median and onto the highway.



J-turns significantly improve rural highway intersection safety by preventing drivers from directly crossing medians and requiring them instead to make a right turn followed by a U-turn.

Because interchanges and traffic lights are not always the most effective or cost-efficient solutions to these problems, transportation agencies are in need of innovative, low-cost designs that can be used to improve the safety of such intersections. To help establish design guidance and safety data for

“In the past, options for improving safety at high-speed rural safety intersections were limited.”

these treatments, NCHRP Project 15-30 was undertaken, resulting in *NCHRP Report 650: Median Intersection Design for Rural High-*

Speed Divided Highways (www.trb.org/main/blurbs/163452.aspx).

The report includes 10 case studies illustrating how various intersection designs have been applied in the field and includes recommendations for updating guidance in the FHWA *Manual on Uniform Traffic Control Devices* and AASHTO’s *A Policy on Geometric Design of Highways and Streets*, or “Green Book.”

Paths to Practice

An expanded toolbox for state DOTs

NCHRP Report 650 showed that many of the intersection designs examined can significantly improve safety at a lower cost than constructing an interchange. In doing so, the report gives states an expanded set of options for dealing with problem intersections.

“In the past, options for improving safety at high-speed rural intersections were limited,” says Tom Welch, panel chair for NCHRP

15-30 and formerly a highway safety engineer for the Iowa DOT. “Options included a new interchange, which involves major new spending, or installing a traffic signal, which is not guaranteed to improve safety and may even worsen it.”

According to Welch, *NCHRP Report 650* provides engineers with everything they need to make an informed decision about how to handle a problem intersection and how to approach the task of design. “With this

report, we have a good toolbox,” Welch says. “There is no missing information.”

J-turns: States adopt a safer intersection design

One of the median treatments examined in *NCHRP Report 650* is the J-turn intersection, which prevents a driver on a minor road from directly crossing the median. Instead, drivers are forced to make a right turn and subsequently a U-turn at some distance from the intersection. Because the J-turn reduces drivers’ exposure to oncoming traffic in the opposing lane, the distance of which can be difficult to judge, the safety benefits can be significant.

“The J-turn is the main tool we consider when we need to address right-angle crashes.”

“Our case study showed that J-turns produced a 48 to 92 percent reduction in

(continued)

Implementation Strategies AT A GLANCE

- **Cost-Efficient Solutions:** *NCHRP Report 650* spells out rural intersection solutions that increase safety benefits and lower costs. This offers DOTs a fast track to implementation.
- **Addressing a High-Profile Research Need:** DOTs have expressed keen interest in these solutions, and research-based guidance supports field trials and implementation.
- **Proof for the Public and Elected Officials:** Research data and supporting materials help satisfy members of the public and lawmakers who need evidence that these new designs work.

NCHRP — Transportation research that works

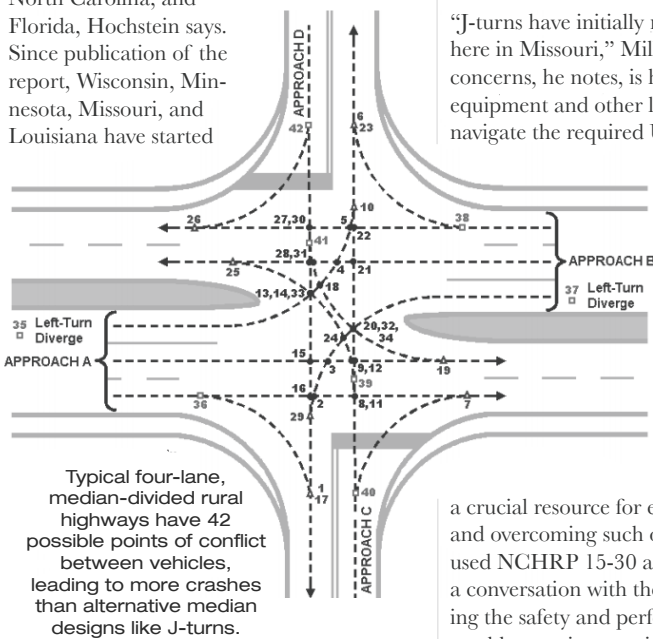
Objective national highway research since 1962 • Focused on practical problems of state DOTs • Contract researchers competitively selected • Overseen by balanced panels of technical experts • Reviewed by TRB highway specialists

crashes, and as much as a 100 percent reduction in more severe right-angle crashes,” says Joshua Hochstein, study co-investigator and Ph.D. candidate at Iowa State University.

“With objective safety data, the report lessens the burden of explaining to the public why these treatments are necessary.”

By the end of the study, state transportation agencies’ interest in J-turns was high. After sharing case studies with agencies during a multistate video conference, researchers had transportation agencies vote on how to prioritize further research into countermeasures. “They voted J-turns to be the highest priority,” Hochstein says.

The only states using J-turns when *NCHRP Report 650* was written were Maryland, North Carolina, and Florida, Hochstein says. Since publication of the report, Wisconsin, Minnesota, Missouri, and Louisiana have started



using J-turns, and Iowa is considering their use. Minnesota and Missouri are leaders in implementing the treatments, Welch says.

According to Missouri DOT traffic engineer John Miller, Missouri has already installed 12 J-turns with four more in the works. “The J-turn is the main tool we consider when we need to address right-angle crashes,” he says.

Minnesota has constructed about six J-turns and is planning six more, according to Brad

Estochen, traffic engineer at Minnesota DOT. “For problem intersections with high-speed angle crashes, J-turns are something we can implement to improve the situation far more quickly and cost-effectively than overpasses,” Estochen says.

A tool for educating the public

However, implementation of J-turns can be a difficult task, often facing fierce public opposition. Minnesota, Missouri, and Iowa have all reported similar problems.

“Drivers want to know why they can’t make a left turn,” Estochen says. “This is something new and nontraditional, and the public can be reluctant to embrace change.”

“J-turns have initially not been well-received here in Missouri,” Miller says. One of the concerns, he notes, is how well agricultural equipment and other large vehicles can navigate the required U-turns. According to



Some J-turn treatment U-turn designs involve bulb-outs to accommodate larger vehicles.

Welch, Iowa also encountered early resistance to its consideration of J-turns.

However, Estochen, Miller, and Welch agree that the safety data and case studies in *NCHRP Report 650* can be

a crucial resource for educating the public and overcoming such opposition. “We’ve used NCHRP 15-30 as a basis to start having a conversation with the locals about improving the safety and performance of potentially troublesome intersections,” Estochen says. “With objective safety data, the report lessens the burden of explaining to the public why these treatments are necessary. It shows that these treatments, while unfamiliar, have been successfully implemented before.”

“We’ve seen a 90 percent reduction in angle crashes where we’ve installed J-turns.”

“Because of the public reaction, the NCHRP results are handy,” Miller says. “We can point to the large reduction in collisions—and it really helps us sell J-turns.”

Implementation Success

Once installed, the safety benefits of J-turns sell themselves. “We’ve seen a 90 percent reduction in angle crashes where we’ve installed J-turns,” Estochen says. Missouri has had similarly impressive safety results.

“This is one of the most successful NCHRP projects I’ve been involved with. I’m proud to be a part of something that has saved lives.”

Estochen notes that *NCHRP Report 650* is a tool not just for educating the public, but also engineers—both new and seasoned—about alternatives to interchanges.

Miller and Welch agree. “This is a really important report,” Miller says. “It’s one I actively share with other staff.”

“This is one of the most successful NCHRP projects I’ve been involved with,” Welch says. “It really identified a need that states had, and I’m proud to be a part of something that has saved lives.” Ultimately the results will be incorporated into AASHTO’s Green Book and the FHWA *Manual on Uniform Traffic Control Devices*, he says.

ACKNOWLEDGEMENT OF SPONSORSHIP Work was sponsored by the American Association of State Highway and Transportation Officials, in cooperation with the Federal Highway Administration, and was conducted in the National Cooperative Highway Research Program, which is administered by the Transportation Research Board of the National Academies.

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Publications of the National Cooperative Highway Research Program

Table 1. Reports

No.	Proj. No.	Title, Pages, Publication Year
*	04-03(02)	A Critical Review of Literature Treating Methods of Identifying Aggregates Subject to Destructive Volume Change When Frozen in Concrete and a Proposed Program of Research—Intermediate Report, 81 p. (1964)
*	20-03D	Freeway Traffic Management, 68 p. (1979)
1	06-08	Evaluation of Methods of Replacement of Deteriorated Concrete in Structures, 56 p. (1964)
2	01-01(01)	An Introduction to Guidelines for Satellite Studies of Pavement Performance, 19 p. (1964)
2A	01-01(01)	Guidelines for Satellite Studies of Pavement Performance, 85 p. (1964)
3	03-05	Improved Criteria for Traffic Signals at Individual Intersections—Interim Report, 36 p. (1964)
4	06-02	Non-Chemical Methods of Snow and Ice Control on Highway Structures, 74 p. (1964)
5	10-03	Effects of Different Methods of Stockpiling Aggregates—Interim Report, 48 p. (1964)
6	03-04	Means of Locating and Communicating with Disabled Vehicles—Interim Report, 56 p. (1964)
7	01-02	Comparison of Different Methods of Measuring Pavement Condition—Interim Report, 29 p. (1964)
8	04-04	Synthetic Aggregates for Highway Construction, 13 p. (1964)
9	03-02	Traffic Surveillance and Means of Communicating with Drivers—Interim Report, 28 p. (1964)
10	01-04(01)	Theoretical Analysis of Structural Behavior of Road Test Flexible Pavements, 31 p. (1964)
11	03-06	Effect of Control Devices on Traffic Operations—Interim Report, 107 p. (1964)
12	04-03(01)	Identification of Aggregates Causing Poor Concrete Performance When Frozen—Interim Report, 47 p. (1964)
13	02-05	Running Cost of Motor Vehicles as Affected by Highway Design—Interim Report, 43 p. (1965)
14	10-05	Density and Moisture Content Measurements by Nuclear Methods—Interim Report, 32 p. (1965)
15	04-03(02)	Identification of Concrete Aggregates Exhibiting Frost Susceptibility—Interim Report, 66 p. (1965)
16	06-03	Protective Coatings to Prevent Deterioration of Concrete by Deicing Chemicals, 21 p. (1965)
17	10-01	Development of Guidelines for Practical and Realistic Construction Specifications, 109 p. (1965)
18	02-02	Community Consequences of Highway Improvement, 37 p. (1966)
19	06-01	Economical and Effective Deicing Agents for Use on Highway Structures, 19 p. (1966)
20	05-04	Economic Study of Roadway Lighting, 77 p. (1966)
21	01-05	Detecting Variations in Load-Carrying Capacity of Flexible Pavements, 30 p. (1966)
22	01-03(02)	Factors Influencing Flexible Pavement Performance, 69 p. (1966)
23	06-04	Methods for Reducing Corrosion of Reinforcing Steel, 22 p. (1966)
24	07-01	Urban Travel Patterns for Airports, Shopping Centers, and Industrial Plants, 116 p. (1966)
25	10-07	Potential Uses of Sonic and Ultrasonic Devices in Highway Construction, 48 p. (1966)
26	13-01	Development of Uniform Procedures for Establishing Construction Equipment Rental Rates, 33 p. (1966)
27	06-05	Physical Factors Influencing Resistance of Concrete to Deicing Agents, 41 p. (1966)
28	03-02	Surveillance Methods and Ways and Means of Communicating with Drivers, 66 p. (1966)
29	03-02	Digital-Computer-Controlled Traffic Signal System for a Small City, 82 p. (1966)
30	01-04(02)	Extension of AASHO Road Test Performance Concepts, 33 p. (1966)
31	08-05	A Review of Transportation Aspects of Land-Use Control, 41 p. (1967)
32	03-05	Improved Criteria for Traffic Signals at Individual Intersections, 134 p. (1967)
33	02-04	Values of Time Savings of Commercial Vehicles, 74 p. (1967)
34	10-02	Evaluation of Construction Control Procedures—Interim Report, 117 p. (1967)
35	01-03(03)	Prediction of Flexible Pavement Deflections from Laboratory Repeated-Load Tests, 117 p. (1967)
36	15-01	Highway Guardrails—A Review of Current Practice, 33 p. (1967)
37	01-07	Tentative Skid-Resistance Requirements for Main Rural Highways, 80 p. (1967)
38	09-03	Evaluation of Pavement Joint and Crack Sealing Materials and Practices, 40 p. (1967)
39	01-08	Factors Involved in the Design of Asphaltic Pavement Surfaces, 112 p. (1967)
40	03-04	Means of Locating Disabled or Stopped Vehicles, 40 p. (1967)
41	03-06	Effect of Control Devices on Traffic Operations, 83 p. (1967)
42	14-01	Interstate Highway Maintenance Requirements and Unit Maintenance Expenditure Index, 144 p. (1967)
43	10-05	Density and Moisture Content Measurements by Nuclear Methods, 38 p. (1967)

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No.	Proj. No.	Title, Pages, Publication Year
44	07-02	Traffic Attraction of Rural Outdoor Recreational Areas, 28 p. (1967)
45	05-05	Development of Improved Pavement Marking Materials—Laboratory Phase, 24 p. (1967)
46	10-03	Effects of Different Methods of Stockpiling and Handling Aggregates, 102 p. (1967)
47	02-03	Accident Rates as Related to Design Elements of Rural Highways, 173 p. (1967)
48	07-04	Factors and Trends in Trip Lengths, 70 p. (1967)
49	20-04	National Survey of Transportation Attitudes and Behavior—Phase I Summary Report, 71 p. (1967)
50	03-08	Factors Influencing Safety at Highway-Rail Grade Crossings, 113 p. (1967)
51	03-03	Sensing and Communication Between Vehicles, 105 p. (1968)
52	10-06	Measurement of Pavement Thickness by Rapid and Nondestructive Methods, 82 p. (1968)
53	07-06	Multiple Use of Lands Within Highway Rights-of-Way, 68 p. (1968)
54	15-01(02)	Location, Selection, and Maintenance of Highway Guardrails and Median Barriers, 63 p. (1968)
55	20-02	Research Needs in Highway Transportation, 66 p. (1968)
56	11-03	Scenic Easements—Legal, Administrative, and Valuation Problems and Procedures, 174 p. (1968)
57	08-02	Factors Influencing Modal Trip Assignment, 78 p. (1968)
58	07-05	Comparative Analysis of Traffic Assignment Techniques with Actual Highway Use, 85 p. (1968)
59	01-06	Standard Measurements for Satellite Road Test Program, 78 p. (1969)
60	05-02(01)	Effects of Illumination on Operating Characteristics of Freeways, 148 p. (1969)
61	01-09	Evaluation of Studded Tire-Performance Data and Pavement Wear Measurement, 66 p. (1969)
62	07-01	Urban Travel Patterns for Hospitals, Universities, Office Buildings, and Capitols, 144 p. (1969)
63	02-06	Economics of Design Standards for Low-Volume Rural Roads, 93 p. (1969)
64	07-07	Motorists' Needs and Services on Interstate Highways, 88 p. (1969)
65	04-03(01)	One-Cycle Slow-Freeze Test for Evaluating Aggregate Performance in Frozen Concrete, 21 p. (1969)
66	04-03(02)	Identification of Frost-Susceptible Particles in Concrete Aggregates, 62 p. (1969)
67	09-01	Relation of Asphalt Rheological Properties to Pavement Durability, 45 p. (1969)
68	03-10	Application of Vehicle Operating Characteristics to Geometric Design and Traffic Operations, 38 p. (1969)
69	10-02A	Evaluation of Construction Control Procedures—Aggregate Gradation Variations and Effects, 58 p. (1969)
70	08-01	Social and Economic Factors Affecting Intercity Travel, 68 p. (1969)
71	07-03	Analytical Study of Weighing Methods for Highway Vehicles in Motion, 63 p. (1969)
72	11-02	Theory and Practice in Inverse Condemnation for Five Representative States, 44 p. (1969)
73	03-05	Improved Criteria for Traffic Signal Systems on Urban Arterials, 55 p. (1969)
74	04-06	Protective Coatings for Highway Structural Steel, 64 p. (1969)
74A	04-06	Protective Coatings for Highway Structural Steel—Literature Survey, 275 p. (1969)
74B	04-06	Protective Coatings for Highway Structural Steel—Current Highway Practices, 102 p. (1969)
75	02-09	Effect of Highway Landscape Development on Nearby Property, 82 p. (1969)
76	01-05(02)	Detecting Seasonal Changes in Load-Carrying Capabilities of Flexible Pavements, 37 p. (1969)
77	15-06	Development of Design Criteria for Safer Luminaire Supports, 82 p. (1969)
78	03-07	Highway Noise—Measurement, Simulation, and Mixed Reactions, 78 p. (1969)
79	17-01	Development of Improved Methods for Reduction of Traffic Accidents, 163 p. (1969)
80	02-10	Oversize-Overweight Permit Operation on State Highways, 120 p. (1969)
81	08-06	Moving Behavior and Residential Choice—A National Survey, 129 p. (1969)
82	20-04	National Survey of Transportation Attitudes and Behavior—Phase II Analysis Report, 89 p. (1969)
83	12-02	Distribution of Wheel Loads on Highway Bridges, 56 p. (1969)
84	03-09	Analysis and Projection of Research on Traffic Surveillance, Communication, and Control, 48 p. (1970)
85	05-05	Development of Formed-in-Place Wet Reflective Markers, 28 p. (1970)
86	12-08	Tentative Service Requirements for Bridge Rail Systems, 62 p. (1970)
87	11-01(05)	Rules of Discovery and Disclosure in Highway Condemnation Proceedings, 28 p. (1970)
88	11-01(02)	Recognition of Benefits to Remainder Property in Highway Valuation Cases, 24 p. (1970)
89	07-04	Factors, Trends, and Guidelines Related to Trip Length, 59 p. (1970)
90	12-05	Protection of Steel in Prestressed Concrete Bridges, 86 p. (1970)

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No.	Proj. No.	Title, Pages, Publication Year
91	16-01	Effects of Deicing Salts on Water Quality and Biota—Literature Review and Recommended Research, 70 p. (1970)
92	11-01(06)	Valuation and Condemnation of Special Purpose Properties, 47 p. (1970)
93	03-13	Guidelines for Medial and Marginal Access Control on Major Roadways, 147 p. (1970)
94	11-01(09)	Valuation and Condemnation Problems Involving Trade Fixtures, 22 p. (1970)
95	05-06	Highway Fog, 48 p. (1970)
96	08-04	Strategies for the Evaluation of Alternative Transportation Plans, 111 p. (1970)
97	01-04(01)A	Analysis of Structural Behavior of AASHO Road Test Rigid Pavements, 35 p. (1970)
98	04-02	Tests for Evaluating Degradation of Base Course Aggregates, 98 p. (1970)
99	05-03	Visual Requirements in Night Driving, 38 p. (1970)
100	04-08	Research Needs Relating to Performance of Aggregates in Highway Construction, 68 p. (1970)
101	06-09	Effect of Stress on Freeze-Thaw Durability of Concrete Bridge Decks, 70 p. (1970)
102	12-07	Effect of Weldments on the Fatigue Strength of Steel Beams, 114 p. (1970)
103	10-04	Rapid Test Methods for Field Control of Highway Construction, 89 p. (1970)
104	11-01	Rules of Compensability and Valuation Evidence for Highway Land Acquisition, 77 p. (1970)
105	15-05	Dynamic Pavement Loads of Heavy Highway Vehicles, 94 p. (1970)
106	18-01	Revibration of Retarded Concrete for Continuous Bridge Decks, 67 p. (1970)
107	11-01(10)	New Approaches to Compensation for Residential Takings, 27 p. (1970)
108	15-02	Tentative Design Procedure for Riprap-Lined Channels, 75 p. (1970)
109	12-09	Elastomeric Bearing Research, 53 p. (1970)
110	03-11	Optimizing Street Operations Through Traffic Regulations and Control, 100 p. (1970)
111	02-05A, 02-07	Running Costs of Motor Vehicles as Affected by Road Design and Traffic, 97 p. (1970)
112	11-03(02)	Junkyard Valuation—Salvage Industry Appraisal Principles Applicable to Highway Beautification, 41 p. (1971)
113	03-14	Optimizing Flow on Existing Street Networks, 414 p. (1971)
114	11-01(01)	Effects of Proposed Highway Improvements on Property Values, 42 p. (1971)
115	15-01(02)	Guardrail Performance and Design, 70 p. (1971)
116	15-03	Structural Analysis and Design of Pipe Culverts, 155 p. (1971)
117	03-07	Highway Noise—A Design Guide for Highway Engineers, 79 p. (1971)
118	15-01(02)	Location, Selection, and Maintenance of Highway Traffic Barriers, 96 p. (1971)
119	11-03(01)	Control of Highway Advertising Signs—Some Legal Problems, 72 p. (1971)
120	08-07	Data Requirements for Metropolitan Transportation Planning, 90 p. (1971)
121	08-05	Protection of Highway Utility, 115 p. (1971)
122	02-11	Summary and Evaluation of Economic Consequences of Highway Improvements, 324 p. (1971)
123	03-12	Development of Information Requirements and Transmission Techniques for Highway Users, 239 p. (1971)
124	03-05	Improved Criteria for Traffic Signal Systems in Urban Networks, 86 p. (1971)
125	10-05A	Optimization of Density and Moisture Content Measurements by Nuclear Methods, 86 p. (1971)
126	11-04	Divergences in Right-of-Way Valuation, 57 p. (1971)
127	06-10	Snow Removal and Ice Control Techniques at Interchanges, 90 p. (1971)
128	01-11	Evaluation of AASHO Interim Guides for Design of Pavement Structures, 111 p. (1972)
129	15-01(02)	Guardrail Crash Test Evaluation New Concepts and End Designs, 89 p. (1972)
130	05-07	Roadway Delineation Systems, 349 p. (1972)
131	19-02(04)	Performance Budgeting System for Highway Maintenance Management, 213 p. (1972)
132	01-03(01)	Relationships Between Physiographic Units and Highway Design Factors, 161 p. (1972)
133	07-08	Procedures for Estimating Highway User Costs, Air Pollution, and Noise Effects, 127 p. (1972)
134	11-01(08)	Damages Due to Drainage, Runoff, Blasting, and Slides, 24 p. (1972)
135	04-10	Promising Replacements for Conventional Aggregates for Highway Use, 53 p. (1972)
136	15-04	Estimating Peak Runoff Rates from Ungauged Small Rural Watersheds, 85 p. (1972)
137	16-02	Roadside Development—Evaluation of Research, 78 p. (1972)
138	21-01	Instrumentation for Measurement of Moisture—Literature Review and Recommended Research, 60 p. (1973)

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No.	Proj. No.	Title, Pages, Publication Year
139	01-10	Flexible Pavement Design and Management—Systems Formulation, 64 p. (1973)
140	01-10	Flexible Pavement Design and Management—Materials Characterization, 118 p. (1973)
141	19-03	Changes in Legal Vehicle Weights and Dimensions—Some Economic Effects on Highways, 184 p. (1973)
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Table 1. Reports

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Table 1. Reports

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Table 1. Reports

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Table 1. Reports

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Table 1. Reports

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Table 1. Reports

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Table 1. Reports

No.	Proj. No.	Title, Pages, Publication Year
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Table 1. Reports

No.	Proj. No.	Title, Pages, Publication Year
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Table 1. Reports

No.	Proj. No.	Title, Pages, Publication Year
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Table 1. Reports

No.	Proj. No.	Title, Pages, Publication Year
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Table 1. Reports

No.	Proj. No.	Title, Pages, Publication Year
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Table 1. Reports

No.	Proj. No.	Title, Pages, Publication Year
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618	07-15	Cost-Effective Performance Measures for Travel Time Delay, Variation, and Reliability, 80 p. (2008)
619	15-28	Modernize and Upgrade CANDE for Analysis and LRFD Design of Buried Structures (& CD 69), 40 p. (2008)
620	12-71	Development of Design Specifications and Commentary for Horizontally Curved Concrete Box-Girder Bridges, 96 p. (2008)
621	10-62	Acceptance Tests for Surface Characteristics of Steel Strands Used in Pre-Stressed Concrete, 140 p. (2008)
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624	13-02	Selection and Application of Warning Lights on Roadway Operations Equipment, 48 p. (2008)
625	08-49(02)	Procedures Guide for Right-of-Way Cost Estimation and Cost Management, 224 p. (2008)
626	10-65	NDT Technology for Quality Assurance of HMA Pavement Construction (& WOD 133), 120 p. (2008)
627	17-30	Traffic Safety Evaluation of Nighttime and Daytime Work Zones, 88 p. (2008)
628	18-12	Self-Consolidating Concrete for Precast, Prestressed Concrete Bridge Elements, 104 p. (2008)
629	09-29	Ruggedness Testing of the Dynamic Modulus and Flow Number Tests with the Simple Performance Tester, 132 p. (2008)
630	01-44	Measuring Tire-Pavement Noise at the Source, 44 p. (2009)
631	04-26	Updated Test and Design Methods for Thermoplastic Drainage Pipe, 336 p. (2009)
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634	10-67	Texturing of Concrete Pavements, 112 p. (2009)
635	08-56	Acoustic Beamforming: Mapping Sources of Truck Noise, 88 p. (2009)
636	20-72	Tools to Aid State DOTs in Responding to Workforce Challenges, 96 p. (2009)
637	10-69	Guidelines for Dowel Alignment in Concrete Pavements, 64 p. (2009)
638	22-12(02)	Guidelines for Guardrail Implementation, 40 p. (2009)
639	20-07/Task 255	Adhesive Anchors in Concrete Under Sustained Loading Conditions, 144 p. (2009)
640	09-41	Construction and Maintenance Practices for Permeable Friction Courses (& WOD 138), 132 p. (2009)
641	17-32	Guidance for the Design and Application of Shoulder and Centerline Rumble Strips, 184 p. (2009)
642	15-32	Quantifying the Benefits of Context Sensitive Solutions, 176 p. (2009)
643	20-75	Implementing Transportation Knowledge Networks, 88 p. (2009)
644	20-76	Guidelines for Conducting a Disparity and Availability Study for the Federal DBE Program, 112 p. (2010)
645	12-72	Blast-Resistant Highway Bridges: Design and Detailing Guidelines, 152 p. (2010)
646	09-38	Validating the Fatigue Endurance Limit for Hot Mix Asphalt, 144 p. (2010)

Table 1. Reports

No.	Proj. No.	Title, Pages, Publication Year
647	15-29	Recommended Design Specifications for Live Load Distribution to Buried Structures, 88 p. (2010)
648	09-39	Mixing and Compaction Temperatures of Asphalt Binders in Hot-Mix Asphalt, 160 p. (2010)
649	03-73	Separation of Vehicles—CMV-Only Lanes (joint report with NCFRP Report 3), 108 p. (2010)
650	15-30	Median Intersection Design for Rural High-Speed Divided Highways, 168 p. (2010)
651	24-31	LRFD Design and Construction of Shallow Foundations for Highway Bridge Structures, 148 p. (2010)
652	10-58(01)	Time-Related Incentive and Disincentive Provisions in Highway Construction Contracts, 76 p. (2010)
653	24-26	Effects of Debris on Bridge Pier Scour (& WOD 148), 184 p. (2010)
654	18-14	Evaluation and Repair Procedures for Precast/Prestressed Concrete Girders with Longitudinal Cracking in the Web, 76 p. (2010)
655	10-73	Recommended Guide Specification for the Design of Externally Bonded FRP Systems for Repair and Strengthening of Concrete Bridge Elements, 115 p. (2010)
656	22-23	Criteria for Restoration of Longitudinal Barriers, 104 p. (2010)
657	08-64	Guidebook for Implementing Passenger Rail Service on Shared Passenger and Freight Corridors, 184 p. (2010)
658	08-60	Guidebook on Risk Analysis Tools and Management Practices to Control Transportation Project Costs, 132 p. (2010)
659	15-35	Guide for the Geometric Design of Driveways, 96 p. (2010)
660	08-62	Transportation Performance Management: Insight from Practitioners, 56 p. (2010)
661	08-58	A Guidebook for Corridor-Based Statewide Transportation Planning, 76 p. (2010)
662	20-73	Accelerating Transportation Project and Program Delivery: Conception to Completion, 104 p. (2010)
663	22-20	Design of Roadside Barrier Systems Placed on MSE Retaining Walls, 194 p. (2010)
664	08-67	Measuring Transportation Network Performance, 84 p. (2010)
665	17-22	Identification of Vehicular Impact Conditions Associated with Serious Ran-off-Road Crashes, 80 p. (2010)
666	08-70	Target-Setting Methods and Data Management to Support Performance-Based Resource Allocation by Transportation Agencies (& WOD 154), 138 p. (2010)
667	17-40	Model Curriculum for Highway Safety Core Competencies (& CD 84), 24 p. (2010)
668	14-15	A Framework for a National Database System for Maintenance Action on Highway Bridges, 94 p. (2010)
669	01-41	Models for Predicting Reflection Cracking of Hot-Mix Asphalt Overlays, 70 p. (2010)
670	04-33	Recommended Procedures for Testing and Evaluating Detectable Warning Systems, 114 p. (2010)
671	08-63	Review of Canadian Experience with Regulation of Large Commercial Motor Vehicles, 138 p. (2010)
672	03-65A	Roundabouts: An Informational Guide, Second Edition, 416 p. (2010)
673	09-33	A Manual for Design of Hot Mix Asphalt with Commentary (& WOD 159), 284 p. (2011)
674	03-78A	Crossing Solutions at Roundabouts and Channelized Turn Lanes for Pedestrians with Vision Disabilities (& WOD 160), 150 p. (2011)
675	24-28	LRFD Metal Loss and Service-Life Strength Reduction Factors for Metal-Reinforced Systems, 114 p. (2011)
676	21-09	Intelligent Soil Compaction Systems, 178 p. (2010)
677	20-74A	Development of Levels of Service for the Interstate Highway System (& CD 85), 48 p. (2010)
678	12-75	Design of FRP Systems for Strengthening Concrete Girders in Shear, 128 p. (2011)
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681	12-74	Development of a Precast Bent Cap System for Seismic Regions, 114 p. (2011)
682	24-32	Scour at Wide Piers and Long Skewed Piers, 64 p. (2011)
683	12-76(01)	Protocols for Collecting and Using Traffic Data in Bridge Design, 124 p. (2011)
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688	14-18	Determining Highway Maintenance Costs, 100 p. (2011)
689	19-08	Costs of Alternative Revenue-Generation Systems, 138 p. (2011)
690	08-65	A Guidebook for Successful Communication, Cooperation, and Coordination Strategies Between Transportation Agencies and Tribal Communities (& WOD 171), 122 p. (2011)

Table 1. Reports

No.	Proj. No.	Title, Pages, Publication Year
691	09-43	Mix Design Practices for Warm Mix Asphalt, 110 p. (2011)
692	13-03A	Decision Making for Outsourcing and Privatization of Vehicle and Equipment Fleet Maintenance, 64 p. (2011)
693	20-86	Attracting, Recruiting, and Retaining Skilled Staff for Transportation System Operations and Management (& WOD 182), 164 p. (2012)
694	08-75	Evaluation and Performance Measurement of Congestion Pricing Projects (& WOD 174), 190 p. (2011)
695	08-55A	Guide for Implementing a Geospatially Enabled Enterprise-wide Information Management System for Transportation Agency Real Estate Offices (& CD 99), 56 p. (2011)
696	04-32	Performance of Corrugated Pipe Manufactured with Recycled Polyethylene Content, 144 p. (2011)
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698	12-88	Application of Accelerated Bridge Construction Connections in Moderate-to-High Seismic Regions, 62 p. (2011)
699	10-68	Guidelines for the Use of Pavement Warranties on Highway Construction Projects (& CD 101), 62 p. (2011)
700	12-78	A Comparison of AASHTO Bridge Load Rating Methods, 102 p. (2011)
701	24-21	Proposed Specifications for LRFD Soil-Nailing Design and Construction, 146 p. (2011)
702	09-29	Precision of the Dynamic Modulus and Flow Number Tests Conducted with the Asphalt Mixture Performance Tester, 208 p. (2011)
703	10-75	Guide for Pavement-Type Selection, 78 p. (2011)
704	09-22	A Performance-Related Specification for Hot-Mix Asphalt, 198 p. (2011)
705	17-35	Evaluation of Safety Strategies at Signalized Intersections, 46 p. (2011)
706	08-70	Uses of Risk Management and Data Management to Support Target-Setting for Performance-Based Resource Allocation by Transportation Agencies, 58 p. (2011)
707	03-98	Guidelines on the Use of Auxiliary Through Lanes at Signalized Intersections (& WOD 178), 96 p. (2011)
708	08-74	A Guidebook for Sustainability Performance Measurement for Transportation Agencies (& CD 104), 204 p. (2011)
709	09-36	Investigation of Short-Term Laboratory Aging of Neat and Modified Asphalt Binders, 76 p. (2011)
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713	08-71	Estimating Life Expectancies of Highway Assets, Vol. 1: Guidebook, 140 p. (2012)
713	08-71	Estimating Life Expectancies of Highway Assets, Vol. 2: Final Report, 240 p. (2012)
714	09-43	Special Mixture Design Considerations and Methods for Warm Mix Asphalt (WMA): A Supplement to NCHRP Report 673, 54 p. (2012)
715	17-38	Highway Safety Manual Training Materials (& CD 106), 26 p. (2012)
716	08-61	Travel Demand Forecasting: Parameters and Techniques, 170 p. (2012)
717	24-29	Scour at Bridge Foundations on Rock, 184 p. (2012)
718	10-74	Fatigue Loading and Design Methodology for High-Mast Lighting Towers, 144 p. (2012)
719	09-30A	Calibration of Rutting Models for Structural and Mix Design, 220 p. (2012)
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722	08-57	Assessing Highway Tolling and Pricing Options and Impacts, Vol. 1: Decision-Making Framework, 128 p. (2012)
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726	10-78	A Guidebook for Nighttime Construction: Impacts on Safety, Quality, and Productivity, 130 p. (2012)
727	20-71	Effective Experiment Design and Data Analysis in Transportation Research, 88 p. (2012)
728	25-31	Guidelines for Evaluating and Selecting Modifications to Existing Roadway Drainage Infrastructure to Improve Water Quality in Ultra-Urban Areas (& CD 116), 176 p. (2012)

Table 1. Reports

No.	Proj. No.	Title, Pages, Publication Year
729	03-93	Automated Enforcement for Speeding and Red Light Running, 86 p. (2012)
730	15-31A	Design Guidance for Freeway Mainline Ramp Terminals, 128 p. (2012)
731	03-95	Guidelines for Timing Yellow and All-Red Intervals at Signalized Intersections, 96 p. (2012)
732	20-59(34)	Methodologies to Estimate the Economic Impacts of Disruptions to the Goods Movement System, 104 p. (2012)
733	18-15	High-Performance/High-Strength Lightweight Concrete for Bridge Girders and Decks, 90 p. (2013)
734	15-24	Hydraulic Loss Coefficients for Culverts, 122 p. (2012)
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736	14-21	Resource Allocation Logic Framework to Meet Highway Asset Preservation, 89 p. (2012)
737	15-40	Design Guidance for High-Speed to Low-Speed Transition Zones for Rural Highways, 96 p. (2012)
738	10-76	Evaluating Pavement Strategies and Barriers for Noise Mitigation, 72 p. (2013)
739	08-80	Freight Trip Generation and Land Use (joint report with NCFRP Report 19), 158 p. (2012)
740	20-59(32)	A Transportation Guide for All-Hazards Emergency Evacuation (& CD 132; & WOD 196), 194 p. (2013)
741	25-33	Evaluation of Methodologies for Visual Impact Assessments, 160 p. (2013)
742	14-24	Communicating the Value of Preservation: A Playbook, 196 p. (2012)
743	04-38	Predicting the Initial Retroreflectivity of Pavement Markings from Glass Bead Quality, 84 p. (2013)
744	10-81	Fuel Usage Factors in Highway and Bridge Construction, 144 p. (2013)
745	03-91	Left-Turn Accommodations at Unsignalized Intersections (& WOD 193), 64 p. (2013)
746	03-80	Traffic Enforcement Strategies for Work Zones (& WOD 194), 42 p. (2013)
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749	18-13	Methods for Evaluating Fly Ash for Use in Highway Concrete, 90 p. (2013)
750	20-83(01)	Strategic Issues Facing Transportation, Vol. 1: Scenario Planning for Freight Transportation Infrastructure Investment (& CD 130; & WOD 195), 164 p. (2013)
750	20-83(05)	Strategic Issues Facing Transportation, Vol. 2: Climate Change, Extreme Weather Events, and the Highway System: Practitioner's Guide and Research Report (& CD 146), 214 p. (2014)
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750	20-83(04)	Strategic Issues Facing Transportation, Vol. 5: Preparing State Transportation Agencies for an Uncertain Energy Future, 338 p. (2014)
750	20-83(06)	Strategic Issues Facing Transportation, Vol. 6: The Effects of Socio-Demographics on Future Travel Demand (& CD 152), 138 p. (2014)
751	20-85	Renewable Energy Guide for Highway Maintenance Facilities, 254 p. (2013)
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765	08-83	Analytical Travel Forecasting Approaches for Project-Level Planning and Design (& CD 143), 318 p. (2014)

Table 1. Reports

No.	Proj. No.	Title, Pages, Publication Year
766	15-42	Recommended Bicycle Lane Widths for Various Roadway Characteristics, 72 p. (2014)
767	25-32	Measuring and Removing Dissolved Metals from Stormwater in Highly Urbanized Areas (& CD 147), 172 p. (2014)
768	20-93	Guide to Accelerating New Technology Adoption through Directed Technology Transfer, 104 p. (2014)
769	20-59(44)	A Guide for Public Transportation Pandemic Planning and Response, 64 p. (2014)
770	08-78A	Estimating Bicycling and Walking for Planning and Project Development: A Guidebook (& CD 148), 162 p. (2014)
771	20-84	Strategies to Optimize Real Property Acquisition, Relocation Assistance, and Property Management Practices (& CD 154), 216 p. (2014)
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775	08-89	Applying GPS Data to Understand Travel Behavior, 214 p. (2014)
776	12-86	Bridge System Safety and Redundancy, 124 p. (2014)
777	20-59(42)	A Guide to Regional Transportation Planning for Disasters, Emergencies, and Significant Events, 160 p. (2014)
778	25-42	Bridge Stormwater Runoff Analysis and Treatment Options, 210 p. (2014)
779	09-47A	Field Performance of Warm Mix Asphalt Technologies, 256 p. (2014)
780	03-102	Design Guidance for Intersection Auxiliary Lanes, 158 p. (2014)
781	20-59(37)	A Debris Management Handbook for State and Local DOTs and Departments of Public Works, 204 p. (2014)
782	12-82(01)	Proposed Guideline for Reliability-Based Bridge Inspection Practices, 224 p. (2014)
783	17-53	Evaluation of the 13 Controlling Criteria for Geometric Design, 100 p. (2014)
784	20-07/Task 339	Best Practices for Crack Treatments for Asphalt Pavements, 46 p. (2014)
785	15-34A	Performance-Based Analysis of Geometric Design of Highways and Streets, 130 p. (2014)
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791	25-34	Supplemental Guidance on the Application of FHWA's Traffic Noise Model (TNM), 110 p. (2014)
792	25-40	Long-Term Performance and Life-Cycle Costs of Stormwater Best Management Practices (& CD 153), 162 p. (2014)
793	20-59(43)	Incorporating Transportation Security Awareness into Routine State DOT Operations and Training, 38 p. (2014)
794	22-21A	Median Cross-Section Design for Rural Divided Highways, 122 p. (2014)
795	24-33	Design Methods for In-Stream Flow Control Structures, 94 p. (2014)
796	10-80	Development and Calibration of AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 124 p. (2014)

Table 2. Syntheses of Highway Practice (Project 20-05)

No.	Topic No.	Title, Pages, Publication Year
1	00-01	Traffic Control for Freeway Maintenance, 47 p. (1969)
2	00-02	Bridge Approach Design and Construction Practices, 30 p. (1969)
3	00-04	Traffic-Safe and Hydraulically Efficient Drainage Practice, 38 p. (1969)
4	00-03	Concrete Bridge Deck Durability, 28 p. (1970)
5	00-05	Scour at Bridge Waterways, 37 p. (1970)
6	00-06	Principles of Project Scheduling and Monitoring, 43 p. (1970)
7	03-01	Motorist Aid Systems, 28 p. (1971)
8	00-09	Construction of Embankments, 38 p. (1971)

Table 2. Syntheses of Highway Practice (Project 20-05)

No.	Topic No.	Title, Pages, Publication Year
9	00-08	Pavement Rehabilitation—Materials and Techniques, 41 p. (1972)
10	00-10	Recruiting, Training, and Retaining Maintenance and Equipment Personnel, 35 p. (1972)
11	00-12	Development of Management Capability, 50 p. (1972)
12	03-03	Telecommunications Systems for Highway Administration and Operations, 29 p. (1972)
13	03-03	Radio Spectrum Frequency Management, 32 p. (1972)
14	00-07	Skid Resistance, 66 p. (1972)
15	03-02	Statewide Transportation Planning—Needs and Requirements, 41 p. (1972)
16	03-08	Continuously Reinforced Concrete Pavement, 23 p. (1973)
17	03-05	Pavement Traffic Marking—Materials and Application Affecting Serviceability, 44 p. (1973)
18	04-01	Erosion Control on Highway Construction, 52 p. (1973)
19	03-04	Design, Construction, and Maintenance of PCC Pavement Joints, 40 p. (1973)
20	04-04	Rest Areas, 38 p. (1973)
21	04-06	Highway Location Reference Methods, 30 p. (1974)
22	04-03	Maintenance Management of Traffic Signal Equipment and Systems, 41 p. (1974)
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24	04-02	Minimizing Deicing Chemical Use, 58 p. (1974)
25	05-01	Reconditioning High-Volume Freeways in Urban Areas, 56 p. (1974)
26	03-07	Roadway Design in Seasonal Frost Areas, 104 p. (1974)
27	05-06	PCC Pavements for Low-Volume Roads and City Streets, 31 p. (1975)
28	05-05	Partial-Lane Pavement Widening, 30 p. (1975)
29	04-09	Treatment of Soft Foundations for Highway Embankments, 25 p. (1975)
30	06-10	Bituminous Emulsions for Highway Pavements, 76 p. (1975)
31	05-08	Highway Tunnel Operations, 29 p. (1975)
32	05-13	Effects of Studded Tires, 46 p. (1975)
33	05-03	Acquisition and Use of Geotechnical Information, 40 p. (1976)
34	06-03	Policies for Accommodation of Utilities on Highway Rights-of-Way, 22 p. (1976)
35	05-02	Design and Control of Freeway Off-Ramp Terminals, 61 p. (1976)
36	06-01	Instrumentation and Equipment for Testing Highway Materials, Products, and Performance, 70 p. (1976)
37	06-06	Lime-Fly Ash-Stabilized Bases and Subbases, 66 p. (1976)
38	06-02	Statistically Oriented End-Result Specifications, 40 p. (1976)
39	06-07	Transportation Requirements for the Handicapped, Elderly, and Economically Disadvantaged, 54 p. (1976)
40	07-02	Staffing and Management for Social, Economic, and Environmental Impact Assessments, 43 p. (1977)
41	06-09	Bridge Bearings, 62 p. (1977)
42	05-04	Design of Pile Foundations, 68 p. (1977)
43	07-05	Energy Effects, Efficiencies, and Prospects for Various Modes of Transportation, 57 p. (1977)
44	07-01	Consolidation of Concrete for Pavements, Bridge Decks, and Overlays, 61 p. (1977)
45	06-05	Rapid-Setting Materials for Patching of Concrete, 13 p. (1977)
46	07-04	Recording and Reporting Methods for Highway Maintenance Expenditures, 35 p. (1977)
47	05-07	Effect of Weather on Highway Construction, 29 p. (1978)
48	07-07	Priority Programming and Project Selection, 31 p. (1978)
49	08-09	Open-Graded Friction Courses for Highways, 50 p. (1978)
50	05-09	Durability of Drainage Pipe, 37 p. (1978)
51	08-02	Construction Contract Staffing, 62 p. (1978)
52	08-08	Management and Selection Systems for Highway Maintenance Equipment, 17 p. (1978)
53	08-05	Precast Concrete Elements for Transportation Facilities, 48 p. (1978)
54	08-01	Recycling Materials for Highways, 53 p. (1978)
55	08-06	Storage and Retrieval Systems for Highway and Transportation Data, 30 p. (1978)
56	07-06	Joint-Related Distress in PCC Pavement—Cause, Prevention and Rehabilitation, 36 p. (1979)
57	09-01	Durability of Concrete Bridge Decks, 61 p. (1979)

Table 2. Syntheses of Highway Practice (Project 20-05)

No.	Topic No.	Title, Pages, Publication Year
58	10-01	Consequences of Deferred Maintenance, 24 p. (1979)
59	08-11	Relationship of Asphalt Cement Properties to Pavement Durability, 43 p. (1979)
60	09-08	Failure and Repair of Continuously Reinforced Concrete Pavement, 42 p. (1979)
61	09-03	Changeable Message Signs, 37 p. (1979)
62	09-09	State Resources for Financing Transportation Programs, 34 p. (1979)
63	08-03	Design and Use of Highway Shoulders, 26 p. (1979)
64	08-12	Bituminous Patching Mixtures, 26 p. (1979)
65	09-05	Quality Assurance, 42 p. (1979)
66	09-11	Glare Screen Guidelines, 17 p. (1979)
67	10-06	Bridge Drainage Systems, 44 p. (1979)
68	10-04	Motor Vehicle Size and Weight Regulations, Enforcement, and Permit Operations, 45 p. (1980)
69	07-09	Bus Route and Schedule Planning Guidelines, 99 p. (1980)
70	09-10	Design of Sedimentation Basins, 54 p. (1980)
71	09-07	Direction Finding from Arterials to Destinations, 50 p. (1980)
72	11-01	Transportation Needs Studies and Financial Constraints, 54 p. (1980)
73	09-06	Alternative Work Schedules: Impacts on Transportation, 54 p. (1980)
74	10-11	State Transit-Management Assistance to Local Communities, 35 p. (1980)
75	11-09	Transit Boards—Composition, Roles, and Procedures, 24 p. (1981)
76	10-05	Collection and Use of Pavement Condition Data, 74 p. (1981)
77	11-08	Evaluation of Pavement Maintenance Strategies, 56 p. (1981)
78	11-02, 11-03	Value Engineering in Preconstruction and Construction, 23 p. (1981)
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80	10-03	Formulating and Justifying Highway Maintenance Budgets, 49 p. (1981)
81	11-14	Experiences in Transportation System Management, 88 p. (1981)
82	12-02	Criteria for Evaluation of Truck Weight Enforcement Programs, 74 p. (1981)
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89	11-06	Geotechnical Instrumentation for Monitoring Field Performance, 46 p. (1982)
90	12-12	New-Product Evaluation Procedures, 34 p. (1982)
91	12-03	Highway Accident Analysis Systems, 69 p. (1982)
92	11-04	Minimizing Reflection Cracking of Pavement Overlays, 38 p. (1982)
93	12-08	Coordination of Transportation System Management and Land Use Management, 38 p. (1982)
94	08-10	Photologging, 38 p. (1982)
95	13-05	Statewide Transportation Planning, 54 p. (1982)
96	11-07	Pavement Subsurface Drainage Systems, 38 p. (1982)
97	13-06	Transit Ownership/Operation Options for Small Urban and Rural Areas, 28 p. (1982)
98	12-04	Resealing Joints and Cracks in Rigid and Flexible Pavements, 62 p. (1982)
99	13-04	Resurfacing with Portland Cement Concrete, 90 p. (1982)
100	13-03	Managing State Highway Finance, 23 p. (1982)
101	13-11	Historic Bridges: Criteria for Decision Making, 84 p. (1983)
102	14-05	Material Certification and Material-Certification Effectiveness, 24 p. (1983)
103	13-10	Risk Assessment Process for Hazardous Materials Transportation, 36 p. (1983)
104	14-08	Criteria for Use of Asphalt Friction Surfaces, 41 p. (1983)
105	13-01	Construction Contract Claims: Causes and Methods of Settlement, 58 p. (1983)
106	14-01	Practical Guidelines for Minimizing Tort Liability, 40 p. (1983)

Table 2. Syntheses of Highway Practice (Project 20-05)

No.	Topic No.	Title, Pages, Publication Year
107	12-06	Shallow Foundations for Highway Structures, 38 p. (1983)
108	13-08	Bridge Weight Limit Posting Practice, 30 p. (1984)
109	14-12	Highway Uses of Epoxy with Concrete, 68 p. (1984)
110	14-06	Maintenance Management Systems, 49 p. (1984)
111	14-22	Distribution of Wheel Loads on Highway Bridges, 21 p. (1984)
112	15-19	Cost Effectiveness of Hot-Dip Galvanizing for Exposed Steel, 28 p. (1984)
113	14-11	Administration of Research, Development, and Implementation Activities in Highway Agencies, 49 p. (1984)
114	14-02	Management of Traffic Signal Maintenance, 133 p. (1984)
115	14-03	Reducing Construction Conflicts Between Highways and Utilities, 72 p. (1984)
116	14-04	Asphalt Overlay Design Procedures, 66 p. (1984)
117	15-01	Toll Highway Financing, 29 p. (1984)
118	15-03	Detecting Defects and Deterioration in Highway Structures, 52 p. (1985)
119	15-10	Prefabricated Bridge Elements and Systems, 75 p. (1985)
120	15-08	Professional Resource Management and Forecasting, 14 p. (1985)
121	14-09	Energy Conservation in Transportation, 25 p. (1985)
122	15-07	Life-Cycle Cost Analysis of Pavements, 136 p. (1985)
123	12-11	Bridge Designs to Reduce and Facilitate Maintenance Repairs, 65 p. (1985)
124	16-02	Use of Weigh-In-Motion Systems for Data Collection and Enforcement, 34 p. (1986)
125	14-07	Maintenance Activities Accomplished by Contract, 42 p. (1986)
126	15-04	Equipment for Obtaining Pavement Condition and Traffic Loading Data, 117 p. (1986)
127	16-07	Use of Fly Ash in Concrete, 66 p. (1986)
128	15-06	Methods of Identifying Hazardous Highway Elements, 80 p. (1986)
129	16-05	Freezing and Thawing Resistance of High-Strength Concrete, 31 p. (1986)
130	15-11	Traffic Data Collection and Analysis: Methods and Procedures, 58 p. (1986)
131	15-05	Effects of Permit and Illegal Overloads on Pavements, 99 p. (1987)
132	17-01	System-Wide Safety Improvements: An Approach to Safety Consistency, 20 p. (1987)
133	17-02	Integrated Highway Information Systems, 31 p. (1987)
134	17-08	D-Cracking of Concrete Pavements, 33 p. (1987)
135	17-10	Pavement Management Practices, 139 p. (1987)
136	15-09	Protective Coatings for Bridge Steel, 107 p. (1987)
137	18-05	Negotiating and Contracting for Professional Engineering Services, 75 p. (1988)
138	18-06	Pavement Markings: Materials and Application for Extended Service Life, 45 p. (1988)
139	17-11	Pedestrians and Traffic-Control Measures, 75 p. (1988)
140	15-02	Durability of Prestressed Concrete Highway Structures, 65 p. (1988)
141	16-10	Bridge Deck Joints, 66 p. (1988)
142	13-02	Methods of Cost-Effectiveness Analysis for Highway Projects, 22 p. (1988)
143	19-02	Uniformity Efforts in Oversize/Overweight Permits, 79 p. (1988)
144	17-09	Breaking/Cracking and Sealing Concrete Pavements, 39 p. (1989)
145	17-13	Staffing Considerations in Construction Engineering Management, 42 p. (1989)
146	18-01	Use of Consultants for Construction Engineering and Inspection, 64 p. (1989)
147	18-04	Treatment of Problem Foundations for Highway Embankments, 72 p. (1989)
148	18-12	Indicators of Quality in Maintenance, 114 p. (1989)
149	19-23	Partnerships for Innovation: Private-Sector Contributions to Innovation in the Highway Industry, 45 p. (1990)
150	19-08	Technology Transfer in Selected Highway Agencies, 38 p. (1990)
151	19-06	Process for Recapitalizing Highway Transportation Systems, 43 p. (1990)
152	19-04	Compaction of Asphalt Pavement, 42 p. (1990)
153	18-11	Evolution and Benefits of Preventive Maintenance, 69 p. (1990)
154	17-06	Recycling of Portland Cement Concrete Pavements, 46 p. (1990)
155	19-07	Sign Evaluation and Replacement Programs: Policies and Criteria for Freeways and Expressways, 37 p. (1990)

Table 2. Syntheses of Highway Practice (Project 20-05)

No.	Topic No.	Title, Pages, Publication Year
156	18-08	Freeway Incident Management, 23 p. (1990)
157	16-03	Maintenance Management of Street and Highway Signs, 134 p. (1990)
158	16-06	Wet Pavement Safety Programs, 54 p. (1990)
159	18-03	Design and Construction of Bridge Approaches, 45 p. (1990)
160	18-09	Cold-Recycled Bituminous Concrete Using Bituminous Materials, 105 p. (1990)
161	19-01	Computer-Aided Design and Drafting Systems, 24 p. (1990)
162	20-03	Signing Policies, Procedures, Practices, and Fees for Logo and Tourist-Oriented Directional Signing, 41 p. (1990)
163	18-02	Innovative Strategies for Upgrading Personnel in State Transportation Departments, 35 p. (1990)
164	20-02	Measures to Curtail State Fuel Tax Evasion, 14 p. (1990)
165	19-10	Transportation Telecommunications, 92 p. (1990)
166	20-08	Traffic Signal Control Equipment: State of the Art, 43 p. (1991)
167	19-12	Measurements, Specifications, and Achievement of Smoothness for Pavement Construction, 34 p. (1991)
168	18-10	Contract Management Systems, 74 p. (1991)
169	20-07	Removing Concrete from Bridges, 42 p. (1991)
170	16-09	Managing Urban Freeway Maintenance, 26 p. (1991)
171	20-01	Fabrics in Asphalt Overlays and Pavement Maintenance, 72 p. (1991)
172	19-03	Signal Timing Improvement Practices, 88 p. (1991)
173	20-05	Short-Term Maintenance Systems, 44 p. (1991)
174	13-07	Stormwater Management for Transportation Facilities, 82 p. (1991)
175	19-09	Moisture Damage in Asphalt Concrete, 90 p. (1992)
176	20-09	Bridge Paint: Removal, Containment, and Disposal, 60 p. (1992)
177	18-07	Freeway Corridor Management, 64 p. (1992)
178	21-12	Truck Escape Ramps, 56 p. (1992)
179	20-12	Latex-Modified Concretes and Mortars, 58 p. (1992)
180	20-01	Performance Characteristics of Open-Graded Friction Courses, 44 p. (1992)
181	20-11	In-Service Experience with Traffic Noise Barriers, 62 p. (1992)
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183	22-09	Knowledge Based Expert Systems in Transportation, 52 p. (1992)
184	22-08	Disposal of Roadside Litter Mixtures, 52 p. (1993)
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186	21-09	Supplemental Advance Warning Devices, 84 p. (1993)
187	23-02	Rapid Test Methods for Asphalt Concrete and Portland Cement Concrete, 48 p. (1993)
188	21-03	Management Training and Development Programs, 56 p. (1993)
189	21-13	Pavement Structural Design Practices, 46 p. (1993)
190	21-14	Criteria for Qualifying Contractors for Bidding Purposes, 40 p. (1993)
191	22-13	Use of Rumble Strips to Enhance Safety, 80 p. (1993)
192	23-01	Accident Data Quality, 48 p. (1993)
193	21-10	Hot In-Place Recycling of Asphalt Concrete, 69 p. (1993)
194	24-06	Electronic Toll and Traffic Management (ETTM) Systems, 64 p. (1993)
195	23-07	Use of Warranties in Road Construction, 65 p. (1993)
196	21-11	Highway Maintenance Procedures Dealing with Hazardous Material Incidents, 60 p. (1994)
197	23-06	Corridor Preservation, 43 p. (1994)
198	22-02	Uses of Recycled Rubber Tires in Highways, 162 p. (1994)
199	22-10	Recycling and Use of Waste Materials and By-Products in Highway Construction, 84 p. (1994)
200	22-04	Underwater Bridge Maintenance and Repair, 54 p. (1994)
201	23-04	Multimodal Evaluation in Passenger Transportation, 57 p. (1994)
202	23-09	Severity Indices for Roadside Features, 54 p. (1994)
203	22-07	Current Practices in Determining Pavement Condition, 57 p. (1994)

Table 2. Syntheses of Highway Practice (Project 20-05)

No.	Topic No.	Title, Pages, Publication Year
204	23-10	Portland Cement Concrete Resurfacing, 56 p. (1994)
205	24-03	Performance and Operational Experience of Crash Cushions, 74 p. (1994)
206	20-22	Highway Tort Liability Management Programs, 40 p. (1994)
207	23-03	Managing Roadway Snow and Ice Control Operations, 85 p. (1994)
208	21-08	Development and Implementation of TCP for Highway Work Zones, 48 p. (1994)
209	24-12	Sealers for Portland Cement Concrete Highway Facilities, 68 p. (1994)
210	24-02	Road Pricing for Congestion Management: A Survey of International Practice, 65 p. (1994)
211	17-05	Design, Construction, and Maintenance of PCC Pavement Joints, 50 p. (1995)
212	23-05	Performance-Related Specification for Highway Construction and Rehabilitation, 48 p. (1995)
213	23-13	Effective Use of Park-and-Ride Facilities, 45 p. (1995)
214	24-01	Resolution of Disputes to Avoid Construction Claims, 39 p. (1995)
215	24-04	Determination of Contract Time for Highway Construction Projects, 43 p. (1995)
216	24-11	Implementation of Technology from Abroad, 44 p. (1995)
217	25-13	Consideration of the 15 Factors in the Metropolitan Planning Process, 57 p. (1995)
218		Mitigation of Nighttime Construction Noise, Vibrations and Other Nuisances (Project 20-07/Task 94), 93 p. (1996)
219	22-11	Photographic Enforcement of Traffic Laws, 67 p. (1996)
220	25-09	Waterproofing Membranes for Concrete Bridge Decks, 69 p. (1996)
221	24-13	Assessing the Effects of Highway-Widening Improvements on Urban and Suburban Areas, 43 p. (1996)
222	24-05	Pavement Management Methodologies to Select Projects and Recommend Preservation Treatments, 96 p. (1996)
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228	23-12	Reduced Visibility Due to Fog on the Highway, 51 p. (1996)
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232	26-02	Variability in Highway Pavement Construction, 38 p. (1996)
233	26-06	Land Development Regulations that Promote Access Management, 45 p. (1996)
234	26-07	Settlement of Bridge Approaches (The Bump at the End of the Bridge), 57 p. (1996)
235	26-07	Application of Full-Scale Accelerated Pavement Testing, 110 p. (1996)
236	26-03	Methods for Household Travel Surveys, 57 p. (1996)
237	23-11	Changeable Message Signs, 57 p. (1996)
238	25-15	Performance Measurement in State Departments of Transportation, 69 p. (1997)
239	25-07	Pavement Subsurface Drainage Systems, 44 p. (1997)
240	25-11	Toll Plaza Design, 113 p. (1997)
241	22-12	Truck Operating Characteristics, 62 p. (1997)
242	27-01	Trenchless Installation of Conduits Beneath Roadways, 76 p. (1997)
243	27-09	Methods for Capital Programming and Project Selection, 85 p. (1997)
244	25-04	Guardrail and Median Barrier Crashworthiness, 160 p. (1997)
245	27-11	Traffic Signal Control Systems Maintenance Management Practices, 63 p. (1997)
246	27-06	Outsourcing of State Highway Facilities and Services, 69 p. (1997)
247	27-03	Stabilization of Existing Subgrades to Improve Constructability During Interstate Pavement Reconstruction, 75 p. (1997)
248	26-09	Evaluating and Measuring the Effectiveness of Training, 28 p. (1997)
249	27-04	Methods for Increasing Live Load Capacity of Existing Highway Bridges, 66 p. (1997)
250	26-04	Highway-Rail Crossing Surfaces, 56 p. (1997)

Table 2. Syntheses of Highway Practice (Project 20-05)

No.	Topic No.	Title, Pages, Publication Year
251	28-04	Lead-Based Paint Removal for Steel Highway Bridges, 115 p. (1997)
252	27-10	Response of Small Urbanized Area MPOs to ISTEA, 35 p. (1997)
253	25-16	Dynamic Effects of Pile Installation on Adjacent Structures, 86 p. (1997)
254	25-21	Service Life of Drainage Pipe, 39 p. (1998)
255	26-08	Ground Penetrating Radar for Evaluating Subsurface Conditions for Transportation Facilities, 37 p. (1998)
256	28-07	Submittal of Bid Proposals in Electronic Format, 26 p. (1998)
257	26-12	Maintenance Issues and Alternate Corrosion Protection Methods for Exposed Bridge Steel (& WOD 11), 90 p. (1998)
258	27-16	Applications of GPS for Surveying and Other Positioning Needs in Departments of Transportation, 46 p. (1998)
259	25-12	Management of Surface Transportation Systems, 26 p. (1998)
260	27-08	Thin-Surfaced Pavements, 112 p. (1998)
261	27-02	Criteria for Highway Routing of Hazardous Materials, 38 p. (1998)
262	28-11	Tolling Practices for Highway Facilities, 54 p. (1998)
263	27-05	State DOT Management and Techniques for Materials and Construction Acceptance, 51 p. (1998)
264	28-09	Modern Roundabout Practice in the United States, 73 p. (1998)
265	27-07	Managing Product Liability to Achieve Highway Innovations, 54 p. (1998)
266	28-05	Dynamic Impact Factors for Bridges, 60 p. (1998)
267	26-11	Transportation Development Process, 48 p. (1998)
268	26-05	Relationship Between Pavement Surface Texture and Highway Traffic Noise, 85 p. (1998)
269	27-12	Road User and Mitigation Costs in Highway Pavement Projects, 47 p. (1998)
270	28-10	Transportation Management Center Functions, 68 p. (1998)
271	28-12	Traffic Signal Operations Near Highway-Rail Grade Crossings, 90 p. (1999)
272	28-01	Best Management Practices for Environmental Issues Related to Highway and Street Maintenance, 103 p. (1999)
273	28-03	Project Development Methodologies for Reconstruction of Urban Freeways and Expressways, 45 p. (1999)
274	28-06	Methods to Achieve Rut-Resistant Durable Asphalt Pavements, 61 p. (1999)
275	28-08	Historic Highway Bridge Preservation Practices, 58 p. (1999)
276	28-02	Geotechnical Related Development and Implementation of LRFD Methods, 69 p. (1999)
277	29-06	Consultants for DOT Preconstruction Engineering Work, 115 p. (1999)
278	29-08	Measuring In Situ Mechanical Properties of Pavement Subgrade Soils, 73 p. (1999)
279	29-02	Roadway Incident Diversion Practices, 84 p. (1999)
280	29-01	Seven Keys to Building a Robust Research Program, 64 p. (2000)
281	29-05	Operational Impacts of Median Width on Larger Vehicles, 68 p. (2000)
282	29-04	Project Management Information Systems, 37 p. (2000)
283	29-07	Fleet Management and Selection Systems for Highway Maintenance Equipment, 33 p. (2000)
284	29-03	Performance Survey on Open-Graded Friction Course Mixes, 38 p. (2000)
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287	30-06	Sleep Deprivation Countermeasures for Motorist Safety, 92 p. (2000)
288	30-07	Data Sharing and Data Partnerships for Highways, 31 p. (2000)
289	30-03	Corridor Management, 58 p. (2000)
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291	30-11	Evaluation of Pavement Friction Characteristics, 66 p. (2000)
292	30-04	Innovative Practices to Reduce Delivery Time for Right-of-Way in Project Development, 73 p. (2000)
293	30-12	Reducing and Mitigating the Impacts of Lane Occupancy During Construction and Maintenance, 60 p. (2000)
294	31-10	Configuration Management in Transportation Management Systems, 44 p. (2001)
295	31-02	Statistical Methods in Highway Safety Analysis, 75 p. (2001)
296	31-08	Impact of New Information and Communication Technologies on Transportation Agencies, 57 p. (2001)
297	31-11	Building Effective Relationships Between Central Cities and Regional, State, and Federal Agencies, 69 p. (2001)

Table 2. Syntheses of Highway Practice (Project 20-05)

No.	Topic No.	Title, Pages, Publication Year
298	31-09	Truck Trip Generation Data, 81 p. (2001)
299	31-01	Recent Geometric Design Research for Improved Safety and Operations, 134 p. (2001)
300	31-04	Performance Measures for Research, Development, and Technology Programs, 97 p. (2001)
301	31-05	Collecting, Processing, and Integrating GPS Data into GIS, 65 p. (2002)
302	31-12	Mitigation of Ecological Impacts, 100 p. (2002)
303	31-03	Assessment and Rehabilitation of Existing Culverts, 74 p. (2002)
304	32-05	Driveway Regulation Practices, 77 p. (2002)
305	32-11	Interaction Between Roadways and Wildlife Ecology, 78 p. (2002)
306	31-07	Long-Term Pavement Marking Practices, 154 p. (2002)
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308	32-12	Owner-Controlled Insurance Programs, 133 p. (2002)
309	32-09	Transportation Planning and Management for Special Events, 71 p. (2003)
310	32-03	Impact of Red Light Camera Enforcement on Crash Experience, 57 p. (2003)
311	32-07	Performance Measures of Operational Effectiveness for Highway Segments and Systems, 59 p. (2003)
312	31-06	Facilitating Partnerships in Transportation Research, 76 p. (2003)
313	34-15	State DOT Outsourcing and Private-Sector Utilization, 42 p. (2003)
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315	32-10	Compensation for Contractors' Home Office Overhead, 47 p. (2003)
316	33-01	Design Exception Practices, 82 p. (2003)
317	32-01	Dealing with Truck Parking Demands, 37 p. (2003)
318	33-05	Safe and Quick Clearance of Traffic Incidents, 143 p. (2003)
319	30-08	Bridge Deck Joint Performance, 46 p. (2003)
320	33-12	Integrating Freight Facilities and Operations with Community Goals, 58 p. (2003)
321	33-06	Roadway Safety Tools for Local Agencies, 166 p. (2003)
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325	32-04	Significant Findings from Full-Scale/Accelerated Pavement Testing, 202 p. (2003)
326	34-03	Strategic Planning and Decision Making in State Departments of Transportation, 62 p. (2004)
327	32-08	Cost-Effective Practices for Off-System and Local Interest Bridges, 130 p. (2004)
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329	33-11	Integrating Tourism and Recreation Travel with Transportation Planning and Project Delivery, 53 p. (2004)
330	32-06	Public Benefits of Highway System Preservation and Maintenance, 45 p. (2004)
331	33-09	State Highway Letting Program Management, 47 p. (2004)
332	34-12	Access Management on Crossroads in the Vicinity of Interchanges, 82 p. (2004)
333	34-09	Concrete Bridge Deck Performance, 101 p. (2004)
334	34-04	Automated Pavement Distress Collection Techniques, 84 p. (2004)
335	34-11	Pavement Management Applications Using Geographic Information Systems, 65 p. (2004)
336	34-02	Road Safety Audits, 127 p. (2004)
337	34-07	Cooperative Agreements for Corridor Management, 70 p. (2004)
338	34-08	Thin and Ultra-Thin Whitetopping, 96 p. (2004)
339	34-01	Centerline Rumble Strips on Rural Roads, 72 p. (2004)
340	34-06	Convertible Roadways and Lanes, 100 p. (2004)
341	33-04	Integrated Roadside Vegetation Management, 88 p. (2005)
342	35-02	Chip Seal Best Practices, 120 p. (2005)
343	34-05	Management of Disabled Business Enterprise Issues in Construction Contracting, 108 p. (2005)
344	34-10	Winter Highway Operations, 76 p. (2005)
345	33-10	Steel Bridge Erection Practices, 88 p. (2005)
346	35-01	State Construction Quality Assurance Programs, 88 p. (2005)

Table 2. Syntheses of Highway Practice (Project 20-05)

No.	Topic No.	Title, Pages, Publication Year
347	35-09	Managing Archaeological Investigations, 64 p. (2005)
348	35-10	Improving the Safety of Older Road Users, 112 p. (2005)
349	35-05	Developing Transportation Agency Leaders, 64 p. (2005)
350	35-03	Crash Records Systems, 48 p. (2005)
351	35-06	Access Rights, 96 p. (2005)
352	35-04	Value Engineering Applications in Transportation, 136 p. (2005)
353	35-07	Inspection and Maintenance of Bridge Stay Cable Systems, 88 p. (2005)
354	35-08	Inspection and Management of Bridges with Fracture-Critical Details, 84 p. (2005)
355	35-12	Transportation Technology Transfer: Successes, Challenges, and Needs, 96 p. (2005)
356	36-06	Pavement Markings—Design and Typical Layout Details, 152 p. (2006)
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358	36-09	Statewide Travel Forecasting Models, 120 p. (2006)
359	36-01	Bridge Rating Practices and Policies for Overweight Vehicles, 108 p. (2006)
360	36-12	Rock-Socketed Shafts for Highway Structure Foundations, 144 p. (2006)
361	36-04	Visualization for Project Development, 92 p. (2006)
362	36-07	Training Programs, Processes, Policies, and Practices, 104 p. (2006)
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365	37-02	Preserving and Using Institutional Memory Through Knowledge Management Practices, 128 p. (2007)
366	36-16	Tribal Transportation Programs, 144 p. (2007)
367	36-03	Technologies for Improving Safety Data, 102 p. (2007)
368	37-14	Cone Penetration Testing, 117 p. (2007)
369	37-08	State DOT Crash Reconstruction Practices, 32 p. (2007)
370	37-12	Animal-Vehicle Collision Data Collection, 107 p. (2007)
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379	38-12	Selection and Evaluation of Alternative Contracting Methods to Accelerate Project Completion, 76 p. (2008)
380	38-13	Applications of Illuminated, Active, In-Pavement Marker Systems, 80 p. (2008)
381	38-15	Falling Weight Deflectometer Usage, 136 p. (2008)
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394	39-07	Reducing Litter on Roadsides, 80 p. (2009)

Table 2. Syntheses of Highway Practice (Project 20-05)

No.	Topic No.	Title, Pages, Publication Year
395	37-11	Debt Finance Practices for Surface Transportation, 96 p. (2009)
396	36-02	Monitoring Scour Critical Bridges, 168 p. (2010)
397	37-07	Bridge Management Systems for Transportation Agency Decision Making, 136 p. (2009)
398	39-03	Cathodic Protection for Life Extension of Existing Reinforced Concrete Bridge Elements, 56 p. (2009)
399	39-08	Real-Time Traveler Information Systems, 72 p. (2009)
400	39-12	Identifying Promising Technologies for Environmental Surveys, 80 p. (2009)
401	39-01	Quality Management of Pavement Condition Data Collection, 144 p. (2009)
402	40-02	Construction Manager-at-Risk Project Delivery for Highway Programs, 136 p. (2010)
403	40-03	Adaptive Traffic Control Systems: Domestic and Foreign State of Practice, 112 p. (2010)
404	40-11	State of the Practice in Highway Access Management, 120 p. (2010)
405	40-04	Utility Location and Highway Design, 56 p. (2010)
406	40-06	Advanced Practices in Travel Forecasting, 88 p. (2010)
407	40-05	Effective Public Involvement Using Limited Resources, 112 p. (2010)
408	39-13	Pavement Marking Warranty Specifications, 64 p. (2010)
409	40-10	Traffic Signal Retiming Practices in the United States, 88 p. (2010)
410	40-09	Freight Transportation Surveys, 86 p. (2011)
411	41-12	Microsurfacing, 124 p. (2010)
412	40-08	Speed Reduction Techniques for Rural High-to-Low Speed Transitions, 110 p. (2011)
413	41-09	Techniques for Effective Highway Construction Projects in Congested Urban Areas, 86 p. (2011)
414	41-02	Effective Delivery of Small-Scale Federal-Aid Projects, 90 p. (2011)
415	41-05	Design Fires in Road Tunnels, 160 p. (2011)
416	41-08	Implementing Race-Neutral Measures in State Disadvantaged Business Enterprise Programs, 96 p. (2011)
417	41-01	Geometric Design Practices for Resurfacing, Restoration, and Rehabilitation, 110 p. (2011)
418	41-10	Developing Production Pile Driving Criteria from Test Pile Data, 76 p. (2011)
419	41-11	Transportation Improvement Program Revision Process, 78 p. (2011)
420	41-07	Operational and Institutional Agreements That Facilitate Regional Traffic Signal Operations, 114 p. (2011)
421	40-13	Recycling and Reclamation of Asphalt Pavements Using In-Place Methods, 70 p. (2011)
422	40-07	Trade-off Considerations in Highway Geometric Design, 172 p. (2011)
423	39-11	Long-Term Performance of Polymer Concrete for Bridge Decks, 72 p. (2011)
424	42-06	Engineering Economic Analysis Practices for Highway Investment, 128 p. (2012)
425	42-07	Waterproofing Membranes for Concrete Bridge Decks, 68 p. (2012)
426	42-06	Performance-Based Highway Maintenance and Operations Management, 96 p. (2012)
427	42-10	Extent of Highway Capacity Manual Use in Planning, 62 p. (2012)
428	42-03	Practices and Procedures for Site-Specific Evaluations of Earthquake Ground Motions, 90 p. (2012)
429	42-01	Geotechnical Information Practices in Design-Build Projects, 120 p. (2012)
430	42-09	Cost-Effective and Sustainable Road Slope Stabilization and Erosion Control, 78 p. (2012)
431	42-12	Practices to Manage Traffic Signal Reflectivity, 52 p. (2012)
432	42-04	Recent Roadway Geometric Design Research for Improved Safety and Operations, 90 p. (2012)
433	42-08	Significant Findings from Full-Scale Accelerated Pavement Testing, 162 p. (2012)
434	42-02	Use of the U.S. Census Bureau's Public Use Microdata Sample (PUMS) by State Departments of Transportation and Metropolitan Planning Organizations, 82 p. (2012)
435	40-01	Recycled Materials and Byproducts in Highway Applications, Vol. 1: Summary Report, 102 p. (2013)
435	40-01	Recycled Materials and Byproducts in Highway Applications, Vol. 2: Coal Combustion Byproducts, 51 p. (2013)
435	40-01	Recycled Materials and Byproducts in Highway Applications, Vol. 3: Non-Coal Combustion Byproducts, 31 p. (2013)
435	40-01	Recycled Materials and Byproducts in Highway Applications, Vol. 4: Mineral and Quarry Byproducts, 32 p. (2013)
435	40-01	Recycled Materials and Byproducts in Highway Applications, Vol. 5: Slag Byproducts, 35 p. (2013)

Table 2. Syntheses of Highway Practice (Project 20-05)

No.	Topic No.	Title, Pages, Publication Year
435	40-01	Recycled Materials and Byproducts in Highway Applications, Vol. 6: Reclaimed Asphalt Pavement, Recycled Concrete Aggregate, and Construction Demolition Waste, 72 p. (2013)
435	40-01	Recycled Materials and Byproducts in Highway Applications, Vol. 7: Scrap Tire Byproducts, 47 p. (2013)
435	40-01	Recycled Materials and Byproducts in Highway Applications, Vol. 8: Manufacturing and Construction Byproducts, 98 p. (2013)
436	42-11	Local Policies and Practices That Support Safe Pedestrian Environments, 94 p. (2012)
437	42-05	Assessing the Long-Term Performance of Mechanically Stabilized Earth Walls, 56 p. (2012)
438	43-11	Expedited Procurement Procedures for Emergency Construction Services, 114 p. (2012)
439	43-01	Use of Transportation Asset Management Principles in State Highway Agencies, 94 p. (2013)
440	43-07	Performance-Based Seismic Bridge Design, 134 p. (2013)
441	43-02	High Performance Concrete Specifications and Practices for Bridges, 82 p. (2013)
442	43-04	Practices and Performance Measures for Local Public Agency Federally Funded Highway Projects, 130 p. (2013)
443	43-05	Practical Highway Design Solutions, 104 p. (2013)
444	43-06	Pollutant Load Reductions for Total Maximum Daily Loads for Highways, 70 p. (2013)
445	43-03	Practices for Unbound Aggregate Pavement Layers, 180 p. (2013)
446	43-09	Use of Advanced Geospatial Data, Tools, Technologies, and Information in Department of Transportation Projects, 96 p. (2013)
447	43-10	Active Traffic Management for Arterials, 64 p. (2013)
448	43-08	State Department of Transportation Small Business Programs, 92 p. (2013)
449	43-12	Strategies to Mitigate the Impacts of Chloride Roadway Deicers on the Natural Environment, 104 p. (2013)
450	43-13	Forecasting Highway Construction Staffing Requirements, 84 p. (2013)
451	43-15	Emergency Medical Services Response to Motor Vehicle Crashes in Rural Areas, 80 p. (2013)
452	43-14	State Department of Transportation Fleet Replacement Management Practices, 50 p. (2014)
453	44-15	State Bridge Load Posting Processes and Practices, 144 p. (2014)
454	44-08	Response to Extreme Weather Impacts on Transportation Systems, 104 p. (2014)
455	44-09	Alternative Technical Concepts for Contract Delivery Methods, 116 p. (2014)
456	44-10	Non-Nuclear Methods for Compaction Control of Unbound Materials, 168 p. (2014)
457	44-06	Implementation of the AASHTO Mechanistic-Empirical Pavement Design Guide and Software, 80 p. (2014)
458	44-05	Roadway Safety Data Interoperability Between Local and State Agencies, 88 p. (2014)
459	44-02	Using the Economic Value Created by Transportation to Fund Transportation, 120 p. (2014)
460	44-13	Sharing Operations Data Among Agencies, 200 p. (2014)
461	41-06	Accelerating Implementation of Transportation Research Needs, 72 p. (2014)
462	44-11	Managing Longitudinal Utility Installations on Controlled Access Highway Right-of-Way, 66 p. (2014)
463	44-04	Pavement Patching Practices, 94 p. (2014)
464	44-07	Thin Asphalt Concrete Overlays, 58 p. (2014)
465	44-14	Permanent Signs Mounted on Median Barriers, 44 p. (2014)
466	45-16	Alliance Contracting—Evolving Alternative Project Delivery, 72 p. (2014)

Table 3. Research Results Digests

No.	Proj. No.	Title, Pages, Publication Year
1	15-02	Tentative Design Procedures for Riprap-Lined Channels, 24 p. (1968)
2	07-07	Motorists' Needs and Services on Interstate Highways, 4 p. (1969)
3	20-06	Relocation Assistance Under Chapter Five of the 1968 Federal-Aid Highway Act, 18 p. (1969)
4	01-04(01)A	Rigid Pavement Performance Influenced by Slab Strength and Thickness, 4 p. (1969)
5	12-05	Protection of Steel in Prestressed Concrete Bridges, 2 p. (1969)
6	20-06	Standing to Sue for Purposes of Securing Judicial Review of Exercise of Administrative Discretion in Route Location of Federal-Aid Highways, 9 p. (1969)
7	17-01	Development of Improved Methods for Reduction of Traffic Accidents, 2 p. (1969)

Table 3. Research Results Digests

No.	Proj. No.	Title, Pages, Publication Year
8	04-06	Protective Coatings for Highway Structural Steel, 2 p. (1969)
9	Various	National Survey of Transportation Attitudes and Behavior—Phase II Analysis Report, 4 p. (1969)
10	Various	Distribution of Wheel Loads on Highway Bridges, 4 p. (1969)
11	20-06	Valuation Changes Resulting from Influence of Public Improvements, 25 p. (1969)
12	Various	Tentative Service Requirements for Bridge Rail Services, 2 p. (1969)
13	06-09	Effect of Stress on Freeze-Thaw Durability of Concrete Bridge Decks, 2 p. (1969)
14	12-03	Waterproof Expansion Joints for Bridges, 3 p. (1969)
15	05-06	Highway Fog, 2 p. (1970)
16	18-01	Revibration of Retarded Concrete for Continuous Bridge Decks, 3 p. (1970)
17	15-03	Structural Design of Pipe Culverts, 4 p. (1970)
18	12-07	Effects of Weldments on Fatigue Strength of Steel Beams, 4 p. (1970)
19	20-06	Advance Acquisition Under the Federal-Aid Highway Act of 1968, 21 p. (1970)
20	19-01	Budgeting for State Highway Departments, 4 p. (1970)
21	03-14	Optimizing Flow on Existing Street Networks, 5 p. (1970)
22	20-06	Valuation in Eminent Domain as Affected by Zoning, 19 p. (1970)
23	02-05A, 02-07	Running Costs of Motor Vehicles as Affected by Road Design and Traffic, 5 p. (1970)
24	03-07	Establishment of Standards for Highway Noise, 6 p. (1970)
25	20-06	Federal Environmental Legislation and Regulations as Affecting Highways, 35 p. (1971)
26	03-05	Improved Criteria for Timing Traffic Signal Systems in Urban Networks, 3 p. (1971)
27	08-07	Data Requirements for Metropolitan Transportation Planning, 5 p. (1971)
28	03-12	Development of Information Requirements and Transmission Techniques for Highway Users, 4 p. (1971)
29	10-05A	Optimization of Density and Moisture Content Measurements by Nuclear Methods, 8 p. (1971)
30	04-07	Fatigue Strength of High-Yield Reinforcing Bars, 4 p. (1971)
31	20-06	Proposed Legislation to Authorize Joint Development of Highway Rights-of-Way, 12 p. (1971)
32	20-06	Changes in Existing State Law Required by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, 13 p. (1971)
33	21-01	Moisture Measurement Instrumentation: Review of Literature and Existing Technology, 5 p. (1971)
34	01-10	Flexible Pavement Design and Management: Systems Formulation and Materials Characterization, 10 p. (1971)
35	04-09	Evaluation of Preformed Elastomeric Pavement Joint Sealing Systems and Practices, 8 p. (1972)
36	05-07	Roadway Delineation Systems, 17 p. (1972)
37	20-08	Interactive Graphic Roadway Design System: Functional Specification and Feasibility Study, 5 p. (1972)
38	01-12(02)	Locked-Wheel Pavement Skid Tester Correlation and Calibration Techniques, 5 p. (1972)
39	20-06	Legal Effect of Representations as to Subsurface Conditions, 17 p. (1972)
40	20-06	Appeal Bodies for Highway Relocation Assistance, 16 p. (1972)
41	20-06	Trial Strategy and Techniques to Exclude Noncompensable Damages and Improper Valuation Methods in Eminent Domain Cases, 24 p. (1972)
42	20-06	Supplemental Condemnation: A Discussion of the Principles of Excess and Substitute Condemnation, 20 p. (1972)
43	22-02	Evaluation of Breakaway Cable Terminals for Guardrails, 10 p. (1972)
44	12-07	Fatigue Strength of Welded Steel Beams, 13 p. (1973)
45	20-06	Exclusion of Increase or Decrease in Value Caused by Public Improvement for Which Lands are Condemned, 24 p. (1973)
46	03-18(01)	Control Logic for Traffic Signal Networks, 5 p. (1973)
47	20-06	Trial Strategy and Techniques Using the Comparable Sales Approach to Valuation, 13 p. (1973)
48	10-09	Surface Condition Rating System for Bituminous Pavements, 24 p. (1973)
49	01-12(02)	Locked-Wheel Pavement Skid Tester Correlation and Calibration Techniques, 5 p. (1973)
50	01-12	Determining Pavement Skid Resistance Requirements at Intersections and Braking Sites, 12 p. (1973)
51	03-18(02)	Traffic Control in Oversaturated Street Networks, 9 p. (1973)
52	03-12	Urban Area Highway Guide Signing, 5 p. (1973)
53	22-02	Development of a Breakaway Cable Terminal for Median Barriers, 10 p. (1973)

Table 3. Research Results Digests

No.	Proj. No.	Title, Pages, Publication Year
54	20-06	Trial Strategy and Techniques Using the Income Approach to Valuation, 31 p. (1973)
55	20-07/Task 004	Side-Friction Factors in the Design of Highway Curves, 9 p. (1974)
56	12-11	Waterproof Membranes for Protection of Concrete Bridge Decks, 13 p. (1974)
57	04-08(02)	Density Standards for Field Compaction of Granular Bases and Subbases, 11 p. (1974)
58	09-04	Minimizing Premature Cracking in Asphaltic Concrete Pavement, 8 p. (1974)
59	12-15	Classification of Welded Bridge Details for Fatigue Loading, 22 p. (1974)
60	12-12	Fatigue of Welded Steel Bridge Members Under Variable-Amplitude Loadings, 21 p. (1974)
61	01-12(03)	Wear-Resistant and Skid-Resistant Highway Pavement Surfaces, 7 p. (1974)
62	01-10A	Systems Approach to Flexible Pavement Design and Management, 8 p. (1974)
63	10-08	Evaluating Procedures for Determining Concrete Pavement Thickness and Reinforcement Position, 11 p. (1974)
64	20-05	Roadway Design in Seasonal Frost Areas, 9 p. (1974)
65	12-10	Design of Bent Caps for Concrete Box Girder Bridges, 14 p. (1974)
66	12-15	Nondestructive Methods of Fatigue Crack Detection in Steel Bridge Members, 14 p. (1975)
67	15-02	Field Evaluation of Tentative Design Procedure for Riprap-Lined Channels, 4 p. (1975)
68	20-06	The Meaning of Highway Purpose, 15 p. (1975)
69	03-07	Establishment of Standards for Highway Noise Levels, 6 p. (1975)
70	17-02A	Methods for Evaluating Highway Safety Improvements, 3 p. (1975)
71	20-07/Task 002	Selection of Safe Roadside Cross Sections, 7 p. (1975)
72	01-14	Recommended Modification of Superelevation Practice for Long-Radius Curves, 10 p. (1975)
73	04-07	Fatigue Strength of High-Yield Reinforcing Bars, 6 p. (1975)
74	10-10	Electroslag Weldments in Bridges, 23 p. (1975)
75	21-02	Development of Prototype Soil Moisture Sensors, 2 p. (1975)
76	22-03, 22-03A	Field Evaluation of Vehicle Barrier System, 3 p. (1975)
77	20-07/Task 003	Earth-Berm Vehicle Deflector, 3 p. (1975)
78	03-20	Traffic Signal Warrants—A Bibliography, 42 p. (1975)
79	20-06	Personal Liability of State Highway Department Officers and Employees, 22 p. (1975)
80	20-06	Liability of State Highway Departments for Design, Construction, and Maintenance Defects, 49 p. (1975)
81	22-01A	Crash Testing and Evaluation of Attenuating Bridge Railing System, 10 p. (1976)
82	01-15	Design of Continuously Reinforced Concrete Pavements for Highways, 12 p. (1976)
83	20-06	Liability of State and Local Governments for Snow and Ice Control, 16 p. (1976)
84	22-02	Breakaway Cable Terminals for Guardrails and Median Barriers, 18 p. (1976)
85	12-16	Bridge Deck Repairs, 22 p. (1976)
86	03-22	Guidelines for Design and Operation of Ramp Control Systems, 5 p. (1976)
87	03-24	Current Practices in Use of Retroreflective Signing Materials, 6 p. (1976)
88	03-18(03)	Summary of Project 3-18(3): Traffic Signal System Surveys, 3 p. (1976)
89	01-12(03)	Guidelines for Skid-Resistant Highway Pavement Surfaces, 12 p. (1976)
90	20-05	Continuing Project to Synthesize Information on Highway Problems, 7 p. (1976)
91	03-21	Motorist Response to Guide Signing, 9 p. (1977)
92	08-17	Freight Data Requirements for Statewide Transportation Systems Planning, 4 p. (1977)
93	08-11	Impact Assessment Guidelines for Evaluating the No-Build Alternative in Transportation, 7 p. (1977)
94	08-13	Disaggregate Travel Demand Models, 7 p. (1977)
95	20-06	Legal Implications of Regulations Aimed at Reducing Wet-Weather Skidding Accidents on Highways, 31 p. (1977)
96	20-06	Continuing Project on Highway Right-of-Way and Legal Problems, 7 p. (1977)
97	03-23	Guidelines for Uniformity in Traffic Control Signal Design Configurations, 8 p. (1977)
98	20-07	Safety at Narrow Bridge Sites, 9 p. (1977)
99	20-06	Liability of the State for Highway Traffic Noise, 14 p. (1978)

Table 3. Research Results Digests

No.	Proj. No.	Title, Pages, Publication Year
100	20-05	Safe Conduct of Traffic Through Highway Construction and Maintenance Zones, 5 p. (1978)
101	12-15(02)	Retrofitting Procedures for Fatigue-Damaged Full-Scale Welded Bridge Beams, 7 p. (1978)
102	22-02	Modified Breakaway Cable Terminals for Guardrails and Median Barriers, 13 p. (1978)
103	20-06	Payment of Attorney Fees in Eminent Domain and Environmental Litigation, 24 p. (1978)
104	Various	NCHRP Research on Bridge Engineering, 6 p. (1978)
105	03-26	Selected Acoustical Parameters of Highway Noise Barriers, 8 p. (1978)
106	20-05	Use of Waste Materials in Highway Construction and Maintenance, 2 p. (1979)
107	20-05	Continuing Project to Synthesize Information on Highway Problems, 8 p. (1979)
108	20-06	Trial Strategy and Techniques in Highway Contract Litigation, 31 p. (1979)
109	20-06	Control of Conflicts of Interest in Highway Construction Contract Administration, 56 p. (1979)
110	20-06	Liability of State and Local Governments for Negligence Arising Out of the Installation and Maintenance of Warning Signs, Traffic Lights, and Pavement Markings, 14 p. (1979)
111	20-06	Trial Aids in Highway Condemnation Cases, 11 p. (1979)
112	20-06	Legal Implications of Control of Access to Uncontrolled-Access Highways, 21 p. (1979)
113	20-06	Right to Compensation in Eminent Domain for Abrogation of Restrictive Covenants, 12 p. (1979)
114	20-11	Energy Analysis Methodology for Assessing Environmental Impacts, 7 p. (1979)
115	Various	NCHRP Research on the Durability of Reinforced Concrete Bridge Components, 6 p. (1979)
116	20-06	Payments to Public Utilities for Relocation of Facilities in Highway Rights-of-Way, 35 p. (1980)
117	03-27	Guidelines for Selecting Traffic Signal Control at Individual Intersections, 7 p. (1980)
118	Various	NCHRP Research on Bridge Engineering, 6 p. (1980)
119	20-06	Recovery for Condemnation Blight Under Inverse Law, 11 p. (1980)
120	Various	Residential Dislocation—Costs and Consequences, 3 p. (1980)
121	21-02(03)	Development and Field Evaluation of Prototype Soil Moisture Sensors, 3 p. (1980)
122	03-26	Noise Barrier Acoustical Parameters—Experimental Results, 5 p. (1980)
123	04-09	Evaluation of Preformed Elastomeric Pavement Joint Sealing Systems, 7 p. (1980)
124	Various	A Modified Foundation for Breakaway Cable Terminals, 7 p. (1980)
125	20-05	Continuing Project to Synthesize Information on Highway Problems, 7 p. (1980)
126	03-18(04)	Performance Evaluation of Signalized Network Control Strategies, 4 p. (1980)
127	08-19	The Vehicle-Miles of Travel—Urban Highway Supply Relationship, 7 p. (1980)
128	20-06	Continuing Project on Highway-Right-of-Way and Legal Programs, 7 p. (1980)
129	20-06	Legal Implications of Highway Department's Failure to Comply with Design, Safety, or Maintenance Guidelines, 17 p. (1981)
130	01-20	Variability in Temperature Susceptibility of Asphalt Cement, 5 p. (1981)
131	20-05	Continuing Project to Synthesize Information on Highway Problems, 7 p. (1982)
132	Various	NCHRP Research on Bridge Engineering, 8 p. (1982)
133	01-16	Evaluation of Winter-Driving Traction Aids, 7 p. (1982)
134	20-06	Procedural Aspects of Inverse Condemnation—Title on Interest Acquired by Transportation and Other Public Agencies, 13 p. (1982)
135	20-06	Liability of the State for Injury-Producing Defects in Highway Surface, 14 p. (1982)
136	20-06	State Highway Programs Versus the Spending Powers of Congress, 18 p. (1982)
137	20-06	The Effects of Federal and State Public Information Acts on Highway and Transportation Department Activities, 23 p. (1982)
138	20-06	Legal Aspects of Historic Preservation in Highway Programs, 27 p. (1982)
139	20-05	Continuing Project to Synthesize Information on Highway Problems, 7 p. (1983)
140	Various	Development of a New Highway Capacity Manual: Status Report, 5 p. (1983)
141	20-06	Liability of State Highway Departments for Defects in Design, Construction, and Maintenance of Bridges, 20 p. (1983)
142	20-05	Continuing Project to Synthesize Information on Highway Problems, 7 p. (1983)
143	Various	NCHRP Research on Bridge Engineering, 8 p. (1984)
144	20-05	Continuing Project to Synthesize Information on Highway Problems, 8 p. (1984)

Table 3. Research Results Digests

No.	Proj. No.	Title, Pages, Publication Year
145	20-06	First Amendment Aspects of Control of Outdoor Advertising, 31 p. (1985)
146	20-06	Minority and Disadvantaged Business Enterprise Requirements in Public Contracting, 31 p. (1985)
147	20-06	Mineral Rights in Rights-of-Way: Acquisition, Valuation, and Disposition, 15 p. (1985)
148	20-05	Continuing Project to Synthesize Information on Highway Problems, 7 p. (1985)
149	20-06	Exaction of Right-of-Way by Exercise of Police Power, 13 p. (1986)
150	20-06	Planning and Precondemnation Activities as Constituting a Taking under Inverse Law, 14 p. (1986)
151	20-06	Liability of State for Injury or Damage Occurring in Motor Vehicle Accident Caused by Trees, Shrubbery, or Other Vegetative Obstruction Located in Right-of-Way or Growing on Adjacent Private Property, 20 p. (1986)
152	20-06	Enforceability of the Requirement of Notice in Highway Construction Contracts, 17 p. (1986)
153	20-06	Liability of the State for Injuries Caused by Obstructions or Defects in Highway Shoulder or Berm, 19 p. (1986)
154	20-06	Trial Strategy and Techniques in Enforcing Laws Relating to Truck Weights and Sizes, 35 p. (1986)
155	Various	NCHRP Research on Bridge Engineering, 6 p. (1986)
156	20-06	Continuing Project on Legal Problems Arising Out of Highway Programs, 5 p. (1986)
157	20-06	Supplement to Licensing and Qualification of Bidders in Selected Studies in Highway Law, 19 p. (1986)
158	20-06	Legal and Procedural Issues Related to Relocation Assistance, 25 p. (1986)
159	20-05	Continuing Project to Synthesize Information on Highway Problems, 7 p. (1986)
160	20-06	Acquisition of Uneconomic Remnants Under 23 U.S.C. 109(f), 13 p. (1987)
161	02-14	Public and Private Partnerships for Financing Highway Improvements, 34 p. (1987)
162	20-06	Continuing Project on Legal Problems Arising Out of Highway Programs, 5 p. (1987)
163	20-06	Supplement to Competitive Bidding and Award of Construction Contracts in Selected Studies in Highway Law, 32 p. (1987)
164	20-06	Rights of Abutting Property Owner Upon Conversion of Uncontrolled-Access Road into Limited-Access Highway, 14 p. (1987)
165	20-06	Legal Techniques for Reserving Right-of-Way for Future Projects Including Corridor Protection, 44 p. (1987)
166	20-05	Continuing Project to Synthesize Information on Highway Problems, 7 p. (1987)
167	Various	NCHRP Research on Bridge Engineering, 8 p. (1988)
168	20-05	Continuing Project to Synthesize Information on Highway Problems, 8 p. (1988)
169	10-24	Rapid Replacement of Portland Cement Concrete Pavement Segments, 11 p. (1989)
170	20-24	Research Program Design Administration of Highway and Transportation Agencies, 5 p. (1989)
171	10-20	Pot Bearings and PTFE Surfaces, 14 p. (1989)
172	20-05	Continuing Project to Synthesize Information on Highway Problems, 8 p. (1989)
173	20-24(02)	Guidelines for Establishing Executive Management Information Systems for State Departments of Transportation, 7 p. (1990)
174	10-25A	Determination of Water-Cement Ratio in Fresh Concrete, 4 p. (1990)
175	Various	NCHRP Research on Construction Engineering, 8 p. (1990)
176	20-05	Continuing Project to Synthesize Information on Highway Problems, 7 p. (1990)
177	Various	NCHRP Research on Maintenance Engineering, 7 p. (1990)
178	04-16	Service Life and Cost of Pavement Marking Materials, 403 p. (1990)
179	02-14	Financing Highway Improvements Through Public and Private Partnerships, 7 p. (1991)
180	20-27	Implementation of Geographic Information Systems (GIS) in State DOTs, 31 p. (1991)
181	01-27	Video Image Processing for Evaluating Pavement Surface Distress, 4 p. (1991)
182	20-05	Continuing Project to Synthesize Information on Highway Problems, 8 p. (1991)
183	20-24	Administration of Highway and Transportation Agencies "Project 20-24 Series", 6 p. (1992)
184	Various	NCHRP Research on Pavements, 6 p. (1992)
185	20-23	NCHRP Supports Advances in Differential GPS Satellite Surveying, 4 p. (1992)
186	20-07/Task 046	Data Interchange Standards for Bridge Management Systems and Integrated Highway Information Systems, 20 p. (1992)
187	12-26	Distribution of Wheel Loads on Highway Bridges, 32 p. (1992)
188	10-30(03)	Ultrasonic Nondestructive Testing for Deterioration of High-Strength Steel Components Embedded in Concrete, 4 p. (1992)

Table 3. Research Results Digests

No.	Proj. No.	Title, Pages, Publication Year
189	21-03	Instrumentation for Measuring Scour at Bridge Piers and Abutments, 8 p. (1993)
190	20-05	Continuing Project to Synthesize Information on Highway Problems, 8 p. (1992)
191	20-27	Management Guide for Implementation of Geographic Information Systems (GIS) in State DOTs, 48 p. (1993)
192	03-41	Procedures for Determining Work Zone Speed Limits, 48 p. (1996)
193	20-24	Administration of Highway and Transportation Agencies "Project 20-24 Series", 8 p. (1993)
194	22-05A	Low-Service-Level Guardrail Systems, 14 p. (1994)
195	20-05	Continuing Project to Synthesize Information on Highway Problems, 8 p. (1993)
196	20-24(03)A	A Unique, Hands-on Educational Program for High School Mathematics and Science Classes, 6 p. (1994)
197	10-35	Fatigue Behavior of Welded and Mechanical Splices in Reinforcing Steel, 12 p. (1994)
198	12-33	Development of Comprehensive Bridge Specifications and Commentary, 26 p. (1998)
199	20-23	Rapid Static Surveying Using the Global Positioning System, 6 p. (1994)
200	02-17(01)	Objectives and Decision Criteria for Infrastructure Investment, 20 p. (1994)
201	15-11A	BRI-STARS (BRIDGE Stream Tube Model for Alluvial River Simulation), 4 p. (1994)
202	02-17(05)	Congestion Impacts on Business and Strategies to Mitigate Them, 12 p. (1995)
203	20-05	Continuing Project to Synthesize Information on Highway Problems, 8 p. (1994)
204	20-36	Winter Maintenance Technology and Practices—Learning from Abroad, 16 p. (1995)
205	05-12	Requirements for Application of Light Emitting Diodes (LEDs) to Traffic Control Signals, 12 p. (1995)
206	20-25(02)	Training for Highway Construction Personnel, 6 p. (1995)
207	20-33	On the Implementation of Research Findings in Surface Transportation, 8 p. (1995)
208	10-32A	Durability Testing of High-Strength Concrete Containing High-Range, Water-Reducing Admixtures, 10 p. (1996)
209	20-05	Continuing Project to Synthesize Information on Highway Problems, 8 p. (1995)
210	20-05	Effects of Highway Bypasses on Rural Communities and Small Urban Areas, 22 p. (1996)
211	02-17(06)	Current State Practices in the Transportation-Tourism Interface, 10 p. (1996)
212	20-05	Continuing Project to Synthesize Information on Highway Problems, 8 p. (1996)
213	21-05	Nondestructive Testing of Unknown Subsurface Bridge Foundations—Results of NCHRP Project 21-05, 42 p. (1996)
214	03-39(02)	On-Site Evaluation and Calibration Procedures for Weigh-In-Motion Systems, 4 p. (1996)
215	10-37B	Protocol for In-Service Evaluation of Bridges with Epoxy-Coated Reinforcing Steel, 4 p. (1996)
216	05-13	Illumination Guidelines for Nighttime Highway Work, 8 p. (1996)
217	08-33	Relationships Between Implemented Transportation Control Measures and Measured Pollutant Levels, 12 p. (1997)
218	20-27(02)	A Generic Data Model for Linear Referencing System, 28 p. (1997)
219	20-05	Continuing Project to Synthesize Information on Highway Problems, 9 p. (1997)
220	17-13	Strategies for Improving Roadside Safety, 8 p. (1997)
221	20-27(02)	Development of System and Application Architectures for Geographic Information Systems in Transportation, 34 p. (1998)
222	04-22	Pavement Marking Assessment System (PAMAS), 11 p. (1998)
223	08-33	Development of an Improved Framework for the Analysis of Air Quality and Other Benefits and Costs of Transportation Control Measures, 15 p. (1998)
224	20-05	Continuing Project to Synthesize Information on Highway Problems, 9 p. (1998)
225	20-33(02)	Putting Research into Practice: A Synopsis of Successful Strategies and Case Histories, 16 p. (1998)
226	08-32(02)	Multimodal Transportation: Development of a Performance-Based Planning Process, 16 p. (1998)
227	01-32	Systems for Design of Highway Pavements, 4 p. (1998)
228	20-25(03)	Development of Training Material for Highway Construction Personnel, 4 p. (1998)
229	20-34	Developing Measures of Effectiveness for Truck Weight Enforcement Activities, 14 p. (1998)
230	08-33	Review of Travel Assumptions Employed in Emission Factor Models, 23 p. (1998)
231	25-04	Economic Effects of Restricting Left Turns, 14 p. (1998)
232	20-36	Report on the 1997 Review of Asian Bridge Structures, 45 p. (1998)
233	Various	Summary of Economic Development Research Projects, 13 p. (1998)

Table 3. Research Results Digests

No.	Proj. No.	Title, Pages, Publication Year
234	12-28(13)A	Manual for Bridge Rating Through Load Testing, 146 p. (1998)
235	25-13	Assessment of Impacts of Bridge Deck Runoff Contaminants on Receiving Waters, 32 p. (1998)
236	20-36	Emerging Models for Delivering Transportation Programs and Services: A Report of the Transportation Agency Organization and Management Scan Tour, 49 p. (1999)
237	09-09	Superpave Gyrotory Compaction Guidelines, 5 p. (1999)
238	20-36	Report on the 1998 Scanning Review of European Winter Service Technology, 33 p. (1999)
239	17-12	Improved Safety Information for Highway Design, 9 p. (1999)
240	20-40	Conversion of AASHTO Documents to Metric Units, 24 p. (1999)
241	20-36	1998 Scanning Review of European Practice for Bridge Scour and Stream Instability Countermeasures, 36 p. (1999)
242	07-12(02)	Metrication and Enhancement of MicroBENCOST Software Package, 5 p. (1999)
243	01-29	Proposed Design Guidelines for Reducing Hydroplaning on New and Rehabilitated Pavements, 25 p. (1999)
244	10-47	Operational Guidelines for Longitudinal Pavement Profile Measurement, 14 p. (1999)
245	20-05	Continuing Project to Synthesize Information on Highway Problems, 10 p. (1999)
246	01-33	Methodology for Pavement-Investment Decisions, 6 p. (2000)
247	03-52A	The Relationship Between Access Density and Accident Rates: Comparisons of NCHRP Report 420 and Minnesota Data, 11 p. (2000)
248	02-17(03)A	Updated and Enhanced Database for Macroeconomic Analysis of Transportation Investments and Economic Performance, 5 p. (2000)
249	20-05	Continuing Project to Synthesize Information on Highway Problems, 10 p. (2000)
250	06-12	Improved Visibility for Snowplowing Operations, 4 p. (2000)
251	25-16	Guidance for Selecting Compensatory Wetland Mitigation Options, 16 p. (2001)
252	02-18(04)	Development and Demonstration of StratBENCOST Procedure, 6 p. (2001)
253	09-12	Recommended Use of Reclaimed Asphalt Pavement in the Superpave Mix Design Method: Guidelines (& CD 44; & Rep. 452; & WOD 30), 17 p. (2001)
254	10-48	Assessing Pavement Layer Condition Using Deflection Data, 3 p. (2001)
255	17-09(02)	Impacts of Resurfacing Projects With and Without Additional Safety Improvements, 15 p. (2001)
256	17-13	Strategic Plan for Improving Roadside Safety, 3 p. (2001)
257	14-11(02)	Effective Motivation of Highway Maintenance Personnel: Tools for Peak Performance, 3 p. (2001)
258	20-29(02)	Development of a Computer Model for Multimodal, Multicriteria Transportation Investment Analysis, 4 p. (2001)
259	05-14	Guidelines for the Effective Use and Procurement of Advanced Warning Arrow Panels, 25 p. (2001)
260	20-05	Continuing Project to Synthesize Information on Highway Problems, 10 p. (2001)
261	08-37	The Case for Standardizing Household Travel Surveys, 13 p. (2002)
262	09-18	Field Shear Test for Hot Mix Asphalt, 14 p. (2002)
263	20-05	Continuing Project to Synthesize Information on Highway Problems, 10 p. (2002)
264	20-50(08/13)	LTPP Data Analysis: Factors Affecting Pavement Smoothness, 5 p. (2002)
265	17-18(06)	AASHTO Strategic Highway Safety Plan—Case Studies, 18 p. (2002)
266	20-24(11)	Asset Management Guidance for Transportation Agencies, 3 p. (2002)
267	20-48	Utility of Machine Translation Software, 11 p. (2002)
268	01-34	Performance of Pavement Subsurface Drainage, 15 p. (2002)
269	20-50(14)	Significance of "As-Constructed" HMA Air Voids to Pavement Performance from an Analysis of LTPP Data, 21 p. (2002)
270	18-05	Relationship of Portland Cement Characteristics to Concrete Durability, 4 p. (2002)
271	10-44A	Determination of Insitu Material Properties of Asphalt Concrete Pavement Layers from Nondestructive Tests, 3 p. (2002)
272	10-50A	A Process for Selecting Strategies for Rehabilitation of Rigid Pavements, 4 p. (2003)
273	22-16	Development of an Improved Roadside Barrier System—Phase I, 23 p. (2003)
274	20-05/Topic 30-09	Quality Assurance of Structural Materials, 32 p. (2003)

Table 3. Research Results Digests

No.	Proj. No.	Title, Pages, Publication Year
275	20-07/Task 139	Application of European 2+1 Roadway Designs, 31 p. (2003)
276	20-07/Task 127	Business Needs for Pavement Engineering, 8 p. (2003)
277	08-40	Review and Improvement of Existing Processes and Procedures for Evaluating Cultural Resource Significance (& CD 53 Vol. 1; & CD 53 Vol. 2; & Rep. 542), 10 p. (2003)
278	03-62	Accessible Pedestrian Signals: Synthesis and Guide to Best Practice, 22 p. (2003)
279	20-48(01)	Making the Business Case for Translating Non-English Transportation Information, 40 p. (2003)
280	20-05	Continuing Project to Synthesize Information on Highway Problems, 12 p. (2003)
281	04-20C	Aggregate Tests for Portland Cement Concrete Pavements: Review and Recommendations, 28 p. (2003)
282	10-55	Fiber Reinforced Polymer Composites for Concrete Bridge Deck Reinforcement, 4 p. (2003)
283	09-30	Jackknife Testing--An Experimental Approach to Refine Model Calibration and Validation, 12 p. (2003)
284	09-30	Refining the Calibration and Validation of Hot Mix Asphalt Performance Models: An Experimental Plan and Database, 20 p. (2003)
285	01-28A	Laboratory Determination of Resilient Modulus for Flexible Pavement Design, 52 p. (2004)
286	17-18(04)	Development of a Highway Safety Manual, 9 p. (2004)
287	03-64	Highway Capacity Manual Applications Guidebook, 4 p. (2004)
288	08-45, TCRP H-29	A New Vision of Mobility: Guidance to Foster Collaborative Multimodal Decision Making (joint digest with TCRP RRD 65), 10 p. (2004)
289	20-07/Task 173	Measuring and Communicating the Effects of Traffic Incident Management Improvements (& WOD 64), 40 p. (2004)
290	01-37A	Recommended Mechanistic-Empirical Pavement Design Guide and Software: Available for Evaluation, 4 p. (2004)
291	09-15	Quality Characteristics for Use in Performance-Related Specifications for Hot Mix Asphalt, 8 p. (2004)
292	20-05	Continuing Project to Synthesize Information on Highway Problems, 18 p. (2004)
293	17-17(02)	Training Program for Night Road Work to Improve Safety and Operations (& CD 50; & Rep. 475), 4 p. (2004)
294	20-65/Task 05	Transit-Oriented Development: Developing a Strategy to Measure Success, 32 p. (2005)
295	20-65/Task 03	Availability and Accessibility of Liability and Excess Insurance for Public Transit and Private Coach Operators, 36 p. (2005)
296	17-18(08)	Comprehensive Human Factors Guidelines for Road Systems, 8 p. (2005)
297	05-16	New Facility for Calibrating Retroreflectometers, 4 p. (2005)
298	17-24	Use of Event Data Recorder (EDR) Technology for Highway Crash Data Analysis, 4 p. (2005)
299	17-25	Crash Reduction Factors for Traffic Engineering and Intelligent Transportation Systems (ITS) Improvements: State-of-Knowledge Report, 32 p. (2005)
300	25-24	Outcomes of the Environmental Streamlining Pilot Projects (& WOD 79), 12 p. (2005)
301	20-05	Continuing Project to Synthesize Information on Highway Problems, 20 p. (2005)
302	17-18(09)	Core Competencies for Highway Safety Professionals, 24 p. (2006)
303	17-23	Safety Impacts and Other Implications of Raised Speed Limits on High-Speed Roads (& WOD 90), 11 p. (2006)
304	25-22(02)	Technologies to Improve Consideration of Environmental Concerns in Transportation Decisions, 38 p. (2006)
305	17-28	Pavement Marking Materials and Markers: Testing the Relationship Between Retroreflectivity and Safety (& WOD 92), 8 p. (2006)
306	08-54	Identification of Liability-Related Impediments to Sharing Section 409 Safety Data Among Transportation Agencies and a Synthesis of Best Practices (& WOD 89), 16 p. (2006)
307	01-40	Independent Review of the Recommended Mechanistic-Empirical Design Guide and Software, 36 p. (2006)
308	01-40D(01)	Changes to the Mechanistic-Empirical Pavement Design Guide, 24 p. (2006)
309	20-05	Continuing Project to Synthesize Information on Highway Problems, 18 p. (2007)
310	08-55	Integrating Geospatial Technologies into the Right-of-Way Data-Management Process (& WOD 95), 13 p. (2006)
311	20-65/Task 10	FMCSA Regulations as They Apply to FTA Section 5310/5311 Providers: A Handbook, 32 p. (2006)
312	03-68	Guide to Effective Freeway Performance Measurement (& WOD 97), 41 p. (2007)
313	20-65/Task 12	Cost-Allocation Methods for Commuter, Intercity, and Freight Rail Operations on Shared-Use Rail Systems and Corridors, 30 p. (2007)

Table 3. Research Results Digests

No.	Proj. No.	Title, Pages, Publication Year
314	20-65/Task 07	State DOT Staff Resources for Administering Federal Public Transportation Programs (& WOD 99), 24 p. (2007)
315	20-65/Task 09	Centralized Versus Decentralized State Procurement of Paratransit Vehicles for the Federal Section 5310 Program, 48 p. (2007)
316	09-37	Using Surface Energy Measurements to Select Materials for HMA Pavements (& WOD 104), 17 p. (2007)
317	25-23(02)	Prototype Software for an Environmental Information Management and Decision Support System (& WOD 103), 24 p. (2007)
318	03-67	An Expert System for Recommending Speed Limits in Speed Zones, 24 p. (2007)
319	20-65/Task 08A	Buy America Issues Associated with State DOT Procurement of Paratransit Vehicles Using FTA Funds, 48 p. (2007)
320	20-65/Task 11	Current State Issues with Implementing FTA Section 5310 and Section 5311 Programs, 20 p. (2007)
321	01-43	Guide for Pavement Friction: Background and Research (& WOD 108), 5 p. (2009)
322	17-33	Public Information and Education in the Promotion of Highway Safety, 13 p. (2007)
323	10-58(02)	Using the Results of Contractor-Performed Tests in Quality Assurance (& WOD 115), 17 p. (2007)
324	09-23	Simulating the Effects of Hot Mix Asphalt Aging for Performance Testing and Pavement Structural Design (& WOD 113), 8 p. (2007)
325	20-05	Continuing Project to Synthesize Information on Highway Problems, 20 p. (2007)
326	20-65/Task 13	State Public Transportation Division Involvement in State Emergency Planning, Response, and Recovery, 18 p. (2008)
327	20-05/Topic 30-05	Transportation Implications of Emerging Economic Development Trends, 33 p. (2008)
328	05-18	Color Effectiveness of Yellow Pavement Marking Materials (& WOD 125), 12 p. (2008)
329	17-36	Highway Safety Manual Data Needs Guide, 11 p. (2008)
330	25-30	Temporary Bridging to Avoid or Minimize Impacts to Waters and Wetlands During Highway Construction, 28 p. (2008)
331	20-65/Task 14	Preparing Coordinated Transportation Plans: A Guidebook for State Departments of Transportation, 60 p. (2009)
332	20-05	Continuing Project to Synthesize Information on Highway Problems, 18 p. (2009)
333	20-59(24)	A Guide to Planning Resources on Transportation and Hazards (joint digest with TCRP RRD 90), 46 p. (2009)
334	24-20	Joint Workshop on Abutment Scour: Present Knowledge and Future Needs—June 2008, 6 p. (2009)
335	06-17	Performance Measures for Snow and Ice Control Operations (& WOD 136), 4 p. (2009)
336	20-65/Task 21	Benefit/Cost Analysis of Converting a Lane for Bus Rapid Transit, 28 p. (2009)
337	20-05/Topic 39-09	Design Flexibility Considerations for Built Urban Environments, 32 p. (2009)
338	20-65/Task 19	Utilization by States of the Flexibility to Transfer Federal Funds Among Eligible Federal Programs, 44 p. (2009)
339	20-05/Topic 39-02	Improving the Safety of Mobile Lane Closures, 48 p. (2009)
340	20-65/Task 18	State DOT Best Practices for Developing a Title VI Civil Rights Program Document (& WOD 147), 24 p. (2009)
341	20-65/Task 17	Compliance Monitoring Tools (CD 76), 0 p. (2010)
342	09-26A	Recommended Precision Statements for AASHTO Standard Methods of Test T 22, T 104, T 105, T 154, T 186, and T 242, 8 p. (2010)
343	20-05	Continuing Project to Synthesize Information on Highway Problems, 20 p. (2010)
344	24-10(02)	Thermally Sprayed Metallic Coatings to Protect Steel Pilings: 5-Year Performance Update, 16 p. (2010)
345	17-18(19)	Alternate Strategies for Safety Improvement Investments, 28 p. (2010)
346	20-07/Task 243	Optical Sizing and Roundness Determination of Glass Beads Used in Traffic Markings (& WOD 156), 36 p. (2010)
347	09-23A	A National Database of Subgrade Soil-Water Characteristic Curves and Selected Soil Properties for Use with the MEPDG (& WOD 153), 24 p. (2010)
348	20-65/Task 24	State Department of Transportation Role in the Implementation of Transportation Demand Management Programs, 52 p. (2010)
349	22-14(03)	Evaluation of Existing Roadside Safety Hardware Using Manual for Assessing Safety Hardware (MASH) Criteria (& WOD 157), 12 p. (2010)

Table 3. Research Results Digests

No.	Proj. No.	Title, Pages, Publication Year
350	20-05	Continuing Project to Synthesize Information on Highway Problems, 20 p. (2011)
351	09-26A	Precision Statements for AASHTO Standard Methods of Tests T 148, T 265, T 267, and T 283 (& WOD 163; & WOD 164; & WOD 165; & WOD 166), 10 p. (2011)
352	20-65/Task 22	Cost/Benefit Analysis of Converting a Lane for Bus Rapid Transit—Phase II Evaluation and Methodology, 30 p. (2011)
353	20-65/Task 23	Identification of Local Matching Fund Requirements for State-Administered Federal and Non-Federal Public Transportation Programs, 116 p. (2011)
354	20-65/Task 26	A Review of Human Services Transportation Plans and Grant Programs, 64 p. (2011)
355	10-71	Summary of Cast-in-Place Concrete Connections for Precast Deck Systems (& WOD 173), 32 p. (2011)
356	20-65/Task 25, Task 20	Analysis of State Rural Intercity Bus Strategies: Requirements for Utilization of S.5311(f) Funding, 100 p. (2011)
357	09-45	Test Methods and Specifications Criteria for Mineral Filler Used in Hot Mix Asphalt, 8 p. (2011)
358	20-65/Task 34	Statewide Transit Goal Setting, 20 p. (2011)
359	20-65/Task 32	Models to Support State-Owned Park and Ride Lots and Intermodal Facilities, 48 p. (2012)
360	20-07/Task 272	Rheological Characterization of Flow Table Reference Material, 4 p. (2011)
361	20-65/Task 29	State DOT Public Transportation Performance Measures: State of the Practice and Future Needs, 44 p. (2011)
362	08-63	Review of Mexican Experience with the Regulation of Large Commercial Motor Vehicles, 32 p. (2011)
363	25-28	Hydroacoustic Impacts on Fish from Pile Installation, 26 p. (2011)
364	24-28A	Validation of LRFD Metal Loss and Service-Life Strength Reduction Factors for Metal-Reinforced Systems, 8 p. (2011)
365	20-05/Topic 41-04	Sustainable Pavement Maintenance Practice, 28 p. (2012)
366	20-65/Task 30	Local and State Partnerships with Taxicab Companies, 56 p. (2012)
367	20-05	Continuing Project to Synthesize Information on Highway Problems, 20 p. (2012)
368	20-65/Task 33	State DOT Financial Auditing Requirements for Public Transportation Assistance Programs, 36 p. (2012)
369	10-87(01)	AASHTO T 209: Effect of Agitation Equipment Type on Theoretical Maximum Specific Gravity Values, 28 p. (2012)
370	09-43, 09-47, 09-49	Guidelines for Project Selection and Materials Sampling, Conditioning, and Testing in WMA Research Studies, 36 p. (2012)
371	10-79	Quality-Related Pay Adjustment Factors for Pavements, 8 p. (2013)
372	01-47	Sensitivity Evaluation of MEPDG Performance Prediction, 16 p. (2013)
373	20-65/Task 28	A Toolkit for Reporting Rural and Specialized Transit Data—Making Transit Count, 148 p. (2012)
374	20-07/Task 331	A Proposed Technology Evaluation Program for Warm Mix Asphalt, 28 p. (2012)
375	20-65/Task 42	Rural Public Transportation Strategies for Responding to the Livable and Sustainable Communities Initiative, 24 p. (2012)
376	20-65/Task 36	Data Needs for Assessing Rural Transit Needs, Benefits, and Levels of Service, 56 p. (2012)
377	20-05	Continuing Project to Synthesize Information on Highway Problems, 24 p. (2013)
378	24-27(02)	Evaluation of Bridge Scour Research, 28 p. (2012)
379	20-65/Task 38	Selected State DOT Cost Reduction Initiatives for the Administration of State Public Transportation Programs, 80 p. (2012)
380	24-11(02)	Guidelines for Geofoam Applications in Slope Stability Projects, 28 p. (2013)
381	20-65/Task 40	Guidebook for Construction Management Practices for Rural Projects, 36 p. (2013)
382	20-07/Task 301	Measuring Cement Particle Size and Surface Area by Laser Diffraction, 28 p. (2013)
383	20-65/Task 39	Potential Impacts of Federal Health Care Reform on Public Transit, 44 p. (2013)
384	20-65/Task 45	New Urban Areas: A Transit Guidance Brief, 36 p. (2013)
385	20-59(41)	The Legal Definitions of "First Responder", 32 p. (2013)
386	20-05	Continuing Project to Synthesize Information on Highway Problems, 24 p. (2014)
387	20-07/Task 329	Alternative Delivery Methods for Winter Maintenance Operations, 8 p. (2014)

Table 3. Research Results Digests

No.	Proj. No.	Title, Pages, Publication Year
388	10-87	Precision Estimates of AASHTO T 201, AASHTO T 202, and AASHTO T 49, 20 p. (2014)
389	10-87	Precision Estimates of AASHTO T 304, AASHTO T 96, and AASHTO T 11 and Investigation of the Effects of Manual and Mechanical Methods of Washing on Sieve Analysis of Aggregates, 40 p. (2014)
390	10-87(02)	Precision Estimate of AASHTO T 324, "Hamburg Wheel-Track Testing of Compacted Hot Mix Asphalt (HMA)", 52 p. (2014)

Table 4. Legal Research Digests

No.	Proj. No.	Title, Pages, Publication Year
1	20-06	Continuing Project on Legal Problems Arising Out of Highway Programs, 6 p. (1988)
2	20-06	Supplement To Liability of State Highway Departments for Design, Construction, and Maintenance Defects, 20 p. (1988)
3	20-06	Supplement to Liability of State and Local Governments for Negligence Arising Out of the Installation and Maintenance of Warning Signs, Traffic Lights, and Pavement Markings, 10 p. (1988)
4	20-06	Supplement to Personal Liability of State Highway Department Officers and Employees, 9 p. (1988)
5	20-06	Supplement to Labor Standards in Federal-Aid Highway Construction Contracts, 19 p. (1989)
6	20-06	Impact of the Discretionary Function Exception on Tort Liability of State Highway Departments, 25 p. (1989)
7	20-06	Liability of Public Agencies Arising Out of Rejection of Bids and Misaward of Contracts, 17 p. (1989)
8	20-06	Continuing Project on Legal Problems Arising Out of Highway Programs, 11 p. (1989)
9	20-06	Supplement to Liability of State and Local Governments for Snow and Ice Control, 11 p. (1990)
10	20-06	Supplement to Liability of the State for Injury-Producing Defects in Highway Surface, 10 p. (1990)
11	20-06	Impact of 42 U.S.C. §1983 (Civil Rights Act) On Highway Departments, Personnel, and Officials, 21 p. (1990)
12	20-06	Suspension, Debarment, and Disqualification of Highway Construction Contractors, 27 p. (1990)
13	20-06	Civil RICO (Racketeer Influenced and Corrupt Organizations Act) Applications in the Highway Construction Industry, 27 p. (1990)
14	20-06	Supplement to Liability of State Highway Departments for Defects in Design, Construction, and Maintenance of Bridges, 10 p. (1990)
15	20-06	The Application of NEPA (National Environmental Policy Act) to Federal Highway Projects, 22 p. (1990)
16	20-06	Supplement to Payment of Attorney Fees in Eminent Domain and Environmental Litigation, 17 p. (1990)
17	20-06	The Public Duty Defense to Tort Liability, 25 p. (1990)
18	20-06	Supplement to Planning and Precondemnation Activities as Constituting a Taking Under Inverse Law, 10 p. (1991)
19	20-06	Continuing Project on Legal Problems Arising Out of Highway Programs, 11 p. (1991)
20	20-06	Supplement to Legal Aspects of Historic Preservation in Highway and Transportation Programs, 40 p. (1991)
21	20-06	Supplement to Liability of the State for Highway Traffic Noise, 8 p. (1991)
22	20-06	Authority of State Departments of Transportation to Mitigate the Environmental Impact of Transportation Projects, 12 p. (1992)
23	20-06	Supplement to Valuation Changes Resulting From Influence of Public Improvements, 21 p. (1992)
24	20-06	Continuing Project on Legal Problems Arising Out of Highway Programs, 8 p. (1992)
25	20-06	Supplement to Minority and Disadvantaged Business Enterprise Requirements in Public Contracting, 28 p. (1992)
26	20-06	Supplement to Legal Implications of Highway Department's Failure to Comply with Design, Safety, or Maintenance Guidelines, 10 p. (1992)
27	20-06	Supplement to Liability of the State for Injury or Damage Occurring in Motor Vehicle Accident Caused by Trees, Shrubbery, or Other Vegetative Obstruction Located in Right-of-Way or Growing on Adjacent Private Property, 12 p. (1993)
28	20-06	Preventing and Defending Against Highway Construction Contract Claims: The Use of Changes or Differing Site Conditions Clauses and New York State's Use of Exculpatory Contract Provisions and No Claims Clauses, 51 p. (1993)
29	20-06	Highways and the Environment: Resource Protection and the Federal Highway Program, 46 p. (1994)
30	20-06	Legal Issues Relating to the Acquisition of Right of Way and the Construction and Operation of Highways over Indian Lands, 24 p. (1994)

Table 4. Legal Research Digests

No.	Proj. No.	Title, Pages, Publication Year
31	20-06	Federal Air Quality Laws Governing State and Regional Transportation Planning, 31 p. (1994)
32	20-06	Federalism and the Intermodal Surface Transportation Efficiency Act of 1991, 23 p. (1995)
33	20-06	Freedom of Information Acts, Federal Data Collections, and Disclosure Statutes Applicable to Highway Projects and the Discovery Process, 28 p. (1995)
34	20-06	Transportation Agencies as Potentially Responsible Parties at Hazardous Waste Sites, 29 p. (1995)
35	20-06	Continuing Project on Legal Problems Arising Out of Highway Programs, 8 p. (1995)
36	20-06	Photographic Traffic Law Enforcement, 43 p. (1996)
37	20-06	Indemnification and Insurance Requirements for Design Consultants and Contractors on Highway Projects, 25 p. (1996)
38	20-06	Risk Management for Transportation Programs Employing Written Guidelines as Design and Performance Standards, 22 p. (1997)
39	20-06	Liability of Contractors to State Transportation Departments for Latent Defects in Construction after Project Acceptance, 14 p. (1997)
40	20-06	Liability of Highway Departments for Damages Caused by Stormwater Runoff, 23 p. (1998)
41	20-06	Application of Outdoor Advertising Controls on Indian Land, 31 p. (1998)
42	20-06	Enforcement of Environmental Mitigation Commitments in Transportation Projects: A Survey of Federal and State Practice, 18 p. (1999)
43	20-06	Application of the Fourth Amendment to the Inspection of Commercial Motor Vehicles and Drivers, 33 p. (2000)
44	20-06	Reexamination of the Line Between Governmental Exercise of the Police Power and Eminent Domain, 63 p. (2000)
45	20-06	The States' Immunity from Suit in Federal and State Court, 24 p. (2000)
46	20-06	Drug and Alcohol Testing—A Survey of Labor-Management Relations, 61 p. (2001)
47	20-06	Judicial Enforcement of Variable Speed Limits, 26 p. (2002)
48	20-06	Civil Rights in Transportation Projects, 24 p. (2003)
49	20-06	Emergency Contracting: Flexibilities in Contracting Procedures during an Emergency, 28 p. (2008)
50	20-06	Current Practices in the Use of Alternative Dispute Resolution, 46 p. (2008)
51	20-06	Major Legal Issues for Highway Public-Private Partnerships, 40 p. (2009)
52	20-06	Record Keeping Requirements for State Departments of Transportation, 59 p. (2009)
53	20-06	Liability Aspects of Bikeways, 56 p. (2010)
54	20-06	Practice Under the Environmental Provisions of SAFETEA-LU, 28 p. (2010)
55	20-06	Identification, Prevention, and Remedies for False Claims in Highway Improvement Contracting, 108 p. (2011)
56	20-06	The Ramifications of Post-Kelo Legislation on State Transportation Projects, 34 p. (2012)
57	20-06	Tort Liability Defense Practices for Design Flexibility, 52 p. (2012)
58	20-06	Legal Issues Surrounding the Use of Digital Intellectual Property on Design and Construction Projects, 48 p. (2013)
59	20-06	Enforceability of Local Hire Preference Programs, 40 p. (2013)
60	20-06	Legal Aspects of Conservation Easements: A Primer for Transportation Agencies, 50 p. (2013)
61	20-06	Legal Aspects of Performance-Based Specifications for Highway Construction and Maintenance Contracts, 64 p. (2013)
62	20-06	Eminent Domain and Fair Market Value in a Depressed Real Estate Market, 60 p. (2014)
63	20-06	Effect of MUTCD on Tort Liability of Government Transportation Agencies, 98 p. (2014)

Table 5. Web-Only Documents

No.	Proj. No.	Title, Pages, Publication Year
1	01-31	Smoothness Specifications for Pavements—Contractor's Final Report, 540 p. (1997)
2	03-51	Communications Mediums for Intelligent Transportation Systems—Contractor's Appendix A, 540 p. (1996)
3	08-32(05)	Multimodal Transportation Planning Data—Contractor's Final Report (& Rep. 401; & WOD 4), 192 p. (1997)
4	08-32(05)	Multimodal Transportation Planning Data—Compendium to Contractor's Final Report (& Rep. 401; & WOD 3), 236 p. (1997)

Table 5. Web-Only Documents

No.	Proj. No.	Title, Pages, Publication Year
5	03-46	Capacity and Level of Service at Unsignalized Intersections. Volume 1, Two-Way Stop-Controlled Intersections—Contractor's Final Report, 134 p. (1996)
6	03-46	Capacity and Level of Service at Unsignalized Intersections. Volume 2, All-Way, Stop-Controlled Intersections—Contractor's Final Report, 72 p. (1996)
7	Various	Summary of Progress Through 1998, 244 p. (1999)
8	14-12	Highway Maintenance Quality Assurance—Contractor's Final Report, 222 p. (1997)
9	08-32(01)	Innovative Practices for Multimodal Planning for Freight and Passengers—Project Bibliography, 166 p. (1995)
10	03-48	Capacity Analysis for Actuated Intersections—Contractor's Final Report, 42 p. (1996)
11	20-05/Topic 26-12	NCHRP Synthesis 257—Appendix C (& Syn. 257), 78 p. (1998)
12	03-47	Capacity Analysis of Interchange Ramp Terminals—Contractor's Final Report, 356 p. (1997)
13	20-34	Developing Measures of Effectiveness for Truck Weight Enforcement Activities—Contractor's Final Report, 278 p. (1998)
14	01-28	Laboratory Determination of Resilient Modulus for Flexible Pavement Design—Contractor's Final Report, 463 p. (1997)
15	20-07/Task 092	Durability of Precast Segmental Bridges—Contractor's Final Report, 45 p. (1998)
16	01-29	Improved Surface Drainage of Pavements—Contractor's Final Report, 225 p. (1998)
17	20-24(07)A	Alternative Approaches to the Taxation of Heavy Vehicles—Contractor's Applications Manual, 85 p. (1997)
18	02-17(06)	Tourism Travel Contributions to Economic Development—Volume II of Contractor's Final Report (Supporting Materials and References), 108 p. (1997)
19	04-24	HDPE Pipe: Recommended Material Specifications and Design Requirements—Contractor's Final Report, 272 p. (2000)
20	20-07/Task 100	Safety Appraisal of Suspension Bridge Main Cables—Workshop Final Report, 37 p. (2000)
21	08-32(04)	Developing and Maintaining Partnerships for Multimodal Transportation Planning, Volume II: Case Studies of Multimodal Partnerships—Contractor's Final Report (& Rep. 433; & WOD 22), 200 p. (2000)
22	08-32(04)	Developing and Maintaining Partnerships for Multimodal Transportation Planning, Volume III: Research Report—Contractor's Final Report (& Rep. 433; & WOD 21), 88 p. (2000)
23	10-53	Nondestructive Methods for Condition Evaluation of Prestressing Steel Strands in Concrete Bridges, 81 p. (2000)
24	20-07/Task 099	LRFD Design Criteria for Cotton Duck Pad Bridge Bearing, 43 p. (2000)
25	20-07/Task 090	TRAC PAC: The Next Generation, 249 p. (2000)
26	08-32(02)A	Multimodal Transportation: Development of a Performance-Based Planning Process, 320 p. (2000)
27	24-13	Evaluation of Metal-Tensioned Systems in Geotechnical Applications, Phase I, 215 p. (2001)
28	12-46	Manual for Condition Evaluation and Load Rating of Highway Bridges Using Load and Resistance Factor Philosophy, 65 p. (2001)
29	10-45	Procedures for Evaluating Corrosion-Inhibiting Admixtures for Structural Concrete, 216 p. (2001)
30	09-12	Recommended Use of Reclaimed Asphalt Pavement in the Superpave Mix Design Method (& CD 44; & Rep. 452; & RRD 253), 461 p. (2001)
31	25-19	Assessing the Social and Economic Effects of Transportation Projects, 109 p. (2001)
32	20-50(02)	LTPP Data Analysis: Relative Performance of Jointed Plain Concrete Pavements with Sealed and Unsealed Joints, 103 p. (2001)
33	17-33	Strategic Plan for Improving Roadside Safety, 113 p. (2001)
34	09-09(01)	Literature Review: Verification of Gyration Levels in the Superpave Ndesign Table, 83 p. (2001)
35	01-38	Rehabilitation Strategies for Highway Pavements, 310 p. (2001)
36	10-37A(01)	Extended Exposure and Monitoring of Epoxy-Coated Reinforced Concrete Test Slabs, 49 p. (2001)
37	25-20	Management of Runoff from Surface Transportation Facilities—Synthesis and Research Plan, 65 p. (2001)
38	10-54	Quality-Based Performance Rating of Contractors for Prequalification and Bidding Purposes, 220 p. (2001)
39	20-24(14)	Managing Change in State Departments of Transportation: Scans 1 through 8, 494 p. (2001)
40	20-50(08/13)	LTPP Data Analysis: Factors Affecting Pavement Smoothness, 299 p. (2002)

Table 5. Web-Only Documents

No.	Proj. No.	Title, Pages, Publication Year
41	20-24(11)	Phase I Report: Task 1 of 3: Synthesis of Asset Management, 84 p., Task 2 of 3: Asset Management Framework, 155 p., Task 3 of 3: Recommended Research Program, 68 p. (2002)
42	20-51(01)	Issues in Pavement Smoothness: A Summary Report, 200 p. (2002)
43	25-10(02)	Guidance for Estimating the Indirect Effects of Proposed Transportation Projects: PowerPoint Presentation, 230 p. (2002)
44	12-45	Design Examples for Large-Span Culverts: Supporting Material for NCHRP Report 473, 60 p. (2002)
45	10-50A	A Process for Selecting Strategies for Rehabilitation of Rigid Pavements, 129 p. (2002)
46	20-07/Task 133	Improved Live Load Deflection Criteria for Steel Bridges, 140 p. (2002)
47	20-50(03/04)	LTPP Data Analysis: Effectiveness of Maintenance and Rehabilitation Options, 332 p. (2002)
48	20-50(05)	LTPP Data Analysis: Variations in Pavement Design Inputs, 265 p. (2002)
49	20-52	TRAC PAC 2—A Hands-On Educational Program, 69 p. (2002)
50	10-37C	Repair and Rehabilitation of Bridge Components Containing Epoxy-Coated Reinforcement, 192 p. (2002)
51	10-58	Construction Engineering and Management Research Program, 300 p. (2002)
52	20-50(09)	LTPP Data Analysis: Feasibility of Using FWD Deflection Data to Characterize Pavement Construction Quality, 78 p. (2002)
53	06-14	Feasibility of Using Friction Indicators to Improve Winter Maintenance Operations and Mobility, 180 p. (2002)
54	09-26	Precision Estimates of Selected Volumetric Properties of HMA Using Non-Absorptive Aggregate, 65 p. (2003)
55	25-23	Environmental Information Management and Decision Support System Implementation Handbook—Appendixes B through F, 79 p. (2003)
56	09-18	Sensitivity Evaluation of Field Shear Test Using Improved Protocol and Indirect Tension Strength Test, 33 p. (2003)
57	11-07	Development and Evaluation of a National Data-Management System for Highway Tort Claims, 103 p. (2003)
58	14-13	Research for Customer-Driven Benchmarking of Maintenance Activities, 99 p. (2003)
59	20-24(18)	Outsourcing of State DOT Capital Program Delivery Functions, 62 p. (2003)
60	20-50(07/12)	LTPP Data Analysis: Daily and Seasonal Variations in In Situ Material Properties, 707 p. (2003)
61	19-04	Improving the Compatibility of Vehicles and Roadside Safety Hardware, 270 p. (2004)
62	17-18(04)	Development of a Highway Safety Manual, 302 p. (2004)
63	19-04	A Review of DOT Compliance with GASB 34 Requirements—Final Report Appendixes A through G, 118 p. (2004)
64	20-07/Task 173	Appendixes to NCHRP Research Results Digest 289: Measuring and Communicating the Effects of Traffic Incident Management Improvements (& RRD 289), 116 p. (2004)
65	24-11	Geofoam Applications in the Design and Construction of Highway Embankments, 792 p. (2004)
66	09-26	An Investigation of the Cause of Variation in HMA Bulk Specific Gravity Test Results Using Non-Absorptive Aggregates, 49 p. (2004)
67	24-16	Methodology for Predicting Channel Migration (& CD 49; & Rep. 533), 214 p. (2004)
68	09-27	Relationship of Air Voids, Lift Thickness, and Permeability in HMA Pavements, Vols 1–4, 607 p. (2004)
69	20-24(30)	Performance Measures for Context-Sensitive Solutions: A Guidebook for State DOTs, 95 p. (2004)
70	17-18(08)	Comprehensive Human Factors Guidelines for Road Systems, 133 p. (2005)
71	09-26	Precision Estimates for AASHTO Test Method T308 and the Test Methods for Performance-Graded Asphalt Binder in AASHTO Specification M320, 138 p. (2005)
72	05-16	National Calibration Facility for Retroreflective Traffic Control Materials, 154 p. (2005)
73	20-59(11)	Emergency Transportation Operations: Resources Guide for NCHRP Report 525, Volume 6 (& Rep. 525 Vol. 6), 70 p. (2005)
74	20-50(10), 20- 50(16)	LTPP Data Analysis: Influence of Design and Construction Features on the Response and Performance of New Flexible and Rigid Pavements, 702 p. (2005)
75	17-24	Use of Event Data Recorder Technology for Highway Crash Data Analysis, 210 p. (2005)
76	18-04B	Final Report for Early-Opening-to-Traffic Portland Cement Concrete for Pavement Rehabilitation, 166 p. (2005)
77	08-38	Consideration of Environmental Factors in Transportation Skills Planning: Appendixes, 92 p. (2005)
78	12-61	Simplified Shear Design of Structural Concrete Members: Appendixes, 338 p. (2005)
79	25-24	Monitoring, Analyzing, and Reporting on the Environmental Streamlining Pilot Projects (& RRD 300), 479 p. (2005)

Table 5. Web-Only Documents

No.	Proj. No.	Title, Pages, Publication Year
80	04-30A	Appendixes to NCHRP Report 555: Test Methods for Characterizing Aggregate Shape, Texture, and Angularity (& Rep. 555), 113 p. (2007)
81	12-59	Design and Construction Guidelines for Geosynthetic-Reinforced Soil Bridge Abutments with a Flexible Facing: Appendix C—Verification of the Analytical Model (& Rep. 556), 53 p. (2006)
82	04-19(02)	Validation of Performance-Related Tests of Aggregates for Use in Hot-Mix Asphalt Pavements: Appendixes A Through F of the Contractor's Final Report, 117 p. (2006)
83	24-14	Scour at Contracted Bridge Sites, 299 p. (2006)
84	21-08	Innovative Load Testing Systems, 675 p. (2006)
85	03-77	Considerations for a Guide to Contracting ITS Projects, 249 p. (2006)
86	20-65/Task 04	Estimating the Impacts of the Aging Population on Transit Ridership, 53 p. (2006)
87	06-15	Test Methods for Evaluating Field Performance of RWIS Sensors, 331 p. (2006)
88	18-06A	Service Life of Corrosion-Damaged Reinforced Concrete Bridge Superstructure Elements, 57 p. (2006)
89	08-54	Identification of Reliability-Related Impediments to Sharing \$409 Safety Data Among Transportation Agencies and a Synthesis of Best Practices (& RRD 306), 38 p. (2006)
90	17-23	Safety Impacts and Other Implications of Raised Speed Limits on High-Speed Roads (& RRD 303), 197 p. (2006)
91	03-71	Improving Pedestrian Safety at Unsignalized Crossings, Appendixes B to O (joint web-only document with TCRP WOD 30) (& Rep. 562), 270 p. (2006)
92	17-28	Pavement Marking Materials and Markers: Real-World Relationship Between Retroreflectivity and Safety over Time (& RRD 305), 206 p. (2006)
93	08-37	Technical Appendix to NCHRP Report 571: Standardized Procedures for Personal Travel Surveys (& Rep. 571), 239 p. (2008)
94	03-65	Appendixes to NCHRP Report 572: Roundabouts in the United States (& Rep. 572), 197 p. (2007)
95	08-55	Integrating Geospatial Technologies into the Right-of-Way Data Management Process: Appendixes A through F (& RRD 310), 246 p. (2007)
96	09-09(01)	Appendixes to NCHRP Report 573: Superpave Mix Design: Verifying Gyration Levels in the Ndesign Table, 195 p. (2007)
97	03-68	Guide to Effective Freeway Performance Measurement: Final Report and Guidebook (& RRD 312), 482 p. (2007)
98	08-49	Final Report for NCHRP Report 574: Guidance for Cost Estimation and Management for Highway Projects During Planning, Programming, and Preconstruction (& Rep. 574), 163 p. (2007)
99	20-65/Task 07	Appendixes to NCHRP Research Results Digest 314: State DOT Staff Resources for Administering Federal Public Transportation Programs (& RRD 314), 126 p. (2007)
100	02-22(02)	Examples of Best Practices for Communicating the Economic Benefits of Transportation, 140 p. (2007)
101	18-10	Procedures for Evaluating Air Entraining Admixtures for Highway Concrete, 100 p. (2007)
102	20-24(49)	Future Financing Options to Meet Highway and Transit Needs, 197 p. (2007)
103	25-23(02)	Final Report for NCHRP Research Results Digest 317: Prototype Software for an Environmental Information Management and Decision Support System (& RRD 317), 108 p. (2007)
104	09-37	Final Report for NCHRP RRD 316: Using Surface Energy Measurements To Select Materials for Asphalt Pavements (& RRD 316), 196 p. (2007)
105	03-69	Final Report for NCHRP Report 581: Design of Construction Work Zones on High-Speed Highways, 116 p. (2007)
106	24-24	Criteria For Selecting Hydraulic Models, 727 p. (2007)
107	24-25	Risk-Based Management Guidelines for Scour at Bridges with Unknown Foundations, 458 p. (2007)
108	01-43	Guide for Pavement Friction (& RRD 321), 257 p. (2009)
109	09-26	Precision Estimates of Selected Volumetric Properties of HMA Using Absorptive Aggregate, 82 p. (2007)
110	18-08A	Supplementary Cementitious Materials to Enhance Durability of Concrete Bridge Decks, 95 p. (2007)
111	09-20	Technical Reports for Recommended Performance-Related Specification for Hot-Mix Asphalt Construction: Results of the WesTrack Project (& CD 9), 2654 p. (2007)
112	08-53	Integrating Freight into Transportation Planning and Project Selection Processes, 94 p. (2007)
113	09-23	Environmental Effects in Pavement Mix and Structural Design Systems (& RRD 324), 298 p. (2007)
114	09-26	Precision Estimates for AASHTO Test Method T 269 Determined Using AMRL Proficiency Sample Data, 40 p. (2007)
115	10-58(02)	Using the Results of Contractor-Performed Tests in Quality Assurance (& RRD 323), 250 p. (2007)

Table 5. Web-Only Documents

No.	Proj. No.	Title, Pages, Publication Year
116	24-12(01)	Corrosion Study and Implementation Plan for NCHRP Report 597 (& Rep. 597), 56 p. (2008)
117	03-62	Accessible Pedestrian Signals, A: Accessible Pedestrian Signals: A Guide to Best Practice, 428 p. (2008)
117	03-62	Accessible Pedestrian Signals, B: Guidelines for Accessible Pedestrian Signals (Final Report), 139 p. (2008)
118	08-35	Incorporating ITS into the Transportation Planning Process: An Integrated Planning Framework (ITS, M&O, Infrastructure), Part I: Executive Guidebook, 84 p. (2008)
118	08-35	Incorporating ITS into the Transportation Planning Process: An Integrated Planning Framework (ITS, M&O, Infrastructure), Part II: Practitioner's Guidebook, 240 p. (2008)
119	04-31	Appendixes to NCHRP Report 598 (& Rep. 598), 81 p. (2008)
120	20-06/Topic 13-01	Protecting Transportation Agencies Against Construction & DBE Fraud Including Use of Contractor Suspension and Debarment Procedures, 62 p. (2007)
121	19-05	Assessing and Mitigating Future Impacts to the Federal Highway Trust Fund Such as Alternative Fuel Consumption, 41 p. (2008)
122	25-11	Development of a Modal-Emissions Model, 435 p. (2008)
123	20-07/Task 222	Evaluation of the Flashing Yellow Arrow Permissive-Only Left-Turn Indication Field Implementation, 136 p. (2008)
124	03-74	Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections: Supplement to NCHRP Report 613 (& Rep. 613), 268 p. (2007)
125	05-18	Color Effectiveness of Yellow Pavement Marking Materials (& RRD 328), 158 p. (2008)
126	17-29	Methodology to Predict the Safety Performance of Rural Multilane Highways, 240 p. (2008)
127	20-63	Performance Measurement Tool Box and Reporting System for Research Programs and Projects, 214 p. (2008)
128	03-70	Multimodal Level of Service Analysis for Urban Streets: Users Guide (& Rep. 616; & WOD 158), 61 p. (2008)
129	17-26	Methodology to Predict the Safety Performance of Urban and Suburban Arterials, Phase I and Phase II, 231 p. (2008)
129	17-26	Methodology to Predict the Safety Performance of Urban and Suburban Arterials, Phase III, 76 p. (2008)
130	20-59(22)	A Guide to Emergency Quarantine and Isolation Controls of Roads in Rural Areas, 113 p. (2008)
131	20-78	Communicating the Value of Research (& Rep. 610), 125 p. (2009)
132	08-49(02)	Right-of-Way Methods and Tools to Control Cost Escalation, 115 p. (2009)
133	10-65	Supporting Materials for NCHRP Report 626 (& Rep. 626), 1097 p. (2009)
134	09-44	An Experimental Plan for Validation of an Endurance Limit for HMA Pavements, 265 p. (2009)
135	12-76	Protocols for Collecting and Using Traffic Data in Bridge Design, 514 p. (2009)
136	06-17	Performance Measures for Snow and Ice Control Operations (& RRD 335), 133 p. (2009)
137	20-69	Guidance for Transportation Project Management, 217 p. (2009)
138	09-41	Annotated Literature Review for NCHRP Report 640 (& Rep. 640), 312 p. (2009)
139	09-26A	Precision Estimates for AASHTO Test Method T 105, Determined Using CCRL Proficiency Sample Data, 143 p. (2009)
140	09-26A	Precision Estimates for AASHTO Test Methods T 186, T 154, and T 22, Determined Using CCRL Proficiency Sample Data, 48 p. (2009)
141	09-26A	Precision Estimates for AASHTO Test Method T 104, Determined Using AMRL Proficiency Sample Data, 122 p. (2009)
142	09-26A	Precision Estimates of AASHTO T 242, 91 p. (2009)
143	20-24(69)	Implementable Strategies for Shifting to Direct Usage-Based Charges for Transportation Funding, 150 p. (2009)
144	20-07/Task 236	Recommended Practice for Stabilization of Subgrade Soils and Base Materials, 67 p. (2009)
145	20-07/Task 236	Recommended Practice for Stabilization of Sulfate Rich Subgrade Soils, 66 p. (2009)
146	20-07/Task 246	Replacement Processes for Light Emitting Diode (LED) Traffic Signals, 42 p. (2009)
147	20-65	Virtual Library for NCHRP Research Results Digest 340 (& RRD 340), 536 p. (2010)
148	24-26	Debris Photographic Archive and Supplemental Materials for NCHRP Report 653 (& Rep. 653), 49 p. (2010)
149	12-80	Recommended LRFD Minimum Flexural Reinforcement Requirements, 160 p. (2010)
150	03-62A	Accessible Pedestrian Signals: A Guide to Best Practices (Workshop Edition 2010), 340 p. (2011)
151	15-35	Geometric Design of Driveways (Contractor's Final Report), 273 p. (2010)

Table 5. Web-Only Documents

No.	Proj. No.	Title, Pages, Publication Year
152	20-24(64)	Assessing Mechanisms for Integrating Transportation-Related Greenhouse Gas Reduction Objectives into Transportation Decision Making, 100 p. (2010)
153	09-23A	A National Database of Subgrade Soil-Water Characteristic Curves and Selected Soil Properties for Use with the MEPDG (& RRD 347), 4347 p. (2010)
154	08-70	Target-Setting Methods and Data Management to Support Performances-Based Resource Allocation by Transportation Agencies, Volume III: Case Studies (& Rep. 666), 311 p. (2010)
155	12-73	Design Guidelines for Durability of Bonded CFRP Repair/Strengthening of Concrete Beams, 63 p. (2010)
156	20-07/Task 243	Optical Sizing and Roundness Determination of Glass Beads Used in Traffic Markings (Contractor's Final Report) (& RRD 346), 179 p. (2010)
157	22-14(03)	Volume I: Evaluation of Existing Roadside Safety Hardware Using Updated Criteria—Technical Report (& RRD 349), 201 p. (2010)
158	03-70	Field Test Results of the Multimodal Level of Service Analysis for Urban Streets (& Rep. 616; & WOD 128), 76 p. (2010)
159	09-33	Supporting Materials for NCHRP Report 673 (& Rep. 673), 246 p. (2011)
160	03-78A	Supporting Material to NCHRP Report 674 (& Rep. 674), 245 p. (2011)
161	20-24(69)	System Trials to Demonstrate Mileage-Based Road User Charges, 191 p. (2010)
162	01-42A	Top-Down Cracking of Hot-Mix Asphalt Layers: Models for Initiation and Propagation, 286 p. (2010)
163	09-26A	Precision Estimates of AASHTO T267: Determination of Organic Content in Soils by Loss on Ignition (& RRD 351), 43 p. (2010)
164	09-26A	Precision Estimates of AASHTO T265: Laboratory Determination of Moisture Content of Soils (& RRD 351), 53 p. (2010)
165	09-26A	Precision Estimates of AASHTO T148: Measuring Length of Drilled Concrete Cores (& RRD 351), 30 p. (2010)
166	09-26A	Precision Estimates of AASHTO T283: Resistance of Compacted Hot Mix Asphalt (HMA) to Moisture-Induced Damage (& RRD 351), 83 p. (2010)
167	09-26A	Statistical Modeling of Cement Heat of Hydration Using Phase and Fineness Variables, 73 p. (2010)
168	09-26A	Precision Estimates of AASHTO T 180: Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop, 55 p. (2011)
169	03-88	Determining Guidelines for Ramp and Interchange Spacing (& Rep. 687), 238 p. (2011)
170	Various	(Pending)
171	08-65	Identification of Results-Oriented Public Involvement Strategies Between Transportation Agencies and Native American Tribal Communities (& Rep. 690), 71 p. (2011)
172	09-33A	Adapting Specification Criteria for Simple Performance Tests to HMA Mix Design, 64 p. (2011)
173	10-71	Cast-in-Place Concrete Connections for Precast Deck Systems (& RRD 355), 782 p. (2011)
174	08-75	Performance Measurement and Evaluation of Tolling and Congestion Pricing Projects (& Rep. 694), 226 p. (2012)
175	24-27(01)	Evaluation of Bridge Scour Research: Pier Scour Processes and Predictions, 195 p. (2011)
176	10-70	Cost-Effective Connection Details for Highway Sign, Luminaire, and Traffic Signal Structures, 236 p. (2011)
177	24-27(03)	Evaluation of Bridge Scour Research: Geomorphic Processes and Predictions, 163 p. (2011)
178	03-98	Assessment of Auxiliary Through Lanes at Signalized Intersections (& Rep. 707), 118 p. (2011)
179	22-24	Procedures for Verification and Validation of Computer Simulations Used for Roadside Safety Applications, 565 p. (2011)
180	08-79	Producing Transportation Data Products from the American Community Survey that Comply with Disclosure Rules, 386 p. (2011)
181	24-27(02)	Evaluation of Bridge-Scour Research: Abutment and Contraction Scour Processes and Predictions, 106 p. (2011)
182	20-86	Appendices to NCHRP Report 693 (& Rep. 693), 329 p. (2012)
183	20-24(71)	Guidance for Managing NEPA-Related and Other Risks in Project Delivery, Volume 1: Guide for Managing NEPA-Related and Other Risks in Project Delivery (& WOD 183 Volume 2), 70 p. (2011)
183	20-24(71)	Guidance for Managing NEPA-Related and Other Risks in Project Delivery, Volume 2: Expediting NEPA Decisions and Other Practitioner Strategies for Addressing High Risk Issues in Project Delivery (& WOD 183 Volume 1), 59 p. (2014)
184	08-68	Going the Distance Together: A Citizen's Guide to Context Sensitive Solutions for Better Transportation, 83 p. (2012)

Table 5. Web-Only Documents

No.	Proj. No.	Title, Pages, Publication Year
185	19-09	Truck Tolling—Understanding Industry Tradeoffs When Using or Avoiding Toll Facilities (joint web-only document with NCFRP WOD 3), 90 p. (2012)
186	09-42	The Superpave Mix Design System: Anatomy of a Research Program, 185 p. (2012)
187	12-59(01)	Seismic Design of Geosynthetic-Reinforced Soil Bridge Abutments with Modular Block Facing, 260 p. (2012)
188	20-65/Task 41	Survey of State Funding for Public Transportation—Ways to Improve It, 37 p. (2012)
189	25-29A	Design and Management of Historic Roads, 107 p. (2012)
190	15-38	Structural Design of Culvert Joints, 388 p. (2012)
191	03-96	Analysis of Managed Lanes on Freeway Facilities, 159 p. (2012)
192	08-82	Deployment, Use, and Effect of Real-Time Traveler Information Systems, 159 p. (2012)
193	03-91	Development of Left-Turn Lane Warrants for Unsignalized Intersections (& Rep. 745), 270 p. (2013)
194	03-80	Traffic Law Enforcement in Work Zones: Phase II Research (& Rep. 746), 92 p. (2013)
195	20-83(01)	Driving Forces Influencing Future Freight Flows (& CD 130; & Rep. 750 Vol. 1), 85 p. (2013)
196	20-59(32)	Final Research Report: A Transportation Guide for All-Hazards Emergency Evacuation (& Rep. 740), 201 p. (2013)
197	12-84	Guidelines for the Load and Resistance Factor Design and Rating of Riveted and Bolted Gusset-Plate Connections for Steel Bridges, 163 p. (2013)
198	15-41	Sag Vertical Curve Design Criteria for Headlight Sight Distance, 112 p. (2013)
199	15-36	Estimating Joint Probabilities of Design Coincident Flows at Stream Confluences, 270 p. (2013)
200	20-59(49)	Command-Level Decision Making for Transit Emergency Managers (joint web-only document with TCRP WOD 60), 70 p. (2013)
201	12-83	Calibration of AASHTO LRFD Concrete Bridge Design Specifications for Serviceability, 589 p. (2014)
202	03-90	Operation of Traffic Signal Systems in Oversaturated Conditions, Volume 1: Practitioner Guidance, 158 p. (2014)
202	03-90	Operation of Traffic Signal Systems in Oversaturated Conditions, Volume 2: Final Report, 364 p. (2014)
203	20-65/Task 44	Curriculum for New State DOT Transit Grant Managers in Administering Federal and State Transit Grants, 500 p. (2014)
204	07-18	Crash Experience Warrant for Traffic Signals, 101 p. (2014)
205	07-19	Methods and Technologies for Pedestrian and Bicycle Volume Data Collection (& Rep. 797) (In Production)
206	20-59(36)	Managing Catastrophic Transportation Emergencies: A Guide for Transportation Executives, 53 p. (2014)
207	20-07/Task 283	Evaluation of the Flashing Yellow Arrow (FYA) Permissive Left-Turn in Shared Yellow Signal Sections, 113 p. (2014)
208	03-89	Design Guidance for Channelized Right-Turn Lanes, 149 p. (2014)

Table 6. CD-ROMs

No.	Proj. No.	Title, Publication Year
1	09-07, 09-08, 09-09	Bituminous Materials Research Series (1999)
5	04-21	Appropriate Use of Waste and Recycled Materials in the Transportation Industry—An Information Database (2001)
6	20-32(02)	Transportation Research Thesaurus (2001)
7	25-09	Environmental Impact of Construction and Repair Materials (2001)
8	09-11, 09-12, 09-13	Bituminous Materials Research Series II (2001)
9	09-20	Recommended Performance-Related Specification for Hot-Mix Asphalt Construction: Results of the WesTrack Project (& WOD 111) (2007)
10	09-10, 09-14, 09-19	Bituminous Materials Research Series III (2002)
11	01-32	Pavement Design Tools (Contractor's CD) (1998)
12	14-11(02)	Tools for Peak Performance (Contractor's CD) (2001)
14	25-22	Technologies to Improve Consideration of Environmental Concerns in Transportation Decisions (2002)

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No.	Proj. No.	Title, Publication Year
15	08-33	Supporting Materials for NCHRP Report 462: Quantifying Air-Quality and Other Benefits and Costs of Transportation Control Measures (& Rep. 462) (2002)
20	20-06	Selected Studies in Transportation Law, Vol. 1: Construction Contract Law (2004)
20	20-06	Selected Studies in Transportation Law, Vol. 1 2014 Supplement: Construction Contract Law (2014)
20	20-06	Selected Studies in Transportation Law, Vol. 2: Eminent Domain (2003)
20	20-06	Selected Studies in Transportation Law, Vol. 3: Environmental Law and Transportation (2003)
20	20-06	Selected Studies in Transportation Law, Vol. 3 Supplement: Environmental Law and Transportation (2010)
20	20-06	Selected Studies in Transportation Law, Vol. 4: Tort Liability of Highway Agencies (2003)
20	J-05/Topic 05-04 TCRP	Selected Studies in Transportation Law, Vol. 5: Transit Law (2004)
20	J-05/Topic 06-03 TCRP	Selected Studies in Transportation Law, Vol. 6: Transit Labor 13[c] Decisions (2003)
20	J-05/Topic 07-03 TCRP	Selected Studies in Transportation Law, Vol. 7: Transit Charter Bus Service Decisions and Documents (2005)
20	20-06	Selected Studies in Transportation Law, Vol. 8: Transportation Law and Government Relations (2007)
22	20-45	Scientific Approaches to Transportation Research (2002)
23	15-19	A Guide to Best Practices for Achieving Context Sensitive Solutions (& Rep. 480) (2002)
24	03-52A	Impact Calculator: Impacts of Access Management Techniques (& Rep. 420) (2002)
26	12-43	BLCCA Software, Guidance Manual, User Manual, and Appendixes to NCHRP Report 483 (& Rep. 483) (2003)
28	03-56	RSRAP Software, NCHRP Report 486, and Supplementary Material (& Rep. 486) (2003)
29	12-50	NCHRP Report 485 Supporting Software, Vol. 1: Subdomain Data, Common Tables, and Data Viewer (& Rep. 485) (2003)
29	12-50	NCHRP Report 485 Supporting Software, Vol. 2: Subdomain Data, Common Tables, and Data Viewer (& Rep. 485) (2003)
30	12-48	Appendixes for NCHRP Report 489: Design of Highway Bridges for Extreme Events (& Rep. 489) (2003)
32	25-06	Intersection Air Quality Model (Contractor's CD) (2003)
33	22-09(02)	NCHRP Report 492 Supplementary Material: RSAP Program and User's Manual (& Rep. 492) (2003)
35	03-54(02)	NCHRP Report 493 Supplementary Material: Working Papers (& Rep. 493) (2003)
36	03-50(02)	Driver Information Load (DIL) Program and User Manual (& Rep. 488) (2003)
37	12-51	Software Module "CARRIS" 1.0 and User's Manual (& Rep. 495) (2003)
38	15-18	Appendix Material for Design Speed and Operating Speed (& Rep. 504) (2003)
39	24-17	Appendix Material for LRFD Deep Foundation Design (& Rep. 507) (2004)
41	20-47(01)	NCHRP Report 506: Supporting Software-GIS Error Model (& Rep. 506) (2003)
44	09-12(01)	Marketing the Use of Reclaimed Asphalt Pavements in the Superpave Mix Design Method (& Rep. 452; & RRD 253; & WOD 30) (2004)
46	09-19	Appendixes to NCHRP Report 547: Simple Performance Tests and Advanced Materials Characterization Models (& Rep. 547) (2005)
47	12-54	Appendixes A through H to NCHRP Report 527 (& Rep. 527) (2004)
48	24-16	ArcView-Based Data Logger and Channel Migration Predictor (& Rep. 533) (2004)
49	24-16	Archived River Meander Bend Database (4-CD set) (& WOD 67) (2004)
50	17-17(02)	Training Materials for Night Road Work to Improve Safety and Operations (& RRD 293) (2004)
52	08-45, H-29	A Research Results Compendium to NCHRP Report 536 (& Rep. 536) (2005)
53	08-40(02)	Evaluating Cultural Resource Significance, Vol. 1: Electronic Cultural Resource Evaluation Library (ECREL) (& Rep. 542; & RRD 277) (2005)
53	08-40(02)	Evaluating Cultural Resource Significance, Vol. 2: Historic Property Screening Tool (HPST) (& Rep. 542; & RRD 277) (2005)
54	10-57	Structural Safety Evaluation Guidelines for Suspension Bridge Parallel-Wire Cables (& Rep. 534) (2005)
55	20-59(02)	Materials Supporting a Self-Study Course on Terrorism-Related Risk Management of Highway Infrastructure (& Rep. 525 Vol. 4) (2005)
56	12-58	Effective Slab Width for Composite Steel Bridge Members Appendixes (& Rep. 543) (2005)
57	20-57	Analytic Tools Supporting Transportation Asset Management (& Rep. 545) (2005)
58	24-19	Supporting Material and Software for NCHRP Report 544 (& Rep. 544) (2005)

Table 6. CD-ROMs

No.	Proj. No.	Title, Publication Year
59	20-59(06)A/B	System Security Awareness for Transportation Employees (Rep. 525 Vol. 7) (2005)
62	08-44	Incorporating Safety into Long-Range Transportation Planning (& Rep. 546) (2006)
63	25-20(01)	Evaluation of Best Management Practices for Highway Runoff Control (& Rep. 565) (2006)
67	12-67	User's Manual and Software for NCHRP Report 590: Multi-Objective Optimization for Bridge Management Systems (& Rep. 590) (2007)
69	15-28	CANDE-2007 Installation Software for NCHRP Report 619 (& Rep. 619) (2008)
76	20-65/Task 17	Compliance Monitoring Tools (RRD 341) (2010)
78	08-44(02)	PLANSAFE: Forecasting the Safety Impacts of Socio-Demographic Changes and Safety Countermeasures (2010)
84	17-40	Road Safety 101 (& Rep. 667) (2010)
85	20-74A	Appendixes to NCHRP Report 677 (& Rep. 677) (2010)
99	08-55A	8-55A Logical Model for Implementing a Geospatially Enabled Enterprise-wide Information Management System (& Rep. 695) (2011)
101	10-68	Automated Decision Tool and Other Appendices to NCHRP Report 699 (& Rep. 699) (2011)
104	08-74	Compendium of Performance Measures for NCHRP Report 708 (& Rep. 708) (2011)
106	17-38	HSM Training Modules (& Rep. 715) (2012)
111	01-45	Models for Estimating the Effects of Pavement Condition on Vehicle Operating Costs (& Rep. 720) (2012)
116	25-31	Stormwater Best Management Practices Sizing and Design Tool (& Rep. 728) (2012)
127	17-48	Safety Research Prioritization Worksheet for NCHRP Report 756 (& Rep. 756) (2013)
130	20-83(01)	Future Freight Flows, World Scenarios 2037: Scenario Planning Toolkit (& Rep. 750 Vol. 1; & WOD 195) (2013)
132	20-59(32)	Toolkit for NCHRP Report 740 (& Rep. 740) (2013)
135	01-49	Example Forms for Conducting Forensic Investigations of Highway Pavements (& Rep. 747) (2013)
143	08-83	NCHRP Report 765—Tools and Contractor's Appendices (& Rep. 765) (2014)
146	20-83(05)	Engineering Options for Climate Stressor Mitigation and Example Benefit-Cost Analyses (& Rep. 750 Vol. 2) (2014)
147	25-32	BMP Sizing and Life Cycle Cost Tool: Supplement to NCHRP Report 767 (& Rep. 767) (2014)
148	08-78	Supplemental Materials to NCHRP Report 770 (& Rep. 770) (2014)
152	20-83(06)	Impacts 2050 Tool and Supplemental Materials to NCHRP Report 750, Volume 6 (& Rep. 750 Vol. 6) (2014)
153	25-40	Spreadsheet Tools and Appendices for NCHRP Report 792 (& Rep. 792) (2014)
154	20-84	Training Materials and Models for NCHRP Report 771 (& Rep. 771) (2014)
155	17-49	Supplemental Materials to NCHRP Report 788 (& Rep. 788) (2014)

Notes:

* indicates Special Publications.

Publications in parentheses with an ampersand (&) are companion publications.

Publications in parentheses without an ampersand are reports or digests published as stand-alone CDs.

See Table 7 for project titles. Progress reports are superseded annually. See inside back cover of this document for ordering information.

TABLE 7
STATUS OF PROJECTS (AS OF 12/31/2014) FOR FY 1963 THROUGH FY 2015

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
AREA ONE : DESIGN--PAVEMENTS						
01-01(01)	Development of Procedures for Comparing the AASHO Road Test Findings with Performance of (1) Existing Pavements and (2) Newly Constructed Experimental Pavements	University of Alabama	42,800	3/1/1963	2/29/1964	Completed---Published as NCHRP Reports 2 and 2A
01-01(02)	Guidelines for Extending the Findings of the AASHO Road Test---Implementation Phase	Highway Research Board	11,356	3/1/1964	8/31/1965	Contract cancelled---No report
01-02	Comparison of Different Methods for Evaluating Pavement Conditions	Purdue University	29,957	2/15/1963	2/28/1965	Completed---Phase I report published as NCHRP Report 7; final report not published; for avail. see Summary of Progress Through 1988
01-03(01)	Factors Influencing Pavement Performance---Regional	Purdue University	45,982	2/15/1963	9/30/1967	Completed---Published as NCHRP Report 132
01-03(02)	Factors Influencing Pavement Performance---Local	Northwestern University	19,850	9/1/1963	9/30/1964	Completed---Published as NCHRP Report 22
01-03(03)	Factors Influencing Pavement Performance	University of California	19,800	4/1/1964	10/31/1965	Completed---Published as NCHRP Report 35
01-04(01)	Extension of Road Test Performance Concepts	Georgia Institute of Technology	10,000	10/1/1963	9/30/1964	Completed---Published as NCHRP Report 10
01-04(01)A	Extension of Road Test Performance Concepts	Duke University	19,924	2/1/1965	9/30/1966	Completed---Published as NCHRP Report 97
01-04(02)	Extension of Road Test Performance Concepts	Purdue University	12,243	2/1/1964	1/31/1966	Completed---Published as NCHRP Report 30
01-05	Detecting Variations in Load-Carrying Capacity of Flexible Pavements	Cornell Aero Lab	49,011	1/15/1964	7/15/1965	Completed---Published as NCHRP Report 21
01-05(02)	Detecting Seasonal Changes in Load-Carrying Capabilities of Flexible Pavements	Texas A&M University	49,428	9/1/1966	6/30/1968	Completed---Published as NCHRP Report 76
01-06	Standard Measurements for Satellite Program---Measurement Team	Texas A&M University	61,353	3/31/1964	1/31/1967	Completed---Published as NCHRP Report 59
01-07	Development of Interim Skid-Resistance Requirements for Highway Pavement Surfaces	Pennsylvania State University	24,815	6/15/1965	12/15/1966	Completed---Published as NCHRP Report 37
01-08	Factors Involved in the Design of Asphalt Pavement Surfaces	Materials R&D	23,255	1/1/1965	2/28/1966	Completed---Published as NCHRP Report 39
01-09	Evaluation of Studded Tires	Cornell Aero Lab	24,998	10/1/1966	6/30/1967	Completed---Published as NCHRP Report 61
01-10	Translating AASHO Road Test Findings---Basic Properties of Pavement Components	Materials R&D	203,094	9/12/1966	12/31/1970	Completed---Published as NCHRP Reports 139 and 140
01-10A	Systems Approach to Pavement Design---Implementation Phase	Texas A&M University	100,000	3/1/1972	12/31/1973	Completed---Published as NCHRP Report 160
01-10B	Development of Pavement Structural Subsystems	Woodward-Clyde	447,941	2/1/1974	7/31/1986	Completed---Published as NCHRP Report 291

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
01-11	Evaluation of AASHTO Interim Guides for Design of Pavement Structures	Materials R&D	83,925	10/23/1967	4/30/1971	Completed---Published as NCHRP Report 128; Guidelines published by AASHTO
01-12	Determination of Pavement Friction Coefficients Required for Driving Tasks	Franklin Institute	309,244	8/25/1969	6/8/1973	Completed---Published as NCHRP Report 154
01-12(02)	Locked-Wheel Pavement Skid Tester Correlation and Calibration Techniques	Pennsylvania State University	319,000	9/16/1970	5/15/1973	Completed---Published as NCHRP Report 151
01-12(03)	Requirements for Wear-Resistant and Skid-Resistant Highway Pavement Surfaces	Materials R&D	261,955	11/1/1971	9/30/1975	Completed---Report not published; summarized in NCHRP Research Results Digest 89; for avail. see Summary of Progress Through 1988
01-12A	Wet-Weather Skidding Accident Reduction at Intersections	Ohio DOT	199,955	7/1/1975	7/1/1978	Completed---Report not published; for avail. see Summary of Progress Through 1988
01-13	Effects of Studded Tires on Highway Safety	Calspan Corporation	208,898	4/19/1971	8/20/1974	Completed---Published as NCHRP Report 183
01-13(02)	Effects of Studded Tires on Highway Safety---Non-Winter Driving Conditions	University of Michigan	39,450	2/15/1972	5/31/1973	Completed---Published as NCHRP Report 176
01-14	Influence of Combined Highway Grade and Horizontal Alignment on Skidding	University of Michigan	69,968	10/15/1972	1/14/1974	Completed---Published as NCHRP Report 184
01-15	Design of Continuously Reinforced Concrete Pavements for Highways	University of Texas	151,870	8/1/1972	8/31/1975	Completed---Report not published; summarized in NCHRP Research Results Digest 82; for avail. see Summary of Progress Through 1988
01-16	Evaluation of Winter-Driving Traction Aids	Pennsylvania State University	304,400	6/3/1974	10/31/1981	Completed---Report not published; summarized in NCHRP Research Results Digest 133; for avail. see Summary of Progress Through 1988
01-17	Guidelines for Recycling Pavement Materials	Texas A&M University	199,470	11/1/1976	9/30/1979	Completed---Published as NCHRP Report 224
01-18	Calibration and Correlation of Response-Type Road Roughness Measuring Systems	University of Michigan	250,000	10/1/1977	9/30/1980	Completed---Published as NCHRP Report 228
01-19	Development of a System for Nationwide Evaluation of PCC Pavements	University of Illinois	225,000	1/23/1978	3/15/1985	Completed---Published as NCHRP Report 277
01-20	Influence of Asphalt Temperature Susceptibility on Pavement Construction and Performance	Texas A&M University	200,000	5/1/1979	7/16/1984	Completed---Published as NCHRP Reports 268 and 269
01-21	Repair of Joint-Related Distress in Portland Cement Concrete Pavements	University of Illinois	300,000	5/15/1980	6/28/1985	Completed---Published as NCHRP Report 281

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
01-22	Shoulder Geometrics and Use Guidelines	Downs, Hugh/RK&K	100,000	9/8/1981	4/7/1983	Completed---Published as NCHRP Report 254
01-23	Pavement Roughness and Rideability	KETRON, Inc.	249,990	1/4/1982	11/30/1984	Completed---Published as NCHRP Report 275
01-23(02)	Pavement Roughness and Rideability---Field Evaluation	JMJ Research	199,983	1/6/1986	12/31/1987	Completed---Published as NCHRP Report 308
01-24	Revision of AASHTO Interim Guide for Design of Pavement Structures	Combined				Conducted under Project 20-07, Task 24
01-25	Effects of Heavy Vehicle Characteristics on Pavement Response and Performance	Transportation Research Board	100,000	6/12/1986	11/30/1987	Completed---Report not published; for avail. see Summary of Progress Through 1988
01-25(01)	Effects of Heavy Vehicle Characteristics on Pavement Response and Performance---Phase II	University of Michigan	400,000	9/1/1988	12/31/1991	Completed---Published as NCHRP Report 353
01-26	Calibrated Mechanistic Structural Analysis Procedures for Pavements	University of Illinois	499,942	2/6/1987	12/31/1992	Completed---Report not published
01-27	Video Image Processing for Evaluating Pavement Surface Distress	Triple Vision	350,000	3/1/1989	8/31/1991	Completed---Summarized in NCHRP Research Results Digest 181
01-28	Laboratory Determination of Resilient Modulus for Flexible Pavement Design	Georgia Institute of Technology	443,433	4/15/1990	7/31/1997	Completed---Agency report available as NCHRP Web-Only Document 14
01-28A	Harmonized Test Methods for Laboratory Determination of Resilient Modulus for Flexible Pavement Design	University of Maryland	101,325	2/1/1998	3/31/2000	Completed---Summarized in NCHRP Research Results Digest 285; agency report available on request
01-29	Improved Surface Drainage of Pavements	Pennsylvania State University	400,000	1/4/1993	4/30/1997	Completed---Summarized in NCHRP Research Results Digest 243; agency report available as NCHRP Web-Only Document 16
01-30	Support Under Portland Cement Concrete Pavements	University of Illinois	150,000	1/1/1993	9/30/1994	Completed---Published as NCHRP Report 372
01-31	Smoothness Specifications for Pavements	ERES Consultants	399,980	2/1/1994	12/31/1996	Completed---Agency report available as NCHRP Web-Only Document 1
01-32	Systems for Design of Highway Pavements	ERES Consultants	500,000	2/1/1994	5/30/1997	Completed---Summarized in NCHRP Research Results Digest 227 and available on CRP-CD-11
01-33	Methodology to Improve Pavement-Investment Decisions	Washington State University	499,800	7/1/1995	4/30/1999	Completed---Summarized in NCHRP Research Results Digest 246
01-34	Performance of Subsurface Pavement Drainage	ERES Consultants	505,070	5/15/1995	4/30/1998	Completed---Summarized in NCHRP Research Results Digest 268
01-34A	Contributions of Pavement Structural Layers to Rutting of Flexible Pavements	Purdue University	149,923	6/18/1999	7/31/2001	Completed---Published as NCHRP Report 468

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
01-34B	Effectiveness of Subsurface Drainage for HMA and PCC Pavements	Hall, Kathleen T.	49,965	4/1/1999	12/31/1999	Completed---Agency report available on request
01-34C	Effects of Subsurface Drainage on Performance of Asphalt and Concrete Pavements	Hall, Kathleen T.	116,581	4/6/2000	3/31/2003	Completed---Published as NCHRP Report 499
01-34D	Effects of Subsurface Drainage on Performance of Asphalt and Concrete Pavements: Further Evaluation and Analysis of LTPP SPS-1 and SPS-2 Field Sections	Hall, Kathleen T.	230,000	11/18/2002	4/30/2007	Completed---Published as NCHRP Report 583
01-35	Guidelines for Developing Pavement Performance Trends	Cancelled				Project cancelled
01-35A	Guide for Pavement Management	Texas A&M University	197,225	12/1/1997	6/30/2000	Completed---Published by AASHTO
01-36	Determination of Pavement Damage from Super-Single and Singled-Out Dual Truck Tires	University of Nevada - Reno	99,027	11/1/1996	2/23/1998	Contract cancelled
01-37	Development of the 2002 Guide for the Design of New and Rehabilitated Pavement Structures	Nichols Consulting Engineers	325,489	12/20/1996	7/31/1997	Contract cancelled
01-37A	Development of the 2002 Guide for the Design of New and Rehabilitated Pavement Structures: Phase II	ERES Consultants	6,577,248	2/1/1998	2/28/2004	Completed---Available online at http://www.trb.org/mepdg
01-37A(01)	Distribution Plan for the Recommended Mechanistic-Empirical Pavement Guide and Software	ERES Consultants	53,126	5/14/2004	12/13/2004	Completed
01-37A(01)B	Distribution Plan for the Recommended Mechanistic-Empirical Pavement Guide and Software	Cancelled				Contract cancelled, amended 01-40D(02) instead
01-38	Guide on Pavement Rehabilitation Strategies	Hall, Kathleen T.	100,000	3/1/1999	3/31/2001	Completed---Agency report available as NCHRP Web-Only Document 35
01-39	Traffic Data Collection, Analysis, and Forecasting for Mechanistic Pavement Design	Cambridge Systematics	500,000	8/30/2000	7/30/2004	Completed---Published as NCHRP Reports 509 and 538
01-40	Independent Review of the Recommended Mechanistic-Empirical Design Guide and Software	-----	55,000			Conducted as NCHRP Projects 1-40A to 1-40S
01-40A(01)A	Independent Review of the Recommended Mechanistic-Empirical Design Guide and Software: Technical Reviewer for Flexible Pavement Design	Elliott, Robert P.	35,000	8/20/2004	9/30/2005	Completed---Summarized in NCHRP Research Results Digest 307
01-40A(01)B	Independent Review of the Recommended Mechanistic-Empirical Design Guide and Software: Senior Technical Reviewer for Flexible Pavement Design	Thompson, Marshall R.	90,000	9/1/2004	12/31/2005	Completed---Summarized in NCHRP Research Results Digest 307

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
01-40A(01)C	Independent Review of the Recommended Mechanistic-Empirical Design Guide and Software: Technical Reviewer for Flexible Pavement Design	Dempsey, Barry J.	25,000	9/3/2004	12/31/2005	Completed---Summarized in NCHRP Research Results Digest 307
01-40A(01)D	Independent Review of the Recommended Mechanistic-Empirical Design Guide and Software: Technical Reviewer for Flexible Pavement Design	Carpenter, Samuel H.	25,000	9/23/2004	10/12/2005	Completed---Summarized in NCHRP Research Results Digest 307
01-40A(02)A	Independent Review of the Recommended Mechanistic-Empirical Design Guide and Software: Senior Technical Reviewer for Rigid Pavement Design	Barenberg, Ernest J.	75,000	8/20/2004	8/15/2005	Completed---Summarized in NCHRP Research Results Digest 307
01-40A(02)B	Independent Review of the Recommended Mechanistic-Empirical Design Guide and Software: Technical Reviewer for Rigid Pavement Design	Construction Technology Laboratories	35,400	9/14/2004	9/14/2005	Completed---Summarized in NCHRP Research Results Digest 307
01-40A(02)C	Independent Review of the Recommended Mechanistic-Empirical Design Guide and Software: Technical Reviewer for Rigid Pavement Design	Roesler, Jeffrey R.	4,415	9/1/2004	8/30/2005	Completed---Summarized in NCHRP Research Results Digest 307
01-40A(02)D	Independent Review of the Recommended Mechanistic-Empirical Design Guide and Software: Technical Reviewer for Rigid Pavement Design	Armaghani, Jamshid M.	27,000	9/3/2004	12/31/2005	Completed---Summarized in NCHRP Research Results Digest 307
01-40A(02)E	Independent Review of the Recommended Mechanistic-Empirical Design Guide and Software: Technical Reviewer for Rigid Pavement Design	Cancelled				
01-40A(02)F	Independent Review of the Recommended Mechanistic-Empirical Design Guide and Software: Technical Reviewer for Rigid Pavement Design	Won, Moon	25,000	4/14/2005	4/14/2006	Completed---Summarized in NCHRP Research Results Digest 307
01-40A(03)	Independent Review of the Recommended Mechanistic-Empirical Design Guide and Software: Reliability, Composite Pavement Design, and Summary Report	Scott Wilson Pavement Engineering, Ltd.	238,285	11/16/2004	6/30/2006	Completed---Summarized in NCHRP Research Results Digest 307
01-40A(04)A	Independent Review of the Mechanistic-Empirical Pavement Design Guide: Senior Technical Reviewer for Low Volume Road Design	Cancelled				Cancelled
01-40A(04)B	Independent Review of the Mechanistic-Empirical Pavement Design Guide: Technical Reviewer for Low Volume Road Design	Orr, David P.	6,250	11/17/2004	3/31/2006	Completed
01-40B	Local Calibration Guidance for the Recommended Guide for Mechanistic-Empirical Design of New and Rehabilitated Pavement Structures	Applied Research Associates	302,285	1/28/2005	2/28/2009	Completed---Reports transferred to AASHTO for publication

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
01-40D(01)	Technical Assistance to NCHRP: Version 0.9 of the Mechanistic-Empirical Pavement Design Software	Arizona State University	642,819	7/18/2005	6/30/2009	Completed---Summarized in NCHRP Research Results Digest 308
01-40D(02)	Technical Assistance to NCHRP: Version 0.9 of the Mechanistic-Empirical Pavement Design Software	Applied Research Associates	802,536	10/25/2005	12/31/2011	Completed---Summarized in NCHRP Research Results Digest 308
01-40D(03)	MEPDG Software Version 0.9-- Verification and Recalibration of the Thermal Cracking Model	Buttler, William G.	4,080	1/11/2006	9/30/2006	Completed
01-40D(04)	MEPDG Software Version 0.9-- Technical Assistance to NCHRP and the NCHRP 1-40D(01) Contractor	Schwartz, Charles W.	14,722	5/15/2006	9/30/2006	Completed
01-40E(01)	Error Patch 2004-01 for the Mechanistic-Empirical Pavement Design Software	ERES Consultants	8,500	11/5/2004	8/31/2005	Completed
01-40S	Roadmap for Future MEPDG Research	Brown, Stephen F.	16,000	8/1/2007	10/31/2007	Completed; report sent to AASHTO Joint Technical Committee on Pavements
01-41	Models for Predicting Reflection Cracking of Hot-Mix Asphalt Overlays	Texas A&M University	495,892	2/3/2005	3/31/2010	Completed---Published as NCHRP Report 669
01-42	Top-Down Fatigue Cracking of Hot-Mix Asphalt Layers - Phase I	Advanced Asphalt Technologies, LLC	39,556	8/22/2003	2/28/2005	Completed---Phase I only; continued under Project 01-42A
01-42A	Models for Predicting Top-Down Cracking of Hot-Mix Asphalt Layers	University of Florida	358,922	5/1/2006	2/16/2010	Completed---Agency report available as NCHRP Web-Only Document 162
01-43	Guide for Pavement Friction	Applied Research Associates	349,805	6/30/2003	6/30/2006	Completed---Available from AASHTO; summarized in NCHRP Research Results Digest 321
01-44	Measuring Tire-Pavement Noise at the Source	Illingworth & Rodkin, Inc.	249,676	9/2/2005	5/16/2008	Completed---Published as NCHRP Report 630
01-44(01)	Measuring Tire-Pavement Noise at the Source: Precision and Bias Statement	Illingworth & Rodkin, Inc.	247,839	7/23/2009	7/29/2011	Completed---Agency report available on project web page
01-45	Models for Estimating the Effects of Pavement Condition on Vehicle Operating Costs	Michigan State University	500,000	10/4/2006	12/16/2011	Completed---Published as NCHRP Report 720 and CRP-CD-111
01-46	Handbook for Pavement Design, Construction, and Management	Applied Pavement Technologies	398,123	10/1/2009	1/31/2012	Completed---Final report provided to AASHTO
01-47	Sensitivity Evaluation of MEPDG Performance Prediction	University of Maryland	249,952	9/2/2009	12/30/2011	Completed---Agency report available on NCHRP website and is summarized in NCHRP Research Results Digest 372
01-48	Incorporating Pavement Preservation into the MEPDG	Applied Pavement Technology	262,124	7/26/2010	12/31/2013	Completed---To be published as an NCHRP report
01-49	Guidelines for Conducting Forensic Investigation of Highway Pavements	Fugro Consultants	485,098	4/7/2010	11/30/2012	Completed---Published as NCHRP Report 747

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
01-50	Quantifying the Influence of Geosynthetics on Pavement Performance	Texas A&M Research Foundation	600,000	9/1/2011	6/30/2015	Research in progress
01-51	A Model for Incorporating Slab/Underlying Layer Interaction into the MEPDG Concrete Pavement Analysis Procedures	University of Minnesota	449,998	8/24/2012	2/23/2015	Research in progress
01-52	A Mechanistic-Empirical Model for Top-Down Cracking of Asphalt Pavement Layers	Texas A&M Transportation Institute	500,000	3/4/2013	3/4/2016	Research in progress
01-53	Proposed Enhancements to Pavement ME Design: Improved Consideration of the Influence of Subgrade and Unbound Layers on Pavement Performance	Texas A&M Transportation Institute	400,000	10/1/2014	3/31/2017	Research in progress
01-54	Guidelines for Limiting Damage to Flexible and Composite Pavements Due to the Presence of Water	Applied Pavement Technology	349,881	8/1/2014	8/1/2016	Research in progress; interim report pending
01-55	Performance-Based Mix Design of Porous Friction Courses	Auburn University	300,000	7/31/2014	7/30/2016	Research in progress; interim report pending
01-56	Synthesis of Practices for Superheavy Load Movements on Highway Pavements	Combined				Assigned to NCHRP Project 20-05, Topic 45-14
01-57	Defining Comparable Pavement Cracking Data	----	300,000			In development

AREA TWO : ADMINISTRATION--ECONOMICS

02-01	Criteria for Highway Benefit Analysis	University of Washington	101,948	6/1/1963	11/30/1967	Completed---Report not published; for avail. see Summary of Progress Through 1988
02-02	Guidelines for the Determination of Community Consequences	University of Washington	48,873	7/1/1963	8/31/1964	Completed---Published as NCHRP Report 18
02-03	Analysis of Motor Vehicle Accident Data as Related to Highway Classes and Design Elements	Cornell Aero Lab	155,972	6/1/1963	8/31/1966	Completed---Published as NCHRP Report 47
02-04	The Value of Highway Travel Time, Comfort, Convenience, and Uniform Driving Speed	Texas A&M University	77,100	6/1/1963	8/31/1966	Completed---Published as NCHRP Report 33
02-05	Running Cost of Motor Vehicles as Affected by Highway Design and Traffic	Catholic University	101,263	6/1/1963	12/31/1966	Completed---Published as NCHRP Report 13; Phase II report included in NCHRP Report 111
02-05A	Running Cost of Motor Vehicles as Affected by Highway Design and Traffic	Claffey, Paul J.	65,665	7/1/1967	8/10/1970	Completed---Report included in NCHRP Report 111
02-06	Warranted Levels of Improvement for Local Rural Roads	Stanford University	40,000	6/1/1963	9/30/1966	Completed---Published as NCHRP Report 63

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
02-07	Road User Costs in Urban Areas	Catholic University	99,376	2/1/1964	5/31/1966	Completed---Report included in NCHRP Report 111
02-08	Estimation and Evaluation of Diverted and Generated (Induced) Traffic	Northwestern University	40,000	5/1/1964	8/31/1966	Completed---Report not published; for avail. see Summary of Progress Through 1988
02-09	Effect of Highway Landscape Development on Nearby Property	Franklin Institute	149,103	11/8/1965	1/31/1968	Completed---Published as NCHRP Report 75
02-10	Future Needs for Oversize-Overweight Permit Operation on State Highways	Jorgensen & Associates	99,655	11/1/1966	4/30/1968	Completed---Published as NCHRP Report 80
02-11	Summary and Evaluation of Economic Consequences of Highway Improvements	Highway Research Board	110,000	1/1/1967	7/31/1970	Completed---Published as NCHRP Report 122
02-12	Highway User Economic Analysis	Stanford University	100,069	4/1/1974	5/31/1977	Completed---Report published by AASHTO
02-13	Multilane Design Alternatives for Improving Suburban Highways	Midwest Research Institute	100,000	7/18/1983	3/31/1985	Completed---Published as NCHRP Report 282
02-14	Public/Private Partnerships for Financing Highway Improvements	Kimley-Horn & Associates	175,000	1/1/1986	1/31/1990	Completed---Ph. I report summarized in NCHRP Research Results Digest 161 and published as NCHRP Report 307; Ph. II report summarized in NCHRP RRD 179
02-15	Identifying, Measuring, and Evaluating the Benefits of Safety Roadside Rest Areas	KLD Associates	236,560	1/13/1986	4/30/1989	Completed---Published as NCHRP Report 324
02-16	Relationships Between Vehicle Configurations and Highway Design	TRB Studies and Special Programs Division	912,000	3/2/1987	6/30/1990	Completed---Published as TRB Special Report 227
02-17(01)	Methodologies for Evaluating the Effects of Transportation Policies on the Economy	Hickling Corporation	99,145	9/1/1989	1/31/1991	Completed---Summarized in NCHRP Research Results Digest 200; published as NCHRP Report 342
02-17(02)	Workshop on Research Needs in Transportation and Economic Development	Greenhorne & O'Mara	52,000	9/1/1989	7/31/1990	Completed---Report not published
02-17(03)	Macroeconomic Analysis of the Linkages Between Transportation Investments and Economic Performance	Johns Hopkins University	250,000	11/1/1991	5/31/1997	Completed---Published as NCHRP Report 389
02-17(03)A	Update and Enhancement of Dataset for Macroeconomic Analysis of Transportation Investments and Economic Performance	Johns Hopkins University	42,701	11/1/1995	12/31/1997	Completed---Summarized in NCHRP Research Results Digest 248
02-17(04)	Measuring the Relationship Between Freight Transportation Services and Industry Productivity	Hickling Lewis Brod	250,000	10/14/1991	5/15/1995	Completed---Report not published
02-17(05)	Impact of Urban Congestion on Business	Cambridge Systematics	170,000	9/15/1991	3/15/1993	Completed---Summarized in NCHRP Research Results Digest 202

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
02-17(06)	Tourism Travel Contributions to Economic Development	Greenhorne & O'Mara	299,448	2/1/1993	2/28/1997	Completed---Published as NCHRP Report 419; Phase I summarized in NCHRP Research Results Digest 211
02-18	Research Strategies for Improving Highway User Cost-Estimating Methodologies	Hickling Corporation	200,000	1/2/1991	4/30/1994	Completed---Report not published
02-18(02)	Valuation of Travel-Time Savings and Predictability in Congested Conditions for Highway User-Cost Estimation	Hickling Lewis Brod	149,809	2/20/1995	7/31/1997	Completed---Published as NCHRP Report 431
02-18(03)	Development of an Innovative Highway User-Cost Estimation Procedure	Hickling Lewis Brod	100,000	11/15/1994	3/30/1997	Completed---Report not published; to be included in Project 02-18(04)
02-18(04)	Development and Demonstration of StratBENCOST Procedure	Hickling Lewis Brod	164,930	12/1/1997	9/30/1999	Completed---Summarized in NCHRP Research Results Digest 252
02-19	Research on the Relationship Between Economic Development and Transportation Development	Hagler Bailly, Inc.	100,000	4/17/1995	4/15/1997	Completed---Published as NCHRP Report 418
02-19(02)	Guidance on Using Existing Analytical Tools for Evaluating Transportation Investments	Hagler Bailly, Inc.	98,593	6/22/1998	8/31/1999	Completed---Draft agency report available on request
02-20	Economic Trends and Multimodal Transportation Requirements	Louis Berger Group	249,999	2/15/1995	4/30/1998	Completed---Published as NCHRP Report 421
02-21	Economic Implications of Congestion	Cambridge Systematics	300,000	4/1/1997	3/30/2001	Completed---Published as NCHRP Report 463
02-22	Needs in Communicating the Economic Impacts of Transportation Investment	Hagler Bailly, Inc.	198,038	2/3/1997	3/15/1999	Completed---Published as NCHRP Report 436
02-22(02)	Case Studies on Communicating the Economic Benefits of Transportation Investments	Hagler Bailly, Inc.	79,598	8/18/1999	9/30/2000	Completed---Available as NCHRP Web-Only Document 100; agency final report available by request
02-23	Development of an Update to the 1977 AASHTO Redbook	ECONorthwest	340,000	5/17/2000	8/31/2003	Completed---Published by AASHTO
02-23(02)	User Benefit Analysis for Highways Manual - Phase 2	ECONorthwest	100,000	12/8/2004	6/1/2007	Completed---Provided to AASHTO
02-24	Economic Productivity and Transportation Investment Priorities	Economic Development Research Group, Inc.	349,987	6/7/2012	6/6/2014	Completed---Published as NCHRP Report 786
AREA THREE : TRAFFIC--OPERATIONS AND CONTROL						
03-01	Development of Criteria for Evaluating Traffic Operations	Cornell Aero Lab	158,878	2/15/1963	2/28/1966	Completed---Report not published; for avail. see Summary of Progress Through 1988
03-02	Surveillance Methods and Ways and Means of Communicating with Drivers	Cornell Aero Lab	246,756	2/15/1963	4/30/1966	Completed---Published as NCHRP Reports 9, 28, and 29

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
03-03	Sensing and Communication Between Vehicles	Ohio State University	163,190	2/15/1963	11/30/1965	Completed---Published as NCHRP Report 51
03-04	Means of Locating Disabled or Stopped Vehicles and Methods of Communication with a Central Location	Airborne Instruments	127,991	3/1/1963	12/15/1966	Completed---Published as NCHRP Report 6; Phase II published as NCHRP Report 40
03-05	Improved Criteria for Designing and Timing Traffic Signal Systems	Planning Research Corporation	264,902	3/1/1963	12/31/1969	Completed---Published as NCHRP Reports 3 and 32; Phase II published as NCHRP Report 73; Phase III published as NCHRP Report 124
03-06	Effect of Regulatory Devices on Intersection Capacity and Operation	De Leuw, Cather	153,175	4/1/1963	8/15/1966	Completed---Published as NCHRP Reports 11 and 41
03-07	Establishment of Standards for Highway Noise Levels	Bolt, Beranek & Newman	572,263	2/1/1964	11/30/1974	Completed---Published as NCHRP Report 78; Phase II publ. as NCHRP Rpt. 117; Phase III publ. as NCHRP Rpt. 144; Phase IV publ. as NCHRP Rpts. 173 & 174
03-08	Factors Influencing Safety at Highway-Rail Grade Crossings	Voorhees & Associates	91,421	12/1/1963	1/6/1967	Completed---Published as NCHRP Report 50
03-09	Analysis and Projection of Research on Traffic Surveillance, Communication, and Control	Jorgensen & Associates	23,760	10/15/1966	1/14/1968	Completed---Published as NCHRP Report 84
03-10	Application of Vehicle Operating Characteristics to Geometric Design and Traffic Operations	Cornell Aero Lab	41,520	1/1/1966	3/10/1967	Completed---Published as NCHRP Report 68
03-11	Optimizing Street Operations Through Traffic Regulations and Control	Peat, Marwick, et al.	258,331	9/1/1966	9/30/1968	Completed---Published as NCHRP Report 110
03-12	Development of Information Requirements and Transmission Techniques for Highway Users	Airborne Instruments	398,976	10/1/1966	12/11/1972	Completed---Phase I and II reports included in NCHRP Report 123; Phase III report not published; for avail. see Summary of Progress Through 1988
03-13	Guidelines for Medial and Marginal Access Control of Major Roadways	Texas A&M University	149,293	9/1/1967	11/30/1969	Completed---Published as NCHRP Report 93
03-14	Optimizing Flow on Existing Street Networks	Edwards & Kelcey, Inc.	990,000	10/1/1967	1/10/1970	Completed---Published as NCHRP Report 113
03-15	Weaving Area Operations Study	Polytechnic Institute of New York	300,000	10/1/1969	12/31/1973	Completed---Published as NCHRP Report 159
03-16	Freeway Lane Drops	System Development Corporation	176,604	11/1/1969	10/31/1973	Completed---Report not published; for avail. see Summary of Progress Through 1988; last phase published as NCHRP Report 175
03-17	Improving Traffic Operations and Safety at Exit Gore Areas	Pennsylvania State University	79,983	1/1/1971	11/30/1972	Completed---Published as NCHRP Report 145

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
03-18(01)	Improved Control Logic for Use with Computer-Controlled Traffic	Stanford University	381,660	7/15/1971	6/30/1977	Completed---Report not published; for avail. see Summary of Progress Through 1988
03-18(02)	Traffic Control in Oversaturated Street Networks	Polytechnic Institute of New York	200,000	9/1/1971	6/30/1975	Completed---Published as NCHRP Report 194
03-18(03)	Cost-Effectiveness Methodology for Evaluation of Signalized Street Network Surveillance and Control Systems	JHK & Associates	123,267	5/1/1975	4/15/1977	Completed---Report not published; for avail. see Summary of Progress Through 1988
03-18(04)	Methodology for Performance Evaluation of Signalized Network Control Strategies	Computran	148,705	7/21/1977	11/20/1980	Completed---Report not published; summarized in NCHRP Research Results Digest 126; for avail. see Summary of Progress Through 1988
03-19	Grade Effects on Traffic Flow Stability and Capacity	Midwest Research Institute	220,443	9/1/1971	8/31/1974	Completed---Published as NCHRP Report 185
03-20	Traffic Signal Warrants	KLD Associates	201,935	9/1/1972	12/31/1976	Completed---Report not published; summarized in NCHRP Research Results Digest 78; for avail. see Summary of Progress Through 1988
03-20A	Peak-Hour Traffic Signal Warrants	JHK & Associates	150,000	6/23/1980	7/31/1982	Completed---Published as NCHRP Report 249
03-21	Motorist Response to Highway Guide Signing	BioTechnology	272,071	4/1/1974	1/31/1976	Completed---Report not published; summarized in NCHRP Research Results Digest 91; for avail. see Summary of Progress Through 1988
03-21(02)	Effectiveness of Changeable-Message Displays in Advance of High-Speed Freeway Lane Closures	BioTechnology	170,993	12/1/1979	8/31/1981	Completed---Published as NCHRP Report 235
03-22	Guidelines for Design and Operation of Ramp Control Systems	Stanford University	199,030	4/15/1974	12/31/1975	Completed---Report not published; for avail. see Summary of Progress Through 1988
03-22A	Guidelines for Design and Operation of Ramp Control Systems	Texas A&M University	249,538	2/1/1977	3/31/1981	Completed---Published as NCHRP Report 232
03-23	Guidelines for Uniformity in Traffic Control Signal Design Configurations	KLD Associates	308,779	4/8/1974	7/28/1977	Completed---Report not published; summarized in NCHRP Research Results Digest 97; for avail. see Summary of Progress Through 1988
03-24	Determine the Luminous Requirements for Retroreflective Highway Signing	University of Michigan	100,000	9/1/1974	4/30/1977	Completed---Report not published; for avail. see Summary of Progress Through 1988

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
03-25	Cost and Safety Effectiveness of Highway Design Elements	Jorgensen & Associates	260,576	7/15/1975	4/16/1978	Completed---Published as NCHRP Report 197
03-26	Investigation of Selected Noise Barrier Acoustical Parameters	Pennsylvania State University	224,494	12/1/1976	2/28/1980	Completed---Report not published; summarized in NCHRP Research Results Digests 105 and 122; for avail. see Summary of Progress Through 1988
03-27	Guidelines for Selecting Traffic Signal Control at Individual Intersections	Voorhees & Associates	150,000	11/15/1976	7/31/1979	Completed---Published as NCHRP Report 233
03-28	Development of an Improved Highway Capacity Manual	JHK & Associates	161,000	12/15/1977	8/15/1979	Completed---Report not published; for avail. see Summary of Progress Through 1988
03-28(02)	Urban Signalized Intersection Capacity	JHK & Associates	331,000	10/1/1979	8/31/1982	Completed---Results included in Highway Capacity Manual (TRB Special Report 209)
03-28A	Two-Lane, Two-Way Rural Highway Capacity	Texas A&M University	157,492	5/1/1980	2/28/1983	Completed---Results included in Highway Capacity Manual (TRB Special Report 209)
03-28B	New Highway Capacity Manual	Polytechnic Institute of New York	283,440	7/1/1982	3/31/1985	Completed---Results included in Highway Capacity Manual (TRB Special Report 209)
03-28C	Effects of Quality of Traffic Signal Progression on Delay	Texas A&M University	164,546	8/1/1986	7/31/1988	Completed---Published as NCHRP Report 339
03-29	Traffic Signal Display Complexity	Systems Technologies	196,284	7/1/1983	3/31/1986	Completed---Report not published; for avail. see Summary of Progress Through 1988
03-30	Intersection Channelization	Jack Leisch Associates	130,000	7/1/1983	5/15/1985	Completed---Published as NCHRP Report 279
03-31	Guidelines for Evaluating Alternatives for Replacing a Grade-Separated Rail/Highway Crossing	Ernst & Whinney	200,000	9/4/1984	2/28/1987	Completed---Published as NCHRP Report 288
03-32	Temporary Pavement Markings for Work Zones	Texas A&M University	164,990	5/1/1985	2/28/1987	Completed---Summary published in Transportation Research Record 1160
03-33	Capacity and Level-of-Service Procedures for Multilane Rural and Suburban Highways	JHK & Associates	475,132	6/1/1985	4/30/1990	Completed---Results included in Highway Capacity Manual (TRB Special Report 209)
03-34	The Feasibility of a National Heavy-Vehicle Monitoring System	Little, Arthur D.	499,791	11/1/1985	9/30/1988	Completed---Published as NCHRP Report 303
03-35	Speed-Change Lanes	JHK & Associates	250,000	6/1/1986	5/31/1989	Completed---Report not published
03-36	Development of a Low-Cost Bridge Weigh-In-Motion System	Bridge Weighing Systems	400,000	2/16/1987	2/28/1990	Completed---Report not published
03-37	Capacity and Level of Service at Ramp-Freeway Junctions	Polytechnic University	400,000	7/1/1990	12/31/1993	Completed---Results included in Highway Capacity Manual (TRB Special Report 209)

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
03-37(02)	Capacity and Level of Service at Ramp-Freeway Junctions (Phase II)	Polytechnic University	150,000	9/1/1994	4/30/1996	Completed---Published as NCHRP Report 385
03-38(01)	Assessment of Advanced Technologies for Relieving Urban Traffic Congestion	Castle Rock Consultants	202,666	7/1/1987	6/30/1991	Completed---Published as NCHRP Report 340
03-38(01)A	A Study to Assess Advanced Vehicle and Highway Technologies	TRB Executive Office	345,000	7/1/1989	3/31/1991	Completed---Published as TRB Special Report 232
03-38(02)	Travel Characteristics of Large-Scale Suburban Activity Centers	JHK & Associates	300,000	6/1/1987	2/28/1989	Completed---Published as NCHRP Report 323
03-38(03)	Traffic Adaptive Control (Phase 1)---Critical Intersection Control Strategies; (Phase 2)---OPAC Control Strategies	Farradyne Systems	374,829	9/1/1987	3/31/1993	Completed---Report not published
03-38(04)	Traffic Signal Control for Saturated Conditions	KLD Associates	270,000	10/1/1987	6/4/1992	Completed---Report not published
03-38(05)	Effective Utilization of Street Width	Midwest Research Institute	159,941	4/1/1988	6/30/1990	Completed---Published as NCHRP Report 330
03-38(06)	Cost Sharing for Transportation Improvements Near Major Suburban Employment Centers	Indiana University	125,000	5/15/1988	2/28/1991	Completed---Report not published
03-38(07)	Access Management Policies and Guidelines for Activity Centers	Metro Transportation Group	224,759	5/15/1989	9/30/1993	Completed---Published as NCHRP Report 348
03-39	Evaluation and Calibration Procedures for Weigh-In-Motion Systems	Texas A&M University	398,500	3/1/1988	12/31/1993	Completed---Report not published
03-39(02)	On-Site Evaluation and Calibration Procedures for Weigh-In-Motion Systems	Washington State University	247,846	3/10/1994	12/9/1995	Completed---Agency report available on request; summarized in NCHRP Research Results Digest 214
03-40	Single Point Urban Interchange Design and Operations Analysis	Texas A&M University	241,037	5/1/1989	11/30/1991	Completed---Published as NCHRP Report 345
03-41	Procedure for Determining Work Zone Speed Limits	Graham-Migletz	200,000	11/15/1989	5/31/1993	Completed---Summarized in NCHRP Research Results Digest 192
03-41(02)	Effectiveness and Implementability of Procedures for Work Zone Speed Limits	Graham-Migletz	200,000	1/1/1994	3/31/1997	Completed---Report not published
03-42	Determination of Stopping Sight Distances	Texas A&M University	500,000	5/1/1991	11/1/1994	Completed---Published as NCHRP Report 400
03-43	Use of Shoulders and Narrow Lanes to Increase Freeway Capacity	JHK & Associates	300,000	1/15/1991	4/15/1994	Completed---Published as NCHRP Report 369
03-44	Improved Traffic Control Device Design and Placement to Aid the Older Driver	Michigan State University	400,000	4/15/1992	12/31/1996	Completed---Results included in FHWA's Older Driver Handbook
03-45	Speed-Flow Relationships for Basic Freeway Segments	JHK & Associates	350,000	11/1/1992	6/30/1995	Completed---Results included in 1997 Highway Capacity Manual update

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
03-46	Capacity and Level of Service at Unsignalized Intersections	University of Idaho	412,436	1/1/1993	12/31/1995	Completed---Results included in 1997 Highway Capacity Manual update; agency report available as NCHRP Web-Only Documents 5 and 6
03-47	Capacity Analysis of Interchange Ramp Terminals	Texas A&M University	400,000	1/1/1994	4/30/1997	Completed---Some results included in 2000 Highway Capacity Manual update; agency report available as NCHRP Web-Only Document 12
03-48	Capacity Analysis for Actuated Intersections	University of Florida	250,000	12/15/1993	9/30/1996	Completed---Some results included in 1997 Highway Capacity Manual update; agency report available as NCHRP Web-Only Document 10
03-49	Capacity and Operational Effects of Midblock Left-Turn Lanes	University of Nebraska - Lincoln	300,000	1/1/1994	11/30/1996	Completed---Published as NCHRP Report 395
03-50	Driver Information Overload	Westat, Inc.	299,833	1/3/1994	9/30/1998	Completed---Report not published; to be included in Project 03-50(02)
03-50(02)	Additional Investigations on Driver Information Overload	Westat, Inc.	220,204	10/13/1999	11/15/2002	Completed---Published as NCHRP Report 488 and available on CRP-CD-36
03-51	Communications Mediums for Signal, IVHS, and Freeway Surveillance Systems	Kimley-Horn & Associates	380,000	12/15/1993	4/30/1996	Completed---Agency report available as NCHRP Web-Only Document 2
03-52	Impacts of Access-Management Techniques	Urbitran Associates	399,982	2/27/1995	3/31/1998	Completed---Published as NCHRP Report 420
03-52A	Impacts of Access-Management Techniques	Urbitran Associates	99,232	12/1/1998	3/31/2000	Completed---Summarized in NCHRP Research Results Digest 247; software available on CRP-CD-24
03-53	Development of a HOV Systems Manual	Texas A&M University	250,000	2/20/1995	2/28/1998	Completed---Published as NCHRP Reports 413 and 414
03-54	Uniform Traffic Signal Displays for Protected/Permissive Left-Turn Control	Kittelson & Associates	100,000	1/9/1995	12/31/1996	Completed---Report included with Project 03-54(02)
03-54(02)	Evaluation of Traffic Signal Displays for Protected/Permissive Left-Turn Control	Kittelson & Associates	732,618	12/22/1997	7/31/2004	Completed---Published as NCHRP Report 493 and CRP-CD-35; interim MUTCD approval granted
03-55	A Highway Capacity Manual for the Year 2000	Catalina Engineering	300,000	1/1/1995	10/31/1996	Completed---Report not published
03-55(02)	Techniques to Estimate Speeds and Service Volumes for Planning Applications	Dowling Associates	200,000	7/1/1995	9/30/1996	Completed---Published as NCHRP Report 387
03-55(02)A	Planning Applications for the Year 2000 Highway Capacity Manual	Dowling Associates	200,000	7/18/1997	6/17/1999	Completed---Results included in 2000 Highway Capacity Manual; report available on the CRP website

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
03-55(03)	Capacity and Quality of Service for Two-Lane Highways	Midwest Research Institute	599,829	9/15/1995	11/30/1999	Completed---Results included in 2000 Highway Capacity Manual; report available on the CRP website
03-55(04)	Performance Measures and Levels of Service in the Year 2000 Highway Capacity Manual	JHK & Associates/TransCore	159,250	1/8/1996	10/31/1997	Completed---Report not published
03-55(05)	Capacity and Quality of Service of Weaving Areas	Viggen Corporation	299,829	12/1/1996	1/31/1999	Completed as Project 03-55(05)B
03-55(05)B	Capacity and Quality of Service of Weaving Areas	Iteris, Inc.	18,866	6/11/2004	12/10/2004	Completed---Report available on the CRP website
03-55(06)	Production of the Year 2000 Highway Capacity Manual	Catalina Engineering	1,152,750	10/15/1996	1/31/2001	Completed---Published as 2000 Highway Capacity Manual
03-56	Systemwide Impact of Safety and Traffic Operation Design Decisions for Resurfacing, Restoration, or Rehabilitation (RRR)	Midwest Research Institute	434,364	5/15/1996	9/30/2002	Completed---Published as NCHRP Report 486 and available on CRP-CD-28
03-56(02)	Implementation of the Resurfacing Safety Resource Allocation Program	Midwest Research Institute	69,295	1/31/2003	6/30/2008	Completed---Assisted state DOTs
03-57	Recommended Traffic Control Devices for Railroad-Highway Grade Crossings	Westat, Inc.	269,957	6/1/1999	12/31/2001	Completed---Published as NCHRP Report 470; results included in the MUTCD
03-58	Assessing Traffic Control Signal Installations Using Capacity Analysis and Simulation	Texas A&M University	174,890	8/4/1999	6/30/2001	Completed---Published as NCHRP Report 457
03-59	Assessment of Variable Speed Limit Implementation Issues	Northwestern University	442,957	11/9/2000	11/9/2005	Completed---Agency report available on request
03-60	Capacity and Quality of Service of Interchange Ramp Terminals	Pennsylvania State University	299,904	5/30/2001	3/31/2005	Completed---Results added to the Highway Capacity Manual
03-60A	Validation and Enhancement of the Highway Capacity Manual's Interchange Ramp Terminal Methodology	University of Florida	198,874	2/15/2008	12/14/2009	Completed---Results incorporated into the Highway Capacity Manual 2010
03-61	Communicating Changes in Horizontal Alignment	Michigan State University	410,365	5/7/2001	8/31/2005	Completed---Published as NCHRP Report 559
03-62	Guidelines for Accessible Pedestrian Signals (APS)	University of North Carolina - Chapel Hill	1,070,000	10/4/2001	9/30/2015	Research in progress; interim materials summarized in NCHRP Research Results Digest 278; contractor's final report pending. Workshops completed.
03-63	Assessment of Sharing Information Between Public Safety and Transportation Agencies for Traffic-Incident Management	Mitretek Systems	199,807	11/12/2001	3/31/2004	Completed---Published as NCHRP Report 520
03-64	Highway Capacity Manual Applications Guide	Kittelson & Associates	245,782	2/13/2002	8/11/2006	Completed---Report available at http://hcmguide.com
03-65	Applying Roundabouts in the United States	Kittelson & Associates	899,994	6/5/2002	3/31/2006	Completed---Published as NCHRP Report 572

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
03-65A	Update of Roundabouts: An Informational Guide	Kittelson & Associates	366,200	2/13/2007	3/26/2011	Completed---Published as NCHRP Report 672
03-66	Traffic Signal State Transition Logic Using Enhanced Sensor Information	University of Tennessee	989,925	4/25/2003	3/30/2010	Completed---Contractor's final report available on project webpage
03-67	Expert System for Recommending Speed Limits in Speed Zones	University of North Carolina - Chapel Hill	297,138	9/17/2003	11/30/2006	Completed---Summarized in NCHRP Research Results Digest 318; agency report available on project web page
03-68	Guide to Effective Freeway Performance Measurement	Cambridge Systematics	299,624	10/13/2003	10/31/2006	Completed---Summarized in NCHRP Research Results Digest 312; agency report available as NCHRP Web-Only Document 97
03-69	Design of Construction Work Zones on High Speed Highways	Pennsylvania State University	499,999	8/6/2003	10/30/2006	Completed---Published as NCHRP Report 581
03-70	Multimodal Level of Service Analysis for Urban Streets	Dowling Associates	1,250,000	3/14/2003	2/28/2010	Completed---Published as NCHRP Report 616; agency report available as NCHRP Web-Only Document 128; Phase III report available as NCHRP WOD 158
03-71	Improving Pedestrian Safety at Unsignalized Roadway Crossings (TCRP Project D-08)	Texas A&M University	547,900	11/6/2002	3/6/2006	Completed---Published as NCHRP Report 562 and TCRP Report 112
03-72	Lane Widths, Channelized Right Turns, and Right-Turn Deceleration Lanes in Urban and Suburban Areas	Midwest Research Institute	450,000	5/20/2003	8/31/2006	Completed---Agency report available on request
03-73	Separation of Vehicles—CMV Only Lanes	Cambridge Systematics	149,922	12/27/2007	10/28/2009	Completed---Published as NCHRP Report 649/NCFRP Report 3; includes \$50k from NCFRP
03-74	Guidelines for Selection of Speed Reduction Treatments at High Speed Intersections	Kittelson & Associates	500,000	6/15/2004	12/31/2007	Completed---Published as NCHRP Report 613
03-75	Analysis of Freeway Weaving Sections	Polytechnic University	450,000	6/1/2004	1/1/2008	Completed---Results incorporated into the Highway Capacity Manual
03-76A	Highway Traffic Signal Warrant For Intersections Near Highway-Rail Grade Crossings	Polytechnic University	199,137	3/31/2004	5/31/2006	Completed---Results incorporated into the MUTCD
03-76B	Low-Cost Active Warning Systems for Highway-Rail Grade Crossings	Texas A&M University	400,000	3/1/2004	12/31/2006	Completed---Agency report available on request
03-77	Guide to Contracting Intelligent Transportation System Projects	Edwards & Kelcey, Inc.	436,339	3/4/2004	1/31/2008	Completed---Published as NCHRP Report 560 and NCHRP Web-Only Document 85
03-78	Crossing Solutions at Roundabouts and Channelized Turn Lanes for Pedestrians with Vision Disabilities	University of North Carolina - Chapel Hill	30,328	2/1/2005	7/31/2008	Contract transferred to North Carolina State University; see Project 03-78A

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
03-78A	Crossing Solutions at Roundabouts and Channelized Turn Lanes for Pedestrians with Vision Disabilities	North Carolina State University	730,000	1/4/2006	5/31/2010	Completed---Published as NCHRP Report 674
03-78B	Guidelines for the Application of Crossing Solutions at Roundabouts and Channelized Turn Lanes to Assist Pedestrians with Vision Disabilities	North Carolina State University	380,000	6/12/2013	6/11/2015	Research in progress; contractor's draft report pending; includes \$40,000 from FHWA
03-79	Measuring and Predicting the Performance of Automobile Traffic on Urban Streets	Texas A&M University	623,126	10/1/2004	1/31/2008	Completed---Results incorporated into the Highway Capacity Manual
03-79A	Arterial Performance Measures	Purdue University	225,000	9/10/2008	6/10/2010	Completed---Contractor's final report available on project web page
03-80	Traffic Enforcement Strategies for Work Zones	Texas A&M University	473,308	7/14/2005	7/28/2010	Completed---Published as NCHRP Report 746
03-81	Strategies for Integrated Operation of Freeway and Arterial Corridors	Siemens Energy & Automation, Inc	175,000	10/7/2005	10/7/2007	Terminated---Contractor's interim report available on request
03-82	Default Values for Capacity and Quality of Service Analysis	Kittelson & Associates	400,000	9/2/2005	9/1/2007	Completed---Published as NCHRP Report 599
03-83	Low-Cost Improvements for Recurring Freeway Bottlenecks	Dowling Associates	260,651	8/10/2005	2/9/2008	Project completed as NCHRP project 03-83A
03-83A	Low-Cost Improvements for Recurring Freeway Bottlenecks	Dowling Associates	39,334	8/14/2012	8/5/2013	Completed---Contractor's final report available on project webpage
03-84	Guide for Multistate Transportation Operations Programs	E-Squared Engineering	265,000	8/23/2006	1/22/2008	Completed---Agency report provided to AASHTO for publication
03-85	Guidance for the Use of Alternative Traffic Analysis Tools in Highway Capacity Analyses	University of Florida	397,405	7/28/2006	12/31/2010	Completed---Results incorporated into the Highway Capacity Manual
03-86	Traffic Operations Management and Planning Process	Cancelled				Terminated---Duplicative
03-87	Proactive Ramp Management Under the Threat of Freeway-Flow Breakdown	University of Florida	397,019	10/19/2006	12/18/2009	Completed---Contractor's final report available on project webpage
03-88	Guidelines for Ramp and Interchange Spacing	Kittelson & Associates	496,051	6/23/2008	12/22/2010	Completed---Published as NCHRP Report 687
03-89	Design Guidance for Channelized Right-Turn Lanes	Midwest Research Institute	400,000	4/23/2008	6/28/2011	Completed---Agency report available as NCHRP Web-Only Document 208
03-90	Operation of Traffic Signal Systems in Oversaturated Conditions	Kimley-Horn & Associates	599,988	3/14/2008	7/14/2012	Completed---Agency report available as NCHRP Web-Only Document 202
03-91	Left-Turn Accommodations at Unsignalized Intersections	Texas A&M University	350,000	4/24/2008	10/31/2010	Completed---Published as NCHRP Report 745
03-92	Production of the Year 2010 Highway Capacity Manual	Kittelson & Associates	1,000,000	9/24/2007	9/23/2011	Completed---HCM 2010 published

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
03-93	Automated Enforcement for Speeding and Red Light Running	Vanasse Hangen Brustlin, Inc.	150,000	8/1/2008	11/30/2011	Completed---Published as NCHRP Report 729
03-94	Transportation Systems Operations and Management Guide	PB Americas, Inc.	475,725	2/20/2009	5/1/2013	Completed---Published on AASHTO website
03-95	Guidelines for Timing Yellow and All-Red Intervals at Signalized Intersections	Vanasse Hangen Brustlin, Inc.	300,000	3/18/2009	11/30/2011	Completed---Published as NCHRP Report 731
03-96	Analysis of Managed Lanes on Freeway Facilities	University of Washington	350,000	4/3/2009	7/2/2012	Completed---Agency report available as NCHRP Web-Only Document 191; incorporated into HCM 2010
03-96A	Analysis of Oversaturated Traffic Flow Conditions on Freeway Facilities	----	350,000			In development
03-97	Traffic Signal Analysis with Varying Demands and Capacities	Dowling Associates	850,000	3/27/2009	11/26/2011	Completed---Results incorporated into SHRP2 L08
03-98	Assessment of Auxiliary through Lanes at Signalized Intersections	Kittelsohn & Associates	400,000	2/26/2009	8/31/2011	Completed---Published as NCHRP Report 707 and agency report available as NCHRP Web-Only Document 178
03-99	Development and Application of Access Management Guidelines	Oregon State University	400,000	5/26/2009	12/1/2014	Completed---Publication decision pending
03-100	Evaluating the Performance of Corridors with Roundabouts	Kittelsohn & Associates	300,000	4/29/2011	12/31/2013	Completed---Published as NCHRP Report 722
03-101	Costs and Benefits of Public-Sector Deployment of Vehicle to Infrastructure Technologies	Science Applications International Corporation	547,296	5/6/2011	5/5/2015	Research in progress
03-102	Design Guidance for Intersection Auxiliary Lanes	Texas A&M Research Foundation	400,000	8/1/2011	12/31/2013	Completed---Published as NCHRP Report 780
03-103	Update of the Signal Timing Manual	Kittelsohn & Associates	600,000	4/8/2011	10/7/2014	Completed---To be published as an NCHRP report
03-104	Unsignalized Intersection Guide	Vanasse Hangen Brustlin, Inc.	502,610	6/6/2012	2/5/2015	Research in progress
03-105	Design Guidance for Interchange Loop Ramps	MRIGlobal	675,000	7/30/2012	1/29/2015	Research in progress
03-106	Guidelines for Traffic Control Devices for Curves	Texas A&M Research Foundation	500,000	6/19/2012	3/18/2015	Research in progress
03-107	Work Zone Capacity Methods for the Highway Capacity Manual	Kittelsohn & Associates	600,000	5/17/2012	2/16/2015	Research in progress
03-108	Guidance on Quantifying Benefits of TIM Strategies	Noblis Inc.	499,985	7/10/2013	7/9/2015	Research in progress; interim report pending
03-109	Potential MUTCD Criteria for Selecting the Type of Control for Unsignalized Intersections	Texas A&M Transportation Institute	250,000	9/1/2013	2/1/2015	Research in progress
03-110	Estimating the Life-Cycle Cost of Intersection Designs	Kittelsohn & Associates	300,000	5/16/2013	4/15/2015	Research in progress

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
03-111	Effectiveness of Work Zone Transportation Management Plan Strategies	KLS Engineering LLC	749,961	6/24/2014	12/24/2016	Research in progress; interim report pending
03-112	Operational and Safety Considerations in Making Lane Width Decisions on Urban and Suburban Arterials	MRIGlobal	750,000	8/4/2014	8/4/2017	Research in progress; interim report pending
03-113	Guidance for Traffic Signals at Diverging Diamond Interchanges and Adjacent Intersections	North Carolina State University	499,993	6/13/2014	6/12/2016	Research in progress
03-114	Planning and Evaluating Active Traffic Management Strategies	Texas A&M Transportation Institute	700,000	1/16/2014	7/15/2016	Research in progress
03-115	Production of a Major Update to the 2010 Highway Capacity Manual	Kittelson & Associates	1,379,737	9/20/2013	12/19/2015	Research in progress
03-116	Performance-Based Asset Management of Traffic Signals	Combined				Incorporated into NCHRP project 07-21
03-117	Traffic Control Devices for Wrong Way Movement Prevention	----	300,000			In development
03-118	Safety and Operational Impacts of Traffic Signal Phasing	----	600,000			In development
03-119	Assessment of Small and Medium Sign Supports, Work Zone Devices, and Luminaires to MASH	----	600,000			In development
03-120	Multimodal Corridor Access Management Planning Methods, Guidelines, Best Practices, and Operational Impacts	----	800,000			In development

AREA FOUR : MATERIALS AND CONSTRUCTION--GENERAL MATERIALS

04-01	Development of Appropriate Methods for Evaluating the Effectiveness of Stabilizing Agents	University of Illinois	114,991	6/1/1963	10/31/1966	Completed---Report not published; for avail. see Summary of Progress Through 1988
04-02	A Study of Degrading Aggregates in Bases and Subbases with Production of Excessive Amounts of and/or Harmful Types of Fines	Purdue University	63,990	2/15/1963	11/30/1966	Completed---Published as NCHRP Report 98
04-03(01)	Development of Methods to Identify Aggregate Particles Which Undergo Destructive Volume Changes When Frozen in Concrete	Virginia Polytechnic Institute	43,337	3/1/1963	3/31/1967	Completed---Published as NCHRP Report 12; Phase II published as NCHRP Report 65
04-03(02)	Development of Methods to Identify Aggregate Particles Which Undergo Destructive Volume Changes When Frozen in Concrete	Pennsylvania State University	106,213	3/25/1963	8/3/1967	Completed---Published as HRB Special Report 80 and NCHRP Report 15; Phase II published as NCHRP Report 66
04-04	Synthetic Aggregates for Highway Uses	Battelle Memorial Institute	14,790	3/1/1963	4/15/1964	Completed---Published as NCHRP Report 8

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
04-05	A Study of the Mechanism Whereby the Strength of Bases and Subbases Is Affected by Frost and Moisture	Michigan Tech University	64,105	2/15/1963	8/31/1965	Completed---Report not published; for avail. see Summary of Progress Through 1988
04-06	Protective Coatings for Highway Structural Steel	Steel Structures Painting Council	25,000	3/1/1965	11/30/1966	Completed---Published as NCHRP Reports 74, 74A, and 74B
04-07	Fatigue Strength of High-Yield Reinforcing Bars	Portland Cement Association	150,000	10/1/1967	8/31/1973	Completed---Report included in NCHRP Report 164
04-08	Research Needs Relating to Performance of Aggregates in Highway Construction	Virginia Polytechnic Institute	55,254	1/1/1968	4/30/1969	Completed---Published as NCHRP Report 100
04-08(02)	Density Standards for Field Compaction of Granular Bases and Subbases	Clemson University	95,248	4/1/1971	6/30/1973	Completed---Published as NCHRP Report 172
04-08(03)	Predicting Moisture-Induced Damage to Asphaltic Concrete	University of Idaho	261,037	9/1/1971	1/31/1982	Completed---Published as NCHRP Report 192; Phase II published as NCHRP Report 246
04-08(04)	Predicting Moisture-Induced Damage to Asphaltic Concrete---10-Year Field Evaluation	University of Idaho	24,402	6/1/1985	1/31/1987	Completed---Report not published; for avail. see Summary of Progress Through 1988
04-09	Evaluation of Preformed Elastomeric Pavement Joint Sealing Systems and Practices	Utah DOT	93,494	10/1/1968	6/30/1971	Completed---Report included in Phase II report; summarized in NCHRP Research Results Digest 123
04-09(01)	Preformed Elastomeric Pavement Joint Sealing Systems---Field Evaluation Phase	Utah DOT	144,837	10/1/1972	12/31/1979	Completed---Report not published; for avail. see Summary of Progress Through 1988
04-10	Promising Replacements for Conventional Aggregates for Highway Use	University of Illinois	50,000	10/15/1969	3/31/1971	Completed---Published as NCHRP Report 135
04-10A	Waste Materials as Potential Replacements for Highway Aggregates	Valley Forge Laboratories	53,663	9/1/1972	11/30/1973	Completed---Published as NCHRP Report 166
04-11	Buried Plastic Pipe for Drainage of Transportation Facilities	Simpson Gumpertz & Heger, Inc.	200,000	9/16/1974	1/26/1979	Completed---Published as NCHRP Report 225
04-12	Upgrading of Poor or Marginal Aggregates for PCC and Bituminous Pavements	Pennsylvania State University	149,941	12/1/1976	5/31/1979	Completed---Published as NCHRP Report 207
04-13	Temporary Pavement Marking Systems	Southwest Research Institute	49,500	11/1/1976	2/28/1978	Completed---Report not published; for avail. see Summary of Progress Through 1988
04-13A	Temporary Pavement Marking Paint Systems	Georgia Institute of Technology	69,971	4/1/1978	9/30/1979	Completed---Report not published; for avail. see Summary of Progress Through 1988

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
04-14	Coating Systems for Painting Old and New Structural Steel	Georgia Institute of Technology	199,302	1/1/1978	12/31/1981	Completed---Report not published; for avail. see Summary of Progress Through 1988
04-15	Corrosion Protection of Prestressing Systems in Concrete Bridges	Wiss, Janney, Elstner & Associates	249,973	7/1/1982	11/30/1985	Completed---Published as NCHRP Report 313
04-16	Cost and Service Life of Pavement Markings	Pennsylvania State University	340,327	10/1/1984	8/30/1990	Completed---Report not published
04-17	Environmental Monitoring and Evaluation of Calcium Magnesium Acetate (CMA)	University of Washington	199,943	1/7/1985	10/31/1987	Completed---Published as NCHRP Report 305
04-18	Design and Evaluation of Large Stone Mixtures	Texas A&M University	299,440	6/1/1992	7/31/1996	Completed---Published as NCHRP Report 386
04-19	Aggregate Tests Related to Asphalt Concrete Performance in Pavements	Auburn University	499,194	2/1/1994	5/31/1997	Completed---Published as NCHRP Report 405
04-19(02)	Validation of Performance-Related Tests of Aggregates for Use in Hot-Mix Asphalt Pavements	Purdue University	399,975	3/16/2000	1/31/2005	Completed---Published as NCHRP Report 557
04-20	Aggregate Tests Related to Performance of Portland Cement Concrete	Texas A&M University	132,890	3/15/1995	12/31/1996	Contract cancelled
04-20A	State-of-the-Art Report and Plan for Research on Aggregate Tests Related to Performance of Portland Cement Concrete	Meininger, Richard C.	30,300	5/27/1997	1/31/1998	Completed---Agency report available on request
04-20B	Aggregate Tests Related to Performance of Portland Cement Concrete Pavements (Phase I)	University of Delaware	19,995	5/3/1999	11/1/1999	Completed---Results incorporated into Project 04-20C
04-20C	Aggregate Tests Related to Performance of Portland Cement Concrete Pavements: State of the Knowledge	Folliard, Kevin J.	36,000	4/1/2001	7/31/2002	Completed---Summarized in NCHRP Research Results Digest 281
04-21	Appropriate Use of Waste and Recycled Materials in the Transportation Industry	Chesner Engineering	499,974	6/1/1995	7/15/2000	Completed---Information database available on CRP-CD-5
04-22	Pavement-Marking Materials: Health, Environmental, and Performance Assessment	Research Triangle Institute	199,996	2/1/1995	1/30/1997	Completed---Published as NCHRP Report 392; summarized in NCHRP Research Results Digest 222
04-23	Performance-Related Tests of Aggregates for Use in Unbound Pavement Layers	Applied Research Associates	499,938	5/1/1996	12/31/1999	Completed---Published as NCHRP Report 453
04-24	HDPE Pipe Material Specifications and Design Requirements	Drexel University	130,000	1/1/1997	8/31/1998	Completed---Published as NCHRP Report 429
04-25	Implementation Plan for Automating Highway-Materials Testing	Braun Intertec Corporation	154,960	2/10/1997	2/26/1999	Completed---Published as NCHRP Report 427
04-26	Thermoplastic Drainage Pipe, Design and Testing	Simpson Gumpertz & Heger, Inc.	500,000	6/18/1999	8/31/2008	Completed---Published as NCHRP Report 631

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
04-27	Application of Fiber-Reinforced Polymer Composites to the Highway Infrastructure	University of Delaware	189,959	9/12/2000	11/30/2002	Completed---Published as NCHRP Report 503
04-28	Feasibility Study for an All-White Pavement Marking System	Texas A&M University	246,890	5/25/2000	7/15/2002	Completed---Published as NCHRP Report 484
04-29	Selection of Sign Materials to Optimize Performance	University of Iowa	300,000	5/2/2001	9/1/2006	Terminated
04-30	Test Methods for Characterizing Aggregate Shape, Texture, and Angularity (Phase I)	Washington State University	49,169	7/2/2002	3/31/2003	Completed---Phase I only; continued under Project 04-30A
04-30A	Test Methods for Characterizing Aggregate Shape, Texture, and Angularity	Texas A&M University	450,000	8/28/2003	5/31/2005	Completed---Published as NCHRP Report 555
04-31	Tests of Recycled Aggregates for Use in Unbound Pavement Layers	Applied Research Associates	299,999	7/2/2003	10/31/2006	Completed---Published as NCHRP Report 598
04-32	Performance and Quality Control of Corrugated Pipe Manufactured with Recycled Polyethylene Content	TRI/Environmental, Inc.	349,819	2/28/2006	3/31/2011	Completed---Published as NCHRP Report 696
04-33	Procedures for Testing and Evaluating Detectable Warning Systems	Wiss, Janney, Elstner & Associates	349,557	11/28/2006	2/26/2010	Completed---Published as NCHRP Report 670
04-34	Application of LADAR in the Analysis of Aggregate Characteristics	Virginia Polytechnic Institute	499,993	6/20/2006	3/31/2012	Completed---Published as NCHRP Report 724
04-35	Improved Test Methods for Specific Gravity and Absorption of Coarse and Fine Aggregate	Auburn University	449,912	4/3/2008	12/31/2014	Completed---Publication decision pending
04-36	Characterization of Cementitiously Stabilized Layers for Use in Pavement Design and Analysis	Washington State University	500,000	6/17/2009	9/30/2013	Completed---Published as NCHRP Report 789
04-37	Long-Term Performance of Epoxy Adhesive Anchor Systems	University of Florida	500,000	7/10/2009	7/31/2013	Completed---Published as NCHRP Report 757
04-38	Recommended Laboratory Test for Predicting the Initial Retroreflectivity of Pavement Markings from Glass Bead Quality	Iowa State University	349,546	6/25/2009	11/30/2012	Completed---Published as NCHRP Report 743
04-39	Field Performance of Corrugated Pipe Manufactured with Recycled Polyethylene Content	TRI/Environmental, Inc.	600,000	7/11/2013	7/11/2016	Research in progress; Phase II underway

AREA FIVE : TRAFFIC--ILLUMINATION AND VISIBILITY

05-02(01)	Effects of Illumination on Operating Characteristics of Freeways---Traffic Flow, Driver Behavior, and Accidents	Yale University	145,849	2/15/1963	7/31/1967	Completed---Report included in NCHRP Report 60
05-02(02)	Effects of Illumination on Operating Characteristics of Freeways---Driver Response, Visibility, and Visual Discomfort	Ohio State University	81,187	2/15/1963	8/31/1965	Completed---Report included in NCHRP Report 60

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
05-02(03)	Effects of Illumination on Operating Characteristics of Freeways---Driver Discomfort	Institute for Research	37,460	2/20/1963	2/28/1966	Completed---Report included in NCHRP Report 60
05-03	Visual Information Needed by the Driver at Night	Ohio State University	100,940	9/1/1964	3/31/1967	Completed---Published as NCHRP Report 99
05-04	Economic Study of Roadway Lighting	Franklin Institute	19,412	7/20/1964	8/31/1965	Completed---Published as NCHRP Report 20
05-05	Nighttime Use of Highway Pavement Delineation Materials	Southwest Research Institute	150,000	3/1/1965	9/15/1969	Completed---Published as NCHRP Report 45; Phase II published as NCHRP Report 85
05-05A	Development of Optimum Specifications for Glass Beads in Pavement Markings	Pennsylvania State University	99,350	5/1/1971	6/30/1973	Completed---Report not published; for avail. see Summary of Progress Through 1988
05-05B	Pavement Marking Systems for Improved Wet-Night Visibility Where Snowplowing Is Prevalent	Texas A&M University	200,000	9/1/1971	12/31/1974	Completed---Report not published; for avail. see Summary of Progress Through 1988
05-06	Highway Fog	Cornell Aero Lab	99,955	10/2/1967	4/30/1969	Completed---Published as NCHRP Report 95
05-06A	Highway Fog	Sperry Rand	93,540	9/1/1970	5/31/1973	Completed---Published as NCHRP Report 171
05-07	Roadway Delineation Systems	Pennsylvania State University	469,526	10/1/1968	6/30/1971	Completed---Published as NCHRP Report 130
05-08	Warrants for Highway Lighting	Texas A&M University	198,875	3/16/1970	2/15/1973	Completed---Published as NCHRP Report 152
05-09	Partial Lighting of Interchanges	KETRON, Inc.	199,999	12/1/1980	1/31/1983	Completed---Published as NCHRP Report 256
05-10	A Mobile System for Measuring Retroreflectance of Traffic Signs	EKTRON Appl Image	480,795	9/7/1987	12/31/1990	Completed---Report not published
05-11	Implementation Strategies for Sign Retroreflectivity Standards	Bellomo-McGee, Inc.	203,544	2/15/1989	8/31/1991	Completed---Published as NCHRP Report 346
05-12	Requirements for Application of Light Emitting Diodes (LEDs) to Traffic Control Signals	Lighting Sciences	249,973	2/15/1992	8/15/1994	Completed---Agency report available on request; summarized in NCHRP Research Results Digest 205
05-13	Illumination Guidelines for Nighttime Highway Work	University of Florida	173,979	2/1/1993	6/30/1995	Completed---Agency report available on request; summarized in NCHRP Research Results Digest 216
05-13(02)	Illumination Guidelines for Nighttime Highway Work	University of Florida	156,787	2/1/1996	10/31/1999	Completed---Published as NCHRP Report 498
05-14	Advance Warning Arrow Panel Visibility	Last Resource	275,000	3/1/1993	12/31/1996	Completed---Summarized in NCHRP Research Results Digest 259
05-15	Visibility Performance Requirements for Vehicular Traffic Signals	Westat, Inc.	350,000	3/18/1996	12/31/1999	Completed---Results provided to ITE

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
05-16	National Calibration Facility for Retroreflective Traffic Control Materials	National Institute of Standards & Technology	534,400	12/12/2001	12/30/2004	Completed---Summarized in NCHRP Research Results Digest 297; agency report available as NCHRP Web-Only Document 72
05-17	Safety Evaluation of Permanent Raised Pavement Markers	iTRANS Consulting, Inc.	392,349	12/3/2001	12/31/2003	Completed---Published as NCHRP Report 518
05-18	Color Effectiveness of Yellow Pavement Marking Materials	University of Iowa	400,000	11/6/2002	6/30/2007	Completed---Summarized in NCHRP Research Results Digest 328; agency report available as NCHRP Web-Only Document 125
05-19	Guidelines for Roadway Lighting Based on Safety Benefits and Costs	Rensselaer Polytechnic Institute	800,000	7/14/2005	6/1/2009	Completed---Results posted on project writeup on NCHRP website
05-20	Guidelines for Nighttime Visibility of Overhead Guide Signs	Texas A&M Research Foundation	720,000	4/1/2011	4/30/2015	Research in progress; Phase II underway
05-21	Safety and Performance Criteria for Retroreflective Pavement Markers	----	675,000			In development
AREA SIX : MAINTENANCE--SNOW AND ICE CONTROL						
06-01	Development of Economical and Effective Chemical Deicing Agents to Minimize Injury to Highway Structures and Vehicles	IIT Research Institute	40,000	2/15/1963	9/30/1964	Completed---Published as NCHRP Report 19
06-02	Nonchemical Methods for Preventing or Removing Snow and Ice Accumulations on Highway Structures	Jorgensen & Associates	25,000	2/15/1963	2/29/1964	Completed---Published as NCHRP Report 4
06-03	Development and Evaluation of Protective Coatings to Prevent Deterioration of Concrete Structures by Deicing Agents	Battelle Memorial Institute	58,557	3/1/1963	2/28/1965	Completed---Published as NCHRP Report 16
06-04	Evaluation and Development of Methods for Reducing Corrosion of Reinforcing Steel	Battelle Memorial Institute	39,330	3/1/1963	4/30/1965	Completed---Published as NCHRP Report 23
06-05	Study of Physical Factors Influencing Resistance of Concrete to Deicing Agents	University of Illinois	72,500	3/1/1963	8/31/1965	Completed---Published as NCHRP Report 27
06-06	To Evaluate Existing Methods and/or Develop Improved Methods for the Measurement of Certain Properties of Concrete	Ohio State University	69,393	3/1/1963	2/28/1966	Completed---Report not published; for avail. see Summary of Progress Through 1988
06-07	Estimation of Disintegration in Concrete Structures	Geotechnics	8,547	3/1/1963	8/31/1964	Contract cancelled---No report; continued under Project 06-07A
06-07A	Estimation of Disintegration in Concrete Structures	IIT Research Institute	44,614	2/1/1965	7/31/1966	Completed---Report not published; for avail. see Summary of Progress Through 1988

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
06-08	Evaluation of Methods of Replacement of Deteriorated Concrete in Structures	Tallamy Associates	25,000	2/15/1963	2/29/1964	Completed---Published as NCHRP Report 1
06-09	Potential Accelerating Effects of Chemical Deicing Damage by Traffic and Other Environmental-Induced Stresses in Concrete Bridge Decks	University of Illinois	200,000	1/1/1965	6/15/1968	Completed---Published as NCHRP Report 101
06-10	Develop Improved Snow Removal and Ice Control Techniques at Interchanges	Tallamy Associates	95,000	9/1/1967	9/30/1970	Completed---Published as NCHRP Report 127
06-11	Economic Evaluation of the Effects of Ice and Frost on Bridge Decks	Midwest Research Institute	100,000	9/1/1970	9/11/1974	Completed---Published as NCHRP Report 182
06-12	Improved Visibility for Snow Plowing Operations	Rensselaer Polytechnic Institute	287,122	1/1/1996	12/31/1999	Completed---Summarized in NCHRP Research Results Digest 250
06-13	Guidelines for Snow and Ice Control Materials and Methods	Midwest Research Institute	748,252	3/2/1998	5/15/2003	Completed---Guidelines published as NCHRP Report 526
06-14	Feasibility of Using Friction Indicators to Improve Winter Maintenance Operations and Mobility	Virginia Polytechnic Institute	150,013	5/17/2000	8/31/2002	Completed---Agency report available as NCHRP Web-Only Document 53
06-15	Testing and Calibration Methods for RWIS Sensors	SRF Consulting Group, Inc.	299,896	6/20/2003	12/31/2005	Completed---Agency report available as NCHRP Web-Only Document 87
06-16	Guidelines for the Selection of Snow and Ice Control Materials To Mitigate Environmental Impacts	Levelton Engineering, Ltd.	252,698	6/2/2003	1/1/2007	Completed---Published as NCHRP Report 577
06-16A	Guidelines for the Selection of Snow and Ice Control Materials to Mitigate Environmental Impacts-Continuation of Concrete Corrosion Testing	Levelton Engineering, Ltd.	915	11/29/2007	5/28/2009	Terminated---No corrosion detected after extended testing
06-17	Performance Measures for Snow and Ice Control Operations	Iowa State University	150,000	5/24/2005	3/31/2008	Completed---Summarized in NCHRP Research Results Digest 335

AREA SEVEN : TRAFFIC--TRAFFIC PLANNING

07-01	The Influence of Land Use on Urban Travel Patterns	Keefe, Louis E.	129,568	2/1/1964	9/30/1967	Completed---Published as NCHRP Reports 24 and 62
07-02	Traffic Attraction of Rural Outdoor Recreational Areas	IIT Research Institute	49,496	2/1/1964	5/31/1966	Completed---Published as NCHRP Report 44
07-03	Weighing Vehicles in Motion	Franklin Institute	73,391	2/1/1964	8/31/1967	Completed---Published as NCHRP Report 71
07-04	Factors and Trends in Trip Lengths	Voorhees & Associates	150,980	2/1/1964	1/10/1969	Completed---Published as NCHRP Report 48; Phase II published as NCHRP Report 89
07-05	Predicted Traffic Usage of a Major Highway Facility Versus Actual Usage	Yale University	99,675	2/1/1964	11/30/1966	Completed---Published as NCHRP Report 58
07-06	Multiple Use of Lands Within Highway Rights-of-Way	Barton-Aschman Associates	24,220	2/1/1966	2/28/1967	Completed---Published as NCHRP Report 53

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
07-07	Motorists' Needs and Services on Interstate Highways	Airborne Instruments	99,267	1/1/1966	12/31/1967	Completed---Published as NCHRP Report 64
07-08	User Cost and Related Consequences of Alternative Levels of Highway Service	Stanford University	99,070	9/1/1970	4/15/1972	Completed---Published as NCHRP Report 133
07-09	Development of Models for Predicting Weekend Recreational Traffic	Midwest Research Institute	74,983	9/1/1972	5/15/1974	Completed---Report not published; for avail. see Summary of Progress Through 1988
07-10	Peak-Period Traffic Congestion	Remak/Rosenbloom	49,624	4/1/1974	3/31/1975	Completed---Published as NCHRP Report 169
07-10(02)	The Institutional Aspects of Implementing Congestion-Reducing Techniques	Remak/Rosenbloom	74,703	4/1/1975	11/30/1978	Completed---Published as NCHRP Report 205
07-11	Low-Cost TSM Projects---Simplified Procedures for Evaluation and Setting Priorities	Multiplications, Inc.	199,988	4/6/1981	11/30/1983	Completed---Published as NCHRP Report 263
07-11A	Low-Cost TSM Projects---Simplified Procedures for Evaluation, Phase II	Texas A&M University	150,000	3/4/1985	8/3/1986	Completed---Published as NCHRP Report 283
07-12	Microcomputer Evaluation of Highway User Benefits	Texas A&M University	200,000	2/1/1989	9/30/1995	Completed---Report released with software through McTrans Center at University of Florida
07-12(02)	Metrication and Enhancement of MicroBENCOST Software Package	Texas A&M University	170,000	12/15/1995	6/30/1997	Completed---Summarized in NCHRP Research Results Digest 242
07-13	Quantifying Congestion	Texas A&M University	375,000	3/1/1992	2/28/1997	Completed---Published as NCHRP Report 398
07-14	Guidelines for Analysis of Investments in Bicycle Facilities	University of Minnesota	300,000	10/17/2003	8/21/2005	Completed---Published as NCHRP Report 552
07-15	Cost Effective Measures and Planning Procedures for Travel Time Variation, Delay and Reliability	Cambridge Systematics	299,489	2/1/2004	5/15/2007	Completed---Published as NCHRP Report 618
07-16	Recommended Revisions to the AASHTO Guidelines for Traffic Data Programs	Cambridge Systematics	349,902	3/29/2005	4/30/2007	Completed---Final Report transmitted to AASHTO
07-17	Pedestrian and Bicycle Transportation along Existing Roads	Toole Design Group	500,000	3/18/2011	1/1/2015	Research completed; draft final report pending
07-18	Crash Experience Warrant for Traffic Signals	Kittelson & Associates	100,000	5/6/2013	7/5/2014	Completed---Agency report available as NCHRP Web-Only Document 204
07-19	Methods and Technologies for Collecting Pedestrian and Bicycle Volume Data	Kittelson & Associates	400,000	4/11/2012	8/11/2014	Completed---To be published as NCHRP Report 797 and agency report to be made available as NCHRP Web-Only Document 205
07-20	Guidance for Implementation of Traffic Incident Management Performance Measurement	Applied Engineering Management Corporation	204,990	4/2/2013	11/2/2014	Completed---Agency report to be available as an NCHRP web-only document

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
07-21	Asset Management Guidance for Traffic Control Devices, Barriers, and Lighting	Vanasse Hangen Brustlin, Inc.	550,000	4/10/2013	12/9/2015	Research in progress
07-22	Planning and Preliminary Engineering Applications Guide to the Highway Capacity Manual	Kittelson & Associates	400,000	6/4/2013	6/3/2015	Research in progress
07-23	Access Management in the Vicinity of Interchanges	Texas A&M Transportation Institute	575,000	6/20/2013	12/19/2015	Research in progress; contractor's draft report pending
AREA EIGHT : TRANSPORTATION PLANNING--FORECASTING						
08-01	Social and Economic Factors Affecting Travel	----	94,558	2/1/1964	9/23/1966	Completed---Published as NCHRP Report 70
08-02	Factors Influencing Modal Trip Assignment	IIT Research Institute	298,033	2/1/1964	8/31/1966	Completed---Published as NCHRP Report 57
08-03	Individual Preferences for Various Means of Transportation	University of Pennsylvania	63,282	2/1/1964	3/31/1965	Completed---Report not published; for avail. see Summary of Progress Through 1988
08-04	Criteria for Evaluating Alternative Transportation Plans	Northwestern University	89,900	2/1/1965	8/1/1967	Completed---Published as NCHRP Report 96
08-04A	Criteria for Evaluating Alternative Transportation Plans	University of Illinois	5,000	10/14/1968	1/10/1969	Completed---Published as NCHRP Report 96
08-05	Transportation Aspects of Land-Use Controls	Gruen, Victor	125,538	4/1/1965	1/15/1970	Completed---Published as NCHRP Report 31; Phase II published as NCHRP Report 121
08-06	Individual Preferences for Alternative Dwelling Types and Environments	University of North Carolina	99,897	2/14/1966	3/13/1968	Completed---Published as NCHRP Report 81
08-07	Evaluation of Data Requirements and Collection Techniques for Transportation Planning	Creighton-Hamburg	190,000	9/13/1968	8/28/1970	Completed---Published as NCHRP Report 120
08-07A	Data Requirements and Transportation Planning Procedures in Small Urban Areas	University of Tennessee	98,005	6/1/1973	6/14/1975	Completed---Published as NCHRP Report 167
08-08(01)	The Impact of Highways upon Environmental Values (Study Design)	Massachusetts Institute of Technology	29,654	9/16/1968	3/14/1969	Completed---Study design, not published
08-08(02)	The Impact of Highways upon Environmental Values (Study Design)	Daniel, Mann, Johnson, Mendenhall	28,950	9/9/1968	3/7/1969	Completed---Study design, not published
08-08(03)	The Impact of Highways upon Environmental Values	Massachusetts Institute of Technology	470,000	9/15/1969	7/31/1974	Completed---Published as NCHRP Report 156
08-09	Comparative Economic Analysis of Alternative Multimodal Passenger Transportation Systems	Creighton-Hamburg	100,000	9/1/1971	1/31/1973	Completed---Published as NCHRP Report 146
08-10	Planning and Design Guidelines for Efficient Bus Utilization of Highway Facilities	Wilbur Smith Associates	149,907	9/1/1971	7/31/1973	Completed---Published as NCHRP Reports 143 and 155

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
08-11	Social, Economic, Environmental Consequences of Not Constructing a Transportation Facility	David A. Crane & Partners, Inc.	364,363	9/16/1974	11/30/1979	Completed---Phase I report not published; for avail. see Summary of Progress Through 1988; Phase II report published as NCHRP Reports 216 and 217
08-12	Travel Estimation Procedures for Quick Response to Urban Policy Issues	Metropolitan Washington Council of Governments	39,895	9/3/1974	12/31/1975	Completed---Published as NCHRP Reports 186 and 187
08-12A	Travel Estimation Procedures for Quick Response to Urban Policy Issues	COMSIS Corporation	239,331	11/1/1975	10/31/1978	Completed---Published as NCHRP Reports 186 and 187
08-13	Disaggregate Travel Demand Models	Charles River Associates	100,000	9/15/1974	1/31/1976	Completed---Phase I report not published; for avail. see Summary of Progress Through 1988
08-13(02)	Disaggregate Travel Demand Models	Charles River Associates	200,000	5/1/1976	12/31/1980	Completed---Published as NCHRP Report 253
08-14	New Approaches to Understanding Travel Behavior	Boston College	144,135	1/1/1975	4/30/1977	Completed---Report not published; for avail. see Summary of Progress Through 1988
08-14A	New Approaches to Understanding Travel Behavior: Phase II	Charles River Associates	221,250	1/1/1978	6/30/1982	Completed---Published as NCHRP Report 250
08-15	State and Regional Transportation Impact Identification and Measurement	Bigelow-Crain	80,000	9/1/1974	5/31/1976	Completed---Report not published; for avail. see Summary of Progress Through 1988
08-15A	Economic Impacts of State Transportation Policies and Programs	Reg Sci Research Inst	117,852	10/1/1977	3/31/1980	Completed---Report not published; for avail. see Summary of Progress Through 1988
08-16	Guidelines for Public Transportation Levels of Service and Evaluation	University of Tennessee	489,952	1/1/1976	12/31/1980	Completed---Published as NCHRP Reports 208, 209, 210, 211, and 212
08-17	Freight Data Requirements for Statewide Transportation Systems Planning	R. Creighton Associates	231,147	7/15/1975	2/15/1977	Completed---Published as NCHRP Reports 177 and 178
08-18	Techniques for Evaluating Options in Statewide Transportation Planning/Programming	Planning Envr Intl/AMV	300,393	9/1/1975	6/30/1978	Completed---Published as NCHRP Reports 179 and 199
08-19	The Relationship of Changes in Urban Highway Supply to Vehicle-Miles of Travel	Cambridge Systematics	199,954	12/1/1976	11/30/1978	Completed---Report not published; summarized in NCHRP Research Results Digest 127; for avail. see Summary of Progress Through 1988
08-20	Improved Methods for Vehicle Counting and Determining Vehicle-Miles of Travel	Hamburg & Associates	200,000	1/2/1978	7/31/1980	Completed---Report not published; for avail. see Summary of Progress Through 1988

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
08-21	Guidelines for Use of Vanpools and Carpools as a Transportation System Management Technique	George Washington University	265,486	3/1/1979	6/30/1981	Completed---Guidelines published as NCHRP Report 241; report not published; for avail. see Summary of Progress Through 1988
08-22	Transportation Financing Within the Context of Energy Constraints	System Design Concepts, Inc.	100,000	3/26/1979	2/27/1981	Completed---Published as NCHRP Report 231
08-23	Fuel Supply Limitations and Passenger Travel	Charles River Associates	110,000	4/2/1979	9/1/1980	Completed---Published as NCHRP Report 229
08-24	Forecasting the Basic Inputs to Transportation Planning	Hamburg & Associates	81,000	1/21/1980	4/30/1982	Completed---Published as NCHRP Report 266
08-24A	Forecasting the Basic Inputs to Transportation Planning at the Zonal Level	COMSIS Corporation	192,444	4/1/1987	2/28/1990	Completed---Published as NCHRP Report 328
08-25	Intercity Bus Transportation Planning	Peat, Marwick, et al.	200,000	4/1/1980	1/31/1982	Completed---Report not published; for avail. see Summary of Progress Through 1988
08-26	Development of Highway Traffic Data for Project Planning and Design in Urbanized Areas	JHK & Associates	100,000	5/15/1981	12/31/1982	Completed---Published as NCHRP Report 255
08-27	Cost-Effectiveness of Transportation Services for Handicapped Persons	University of Tennessee	199,543	9/1/1981	4/30/1983	Completed---Published as NCHRP Reports 261 and 262
08-28	Strategic Planning and Management for Transportation Agencies	Ernst & Young	180,020	6/1/1987	6/25/1990	Completed---Published as NCHRP Report 331
08-29	Travel Estimation Techniques for Urban Planning	Barton-Aschman Associates	300,000	2/15/1991	4/29/1994	Completed---Published as NCHRP Report 365
08-29(02)	Travel Estimation Techniques for Urban Planning	Barton-Aschman Associates	47,342	4/1/1995	1/31/1996	Completed---Published as NCHRP Report 365
08-30	Characteristics and Changes in Freight Transportation Demand	Cambridge Systematics	550,000	12/15/1992	2/29/1996	Completed---Published as NCHRP Report 388
08-30A	Freight Capacity	TRB Studies and Special Programs Division	100,000	11/1/1997	12/31/2001	Completed---Published as TRB Special Report 271
08-31	Long-Term Availability of Multimodal Corridor Capacity	Urban Institute	224,371	1/4/1993	1/1/1996	Completed---Continued as Project 08-31A
08-31A	Long-Term Availability of Multimodal Corridor Capacity	Cambridge Systematics	65,920	7/1/1995	3/31/1996	Completed---Published as NCHRP Report 399
08-32	Workshop on Multimodal Transportation Planning Research Needs	TRB Cooperative Research Programs	70,000	3/15/1993	3/14/1994	Completed---Problem statements developed - see below
08-32(01)	Innovative Practices for Multimodal Transportation Planning for Freight and Passengers	Transmanagement, Inc.	140,658	12/1/1994	6/30/1996	Completed---Published as NCHRP Report 404
08-32(02)	Multimodal Transportation: Development of a Performance-Based Planning Process	Cambridge Systematics	250,000	1/1/1995	7/31/1996	Completed---Phase I summarized in NCHRP Research Results Digest 226

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
08-32(02)A	Multimodal Transportation: Development of a Performance-Based Planning Process	Cambridge Systematics	299,990	4/1/1997	4/30/1999	Completed---Published as NCHRP Report 446
08-32(03)	Integration of Land-Use Planning with Multimodal Transportation Planning	Parsons Brinckerhoff Quade & Douglas	400,000	10/1/1995	12/31/1998	Completed---Published as NCHRP Report 423A
08-32(04)	Developing and Maintaining Partnerships for Multimodal Transportation Planning	Kimley-Horn & Associates	199,950	3/31/1995	6/30/1997	Completed---Published as NCHRP Report 433
08-32(05)	Multimodal Transportation Planning Data	Jack Faucett Associates	350,000	2/1/1995	12/31/1996	Completed---Published as NCHRP Report 401
08-33	Quantifying Air-Quality and Other Benefits and Costs of Transportation Control Measures	Cambridge Systematics	1,014,964	7/1/1995	12/31/1999	Completed---Summarized in NCHRP Research Results Digests 217, 223, and 230; published as NCHRP Report 462 and available on CRP-CD-15
08-34	Major Investment Studies: Development of a Practitioner's Guidebook for Effective Study Design, Management, and Implementation	Science Applications International Corporation	195,553	3/1/1997	2/28/1999	Completed---Published as NCHRP Report 435
08-35	Incorporating ITS into the Transportation Planning Process	Mitretek Systems	420,799	4/13/1998	6/30/2002	Completed---Published as NCHRP Web-Only Document 118
08-36	Research for the AASHTO Standing Committee on Planning	Various	600,000	c 5/4/1999		Ongoing---Refer to project writeup on CRP website
08-37	Standardized Procedures for Personal Travel Surveys	Louisiana Transportation Research Council	370,000	3/7/2000	3/31/2005	Completed---Summarized in NCHRP Research Results Digest 261; published as NCHRP Report 571
08-38	Consideration of Environmental Factors in Transportation Systems Planning	Georgia Institute of Technology	250,000	3/19/2001	6/19/2003	Completed---Published as NCHRP Report 541; appendixes available as NCHRP Web-Only Document 77
08-39	Financing and Improving Land Access to U.S. Intermodal Cargo Hubs	Louis Berger Group	249,395	11/15/2000	2/28/2003	Completed---Published as NCHRP Report 497
08-40	Evaluating Cultural Resource Significance Using Information Technology	URS Corporation	173,997	11/1/2000	1/31/2002	Completed---Research summarized in NCHRP Research Results Digest 277 and included in Project 08-40(02)
08-40(02)	Evaluating Cultural Resource Significance - Implementation Tools	URS Group, Inc.	225,219	1/15/2003	9/1/2004	Completed---Published as NCHRP Report 542
08-41	Effective Methods for Environmental-Justice Analyses	URS Corporation	499,182	4/24/2001	1/31/2004	Completed---Published as NCHRP Report 532
08-42	Rail Freight Solutions to Roadway Congestion	Global Insight	449,990	7/11/2002	3/1/2007	Completed---Published as NCHRP Report 586
08-43	Methods for Forecasting Statewide Freight Movements and Related Performance Measures	Cambridge Systematics	499,885	2/7/2002	1/17/2005	Completed---Published as NCHRP Report 606

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
08-44	Incorporating Safety into Long-Range Transportation Planning	University of Arizona	500,000	8/8/2002	4/8/2005	Completed---Published as NCHRP Report 546 and CRP-CD-62
08-44(02)	Transportation Safety Planning: Predicting Safety Characteristics and Countermeasures	Arizona State University	400,000	10/27/2006	3/31/2010	Completed---Published as CRP-CD-78
08-45	A Collaborative Vision of Mobility: Updating the Toolbox (TCRP Project H-29)	Transmanagement, Inc.	150,000	4/28/2003	7/28/2004	Completed---Published as NCHRP Report 536 and TCRP Report 106
08-46	A Guide for Including Access Management in Transportation Plans	Dye Management Group	225,000	3/31/2003	5/30/2005	Completed---Published as NCHRP Report 548
08-47	Guidebook for Freight Policy, Planning, and Programming in Small and Mid-Sized Metropolitan Areas	Cambridge Systematics	275,000	8/6/2003	12/31/2005	Completed---Published as NCHRP Report 570
08-48	Using American Community Survey Data for Transportation Planning	Cambridge Systematics	299,999	8/7/2003	9/15/2006	Completed---Published as NCHRP Report 588
08-49	Procedures for Cost Estimation and Management for Highway Projects During Planning, Programming, and Preconstruction	Texas A&M University	400,000	3/15/2004	6/15/2008	Completed---Phase I published as NCHRP Report 574 and agency report available as NCHRP Web-Only Document 98; Phase II published as NCHRP Report 625
08-50	Factors that Support the Planning-Programming Linkage	Cambridge Systematics	249,677	3/24/2004	1/30/2007	Completed---Published as NCHRP Report 591
08-51	Enhancing Internal Trip Capture Estimation for Mixed-Use Developments	Texas A&M University	249,078	7/5/2005	8/31/2010	Completed---Published as NCHRP Report 684
08-52	Best Practices to Enhance the Transportation/Land-Use Connection in Rural America	Renaissance Planning Group	99,990	5/12/2005	3/1/2007	Completed---Published as NCHRP Report 582
08-53	Integrating Freight into Transportation Planning and Project Selection Processes	Cambridge Systematics	300,000	1/24/2005	3/31/2007	Completed---Published as NCHRP Report 594
08-54	Identification of Liability-Related Impediments to Sharing 409 Safety Data among Transportation Agencies, and Synthesis of Best Practices	Cambridge Systematics	50,000	12/28/2004	6/30/2006	Completed---Summarized in NCHRP Research Results Digest 306
08-55	Integrating Geo-Spatial Technologies into the Right-of-Way Data-Management Process	Virginia Polytechnic Institute	100,000	5/13/2005	10/31/2006	Completed---Summarized in NCHRP Research Results Digest 310
08-55A	Developing a Logical Model for a Geo-Spatial Right-of-Way Land Management System	Virginia Polytechnic Institute	349,891	10/3/2007	3/31/2011	Completed---Published as NCHRP Report 695 and CRP-CD-99
08-56	Truck Noise-Source Mapping	Wyle Laboratories, Inc.	496,889	8/25/2005	6/1/2009	Completed---Published as NCHRP Report 635
08-57	Improved Framework and Tools for Highway Pricing Decisions	PB Consult, Inc.	750,000	7/7/2006	6/30/2009	Completed---Published as NCHRP Report 722
08-58	A Guidebook for Corridor-Based Statewide Transportation Planning	Wilbur Smith Associates	377,602	2/7/2006	12/31/2008	Completed---Published as NCHRP Report 661

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
08-59	Transportation Costs of New Development	Rutgers, The State University of New Jersey	390,958	6/1/2006	4/1/2011	Completed---Contractor's report posted on project web page
08-60	Guidebook on Risk Analysis Tools and Management Practices to Control Transportation Project Costs	University of Colorado - Boulder	200,000	6/1/2007	8/1/2009	Completed---Published as NCHRP Report 658
08-61	Travel Demand Forecasting: Parameters and Techniques	Cambridge Systematics	550,000	3/19/2007	11/30/2011	Completed---Published as NCHRP Report 716
08-62	Transportation Performance Management: Insight from Practitioners	Cambridge Systematics	200,000	4/5/2007	6/30/2009	Completed---Published as NCHRP Report 660
08-63	Review of Canadian Experience with Large Commercial Motor Vehicles	University of Michigan	199,998	3/28/2007	4/30/2011	Completed---Published as NCHRP Report 671
08-64	A Guidebook on Improved Principles, Processes, and Methods for Shared-Use Passenger and Freight Rail Corridors	ICF Consulting, Inc.	500,000	4/6/2007	8/5/2009	Completed---Published as NCHRP Report 657
08-65	Identification of Results-oriented Public Involvement Strategies Between Transportation Agencies and Native American Tribal Communities	University of New Mexico	198,860	4/17/2008	12/30/2010	Completed---Published as NCHRP Report 690; agency final report available as NCHRP Web-Only Document 171
08-66	Trip-Generation Rates for Transportation Impact Analyses of Infill Developments	Kimley-Horn & Associates	299,450	4/4/2008	9/30/2013	Completed---Published as NCHRP Report 758
08-67	Measuring Transportation Network Performance	Cambridge Systematics	300,000	4/8/2008	1/28/2010	Completed---Published as NCHRP Report 664
08-68	Citizen's Guide and Discipline-Specific Professionals' Guide for Context-Sensitive Solutions in Transportation	ICF Consulting, Inc.	400,000	4/21/2008	9/30/2010	Completed---Citizen's Guide available as NCHRP Web-Only Document 184; Practitioner's Guide available on FHWA's website
08-69	Supplement to the AASHTO Transportation Asset Management Guide: Volume 2 - A Focus on Implementation	AECOM Consulting Transportation Group	750,000	3/13/2008	10/12/2010	Completed---Final report published by AASHTO
08-70	Target-Setting Methods and Data Management To Support Performance-Based Resource Allocation by Transportation Agencies	Cambridge Systematics	800,000	1/24/2008	6/30/2011	Completed---Phase I published as NCHRP Report 666 and agency report available as NCHRP Web-Only Document 154; Phase II published as NCHRP Report 706
08-71	Estimating Life Expectancies of Highway Assets	Purdue University	497,210	6/16/2009	10/16/2011	Completed---Published as NCHRP Report 713
08-72	Practical Approaches for Involving Traditionally Underserved Populations in Transportation Decisionmaking	Louis Berger & Associates	389,750	5/20/2009	9/15/2011	Completed---Published as NCHRP Report 710
08-73	Road Pricing: Public Perceptions and Program Development	ICF Incorporated	99,960	2/2/2009	10/31/2010	Completed---Published as NCHRP Report 686

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
08-74	Sustainability Performance Measures for State Departments of Transportation and Other Transportation Agencies	Texas A&M Research Foundation	498,384	7/9/2009	10/31/2011	Completed---Published as NCHRP Report 708
08-75	Guidelines for Evaluation and Performance Measurement of Congestion Pricing Projects	PB Americas, Inc.	199,755	4/30/2009	3/1/2011	Completed---Published as NCHRP Report 694 and NCHRP Web-Only Document 174
08-76	Institutionalizing Safety in Transportation Planning Processes: Techniques, Tactics and Strategies	Cambridge Systematics	724,963	5/11/2009	12/31/2014	Completed---Publication decision pending
08-77	Developing Regional Historic Contexts for Post-World War II Housing	Mead & Hunt Inc.	249,695	4/7/2010	4/6/2012	Completed---Published as NCHRP Report 723
08-78	Estimating Bicycling and Walking for Planning and Project Development	Transportation Consulting Ltd	70,282	4/27/2010	6/24/2011	Completed---Published as NCHRP Report 770
08-78A	Estimating Bicycling and Walking for Planning and Project Development	Renaissance Planning Group	229,693	8/1/2011	2/28/2014	Completed---Published as NCHRP Report 770
08-79	Producing Transportation Data Products from the American Community Survey that Comply with Disclosure Rules	Westat, Inc.	549,991	1/7/2010	8/31/2011	Completed---Agency report available as NCHRP Web-Only Document 180
08-80	Generation and Attraction of Freight by Land Use Characteristics	Combined				Completed under NCFRP Project 25---Published as NCHRP Report 739/NCFRP Report 19
08-81	Improving the Quality of Motorcycle Travel Data Collection	Texas A&M Research Foundation	300,000	3/9/2011	11/1/2013	Completed---Published as NCHRP Report 760
08-82	Deployment, Use, and Effect of Real-Time Traveler Information Systems	Westat, Inc.	300,000	2/11/2011	11/30/2012	Completed---Agency report available as NCHRP Web-Only Document 192
08-83	Analytical Travel Forecasting Approaches for Project Level Planning and Design	Wilbur Smith Associates	500,000	2/17/2011	10/15/2013	Completed---Published as NCHRP Report 765 and CRP-CD-143
08-84	Long Distance and Rural Travel Transferable Parameters for Statewide Travel Forecasting Models	Cambridge Systematics	199,994	2/11/2011	8/11/2012	Completed---Published as NCHRP Report 735
08-85	The Comprehensive Costs of Highway-Rail At-Grade Crossing Crashes	DecisionTek, LLC	349,988	3/16/2011	5/15/2013	Completed---Published as NCHRP Report 755
08-86	Capacity Modeling Guidebook for Shared-Use Passenger and Freight Rail Operations	Wilbur Smith Associates	347,744	11/2/2011	12/31/2013	Completed---Published as NCHRP Report 773
08-87	Successful Practices in GIS-Based Asset Management	Spy Pond Partners	500,000	6/6/2012	9/5/2014	Completed---To be published as NCHRP Report 800
08-88	Effective Project Scoping Practices to Improve On-Time and On-Budget Delivery of Highway Projects	Texas A&M Research Foundation	250,000	6/1/2012	6/30/2015	Research in progress; final report pending
08-89	Applying GPS Data to Understand Travel Behavior	GeoStats LP	249,990	4/5/2012	2/28/2014	Completed---Published as NCHRP Report 775

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
08-90	Transportation Asset Management Gap Analysis Tool	Applied Pavement Technology	150,000	5/7/2013	9/15/2014	Completed---Research products to be published by AASHTO
08-91	Cross-Asset Resource Allocation and the Impact on System Performance	CH2M HILL	500,000	3/28/2013	9/28/2016	Completed---Publication decision pending
08-92	Implementing Transportation Data Program Self-Assessment	Spy Pond Partners	399,972	5/17/2013	5/16/2015	Research in progress
08-93	Managing Risk Across the Enterprise: A Guidebook for State Departments of Transportation	Gordon Proctor & Associates, Inc.	500,000	4/18/2014	10/17/2015	Research in progress; final report pending
08-94	Guidelines for Selecting Travel Forecasting Methods and Techniques	Resource Systems Group, Inc.	499,911	5/16/2014	7/15/2016	Research in progress
08-95	Cell Phone Location Data for Travel Behavior Analysis	Cambridge Systematics	250,000	5/30/2014	3/1/2016	Research in progress
08-96	Integrating Goods and Services Movement by Commercial Vehicles in Smart Growth Environments	Cambridge Systematics	300,000	4/9/2014	10/8/2015	Research in progress
08-97	Finding and Using Data to Identify and Evaluate Corridors for Transporting Multi-state, Multi-modal Oversize/Overweight Freight	CPCS Transcom Inc.	500,000	5/9/2014	5/8/2016	Research in progress
08-98	Guide for Identifying, Classifying, Evaluating, and Mitigating Freight Truck Bottlenecks	Cambridge Systematics	350,000	2/24/2014	5/24/2015	Research in progress
08-99	Methodology for Estimating the Value of Travel Time Reliability for Truck Freight System Users	Parsons Brinckerhoff	199,796	5/1/2014	4/30/2015	Research in progress
08-100	Environmental Justice Analyses When Considering Toll Implementation or Rate Changes	Louis Berger Group	499,915	7/29/2014	7/28/2016	Research in progress
08-101	Enhanced Truck Data Collection and Analysis for Emissions Modeling	----	500,000			In development
08-102	Understanding Urban Bicyclist Facility Type Preferences and Facility Type Impacts on Transportation System Performance	----	300,000			In development

AREA NINE : MATERIALS AND CONSTRUCTION--BITUMINOUS MATERIALS

09-01	Asphalt Durability and Its Relation to Pavement Performance	American Oil	100,000	2/1/1964	4/30/1967	Completed---Published as NCHRP Report 67
09-02	Asphalt Durability and Its Relation to Pavement Performance---Adhesion	Montana College	101,903	1/1/1965	10/31/1967	Completed---Report not published; for avail. see Summary of Progress Through 1988
09-03	Evaluation of Pavement Joint and Crack Sealing Materials and Practices	Rensselaer Polytechnic Institute	24,996	6/1/1965	6/30/1966	Completed---Published as NCHRP Report 38
09-04	Minimizing Premature Cracking of Asphaltic Concrete Pavements	Materials R&D	99,560	11/1/1971	6/30/1973	Completed---Published as NCHRP Report 195

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
09-04A	Bayesian Analysis Methodology for Verifying Recommendations to Minimize Asphalt Pavement Distress	Woodward-Clyde	204,194	9/15/1975	11/1/1978	Completed---Published as NCHRP Report 213
09-05	Design of Emulsified Asphalt Paving Mixtures	Asphalt Institute	150,172	4/1/1980	6/30/1984	Completed---Published as NCHRP Report 259
09-06(01)	Asphalt Aggregate Mixture Analysis System (AAMAS)	Brent Rauhut Engineering	660,017	1/5/1987	6/4/1990	Completed---Published as NCHRP Report 338
09-06A	Development of Asphalt Aggregate Mixture Analysis System: Phase I	ARE, Inc.	25,000	6/2/1986	10/2/1986	Completed---Report not published; for avail. see Summary of Progress Through 1988
09-06B	Development of Asphalt Aggregate Mixture Analysis System: Phase I	Brent Rauhut Engineering	25,000	6/2/1986	10/2/1986	Completed---Report not published; for avail. see Summary of Progress Through 1988
09-06C	Development of Asphalt Aggregate Mixture Analysis System: Phase I	University of Maryland	24,879	6/2/1986	10/2/1986	Completed---Report not published; for avail. see Summary of Progress Through 1988
09-07	Field Procedures and Equipment to Implement SHRP Asphalt Specifications	Brent Rauhut Engineering	1,150,784	4/1/1993	7/15/1997	Completed---Published as NCHRP Report 409 and available on CRP-CD-1
09-08	Designing Stone Matrix Asphalt Mixtures	Auburn University	995,720	4/1/1994	6/30/1998	Completed---Published as NCHRP Report 425 and available on CRP-CD-1
09-09	Refinement of the Superpave Gyrotory Compaction Procedure	Auburn University	499,850	6/1/1996	7/31/1998	Completed---Summarized in NCHRP Research Results Digest 237 and available on CRP-CD-1
09-09(01)	Verification of Gyration Levels in the Ndesign Table	Auburn University	625,447	2/3/2000	9/30/2006	Completed---Published as NCHRP Report 573
09-10	Superpave Protocols for Modified Asphalt Binders	Asphalt Institute	985,481	4/15/1996	2/15/2001	Completed---Published as NCHRP Report 459 and available on CRP-CD-10
09-10A	Superpave Protocols for Modified Asphalt Binders Implementation	University of Wisconsin - Madison	19,344	6/20/2001	12/31/2002	Completed---Agency report available on request
09-11	Segregation in Hot-Mix Asphalt Pavements	Auburn University	300,000	6/15/1997	1/14/2000	Completed---Published as NCHRP Report 441 and available on CRP-CD-8
09-12	Incorporation of Reclaimed Asphalt Pavement in the Superpave System	Purdue University	463,514	4/1/1997	9/30/2000	Completed---Published as NCHRP Report 452; summarized in NCHRP Research Results Digest 253; available on CRP-CD-8
09-12(01)	Marketing the Use of Reclaimed Asphalt Pavements in the Superpave Mix Design Method	Fugro-BRE, Inc.	34,250	1/8/2001	12/31/2002	Completed---Video presentation available on CRP-CD-44
09-13	Evaluation of Water Sensitivity Tests	University of Nevada - Reno	150,000	11/1/1997	8/31/1999	Completed---Published as NCHRP Report 444 and available on CRP-CD-8

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
09-14	Investigation of the Restricted Zone in the Superpave Aggregate Gradation Specification	Auburn University	501,678	5/1/1998	7/15/2001	Completed---Published as NCHRP Report 464 and available on CRP-CD-10
09-15	Quality Characteristics and Test Methods for Use in Performance-Related Specifications of Hot-Mix Asphalt Pavements	Fugro Consultants	449,232	1/1/1999	6/30/2004	Completed---Summarized in NCHRP Research Results Digest 291
09-16	Relationship Between Superpave Gyrotory Compaction Properties and Permanent Deformation In Service	Asphalt Institute	234,772	5/10/1999	5/15/2002	Completed---Published as NCHRP Report 478
09-16(01)	Validation of NCHRP 09-16 Findings for HMA Quality Control Operations	Asphalt Institute	79,885	11/30/2002	3/15/2005	Completed---Report available on request
09-17	Accelerated Laboratory Rutting Tests: Asphalt Pavement Analyzer	Auburn University	369,311	5/19/1999	4/15/2003	Completed---Published as NCHRP Report 508
09-18	Field Shear Test for Hot Mix Asphalt	Pennsylvania State University	199,558	6/30/1999	10/31/2001	Completed---Summarized in NCHRP Research Results Digest 262
09-18(01)	Validation of Field Shear Test and Indirect Tension Strength Test	Advanced Asphalt Technologies, LLC	18,983	8/8/2002	12/8/2002	Completed---Agency report available as NCHRP Web-Only Document 56
09-19	Superpave Support and Performance Models Management	University of Maryland	2,628,282	5/10/1999	7/31/2006	Completed---Published as NCHRP Reports 465, 547, and 580, and available on CRP-CD-10 and CRP-CD-46
09-19(01)	Spreadsheet Solutions for E* as an SPT for Permanent Deformation	Arizona State University	41,380	7/12/2004	2/28/2005	Completed---Products transferred to Projects 09-22 and 09-33
09-19(02)	Spreadsheet Solutions for E* as an SPT for Permanent Deformation and Fatigue Cracking	Arizona State University	44,205	7/18/2005	3/31/2007	Completed---Products transferred to Projects 09-22 and 09-33
09-20	Performance-Related Specifications for Hot-Mix Asphalt Construction	Nevada Automotive Test Center	1,500,000	12/31/1998	11/30/2000	Completed---Published as NCHRP Report 455; available on CRP-CD-9
09-20A	Follow-up to Performance-Related Specifications for Hot-Mix Asphalt Construction	Applied Pavement Technologies	12,225	7/1/2001	12/31/2001	Completed---Software deliverable used in 09-22
09-21	Superpave Advisory Structure	TRB Division E	400,000	3/9/1998	3/8/2003	Completed---No report
09-22	Beta Testing and Validation of HMA PRS	Fugro Consultants	1,499,988	10/3/2000	6/30/2011	Completed---Published as NCHRP Report 704
09-22(01)	Facilitating Implementation of the Quality-Related Specification Software (QRSS)	Fugro Consultants	58,854	2/6/2009	6/30/2011	Completed
09-22A	Evaluation of the Quality-Related Specification Software (QRSS) Version 1.0	Fugro Consultants	311,943	4/28/2010	12/31/2012	Completed---Contractor's final report available on project web page
09-22B	Comparing HMA Dynamic Modulus Measured by Axial Compression and IDT Methods	Villanova University	77,645	3/31/2011	8/31/2012	Completed---Contractor's final report available on project web page

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
09-23	Environmental Effects in Pavement Mix and Structural Design Systems	Arizona State University	487,234	2/27/2001	12/31/2007	Completed---Published as NCHRP Report 602 and summarized in NCHRP Research Results Digest 324
09-23A	Implementing a National Catalog of Subgrade Soil-Water Characteristic Curve (SWCC) Default Inputs for Use with the MEPDG	Arizona State University	59,800	7/24/2008	5/31/2010	Completed---Summarized in NCHRP Research Results Digest 347
09-23B	Integrating the National Database of Subgrade Soil-Water Characteristic Curves and Soil Index Properties with the MEPDG	Arizona State University	85,000	8/27/2010	8/31/2012	Completed---Contractor's final report available on project web page
09-24	Validation of a Simple Performance Test Device	Combined				Combined with Project 09-19
09-25	Requirements for Voids in Mineral Aggregate for Superpave Mixtures	Advanced Asphalt Technologies, LLC	399,896	4/2/2001	7/31/2006	Completed---Published as NCHRP Report 567
09-26	Precision Statements for AASHTO Standard Methods of Test	NIST/AASHTO Materials Reference Lab.	1,458,548	1/23/2001	12/31/2010	Completed---Final results in NCHRP Web-Only Documents 54, 66, 71, 109, 114, 139 through 142, and 163 through 168, and in RRDs 342 and 351
09-26A	Data Mining and Interlaboratory Studies to Prepare Precision Statements for AASHTO Standard Test Methods	Combined				Completed---Interim results in NCHRP Web-Only Documents 139 through 142 and 163 through 168, and in NCHRP Research Results Digest 342
09-27	Relationships of HMA In-Place Air Voids, Lift Thickness, and Permeability	Auburn University	349,362	4/19/2001	5/31/2004	Completed---Published as NCHRP Report 531
09-29	Simple Performance Tester for Superpave Mix Design	Advanced Asphalt Technologies, LLC	1,399,980	4/2/2001	6/30/2011	Completed---Results published as NCHRP Reports 513, 530, 614, 629, and 702
09-30	Experimental Plan for Calibration and Validation of HMA Performance Models for Mix and Structural Design	Fugro South LLP	200,000	10/15/2001	2/28/2004	Completed---Summarized in NCHRP Research Results Digests 283 and 284
09-30(01)	Expand Population of M_E Database and Conduct Two Pre-Implementation Studies	Fugro Consultants	42,086	6/24/2004	1/31/2005	Completed---Results used in NCHRP Project 09-30A
09-30A	Calibration of Rutting Models for HMA Structural and Mix Design	Applied Research Associates	1,002,736	8/29/2005	3/31/2012	Completed---Published as NCHRP Report 719
09-31	Air Void Requirements for Superpave Mix Design	Advanced Asphalt Technologies, LLC	249,993	10/15/2001	7/31/2006	Completed---Published as NCHRP Report 567
09-32	Evaluation of SST and IDT Testing and Identification of Future Activities	Combined				Combined with Project 09-29
09-33	A Mix Design Manual for Hot Mix Asphalt	Advanced Asphalt Technologies, LLC	500,000	8/13/2004	6/30/2010	Completed---Manual published as NCHRP Report 673
09-33A	Adapting SPT Specification Criteria to HMA Mix Design	Arizona State University	91,324	1/8/2008	3/31/2011	Completed---Agency report available as NCHRP Web-Only Document 157

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
09-34	Improved Test Procedure for Determining the Moisture Damage Susceptibility of Bituminous Pavements	Pennsylvania State University	400,000	3/26/2002	4/15/2007	Completed---Published as NCHRP Report 589
09-35	Critical Review of Research on Aggregate Properties and Effects on Superpave Designed Mixes	Auburn University	74,963	9/16/2002	10/31/2004	Completed---Published as NCHRP Report 539
09-36	Improved Procedure for Laboratory Aging of Asphalt Binders in Pavements	Advanced Asphalt Technologies, LLC	519,465	2/17/2003	9/30/2011	Completed---Published as NCHRP Report 709
09-37	Using Surface Energy Measurements To Select Materials for Asphalt Pavements	Texas A&M University	450,000	6/16/2003	12/31/2006	Completed---Summarized in NCHRP Research Results Digest 316
09-38	Endurance Limit of Hot Mix Asphalt Mixtures to Prevent Fatigue Cracking in Flexible Pavements	Auburn University	746,391	1/23/2004	9/30/2009	Completed---Published as NCHRP Report 646
09-39	Procedure for Determining Mixing and Compaction Temperatures of Asphalt Binders in Hot Mix Asphalt	Auburn University	400,000	7/1/2005	7/31/2009	Completed---Published as NCHRP Report 648
09-40	Optimization of Tack Coat for HMA Placement	Louisiana Transportation Research Council	428,000	7/1/2005	12/31/2011	Completed---Published as NCHRP Report 712
09-40A	Field Evaluation of the Louisiana Interlayer Shear Strength Tester	Louisiana Transportation Research Council	186,407	6/1/2013	6/1/2015	Research in progress; Phase II underway
09-41	Performance and Maintenance of Permeable Friction Courses	Burns Cooley Dennis, Inc.	249,994	3/8/2005	2/28/2009	Completed---Published as NCHRP Report 640
09-42	History of Superpave: Documenting the Research Program and Implementation Process	Purdue University	150,000	2/28/2006	9/30/2011	Completed---Agency report available as NCHRP Web-Only Document 186
09-43	Mix Design Practices for Warm Mix Asphalt	Advanced Asphalt Technologies, LLC	528,891	3/22/2007	6/30/2011	Completed---Published as NCHRP Report 691
09-44	Developing a Plan for Validating an Endurance Limit for HMA Pavements	Advanced Asphalt Technologies, LLC	174,005	4/17/2007	2/28/2009	Completed---Agency report available as NCHRP Web-Only Document 134
09-44A	Validating an Endurance Limit for HMA Pavements: Laboratory Experiment and Algorithm Development	Arizona State University	839,456	9/1/2009	9/30/2013	Completed---Published as NCHRP Report 762
09-45	Test Methods and Specification Criteria for Mineral Filler Used in HMA	University of Wisconsin - Madison	565,342	6/5/2007	2/28/2011	Completed---Summarized in NCHRP Research Results Digest 357
09-46	Improved Mix Design, Evaluation and Materials Management Practices for HMA with High RAP Content	Auburn University	400,000	4/15/2008	3/31/2013	Completed---Published as NCHRP Report 752
09-47	Engineering Properties/Field Performance of Warm Mix Asphalt Technologies	Asphalt Institute	59,238	3/31/2008	3/12/2009	Completed---Project continued under 09-47A
09-47A	Properties and Performance of Warm Mix Asphalt Technologies	Auburn University	1,121,000	7/13/2009	5/31/2014	Completed---To be published as NCHRP Report 779
09-47B	Properties and Performance of Warm Mix Asphalt Technologies	-----	850,000			Cancelled

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
09-48	Field versus Laboratory Volumetrics and Mechanical Properties	Louisiana State University	600,000	8/1/2009	6/30/2015	Research in progress; Phase II underway
09-49	Performance of WMA Technologies: Stage I--Moisture Susceptibility	Texas A&M Research Foundation	450,000	7/26/2010	9/30/2013	Completed---Published as NCHRP Report 763
09-49A	Performance of WMA Technologies; Stage II--Long-Term Field Performance	Washington State University	960,925	4/29/2011	7/28/2016	Research in progress; Phase II underway
09-49B	Performance of WMA Technologies; Stage I--Moisture Susceptibility--Validation	Texas A&M Transportation Institute	81,500	4/1/2014	9/30/2015	Research in progress
09-50	Performance-Related Specifications for Asphaltic Binders Used in Preservation Surface Treatments	North Carolina State University	500,000	8/1/2011	7/31/2015	Research in progress
09-51	Material Properties of Cold In-Place Recycled and Full Depth Reclamation Asphalt Concrete for Pavement Design	University of Maryland	499,234	6/4/2012	6/30/2015	Research in progress; Phase II underway
09-52	Short-Term Laboratory Conditioning of Asphalt Mixtures	Texas A&M Research Foundation	800,000	6/1/2012	2/28/2015	Research in progress; Phase II underway
09-53	Properties of Foamed Asphalt for Warm Mix Asphalt Applications	Texas A&M Research Foundation	700,000	6/1/2012	1/31/2015	Research in progress; final report under review
09-54	Long-Term Aging of Asphalt Mixtures for Performance Testing and Prediction	North Carolina State University	800,000	5/21/2013	5/21/2016	Research in progress; Phase II underway
09-55	Recycled Asphalt Shingles in Asphalt Mixtures with Warm Mix Asphalt Technologies	Auburn University	600,000	6/10/2013	9/10/2016	Research in progress; Phase II underway
09-56	Identifying Influences on and Minimizing the Variability of Ignition Furnace Correction Factors	Auburn University	500,000	4/15/2014	10/15/2016	Research in progress; Phase II underway
09-57	Experimental Design for Field Validation of Laboratory Tests to Assess Cracking Resistance of Asphalt Mixtures	Texas A&M Transportation Institute	250,000	9/1/2014	3/1/2016	Research in progress; Phase I underway
09-58	The Effects of Recycling Agents on Asphalt Mixtures with High RAS and RAP Binder Ratios	Texas A&M Transportation Institute	1,500,000	5/2/2014	10/2/2017	Research in progress; Phase I underway
09-59	Relating Asphalt Binder Fatigue Properties to Asphalt Mixture Fatigue Performance	----	1,000,000			In development

AREA TEN : MATERIALS AND CONSTRUCTION--SPECIFICATIONS, PROCEDURES, AND PRACTICES

10-01	Development of Guidelines for Practical and Realistic Construction Specifications	Miller-Warden	25,000	11/15/1963	11/14/1964	Completed---Published as NCHRP Report 17
10-02	Evaluation of Construction Control Procedures	Miller-Warden	59,750	11/4/1963	2/1/1966	Completed---Published as NCHRP Report 34
10-02A	Evaluation of Construction Control Procedures	Materials R&D	70,945	7/15/1966	11/14/1967	Completed---Published as NCHRP Report 69

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
10-03	Effects of Different Methods of Stockpiling and Handling Aggregates	Miller-Warden	55,000	10/22/1963	10/16/1965	Completed---Published as NCHRP Report 5; Phase II published as NCHRP Report 46
10-04	Rapid Test Methods for Field Control of Construction	Clemson University	99,320	2/1/1964	2/28/1967	Completed---Published as NCHRP Report 103
10-05	Density and Moisture Content Measurements by Nuclear Methods	Research Triangle Institute	88,636	1/15/1964	10/7/1966	Completed---Published as NCHRP Report 14; Phase II published as NCHRP Report 43
10-05A	Optimization of Nuclear Density and Moisture Content Measurement Methods	North Carolina State University	51,214	2/1/1968	1/31/1970	Completed---Published as NCHRP Report 125
10-06	Measurement of Pavement Thicknesses by Rapid and Nondestructive Methods	IIT Research Institute	108,821	2/1/1964	10/31/1966	Completed---Published as NCHRP Report 52
10-07	Potential Uses of Sonic and Ultrasonic Devices in Highway Construction	Ohio State University	24,310	2/1/1964	3/31/1965	Completed---Published as NCHRP Report 25
10-08	Evaluating Procedures for Determining Concrete Pavement Thickness and Reinforcement Position	Pennsylvania DOT	151,982	3/2/1970	7/31/1973	Completed---Published as NCHRP Report 168
10-09	Criteria for Need of Seal Coats for Bituminous Pavements	University of Minnesota	50,000	11/1/1969	2/28/1974	Completed---Report not published; summarized in NCHRP Research Results Digest 48; for avail. see Summary of Progress Through 1988
10-10	Acceptance Criteria for Electroslag Weldments in Bridges	US Steel	300,000	5/1/1974	9/30/1978	Completed---Published as NCHRP Report 201
10-11	Development of a Performance Specification for Bridge Deck Joint-Sealing Systems	Howard, Needles, et al.	29,996	12/1/1976	4/30/1978	Completed---Published as NCHRP Report 204
10-12	Acceptance of Aggregates Used in Bituminous Paving Mixtures	Texas A&M University	174,411	9/1/1977	6/30/1981	Completed---Report not published; for avail. see Summary of Progress Through 1988
10-13	Ultrasonic Measurement of Weld Flaw Size	Welding Institute	376,000	7/1/1979	8/31/1985	Completed---Published as NCHRP Report 242; Phase II report not published; for avail. see Summary of Progress Through 1988
10-14	Locating Voids Beneath Pavement Using Pulsed Electromagnetic Wave Techniques	Georgia Institute of Technology	99,850	4/2/1979	5/1/1981	Completed---Published as NCHRP Report 237
10-15	Structural Strength Evaluation of Existing Reinforced Concrete Bridges	Eng Computer Corp	225,000	4/1/1980	4/30/1986	Completed---Report not published; for avail. see Summary of Progress Through 1988; Phase II published as NCHRP Report 292
10-16	Assessment of Deficiencies and Preservation of Bridge Substructures Below the Waterline	Byrd, Tallamy, MacDonald & Lewis	150,000	2/16/1981	12/1/1982	Completed---Published as NCHRP Report 251

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
10-17	Use of Antistripping Additives in Asphaltic Concrete Mixtures	Tunnicliff, David G.	676,335	3/1/1981	11/30/1994	Completed---Phase I report published as NCHRP Report 274; Phase II report published as NCHRP Report 373
10-18	Specifying and Obtaining Entrained Air in Concrete	Construction Technology Laboratories/PCA	73,585	5/4/1981	6/1/1983	Completed---Published as NCHRP Report 258
10-19	Adding Dust Collector Fines to Asphalt Paving Mixtures	Pennsylvania State University	49,926	3/1/1981	11/30/1982	Completed---Published as NCHRP Report 252
10-20	Elastomeric Bearings Design, Construction, and Materials	University of Washington	374,715	2/1/1981	5/31/1989	Completed---Summarized in NCHRP RRD 171; publ. as NCHRP Report 248; Ph. II publ. as NCHRP Report 298; Ph. III publ. as NCHRP Report 325
10-20A	High-Load, Multi-Rotational Bridge Bearings: Design, Materials, and Construction	University of Washington	265,398	6/1/1986	12/31/1993	Completed---Published as NCHRP Report 432
10-21	Performance of Bridge Deck Concrete Subjected to Traffic-Induced Vibrations During Placement	Transportation Research Board	25,000	2/1/1980	9/30/1981	Completed---Published as NCHRP Synthesis 86
10-22	The Performance of Weathering Steel in Bridges	Sheladia Associates	195,550	4/1/1982	8/31/1987	Completed---Phase I published as NCHRP Report 272; Phase II published as NCHRP Report 314
10-23	Removal of Lead-Based Bridge Paints	Midwest Research Institute	81,118	7/1/1982	6/30/1983	Completed---Published as NCHRP Report 265
10-24	Rapid Replacement of PCC Pavement Segments	ARE, Inc.	240,000	3/15/1982	3/14/1988	Completed---Report not published; summarized in NCHRP Research Results Digest 169; for avail. see Summary of Progress Through 1988
10-25	Measurement of Cement and Water Content of Fresh Concrete	USACE Waterways Experiment Station	148,303	10/13/1983	9/5/1986	Completed---Published as NCHRP Report 284
10-25A	Instantaneous Determination of Water-Cement Ratio in Fresh Concrete	Wiss, Janney, Elstner & Associates	272,431	6/1/1985	2/15/1990	Completed---Summarized in NCHRP Research Results Digest 174
10-26	Data Bases for Performance-Related Specifications for Highway Construction	ARE, Inc.	60,000	6/15/1983	9/14/1984	Completed---Report not published, for avail. see Summary of Progress Through 1988
10-26A	Performance-Related Specifications for Hot-Mix Asphaltic Concrete	Pennsylvania State University	250,000	1/6/1986	9/30/1989	Completed---Published as NCHRP Report 332
10-27	Determination of Asphaltic Concrete Pavement Structural Properties by Nondestructive Testing	Texas A&M University	449,519	9/17/1984	8/31/1989	Completed---Published as NCHRP Report 327
10-28	A Method to Determine Deteriorated Areas in Portland Cement Concrete Pavements	Gulf Applied Research	199,784	11/1/1985	12/31/1987	Completed---Published as NCHRP Report 304
10-29	Anchorage Zone Reinforcement for Post-Tensioned Concrete Girders	University of Texas	489,223	10/1/1986	9/30/1992	Completed---Published as NCHRP Report 356

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
10-30(01)	Nondestructive Methods for Field Inspection of Embedded or Encased High Strength Steel Rods and Cables	University of Manchester	25,000	1/6/1986	9/29/1986	Completed---Report not published, for avail. see Summary of Progress Through 1988
10-30(02)	Nondestructive Methods for Field Inspection of Embedded or Encased High Strength Steel Rods and Cables	Southwest Research Institute	25,000	1/20/1986	10/3/1986	Completed---Report not published, for avail. see Summary of Progress Through 1988
10-30(03)	Nondestructive Methods for Field Inspection of Embedded or Encased High Strength Steel Rods and Cables	University of Manchester	400,000	7/1/1987	4/30/1991	Completed---Summarized in NCHRP Research Results Digest 188
10-31	Acceptance Criteria for Steel Bridge Welds	Materials Research Lab	348,350	1/1/1986	12/31/1989	Completed---Published as NCHRP Report 335
10-32	Durability of In-Place Concrete Containing High-Range Water-Reducing Admixtures	Construction Technology Laboratories/PCA	99,811	1/6/1986	7/5/1987	Completed---Published as NCHRP Report 296
10-32A	Durability Testing of High-Strength Concrete Containing High-Range Water-Reducing Admixtures	Utah State University	249,238	9/1/1987	4/30/1993	Completed---Summarized in NCHRP Research Results Digest 208
10-33	Potential Benefits of Geosynthetics in Flexible Pavement Systems	Georgia Institute of Technology	100,000	1/6/1986	12/15/1988	Completed---Published as NCHRP Report 315
10-34	Transient Protection, Grounding, and Shielding of Electronic Traffic Control Equipment	Georgia Institute of Technology	339,988	3/1/1986	9/30/1995	Completed---Phase I report published as NCHRP Report 317; Phase II agency report available on request
10-35	Fatigue Behavior of Welded and Mechanical Splices in Reinforcing Steel	Wiss, Janney, Elstner & Associates	300,000	11/1/1987	4/30/1991	Completed---Summarized in NCHRP Research Results Digest 197
10-36	Evaluation of Weldments Incorporating Backing Materials	Arctec Canada Ltd./Fleet Tech Ltd.	349,475	6/13/1988	9/30/1993	Completed---Agency report available on microfiche
10-37	Performance of Epoxy-Coated Reinforcing Steel in Highway Bridges	Clear, Kenneth C.	350,000	5/1/1991	7/31/1994	Completed---Published as NCHRP Report 370
10-37A	Performance of Epoxy-Coated Reinforcing Steel---Laboratory Testing	Florida Atlantic University	66,121	8/1/1994	7/31/1998	Completed---Continued under Project 10-37A(01)
10-37A(01)	Extended Exposure and Monitoring of Epoxy-Coated Reinforced Concrete Test Slabs	Florida Atlantic University	30,000	8/3/1998	12/31/2000	Completed---Agency report available as NCHRP Web-Only Document 36
10-37B	A Protocol for the Evaluation of Existing Bridges Containing Epoxy-Coated Reinforcing Steel	Richard Weyers Consulting	10,000	9/1/1994	12/31/1995	Completed---Report not published; summarized in NCHRP Research Results Digest 215
10-37C	Repair and Rehabilitation of Bridge Components Containing Epoxy-Coated Reinforcement	Concorr, Inc.	354,876	1/1/1996	12/31/2001	Completed---Agency report available as NCHRP Web-Only Document 50
10-38	Fatigue-Resistant Design of Cantilevered Signal, Sign, and Light Supports	Lehigh University	300,000	9/1/1992	5/30/1996	Completed---Published as NCHRP Report 412
10-38(02)	Fatigue-Resistant Design of Cantilevered Signal, Sign, and Light Supports	University of Minnesota	266,358	6/1/1998	1/31/2001	Completed---Published as NCHRP Report 469

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
10-39	Construction Testing and Inspection Levels	Bergstrahl-Shaw-Newman	140,000	9/1/1992	6/1/1994	Completed---Report available only to sponsors
10-39A	Testing and Inspection Levels for Hot-Mix Asphaltic Concrete Overlays	University of Wisconsin - Madison	259,904	2/1/1996	11/15/1998	Completed---Published as NCHRP Report 447
10-40	Plasma Arc Cutting of Bridge Steels	Edison Welding Institute	268,688	1/18/1993	7/31/1995	Completed---Published as NCHRP Report 384
10-41	Evaluation of Unbonded Portland Cement Concrete Overlays	ERES Consultants	200,000	2/1/1994	8/29/1997	Completed---Published as NCHRP Report 415
10-42	Constructability Review Process for Transportation Facilities	Texas A&M University	300,000	2/15/1994	8/14/1996	Completed---Published as NCHRP Reports 390 and 391
10-43	Movable Bridge Inspection, Evaluation, and Maintenance	A.G. Lichtenstein & Associates	284,000	2/1/1994	6/30/1997	Completed---Adopted as an AASHTO manual
10-44	Nondestructive Testing to Determine Insitu Material Properties of Pavement Layers	Brent Rauhut Engineering	160,000	4/3/1995	6/30/1997	Completed---Phase I only
10-44A	Determination of Insitu Material Properties of Asphalt Concrete Pavement Layers	Applied Research Associates	299,990	11/1/1997	10/31/2000	Completed---Summarized in NCHRP Research Results Digest 271
10-45	Procedures for Evaluating Corrosion-Inhibiting Admixtures for Structural Concrete	CC Technologies Laboratories, Inc.	274,848	12/1/1995	3/31/1999	Completed---Agency report available as NCHRP Web-Only Document 29
10-46	Corrosion of Steel Piling in Nonmarine Applications	CC Technologies Laboratories, Inc.	299,061	3/20/1995	5/31/1997	Completed---Published as NCHRP Report 408
10-47	Guidelines for Longitudinal Pavement Profile Measurement	University of Michigan	300,000	7/1/1996	2/28/1999	Completed---Published as NCHRP Report 434; summarized in NCHRP Research Results Digest 244
10-48	Assessing Pavement Layer Condition Using Deflection Data	North Carolina State University	360,437	2/1/1997	10/31/2000	Completed---Agency report summarized in NCHRP Research Results Digest 254
10-49	Improved Contracting Methods for Highway Construction Projects	Texas A&M University	312,500	1/1/1997	3/31/2000	Completed---Guide published as NCHRP Report 451
10-50	Strategies for Rehabilitating Rigid Pavements Subjected to High-Traffic Volumes	Nichols Consulting Engineers	72,480	2/24/1997	6/23/1998	Completed---Phase I only; continued under Project 10-50A
10-50A	Guidelines for Selecting Strategies for Rehabilitating Rigid Pavements Subjected to High-Traffic Volumes	Texas A&M University	225,000	3/1/1999	2/28/2002	Completed---Agency report available as NCHRP Web-Only Document 45; summarized in NCHRP Research Results Digest 272
10-51	Performance-Related Specifications for Elastomeric Bridge Bearings	University of Texas - Austin	325,096	7/1/1997	6/30/2000	Completed---Published as NCHRP Report 449
10-52	Performance Tests for Modular Bridge Joints	University of Minnesota	362,734	6/1/1998	3/31/2001	Completed---Published as NCHRP Report 467
10-53	Condition Evaluation of Prestressed Steel Strands in Concrete Bridges	Construction Technology Laboratories	387,035	4/1/1997	9/30/1999	Completed---Phase I only; agency report available as NCHRP Web-Only Document 23

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
10-54	Quality-Based Performance Rating of Contractors for Prequalification and Bidding Purposes	Pennsylvania State University	199,829	3/1/1997	5/11/2001	Completed---Agency report available as NCHRP Web-Only Document 38
10-55	Fiber Reinforced Polymer Composites for Concrete Bridge Deck Reinforcement	Florida Atlantic University	299,864	4/1/1999	9/30/2002	Completed---Summarized in NCHRP Research Results Digest 282
10-56	Accelerated Pavement Testing: Data Guidelines	ERES Consultants	175,000	3/7/2000	10/14/2002	Completed---Published as NCHRP Report 512
10-57	Structural Safety Evaluation Guidelines For Suspension Bridge Parallel-Wire Cables	Weidlinger Associates	446,581	3/10/2000	4/30/2004	Completed---Guidelines published as NCHRP Report 534; agency report available on CRP-CD-54
10-57A	Structural Safety Evaluation Guidelines For Suspension Bridge Parallel-Wire Cables	Easterling, Robert	24,000	10/16/2002	12/31/2003	Completed---Agency report available as appendix on CRP-CD-54
10-58	Construction Engineering and Management Research Program	University of Wisconsin	200,000	3/1/2000	10/31/2001	Completed---Agency report available as NCHRP Web-Only Document 51
10-58(01)	Time-Related Incentive and Disincentive Provisions in Highway Construction Contracts	Trinity Construction Management Services, Inc.	232,360	6/1/2006	5/31/2010	Completed---Published as NCHRP Report 652
10-58(02)	Using Contractor-Performed Tests in Quality Assurance	Auburn University	298,802	10/24/2003	10/31/2006	Completed---Summarized in NCHRP Research Results Digest 323; agency report available as NCHRP Web-Only Document 115
10-58(03)	Effects of Nighttime Construction Activities on Safety, Quality, and Productivity	Combined				Project cancelled; funds (\$70k) transferred to 10-58(01)
10-58A	Construction Engineering and Management Research Program (Brochure)	Bergstrahl-Shaw-Newman	12,722	6/20/2002	7/31/2002	Completed---Agency report available on the AASHTO Highway Subcommittee on Construction website
10-59	Construction Specifications for Bonded Repair and Retrofit of Concrete Structures Using FRP Composites	University of Cincinnati		5/29/2001	5/28/2003	Contract transferred to North Carolina State University and continued as NCHRP Project 10-59A
10-59A	Construction Specifications for Bonded Repair and Retrofit of Concrete Structures Using FRP Composites	North Carolina State University	193,246	10/19/2001	8/19/2004	Contract transferred to Florida International University; Phase I results published as NCHRP Report 514
10-59B	Construction Specifications for Bonded Repair and Retrofit of Concrete Structures Using FRP Composites	Florida International University	281,754	12/6/2004	8/31/2007	Completed---Published as NCHRP Report 609
10-60	Avoiding Delays in the Delivery of Highway Construction Projects	Cancelled				Project cancelled; funds (\$250k) transferred to 20-24(12)A and \$250k returned for reprogramming
10-61	Best-Value Procurement Methods for Highway Construction Projects	Trauner Consulting Services	312,362	4/1/2002	8/30/2005	Completed---Published as NCHRP Report 561

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
10-62	Acceptance Test for Surface Characteristics of Steel Strands Used in Pre-stressed Concrete	Wiss, Janney, Elstner & Associates	500,000	7/25/2003	7/31/2008	Completed---Published as NCHRP Report 621
10-63	Heat-Straightening Repair of Damaged Steel Bridge Girders: Fatigue and Fracture Performance	Lehigh University	375,000	3/27/2003	12/31/2007	Completed---Published as NCHRP Report 604
10-64	Field Inspection of In-Service FRP Bridge Decks	Construction Technology Laboratories	299,311	4/16/2003	12/31/2005	Completed---Published as NCHRP Report 564
10-65	Nondestructive Testing Technology for Quality Control and Acceptance of Flexible Pavement Construction	Applied Research Associates	699,995	8/22/2003	10/31/2008	Completed---Published as NCHRP Report 626
10-66	Predicting In-Service Performance of Flexible Pavements from Accelerated Pavement Testing	Metcalf, J.B.	99,986	3/4/2004	10/31/2005	Completed---Phase I only
10-67	Texturing of Concrete Pavements	ERES Consultants	499,994	8/20/2004	9/30/2008	Completed---Published as NCHRP Report 634
10-68	Guidelines for the Use of Highway Pavement Warranties	Trauner Consulting Services	400,000	7/7/2005	4/30/2010	Completed---Published as NCHRP Report 699
10-69	Guidelines for Dowel Alignment in Concrete Pavements	University of Minnesota	499,983	9/29/2005	12/31/2008	Completed---Published as NCHRP Report 637
10-70	Cost Effective Connection Details for Highway Sign, Luminaire, and Traffic Signal Structures	Lehigh University	891,086	3/15/2006	3/18/2011	Completed---Agency report available as NCHRP Web-Only Document 176
10-71	Evaluation of CIP Reinforced Joints for Full-Depth Precast Concrete Bridge Decks	University of Minnesota	650,000	7/5/2006	1/31/2011	Completed---Summarized in NCHRP Research Results Digest 355 and agency report available as NCHRP Web-Only Document 173
10-72	Bridge Deck Design Criteria and Testing Procedures	Purdue University	499,836	9/11/2006	4/15/2012	Completed---Agency report available on project website
10-73	Guide Specification for the Design of Externally Bonded FRP Systems for Repair and Strengthening of Concrete Bridge Elements	Georgia Institute of Technology	449,926	8/13/2007	12/31/2009	Completed---Published as NCHRP Report 655
10-74	Development of Fatigue Loading and Design Methodology for High-Mast Lighting Poles	Purdue University	694,001	5/2/2008	11/30/2011	Completed---Published as NCHRP Report 718
10-75	Guide for Pavement-Type Selection	Applied Research Associates	299,278	5/1/2008	3/31/2011	Completed---Published as NCHRP Report 703
10-76	Methodologies for Evaluating Pavement Strategies and Barriers for Noise Mitigation	Illingworth & Rodkin, Inc.	299,665	6/13/2008	7/31/2012	Completed---Published as NCHRP Report 738
10-77	Use of Automated Machine Guidance (AMG) within the Transportation Industry	Iowa State University	350,000	7/24/2009	2/28/2015	Research in progress; contractor's draft final report pending
10-78	Nighttime Construction Impacts on Safety, Quality, and Productivity	Iowa State University	241,799	5/7/2009	12/31/2011	Completed---Published as NCHRP Report 726

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
10-79	Guidelines for Quality-Related Pay Adjustment Factors for Pavements	Fugro Consultants	247,283	5/8/2009	12/16/2011	Completed---Agency report available on NCHRP website and summarized in NCHRP Research Results Digest 371
10-80	New Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals	BridgeTech, Inc.	500,000	5/21/2010	6/29/2015	Research in progress
10-81	Fuel Usage Factors in Highway and Bridge Construction	Jack Faucett Associates	300,000	5/10/2010	11/30/2012	Completed---Published as NCHRP Report 744
10-82	Performance-Related Specifications for Pavement Preservation Treatments - Phase I	Texas A&M Research Foundation	169,762	7/9/2010	2/13/2012	Phase I completed; continued under NCHRP Project 10-82A
10-82A	Performance-Related Specifications for Pavement Preservation Treatments	Michigan State University	400,000	2/3/2014	2/3/2016	Research in progress; interim report under review
10-83	Alternative Quality Systems for Highway Construction	University of Colorado - Boulder	500,000	8/19/2010	2/28/2014	Completed---Publication decision pending
10-84	Modulus-Based Construction Specification for Compaction of Earthwork and Unbound Aggregate	University of Texas	530,000	10/7/2010	9/30/2014	Completed---Publication decision pending
10-85	A Guidebook for Construction Manager-at-Risk Contracting for Highway Projects	Iowa State University	399,881	3/8/2011	7/31/2013	Completed---To be published by AASHTO
10-86	Bidding Alternative Drainage Pipe Systems	Golder Associates Inc.	484,010	2/28/2011	6/30/2014	Research completed; contractor's draft final report under review
10-86A	Software for Bidding Alternative Drainage Pipe Systems	-----	234,608			Contract pending
10-87	Precision Statements for AASHTO Standard Methods of Test	-----				Basic agreement; research completed under projects 10-87(01) and 10-87(02)
10-87(01)	Precision Statements for AASHTO Standard Methods of Test	NIST/AASHTO Materials Reference Lab.	218,529	10/7/2010	9/30/2011	Completed---Summarized in NCHRP Research Results Digest 369
10-87(02)	Precision Statements for AASHTO Standard Methods of Test	NIST/AASHTO Materials Reference Lab.	294,424	3/27/2012	12/31/2014	Completed---Summarized in NCHRP Research Results Digests 388, 389, and 390
10-88	Developing Precision and Bias Statements for AASHTO Standard Methods of Test TP 98 and TP 99	HDR Engineering, Inc.	450,000	10/24/2012	4/23/2015	Research in progress
10-89	Best Practices Guidebook for Optimal Construction Inspection	Applied Pavement Technology	200,000	6/12/2012	2/28/2015	Research in progress; draft final report pending
10-90	Guidance for Complying with EPA Effluent Limitation Guidelines for Construction Runoff					Terminated
10-91	Guidebook for Selecting and Implementing Sustainable Highway Construction Practices	Parsons Brinckerhoff	475,000	4/22/2013	4/22/2015	Research in progress; interim report pending
10-92	Optimizing the Risk and Cost of Materials QA Programs	Hill International Inc.	399,970	9/16/2013	9/16/2015	Research in progress; Phase II underway

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
10-93	Measuring, Characterizing, and Reporting Pavement Roughness of Low-Speed and Urban Roads	University of Michigan	450,000	10/1/2013	10/1/2015	Research in progress
10-94	Mitigation of Weldment Cracking of Highway Steel Structures due to the Galvanizing Process	University of Kansas	499,975	7/1/2014	12/31/2016	Research in progress
10-95	Toughness Requirements for Heat-Affected Zones of Welded Structural Steels for Highway Bridges	Lehigh University	500,000	8/1/2014	1/31/2017	Research in progress
10-96	Guide for Civil Integrated Management (CIM) in Departments of Transportation	University of Texas - Austin	249,988	5/20/2014	8/19/2015	Research in progress
10-97	The Detection and Remediation of Total Soluble Salt Contamination Prior to Coating Structural Steel	-----	500,000			In development
AREA ELEVEN : ADMINISTRATION--LAW						
11-01	Rules of Compensability and Valuation in Highway Land Acquisition	University of Wisconsin	84,840	1/1/1965	4/30/1967	Completed---Published as NCHRP Report 104
11-01(01)	Eliminating Enhancement or Diminution Effects on Right-of-Way Valuation	Real Estate Research	5,000	9/2/1968	2/28/1969	Completed---Published as NCHRP Report 114
11-01(02)	Recognition of Benefits to Remainder Property in Highway Valuation	Montano & Associates	5,000	10/1/1968	3/31/1969	Completed---Published as NCHRP Report 88
11-01(03)	Taxation Aspects of Right-of-Way Acquisition	University of Tulsa	2,250	9/16/1968	4/30/1969	Project cancelled---No final report
11-01(04)	Compensation in the Nature of Additives to Market Value	University of Oklahoma	2,500	12/1/1968	5/31/1969	Completed---Report not published; for avail. see Summary of Progress Through 1988
11-01(05)	Rules of Discovery and Disclosure in Highway Condemnation Proceedings	Long, Mikkeltorg	2,500	9/15/1968	4/14/1969	Completed---Published as NCHRP Report 87
11-01(06)	Valuation and Condemnation Problems of Selected Special Purpose Properties	Level, Edward E.	7,500	9/2/1968	11/28/1969	Completed---Published as NCHRP Report 92
11-01(07)	Valuation and Compensability of Noise, Pollution, and Other Environmental Factors	University of Oklahoma	2,500	10/1/1968	3/31/1969	Completed---Report not published; for avail. see Summary of Progress Through 1988
11-01(08)	Remainder Damages Caused by Drainage, Runoff, Blasting, and Slides	Lewis, Harrison	7,500	10/15/1968	1/15/1970	Completed---Published as NCHRP Report 134
11-01(09)	Valuation and Condemnation Problems Involving Trade Fixtures	Snitzer, Edward L.	5,000	3/15/1969	12/1/1969	Completed---Published as NCHRP Report 94
11-01(10)	Compensability and Valuation Aspects of Residential Displacement in Highway Programs	Ross, Hardies, et al.	5,000	3/15/1969	9/15/1969	Completed---Published as NCHRP Report 107

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
11-01(11)	Valuation Elements of Joint Development Projects, Including Air Rights	Real Estate Research	5,000	2/24/1969	8/25/1969	Completed---Report not published; for avail. see Summary of Progress Through 1988
11-02	Theory and Practice in Inverse Condemnation	Reg & Urban Planning	15,000	2/1/1965	6/30/1966	Completed---Published as NCHRP Report 72
11-03	Valuation and Legal Implications of Scenic, Conservation, and Roadside Easements	Sutte, Jr. & Associates	25,000	11/1/1966	12/15/1967	Completed---Published as NCHRP Report 56
11-03(01)	Public Control of Roadside Advertising Signs for Highway Beautification	Sutte, Jr. & Associates	20,000	10/1/1968	12/31/1969	Completed---Published as NCHRP Report 119
11-03(02)	Public Control of Junkyards for Highway Beautification	Real Estate Research	13,300	9/2/1968	2/28/1970	Completed---Published as NCHRP Report 112
11-04	Elimination of Wide Divergence in Right-of-Way Valuation	Am Inst RI Est App	24,959	7/1/1969	2/28/1971	Completed---Published as NCHRP Report 126
11-05	Valuation of Air Space	Daniel, Mann, Johnson, Mendenhall	49,800	10/1/1970	5/31/1972	Completed---Published as NCHRP Report 142
11-06	Valuation and Compensability of Noise Pollution	Jack Faucett Associates	94,744	4/1/1974	7/31/1975	Completed---Report not published; for avail. see Summary of Progress Through 1988
11-07	National Data-Management System for Highway Tort Claims	Pennsylvania State University	290,482	5/1/1997	8/30/2002	Completed---Agency report available as NCHRP Web-Only Document 57

AREA TWELVE : DESIGN--BRIDGES

12-01	Deformation of Steel Beams Related to Permitted Highway Bridge Overloads	University of Missouri	50,000	2/1/1965	6/30/1967	Completed---Report included in Project 12-06 report
12-02	Distribution of Wheel Loads on Highway Bridges	Iowa State University	79,512	6/1/1966	12/31/1968	Completed---Published as NCHRP Report 83
12-03	Development of Waterproof Roadway Joints for Bridges	Southwest Research Institute	149,895	12/15/1965	3/14/1969	Completed---Report available only to sponsors; summarized in NCHRP Research Results Digest 14
12-04	Thermal Characteristics of Highway Bridges	Southwest Research Institute	102,400	12/15/1965	3/31/1968	Completed---Report not published; for avail. see Summary of Progress Through 1988
12-05	Protection of Steel in Prestressed Concrete Bridges	University of Denver	173,255	9/15/1966	11/15/1968	Completed---Published as NCHRP Report 90
12-06	Prediction of Permanent Camber of Bridges	University of Missouri	82,253	2/1/1967	4/30/1972	Completed---Report not published; for avail. see Summary of Progress Through 1988
12-07	Effects of Weldments on Fatigue Strength of Steel Beams	Lehigh University	399,023	10/1/1966	12/31/1972	Completed---Published as NCHRP Report 102; Phase II published as NCHRP Report 147

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
12-08	Bridge Rail Service Requirements as a Basis for Design Criteria	Texas A&M University	98,546	3/1/1968	6/30/1971	Completed---Published as NCHRP Report 86; Phase II published as NCHRP Report 149
12-09	Elastomeric Bearing Research	Battelle Memorial Institute	84,800	9/1/1967	1/31/1970	Completed---Published as NCHRP Report 109
12-10	Analysis and Design of Bridge Bents	Portland Cement Association	297,900	1/1/1970	12/31/1973	Completed---Published as NCHRP Report 163
12-11	Waterproof Membranes for Protection of Concrete Bridge Decks	Materials R&D	303,004	8/1/1970	9/30/1978	Completed---Published as NCHRP Report 165; Phase II report not published; for avail. see Summary of Progress Through 1988
12-12	Welded Steel Bridge Members Under Variable-Cycle Fatigue Loadings	US Steel	310,000	10/1/1970	10/31/1975	Completed---Published as NCHRP Report 188
12-13	Cathodic Protection for Reinforced Concrete Bridge Decks	USS Engineering & Consulting	174,601	10/1/1972	7/31/1974	Completed---Published as NCHRP Report 180
12-13A	Field Evaluation of Galvanic Cathodic Protection for Reinforced Concrete Bridge Decks	Portland Cement Association	74,405	8/1/1975	5/15/1981	Completed---Published as NCHRP Report 234
12-14	Subcritical Crack Growth in Steel Bridge Members	US Steel	99,923	10/1/1972	6/30/1974	Completed---Published as NCHRP Report 181
12-15	Detection and Repair of Fatigue Cracking in Highway Bridges	Lehigh University	100,000	10/1/1972	4/30/1975	Completed---Published as NCHRP Report 206
12-15(02)	Retrofitting Procedures for Fatigue-Damaged Full-Scale Welded Bridge Beams	Lehigh University	150,000	6/1/1976	11/30/1978	Completed---Published as NCHRP Report 206
12-15(03)	Fatigue Behavior of Full-Scale Welded Bridge Attachments	Lehigh University	125,000	2/1/1978	7/31/1980	Completed---Published as NCHRP Report 227
12-15(04)	Steel Bridge Members Under Variable-Amplitude, Long-Life Fatigue Loading	Lehigh University	150,000	4/1/1980	9/30/1983	Completed---Published as NCHRP Report 267
12-15(05)	Fatigue Behavior of Variable-Loaded Bridge Details Near the Fatigue Limit	Lehigh University	399,999	9/1/1983	12/31/1990	Completed---Interim report published as NCHRP Report 286; final report published as NCHRP Report 354
12-16	Influence of Bridge Deck Repairs on Corrosion of Reinforcing Steel	Battelle Columbus	214,912	9/1/1974	11/30/1977	Completed---Report not published; summarized in NCHRP Research Results Digest 85; for avail. see Summary of Progress Through 1988
12-17	Evaluation of Repair Techniques for Damaged Steel Bridge Members	Battelle Columbus	49,974	11/15/1976	4/30/1978	Completed---Report not published; for avail. see Summary of Progress Through 1988
12-17A	Guidelines for Evaluation and Repair of Damaged Steel Bridge Members	Shanafelt/Horn	99,950	10/1/1981	5/31/1984	Completed---Published as NCHRP Report 271

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
12-18	Development of an Integrated Bridge Design System	Multiplications, Inc.	224,985	9/6/1977	12/31/1982	Completed---Report not published; for avail. see Summary of Progress Through 1988
12-18A	Assessment of an Integrated Bridge Design System	Eng Computer Corp	15,000	2/1/1984	1/3/1986	Completed---Report available only to sponsors
12-19	Cathodic Protection of Concrete Bridge Structures	Corrosion Engineering & Research	250,000	1/1/1978	12/31/1980	Completed---Report not published; for avail. see Summary of Progress Through 1988
12-19A	Concrete Sealers for Protection of Bridge Structures	Wiss, Janney, Elstner & Associates	99,190	8/1/1979	12/1/1981	Completed---Published as NCHRP Report 244
12-19B	Cathodic Protection of Concrete Bridge Structures	Wiss, Janney, Elstner & Associates	138,900	11/1/1982	4/30/1985	Completed---Published as NCHRP Report 278
12-20	Bridges on Secondary Highways and Local Roads: Rehabilitation and Replacement	University of Virginia	169,878	3/1/1978	11/30/1981	Completed---Published as NCHRP Report 222; Phase II published as NCHRP Report 243
12-21	Evaluation of Damage and Methods of Repair for Prestressed Concrete Bridge Members	Shanafelt, G.O.	188,454	4/15/1979	7/8/1985	Completed---Published as NCHRP Report 226; Phase II published as NCHRP Report 280
12-22	Thermal Effects in Concrete Bridge Superstructures	Eng Computer Corp	100,000	10/1/1981	1/31/1984	Completed---Published as NCHRP Report 276
12-23	Recommended Revisions to the AASHTO Manual for Maintenance Inspection of Bridges	A.G. Lichtenstein & Associates	233,800	1/3/1989	8/3/1992	Completed---Report distributed to sponsors
12-24	Design of Multi-Beam Precast Bridge Superstructures	University of Washington	149,879	8/1/1983	5/31/1986	Completed---Published as NCHRP Report 287
12-25	Fatigue and Fracture Evaluation for Rating Riveted Steel Bridges	Lehigh University	199,957	9/1/1984	9/30/1987	Completed---Published as NCHRP Report 302
12-26	Distribution of Wheel Loads on Highway Bridges	Imbsen & Associates	500,000	4/15/1985	10/31/1990	Completed---Phase I and II summarized in NCHRP Research Results Digest 187
12-26(02)	Distribution of Wheel Loads on Highway Bridges	Imbsen & Associates	100,000	9/28/1992	12/31/1993	Completed---Agency report available on microfiche
12-27	Welded Repair of Cracks in Steel Bridge Members	Welding Institute	374,575	10/15/1984	2/28/1989	Completed---Published as NCHRP Report 321
12-28(01)	Load Capacity Evaluation of Existing Bridges	Case Western Reserve University	302,000	9/1/1985	8/31/1989	Completed---Published as NCHRP Report 301
12-28(02)	Bridge Management Systems	ARE, Inc.	495,000	6/24/1985	4/30/1990	Completed---Published as NCHRP Report 300; Phase II has no final report
12-28(02)A	Bridge Management Systems Software	National Engineering Technology Corporation	585,000	1/10/1992	12/31/1994	Completed---No report
12-28(02)B	Bridge Management Systems Software	National Engineering Technology Corporation	140,000	8/14/1995	12/31/1996	Completed---No report; software and documentation available

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
12-28(02)C	Conversion of BRIDGIT Bridge Management Software to Windows	National Engineering Technology Corporation	54,456	1/1/1998	6/30/1998	Completed---No report; ownership transferred to AASHTO
12-28(03)	Fatigue Evaluation Procedures for Steel Bridges	Case Western Reserve University	200,000	7/1/1985	9/30/1987	Completed---Published as NCHRP Report 299
12-28(04)	Methods of Strengthening Existing Highway Bridges	Iowa State University	164,985	7/1/1985	7/31/1987	Completed---Published as NCHRP Report 293
12-28(05)	Standard Methodology for Conducting Condition Surveys of Concrete Bridge Components	New Mexico State University	98,338	8/1/1985	8/31/1987	Completed---Published as NCHRP Report 312
12-28(06)	Distortion-Induced Fatigue Cracking in Steel Bridges	Lehigh University	250,000	10/1/1985	11/30/1989	Completed---Published as NCHRP Report 336
12-28(07)	Guidelines for Evaluating Corrosion Effects in Existing Steel Bridges	Modjeski & Masters	298,644	5/5/1986	11/30/1989	Completed---Published as NCHRP Report 333
12-28(08)	Improving Bridge Load Capacity Estimates by Correlation with Test Data	University of Tennessee	191,024	2/1/1986	2/19/1988	Completed---Published as NCHRP Report 306
12-28(09)	Methods of Flaw Detection in Concrete Bridge Components	Combined				Combined with Project 10-30(03)
12-28(10)	Guidelines for Determining Redundancy in Steel Bridges	Lehigh University	299,995	3/1/1986	5/31/1989	Completed---Published as NCHRP Report 319
12-28(11)	Development of Site-Specific Load Models for Bridge Rating	Imbsen & Associates	200,000	2/9/1987	3/30/1990	Completed---Report not published
12-28(12)	Inelastic Rating Procedures for Steel Beam and Girder Bridges	University of Minnesota	241,031	9/1/1987	5/30/1990	Completed---Published as NCHRP Report 352
12-28(13)	Nondestructive Load Testing for Bridge Evaluation and Rating	Raths Raths & Johnson	150,000	10/4/1987	9/30/1989	Completed---Report not published
12-28(13)A	Bridge Rating Through Nondestructive Load Testing	A.G. Lichtenstein & Associates	227,200	12/17/1990	2/28/1994	Completed---Summarized in NCHRP Research Results Digest 234
12-29	Design of Simple-Span Precast Prestressed Bridge Girders Made Continuous	Construction Technology Laboratories/PCA	241,993	8/26/1985	5/31/1988	Completed---Published as NCHRP Report 322
12-30	Fatigue of Cables in Cable-Stayed Bridges	Acer Freeman Fox Ltd.	124,975	1/13/1986	2/12/1989	Completed---Report not published
12-31	Notch Toughness Variability in Bridge Steel Plates	University of Texas	385,000	9/1/1987	9/1/1992	Completed---Published as NCHRP Report 355
12-32	Evaluation of Bridge Deck Protective Strategies	University of Washington	92,515	4/1/1986	5/15/1987	Completed---Published as NCHRP Report 297
12-33	Development of a Comprehensive Bridge Specification and Commentary	Modjeski & Masters	1,404,167	7/1/1988	12/31/1995	Completed---Specifications published by AASHTO; summarized in NCHRP Research Results Digest 198; report published as NCHRP Report 368

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
12-33A	Development of a Comprehensive Bridge Specification and Commentary---Timber Structures and Code Calibration	Sensei Engineers	60,000	9/19/1988	12/31/1991	Completed---No report; See Project 12-33
12-33B	Development of a Comprehensive Bridge Specification and Commentary---Concrete Structures	Imbsen & Associates	125,500	9/19/1988	3/31/1992	Completed---No report; See Project 12-33
12-33C	Development of a Comprehensive Bridge Specification and Commentary---Soil-Structure Interaction Systems	D'Appolonia	83,832	7/24/1989	3/31/1992	Completed---No report; See Project 12-33
12-34	Update of AASHTO Standard Specifications for Highway Bridges: Division II---Construction	Imbsen & Associates	200,000	10/19/1987	10/18/1989	Completed---Report provided to AASHTO
12-35	Recommended Specifications for the Design of Foundations, Retaining Walls, and Substructures	D'Appolonia	99,588	1/4/1988	7/3/1989	Completed---Report provided to AASHTO
12-36	Redundancy in Highway Bridge Superstructures	City College of New York	200,000	4/8/1991	11/16/1993	Completed---See Project 12-36(02)
12-36(02)	Redundancy in Highway Bridge Superstructures: Phase II	City College of New York	250,000	9/1/1994	5/31/1997	Completed---Published as NCHRP Report 406
12-37	Transverse Cracking in Newly Constructed Bridge Decks	Wiss, Janney, Elstner & Associates	350,000	1/27/1992	3/31/1995	Completed---Published as NCHRP Report 380
12-38	Improved Design Specifications for Horizontally Curved Steel Girder Highway Bridges	Auburn University	378,103	1/1/1993	6/30/1999	Completed---Published as NCHRP Report 424; specification adopted by AASHTO and Appendixes D-F published by AASHTO as GHC-4
12-39	Design Specifications for Debris Forces on Highway Bridges	University of Louisville	474,735	3/1/1993	4/30/2000	Completed---Published as NCHRP Report 445; Task 7 report published as NCHRP Report 417
12-40	Fatigue Criteria for Modular Bridge Expansion Joints	Lehigh University	335,000	1/18/1994	4/30/1997	Completed---Published as NCHRP Report 402
12-41	Rapid Replacement of Bridge Decks	University of Nebraska - Lincoln	499,921	1/1/1994	8/31/1997	Completed---Published as NCHRP Report 407
12-42	LRFD Bridge Design Specifications Support	Modjeski & Masters	856,795	2/1/1995	12/31/2003	Completed---Available on request
12-43	Life-Cycle Cost Analysis for Bridges	National Engineering Technology Corporation	434,423	5/28/1996	3/30/2002	Completed---Published as NCHRP Report 483 and CRP-CD-26
12-44	Recommended Specifications for the Design of Movable Highway Bridges	Modjeski & Masters	374,325	7/26/1996	9/30/1999	Completed---Specifications published by AASHTO
12-45	Recommended Specifications for Large-Span Culverts	Simpson Gumpertz & Heger, Inc.	473,575	4/26/1996	11/30/2001	Completed---Published as NCHRP Report 473

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
12-46	Manual for Condition Evaluation and Load Rating of Highway Bridges Using Load and Resistance Factor Philosophy	A.G. Lichtenstein & Associates	389,187	3/1/1997	9/30/2000	Completed---Report on calibration published as NCHRP Report 454; agency report available as NCHRP Web-Only Document 28
12-47	Redundancy in Highway Bridge Substructures	Imbsen & Associates	250,000	1/1/1998	8/31/2000	Completed---Published as NCHRP Report 458
12-48	Design of Highway Bridges for Extreme Events	City College of New York	350,000	7/15/1998	9/30/2002	Completed---Published as NCHRP Report 489 and CRP-CD-30
12-49	Comprehensive Specification for the Seismic Design of Bridges	ATC/MCEER Joint Venture	850,000	8/1/1998	11/30/2001	Completed---Specifications under review by AASHTO; published as NCHRP Report 472
12-50	Bridge Software Validation Guidelines and Examples	Michael Baker, Jr., Inc.	499,948	5/13/1998	6/30/2002	Completed---Published as NCHRP Report 485 and CRP-CD-29A&B
12-51	Effect of Truck Weight on Bridge Network Costs	Wayne State University	389,899	12/1/2000	12/31/2002	Completed---Published as NCHRP Report 495 and CRP-CD-37
12-52	LRFD Specifications for Horizontally Curved Steel Girder Highway Bridges	Modjeski & Masters	700,000	9/1/1999	10/31/2005	Completed---Published as NCHRP Report 563; recommended specifications adopted by AASHTO
12-53	Connection Between Simple-Span Precast Concrete Girders Made Continuous	University of Cincinnati	291,376	5/1/1999	8/31/2003	Completed---Published as NCHRP Report 519
12-54	Integral Connections of Modern Steel Bridge Structures	Modjeski & Masters	499,961	7/1/1999	1/31/2004	Completed---Published as NCHRP Report 527
12-55	Load and Resistance Factors for Earth Pressures on Bridge Substructures and Retaining Walls	D'Appolonia	250,000	4/17/2001	1/15/2004	Completed---Agency's draft final report available on request
12-55A	Load and Resistance Factors for Earth Pressures on Bridge Substructures and Retaining Walls	Prototype Engineering, Inc.	38,000	7/10/2006	3/27/2007	Contract cancelled; \$62k released
12-56	Application of the LRFD Bridge Design Specifications to High-Strength Structural Concrete: Shear Provisions	University of Illinois	650,000	7/26/2001	8/31/2006	Completed---Published as NCHRP Report 579
12-57	Extending Span Ranges of Precast, Prestressed Concrete Girders	Ralph Whitehead Associates, Inc.	239,979	4/30/2001	9/30/2003	Completed---Published as NCHRP Report 517
12-58	Effective Slab Width for Composite Steel Bridge Members	State University of New York	359,831	7/6/2001	12/30/2004	Completed---Published as NCHRP Report 543
12-59	Design and Construction of Segmental Geosynthetic-Reinforced Soil (GRS) Bridge Abutments for Bridge Support	University of Colorado - Denver	299,998	8/1/2001	12/31/2004	Completed---Published as NCHRP Report 556
12-59(01)	Seismic Design of Geosynthetic-Reinforced Soil (GRS) Bridge Abutments with Modular Block Facing	University of Wisconsin	300,000	1/31/2008	2/29/2012	Completed---Agency report available as NCHRP Web-Only Document 187

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
12-60	Transfer and Development Length of Prestressing Strand and Development and Splice Length of Reinforcement in High-Strength Concrete	Purdue University	600,000	4/16/2002	7/31/2007	Completed---Published as NCHRP Report 603
12-61	Simplified Shear Design of Structural Concrete Members	University of Illinois	249,983	1/7/2003	7/6/2005	Completed---Published as NCHRP Report 549; appendixes available as NCHRP Web-Only Document 78
12-62	Simplified Live Load Distribution-Factor Equations	BridgeTech, Inc.	249,958	4/8/2003	1/30/2005	Completed---Published as NCHRP Report 592
12-62A	Simplified Live Load Distribution-Factor Equations-Phase II	BridgeTech, Inc.	50,817	6/17/2005	1/31/2007	Completed---Published as NCHRP Report 592
12-63	Legal Truck Loads and AASHTO Legal Loads for Posting	Lichtenstein Consulting Engineers, Inc.	340,629	7/1/2003	10/30/2006	Completed---Published as NCHRP Report 575
12-64	Application of the LRFD Bridge Design Specifications to High-Strength Structural Concrete: Flexure and Compression Provisions	North Carolina State University	630,000	8/15/2003	5/28/2007	Completed---Published as NCHRP Report 595
12-65	Full-Depth, Precast-Concrete Bridge Deck Panel Systems	George Washington University	399,989	7/7/2003	12/1/2006	Completed---Published as NCHRP Report 584
12-66	AASHTO LRFD Specifications for Serviceability in the Design of Bridge Foundations	Geosciences Testing & Research, Inc.	357,706	5/1/2004	7/31/2008	Contract terminated; interim material available on request
12-67	Multiple-Objective Optimization for Bridge Management Systems	Purdue University	347,404	2/13/2004	11/17/2006	Completed---Published as NCHRP Report 590
12-68	Improved Rotational Limits of Elastomeric Bearings	University of Washington	350,000	6/18/2004	12/31/2006	Completed---Published as NCHRP Report 596
12-69	Design and Construction Guidelines for Long-Span Decked Precast, Prestressed Concrete Girder Bridges	Construction Technology Laboratories	499,242	6/1/2004	8/1/2009	Completed---Agency report available on NCHRP website
12-70	Seismic Analysis of Retaining Walls, Buried Structures and Embankments	CH2M Hill	497,726	3/25/2004	7/1/2008	Completed---Published as NCHRP Report 611
12-71	Design Specifications and Commentary for Horizontally Curved Concrete Box-Girder Highway Bridges	Nutt, Redfield & Valentine	350,000	7/18/2005	12/31/2007	Completed---Published as NCHRP Report 620
12-72	Blast-Resistant Highway Bridges: Design and Detailing Guidelines	University of Texas - Austin	1,000,000	6/22/2005	1/31/2009	Completed---Published as NCHRP Report 645
12-72(01)	Blast-Resistant Highway Bridges: Design and Detailing Guidelines--Workshop development	Cancelled				Cancelled
12-73	Design Guidelines for Durability of Bonded CFRP Repair/Strengthening of Concrete Beams	University of Wyoming	500,000	3/7/2005	9/30/2008	Completed---Agency report available as NCHRP Web-Only Document 155
12-74	Development of a Precast Bent Cap System for Seismic Regions	University of California	598,916	9/14/2005	6/30/2010	Completed---Published as NCHRP Report 681
12-75	Design of FRP Systems for Strengthening Concrete Girders in Shear	University of Missouri	399,281	3/27/2006	6/30/2010	Completed---Published as NCHRP Report 678

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
12-76	Protocols for Collecting and Using Traffic Data in Bridge Design	Lichtenstein Consulting Engineers, Inc.	300,000	3/1/2006	9/1/2008	Completed---NCHRP Web-Only Document 135 has been superseded by NCHRP Report 683
12-76(01)	Protocols for Collecting and Using Traffic Data in Bridge Design	HNTB Corporation	100,000	7/15/2009	7/15/2010	Completed---Published as NCHRP Report 683
12-77	Structural Design with High-Strength Reinforcement	University of Cincinnati	598,064	5/1/2007	8/31/2010	Completed---Published as NCHRP Report 679
12-78	Evaluation of Load Rating by Load and Resistance Factor Rating	Michael Baker, Jr., Inc.	470,108	3/3/2008	3/18/2011	Completed---Published as NCHRP Report 700
12-79	Guidelines for Analysis and Construction Engineering of Curved and Skewed Steel Girder Bridges	Georgia Institute of Technology	600,000	4/2/2008	2/29/2012	Completed---Published as NCHRP Report 725
12-80	LRFD Minimum Flexural Reinforcement Requirements	PBS&J	199,826	2/14/2008	11/30/2009	Completed---Agency report available as NCHRP Web-Only Document 149
12-81	Evaluation of Fatigue on the Serviceability of Highway Bridges	Purdue University	499,873	4/23/2008	1/31/2012	Completed---Published as NCHRP Report 721
12-82	Developing Reliability-Based Bridge Inspection Practices	University of Missouri	399,930	4/20/2009	10/21/2011	Completed---Phase II completed as NCHRP 12-82(01)
12-82(01)	Developing Reliability-Based Bridge Inspection Practices	University of Missouri	149,542	11/26/2012	3/26/2014	Completed---To be published as NCHRP Report 782
12-83	Calibration of LRFD Concrete Bridge Design Specifications for Serviceability	Modjeski & Masters	499,996	4/20/2009	12/31/2013	Completed---Contractor's final report available as NCHRP Web-Only Document 201
12-84	Guidelines for the Load and Resistance Factor Design and Rating of Riveted, Bolted, and Welded Gusset-Plate Connections for Steel	Federal Highway Administration	500,000	10/1/2008	1/31/2013	Completed---Agency report available as NCHRP Web-Only Document 197
12-85	Highway Bridge Fire Hazard Assessment	Virginia Polytechnic Institute	350,000	6/3/2010	12/31/2013	Completed---Contractor's final deliverables available for download from the project web page
12-86	Bridge System Reliability for Redundancy	Research Foundation of CUNY	325,000	4/26/2010	12/31/2013	Completed---Published as NCHRP Report 776
12-87	Fracture-Critical System Analysis for Steel Bridges	Virginia Polytechnic Institute	55,979	4/10/2011	1/10/2014	Terminated---Work continuing under NCHRP project 12-87A
12-87A	Fracture-Critical System Analysis for Steel Bridges	Purdue University	260,000	9/18/2014	12/17/2016	Research in progress
12-88	System Performance of Accelerated Bridge Construction (ABC) Connections in Moderate-to-High Seismic Regions	BergerABAM Inc.	74,995	8/16/2010	3/16/2011	Completed---published as NCHRP Report 698
12-89	Recommended AASHTO LRFD Tunnel Design and Construction Specifications	PB Americas, Inc.	699,979	6/21/2011	5/31/2016	Research in progress
12-90	Guidelines for Shielding Bridge Piers	Roadsafe LLC	450,000	11/20/2012	10/20/2015	Research in progress

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
12-91	Strand Debonding for Pretensioned Girders	University of Cincinnati	650,000	9/13/2012	9/12/2015	Research in progress
12-92	Proposed LRFD Bridge Design Specifications for Light Rail Transit Loads	University of Colorado - Denver	349,754	7/26/2013	4/25/2016	Research in progress
12-93	Contribution of Steel Casing to Single Shaft Foundation Structural Resistance	State University of New York - Buffalo	469,818	6/13/2013	6/12/2016	Research in progress
12-94	LRFD Minimum Flexural Reinforcement Requirements	Iowa State University	550,000	9/30/2013	12/29/2016	Research in progress
12-95	Connection Details of Adjacent Precast Concrete Box Beam Bridges	Iowa State University	449,400	8/5/2013	11/4/2016	Research in progress
12-96	Simplified Full-Depth Precast Concrete Deck Panel Systems	George Washington University	400,000	7/1/2013	6/30/2016	Research in progress
12-97	Guide Specification for the Design of Concrete Bridge Beams Prestressed with CFRP Systems	University of Houston	500,000	8/1/2013	7/31/2016	Research in progress
12-98	Recommended Guidelines for Prefabricated Bridge Elements and Systems Tolerances and Dynamic Effects of Bridge Moves	CME Associates Inc.	299,875	5/20/2014	8/19/2016	Research in progress
12-99	Guidelines for Calculating Dynamic Effects in Large-Scale Bridge Moves	Combined				NCHRP Project 12-98 has been expanded in scope and budget to include this project. This project is cancelled.
12-100	Guidelines for Maintaining Small Movement Bridge Expansion Joints	University of Delaware	150,000	7/16/2014	1/16/2016	Research in progress
12-101	Seismic Design of Bridge Columns with Improved Energy Dissipating Mechanisms	Infrastructure Innovation LLC	250,000	7/7/2014	10/7/2016	Research in progress
12-102	Recommended AASHTO Guide Specification for ABC Design and Construction	CME Associates Inc.	369,842	5/20/2014	8/19/2016	Research in progress
12-103	Bridge Superstructure Tolerance to Total and Differential Foundation Movements	Drexel University	349,870	12/19/2013	6/15/2016	Research in progress
12-104	Evaluation of Element-Level Inspection Quality	-----	350,000			In development
12-105	Proposed AASHTO Seismic Specifications for ABC Column Connections	-----	500,000			In development

AREA THIRTEEN : MAINTENANCE--EQUIPMENT

13-01	Equipment Rental Rates	Ernst & Ernst	22,800	2/1/1965	1/31/1966	Completed---Published as NCHRP Report 26
13-02	Guidelines for Selection and Application of Warning Lights on Roadway-Operations Equipment	Virginia Polytechnic Institute	300,000	7/29/2004	12/31/2007	Completed---Published as NCHRP Report 624

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
13-03	Decision Making for Outsourcing and Privatization of Vehicle and Equipment Fleet Maintenance	TransTech Management, Inc.	74,954	7/9/2007	5/8/2009	Completed---Phase I only; continued under 13-03A
13-03A	Decision Making for Outsourcing and Privatization of Vehicle and Equipment Fleet Maintenance	Booz-Allen & Hamilton	224,891	5/19/2009	12/30/2010	Completed---Published as NCHRP Report 692
13-04	Guide for Optimal Replacement Cycles of Highway Operations Equipment	----	400,000			Contract pending
13-05	Guide for Utilization Measurement and Management of Fleet Equipment	----	400,000			In development
AREA FOURTEEN : MAINTENANCE--MAINTENANCE OF WAY AND STRUCTURES						
14-01	Upgrading of Unit Maintenance Cost Index and Development of Interstate Maintenance Requirements	Tallamy Associates	205,128	3/1/1965	3/31/1967	Completed---Published as NCHRP Report 42
14-02	Techniques for Reducing Roadway Occupancy During Routine Maintenance Activities	Byrd, Tallamy, MacDonald & Lewis	200,000	10/1/1970	3/31/1973	Completed---Published as NCHRP Report 161
14-03	Improved Pavement-Shoulder Joint Design	Georgia Institute of Technology	100,838	9/11/1972	3/15/1976	Completed---Published as NCHRP Report 202
14-04	Reconditioning Heavy-Duty Freeways in Urban Areas	Texas A&M University	99,665	4/15/1974	3/24/1976	Completed---Published as NCHRP Report 196
14-05	Maintenance Levels-of-Service Guidelines	Woodward-Clyde	204,200	1/1/1978	4/30/1980	Completed---Published as NCHRP Report 223
14-05(02)	Maintenance Levels-of-Service Guidelines	Woodward-Clyde	107,950	9/15/1981	8/31/1984	Completed---Published as NCHRP Report 273
14-06	Evaluating Deferred Maintenance Strategies	ARE, Inc.	325,000	6/1/1982	12/31/1985	Completed---Published as NCHRP Report 285
14-07	Interactive Microcomputer Network for Innovative Maintenance Operations	Woodward-Clyde	82,819	9/1/1987	6/30/1991	Completed---Report not published
14-08	Chip Seal Coats for High-Traffic-Volume Asphalt Concrete Pavements	Intermountain Research Foundation	80,078	7/6/1987	10/5/1990	Contract cancelled---Summary to be included in 14-08A report
14-08A	Chip Seal Coats for High-Traffic-Volume Asphalt Concrete Pavements	Asphalt Institute	159,922	1/1/1991	12/31/1992	Completed---Agency report available on request
14-09	Workshop on Research Needs in the Management of Highway Maintenance	Transportation Research Board	42,000	6/12/1988	6/15/1988	Completed---Problem statements developed
14-09(01)	Effective Maintenance Budget Strategies	Urban Institute	300,000	11/15/1989	4/30/1994	Completed---Published as NCHRP Report 366
14-09(02)	Incorporation of Maintenance Considerations in Highway Design	Daniel, Mann, Johnson, Mendenhall	168,122	1/15/1990	2/27/1992	Completed---Published as NCHRP Report 349
14-09(03)	Maintenance Contracting	Bergstrahl-Shaw-Newman	150,000	3/12/1990	9/11/1991	Completed---Published as NCHRP Report 344
14-09(04)	Role of Highway Maintenance in Integrated Management Systems	Cambridge Systematics	225,000	4/15/1991	7/15/1993	Completed---Published as NCHRP Report 363

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
14-09(05)	Impacts of Environmental, Health, and Safety Regulations on Highway Maintenance	Auburn University	150,000	5/1/1991	5/31/1993	Completed---Agency report available on microfiche
14-09(06)	Professional Development of Maintenance Engineers and Managers	University of Maryland	174,998	2/1/1991	1/31/1993	Completed---Published as NCHRP Report 360
14-10	Improvements in Data Acquisition Technology for Maintenance Management Systems	Urban Institute	300,000	5/29/1989	3/31/1993	Completed---Published as NCHRP Report 334; Phase II published as NCHRP Report 361
14-11	Effective Motivation of Highway Maintenance Personnel	Pennsylvania State University	200,000	6/1/1989	11/30/1992	Completed---Final deliverables superseded by NCHRP Project 14-11(02)
14-11(02)	Enhancement to Program for Effective Motivation of Highway Maintenance Personnel	University of Maryland	165,000	5/1/1998	11/15/2000	Completed---Summarized in NCHRP Research Results Digest 257; available on CRP-CD-12
14-12	Highway Maintenance Quality Assurance	ERES Consultants	325,241	3/1/1995	7/31/1998	Completed---Manual published as NCHRP Report 422; agency report available as NCHRP Web-Only Document 8
14-13	Customer-Driven Benchmarking for Highway Maintenance Activities	Booz-Allen & Hamilton	299,819	5/7/1999	3/31/2003	Completed---Published as NCHRP Report 511
14-14	Guide for Optimal Timing of Pavement Preventive Maintenance Treatment Applications	Applied Pavement Technologies	312,397	4/10/2000	9/30/2003	Completed---Published as NCHRP Report 523
14-15	Developing a National Database System for Maintenance Actions on Highway Bridges	University of Colorado - Boulder	427,633	8/26/2005	3/31/2010	Completed---Published as NCHRP Report 668
14-16	Develop AASHTO Guidelines for Vegetation Control	WeedSmart LLC	300,000	4/28/2006	8/1/2009	Completed---Final report sent to AASHTO
14-17	Manual for Emulsion-Based Chip Seals for Pavement Preservation	Colorado State University	349,821	8/14/2006	5/31/2010	Completed---Published as NCHRP Report 680
14-18	Determining Highway Maintenance Costs	Cambridge Systematics	299,977	4/21/2008	7/30/2010	Completed---Published as NCHRP Report 688
14-19	Culvert Rehabilitation to Maximize Service Life While Minimizing Direct Costs and Traffic Disruption	Louisiana Tech University	749,643	6/9/2008	2/28/2015	Research in progress; contractor's Phase II interim report pending
14-20	Consequences of Delayed Maintenance - Phase I	Cambridge Systematics	247,078	6/7/2010	1/10/2013	Phase I completed; continued under NCHRP Project 14-20A
14-20A	Consequences of Delayed Maintenance of Highway Assets	University of Texas - El Paso	450,000	12/9/2013	3/9/2016	Research in progress; interim report pending
14-21	Optimization of Resource Allocation for Highway Preservation Needs	Booz-Allen & Hamilton	349,786	4/19/2010	1/19/2013	Completed---Published as NCHRP Report 736
14-22	Effective Removal of Pavement Markings	Texas A&M Research Foundation	200,000	4/27/2010	5/31/2013	Completed---Published as NCHRP Report 759
14-23	Practical Bridge Preservation Actions and Investment Strategies	Michigan State University	450,000	11/11/2011	3/10/2015	Research in progress

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
14-24	Communicating the Value of Preservation: A Playbook	High Street Consulting Group	250,000	3/29/2011	9/28/2012	Completed---Published as NCHRP Report 742
14-25	Guide for Selecting Level-of-Service Targets for Maintaining and Operating Highway Assets	University of Wisconsin - Madison	300,000	8/3/2011	11/26/2014	Completed---Publication decision pending
14-26	Culvert and Storm Drain Inspection Manual	Simpson Gumpertz & Heger, Inc.	250,000	8/24/2012	8/31/2015	Research in progress
14-27	A Guide for the Preservation of Highway Tunnel Systems	Gannett Fleming, Inc.	374,997	5/14/2012	3/13/2015	Research in progress
14-28	Condition Assessment of Bridge Post-Tensioning and Stay Cable Systems Using NDE Methods	Texas A&M Transportation Institute	650,000	11/29/2012	5/28/2015	Research in progress
14-29	Assessing, Coding, and Marking of Highway Structures in Emergency Situations	Oregon State University	399,655	11/1/2013	11/1/2015	Research in progress; interim report under review
14-30	Spot Painting to Extend Highway Bridge Coating Life	University of Kentucky	350,000	9/3/2013	7/31/2016	Research in progress; draft final report pending
14-31	Developing a Pavement-Maintenance Database System	Pavia Systems Inc.	249,790	5/28/2013	5/28/2015	Research in progress
14-32	Proposed Revisions to the AASHTO Movable Bridge Inspection, Evaluation, and Maintenance Manual	Parsons Brinckerhoff	210,000	7/31/2013	7/30/2015	Research in progress
14-33	Pavement Performance Measures that Consider the Contributions of Preservation Treatments	AMEC Environment & Infrastructure Inc.	399,993	6/2/2014	6/1/2016	Research in progress
14-34	Guide for Performance Measures in Snow and Ice Control Operations	-----	300,000			In development
14-35	Acceptance Criteria of Complete Joint Penetration Steel Bridge Welds Evaluated Using Enhanced Ultrasonic Methods	-----	600,000			In development

AREA FIFTEEN : DESIGN--GENERAL DESIGN

15-01	Guardrail Design	Cornell Aero Lab	19,723	12/15/1965	6/14/1966	Completed---Published as NCHRP Report 36
15-01(02)	Guardrail Performance and Design	Southwest Research Institute	380,000	7/1/1967	12/31/1971	Completed---Published as NCHRP Reports 54 and 115; Phase II published as NCHRP Reports 118 and 129
15-02	Design to Control Erosion in Roadside Drainage Channels	University of Minnesota	97,300	7/1/1966	6/30/1974	Completed---Ph. I rpt. publ. as NCHRP Rpt. 108; Ph. II rpt. not publ.; summarized in NCHRP RRD 67; for avail. see Summary of Progress Through 1988
15-03	Rational Structural Analysis and Design of Pipe Culverts	Northwestern University	49,937	10/1/1967	12/31/1968	Completed---Published as NCHRP Report 116

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
15-04	Estimating Runoff Rates from Small Rural Watersheds	Travelers Research Center	299,902	9/1/1967	3/16/1970	Completed---Published as NCHRP Report 136
15-05	Dynamic Characteristics of Heavy Highway Vehicles	General Motors Corporation	135,000	8/15/1967	1/10/1969	Completed---Published as NCHRP Report 105
15-06	Development of Criteria for Safer Luminaire Supports	Texas A&M University	147,254	9/1/1967	8/31/1968	Completed---Published as NCHRP Report 77
15-07	Flow Modifications by Storage Loss Through Flood Plain Encroachment	Dames & Moore	99,730	5/1/1980	1/31/1982	Completed---Report not published; for avail. see Summary of Progress Through 1988
15-08	Parameters Affecting Stopping Sight Distance and Vehicle Acceleration/Deceleration Characteristics	University of Michigan	274,482	5/1/1982	5/31/1984	Completed---Published as NCHRP Report 270
15-09	Encasement of Pipelines Through Highway Roadbeds	Byrd, Tallamy, MacDonald & Lewis	30,000	10/1/1986	6/30/1988	Completed---Published as NCHRP Report 309
15-10	Development of a Design/Graphics Interface System	C. W. Beilfuss & Assoc	500,000	8/1/1985	11/30/1988	Completed---Published as NCHRP Report 326
15-11	Computer-Aided Analysis of Highway Encroachments on Mobile Boundary Streams	Simons & Associates	246,945	7/1/1987	3/31/1990	Completed---Report distributed to sponsors; continued under Project 15-11A
15-11A	BRI-STARS Maintenance Support and Enhancement	Hydrau Tech	99,827	6/1/1991	11/30/1993	Completed---Summarized in NCHRP Research Results Digest 201
15-12	Roadway Widths for Low Traffic Volume Roads	CH2M Hill	250,000	5/1/1989	10/31/1995	Completed---Published as NCHRP Report 362
15-13	Long-Term Performance of Geosynthetics in Drainage Applications	Drexel University	455,240	4/1/1990	3/31/1993	Completed---Published as NCHRP Report 367
15-14(01)	Intersection Sight Distance	Midwest Research Institute	350,000	6/1/1992	8/31/1996	Completed---Published as NCHRP Report 383
15-14(02)	Median Intersection Design	Midwest Research Institute	350,000	6/1/1992	5/15/1995	Completed---Published as NCHRP Report 375
15-15	Collection and Presentation of Roadway Inventory Data	MCNC	400,000	2/15/1996	5/31/1999	Completed---Published as NCHRP Report 437
15-16	Superelevation Distribution Methods and Transition Designs	University of Nebraska	45,549	2/1/1997	7/31/1997	Continued under Project 15-16A
15-16A	Superelevation Distribution Methods and Transition Designs	Texas A&M University	154,451	8/1/1997	8/30/1999	Completed---Published as NCHRP Report 439
15-17	Geometric Design Consistency on Higher-Speed, Non-Urban, Two-Lane Roads	Texas A&M University	300,000	6/1/1998	3/31/2003	Completed---Published as NCHRP Report 502
15-18	Design Speed and Operating Speed	Texas A&M University	386,826	12/1/1998	7/15/2002	Completed---Published as NCHRP Report 504 and CRP-CD-38
15-19	Application of Context-Sensitive Design Principles	CH2M Hill	125,000	1/7/2000	8/31/2002	Completed---Published as NCHRP Report 480 and CRP-CD-23

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
15-20	Planning, Design, and Operation of Pedestrian Facilities	T.Y. Lin Inter. BASCOR, Inc.	224,089	5/11/1999	2/10/2001	Completed---Results provided to AASHTO
15-21	Review of Truck Characteristics as Factors in Roadway Design	Midwest Research Institute	250,000	12/13/2000	7/31/2003	Completed---Published as NCHRP Report 505
15-22	Safety Consequences of Flexibility in Highway Design	University of Kentucky	499,407	9/11/2001	12/30/2004	Completed---Agency report distributed to state DOTs; available to others on request
15-23	Recommended Unit Conversions and Updates of the AASHTO Model Drainage Manual (MDM) and Highway Drainage Guidelines (HDG)	Roy Jorgensen Associates, Inc.	278,494	6/11/2001	7/31/2003	Completed---Final report delivered to AASHTO for use in updating the MDM and HDG
15-24	Hydraulic Loss Coefficients for Culverts	Utah State University	575,000	6/20/2003	3/30/2011	Completed---Published as NCHRP Report 734
15-25	Alternatives to Design Speed for Selection of Roadway Design Criteria	Midwest Research Institute	500,000	5/13/2004	7/31/2008	Completed---Work continued under project 15-47
15-26	Evaluation of and/or Development of Passing Sight Distance Design Criteria	Midwest Research Institute	299,998	6/1/2004	9/30/2007	Completed---Published as NCHRP Report 605
15-27	Safety and Operational Impacts of Design Element Trade-Offs	University of Kentucky	449,987	7/13/2004	1/31/2009	Completed---Published as NCHRP Report 633
15-28	Modernize and Upgrade CANDE for Analysis and LRFD Design of Buried Structures	Michael Baker, Jr., Inc.	449,987	4/29/2005	4/30/2008	Completed---Published as NCHRP Report 619 and on CRP-CD-69
15-28(02)	Windows 7 Access to CANDE-2007	Michael Baker, Jr., Inc.	6,000	6/1/2011	6/30/2011	Completed---Updated NCHRP Report 619
15-29	Design Specifications for Live Load Distribution to Buried Structures	CNA Consulting Engineers	349,321	4/21/2005	4/27/2009	Completed---Published as NCHRP Report 647
15-30	Median Intersection Design for Rural High-Speed Divided Highways	Iowa State University	200,000	8/1/2005	12/31/2008	Completed---Published as NCHRP Report 650
15-31	Design Guidance for Freeway Mainline Ramp Terminals	CH2M Hill	80,000	1/27/2005	4/26/2007	Completed---Work continued under project 15-31A
15-31A	Design Guidance for Freeway Mainline Ramp Terminals	Midwest Research Institute	380,000	11/11/2008	6/10/2011	Completed---Published as NCHRP Report 730
15-32	Context Sensitive Solutions: Quantification of the Benefits in Transportation	University of Kentucky	449,613	5/25/2006	6/30/2009	Completed---Published as NCHRP Report 642
15-32A	Facilitating Implementation of Guidelines for Quantifying the Benefits of Context Sensitive Solutions	University of Kentucky	125,000	9/2/2011	3/31/2014	Completed---Workshop summary posted on project web page
15-33	AASHTO Guide for Transportation Landscape and Environmental Design	HNTB Corporation	400,000	3/15/2006	7/1/2011	Completed---Published by AASHTO
15-34	Performance-Based Analysis of Geometric Design of Highways and Streets	Pennsylvania State University	600,000	7/14/2006	3/13/2010	Terminated---Work completed under project 15-34A
15-34A	Performance-Based Analysis of Geometric Design of Highways and Streets	Kittelson & Associates	199,660	7/10/2012	4/9/2014	Completed---Published as NCHRP Report 785

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
15-35	Guide for the Geometric Design of Driveways	University of Arkansas	349,997	6/2/2006	2/28/2010	Completed---Published as NCHRP Report 659
15-36	Estimating Joint Probabilities of Design Coincident Flows at Stream Confluences	Kilgore Consulting and Management	378,058	5/11/2006	10/31/2010	Completed---Agency report available as NCHRP Web-Only Document 199
15-36(02)	Estimating Joint Probabilities of Design Coincident Flows at Stream Confluences	Kilgore Consulting and Management	22,000	10/1/2012	5/31/2013	Completed---Supplemented initial effort of NCHRP project 15-36
15-37	Revision of the AASHTO Guide for the Development of Bicycle Facilities	Toole Design Group	249,976	3/12/2007	3/1/2010	Completed---Published by AASHTO
15-38	Design Requirements for Culvert Joints	Queens University	369,998	5/29/2009	4/30/2012	Completed---Agency report available as NCHRP Web-Only Document 190
15-39	Superelevation Criteria for Sharp Horizontal Curves on Steep Grades	Midwest Research Institute	500,000	6/29/2010	3/31/2014	Completed---Published as NCHRP Report 774
15-40	Design Guidance for High-Speed to Low-Speed Transition Zones for Rural Highways	Midwest Research Institute	300,000	4/22/2010	7/30/2012	Completed---Published as NCHRP Report 737
15-41	Sag Vertical Curve Design Criteria for Headlight Sight Distance	Virginia Polytechnic Institute	250,000	5/24/2010	11/24/2012	Completed---Agency report available as NCHRP Web-Only Document 198
15-42	Recommended Bicycle Lane Widths for Various Roadway Characteristics	Midwest Research Institute	300,000	6/27/2010	2/1/2014	Completed---Published as NCHRP Report 766
15-43	Second Edition of the TRB Access Management Manual	University of South Florida	400,000	5/2/2011	8/31/2013	Completed---Published as the Second Edition of the TRB Access Management Manual
15-44	Guidelines for the Use of Mobile LIDAR in Transportation Applications	Oregon State University	361,428	9/14/2011	6/30/2015	Implementation activities in progress; final report published as NCHRP Report 748
15-45	Proposed Update of the AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities	Sprinkle Consulting, Inc.	349,454	4/12/2012	1/12/2015	Research completed; draft final guide under review
15-46	Design-Management Guide for Design-Build and Construction Manager/General Contractor Projects	University of Florida	400,000	5/2/2012	7/2/2014	Completed---Published as NCHRP Report 787
15-47	Developing an Improved Highway Geometric Design Process	CH2M Hill	524,967	3/15/2013	12/14/2015	Research in progress
15-48	Developing a Methodology for Designing Low and Intermediate Speed Roadways that Serve All Users	Gresham, Smith and Partners	499,900	7/22/2013	12/31/2015	Research in progress; interim report pending
15-49	Geometric Design Guidelines for Managed Lanes	Texas A&M Transportation Institute	750,000	9/1/2013	5/31/2015	Research in progress; Phase II studies underway
15-50	Guidelines for Integrating Safety and Cost-Effectiveness into Resurfacing, Restoration, and Rehabilitation Projects	MRIGlobal	600,000	7/3/2013	7/2/2015	Research in progress
15-51	Preconstruction Services Cost Estimating Guide	Iowa State University	424,995	3/27/2013	9/26/2015	Research in progress

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
15-52	Developing a Context-Sensitive Functional Classification System for More Flexibility in Geometric Design	----	250,000			Contract pending
15-53	Roadside Design for Conflicts in Proximity to Bridge Ends and Intersecting Roadways	KLS Engineering LLC	499,767	8/25/2014	8/25/2017	Research in progress
15-54	Proposed Modifications to AASHTO Culvert Load Rating Specifications	----	600,000			In development
15-55	Guidance to Predict and Mitigate Hydroplaning on Roadways	----	450,000			In development
15-56	Ramp Design Speed Selection	----	400,000			In development
15-57	Interaction Effects between Freeway and Surface Street Facilities: System Considerations in a Highway Capacity Context	----	500,000			In development
15-58	An Assessment of Safety and Geometric Design Criteria for Diverging Diamond Interchanges	Combined				Being incorporated into NCHRP project 03-113
15-59	Horizontal Sightline Offset Criteria for Freeways, Ramps, and Other Similar Roadways	----	400,000			In development
15-60	Update of the AASHTO Guide for the Development of Bicycle Facilities	----	400,000			In development

AREA SIXTEEN : DESIGN--ROADSIDE DEVELOPMENT

16-01	Effects of Deicing Compounds on Vegetation and Water Supplies	Virginia Polytechnic Institute	217,300	3/1/1966	4/30/1972	Completed---Published as NCHRP Reports 91 and 170
16-02	Evaluation of Research on Roadside Development	Western States	100,000	10/1/1967	3/31/1969	Completed---Published as NCHRP Report 137
16-03	Erosion Control During Highway Construction	Utah State University	250,000	11/1/1973	11/30/1979	Completed---Published as NCHRP Reports 220 and 221
16-04	Design Guidelines for Safe and Aesthetic Roadside Treatments in Urban Areas	Georgia Institute of Technology	350,000	10/24/2003	12/31/2007	Completed---Published as NCHRP Report 612
16-05	Guidelines for Cost-Effective Safety Treatments of Roadside Ditches	Texas A&M Research Foundation	400,000	5/14/2010	6/30/2015	Research in progress; Phase II underway

AREA SEVENTEEN : TRAFFIC--SAFETY

17-01	Development of Improved Methods for Reduction of Traffic Accidents	Cornell Aero Lab	247,847	2/1/1966	5/31/1968	Completed---Published as NCHRP Report 79
17-02	Methods for Evaluating Highway Safety Improvements	ORI	29,973	1/10/1972	6/20/1972	Contract cancelled---No report; continued under Project 17-02A
17-02A	Methods for Evaluating Highway Safety Improvements	Jorgensen & Associates	98,403	2/1/1973	7/31/1974	Completed---Published as NCHRP Report 162

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
17-03	Application of Traffic Conflicts Analysis at Intersections	Midwest Research Institute	190,000	12/15/1977	10/31/1979	Completed---Published as NCHRP Report 219
17-04	Evaluation of Traffic Controls for Street and Highway Work Zones	BioTechnology	200,000	1/2/1978	6/30/1979	Completed---Report included in NCHRP Report 236
17-04(02)	Evaluation of Traffic Cones and Tubes for Street and Highway Work Zones	BioTechnology	125,000	4/23/1980	9/30/1981	Completed---Published as NCHRP Report 236
17-05	Effectiveness of Clear Recovery Zones	Midwest Research Institute	200,000	4/1/1980	4/30/1982	Completed---Published as NCHRP Report 247
17-06	Service Vehicle Lighting and Traffic Control Systems for Short-Term and Moving Work Zones---Phase I	BioTechnology	85,069	11/1/1982	7/24/1984	Completed---Continued under Project 17-06A
17-06A	Service Vehicle Lighting and Traffic Control Systems for Short-Term and Moving Work Zones---Phase II	Transportation Research Corporation	252,277	1/2/1990	2/28/1990	Completed---Published as NCHRP Report 337
17-07	Guidelines for Converting STOP to YIELD Control at Intersections	Bellomo-McGee, Inc.	200,000	12/16/1988	5/15/1989	Completed---Published as NCHRP Report 320
17-08	Traffic Barrier and Control Treatments for Restricted Work Zones	Texas A&M University	500,000	6/1/1988	6/30/1993	Completed---Published as NCHRP Report 358
17-09	Effect of Highway Standards on Safety	Bellomo-McGee, Inc.	200,000	2/15/1992	12/31/1994	Completed---Published as NCHRP Report 374
17-09(02)	Impacts of Resurfacing Projects With and Without Additional Safety Improvements	Bellomo-McGee, Inc.	300,000	10/1/1995	2/28/2000	Completed---Summarized in NCHRP Research Results Digest 255
17-10	Structural Supports for Highway Signs, Luminaires, and Traffic Signals	University of Alabama - Birmingham	299,970	2/1/1994	12/1/1997	Completed---Published as NCHRP Report 411; specifications adopted by AASHTO
17-10(02)	Structural Supports for Highway Signs, Luminaires, and Traffic Signals	University of Alabama - Birmingham	366,292	3/10/1999	5/31/2002	Completed---Published as NCHRP Report 494
17-11	Determination of Safe/Cost Effective Roadside Slopes and Associated Clear Distances	Texas A&M University	500,000	3/1/1995	7/30/2004	Completed---Research continued under 17-11(02)
17-11(02)	Development of Clear Recovery Area Guidelines	Texas A&M University	270,000	9/7/2008	4/30/2015	Research in progress; interim report pending
17-12	Improved Safety Information to Support Highway Design	Northwestern University	199,982	1/30/1995	12/31/1997	Completed---Published as NCHRP Report 430; summarized in NCHRP Research Results Digest 239
17-13	Strategic Plan for Improving Roadside Safety	-----	200,000	4/1/1995	6/30/2000	Completed--Summarized in NCHRP Research Results Digests 220 and 256; agency report available as NCHRP Web-Only Document 33
17-13A	Barrier Runout Length Assessment	McGinnis, Richard G./Bucknell Univ.	15,500	5/1/2002	12/31/2004	Completed---Report available on request
17-14	Improved Guidelines for Median Safety	Bellomo-McGee, Inc.	565,000	3/1/1997	9/30/2000	Continued under Project 17-14(02)

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
17-14(02)	Improved Guidelines for Median Safety	Bellomo-McGee, Inc.	148,500	12/19/2002	9/18/2004	Completed---Contractor's report available on NCHRP project web page
17-15	Accident Mitigation on Congested Rural and Exurban Two- and Three-Lane Highways	Texas A&M University	250,000	4/1/1997	11/30/1999	Completed---Published as NCHRP Report 440
17-16	Accident Warrant for Traffic Signals	Bellomo-McGee, Inc.	391,915	3/1/1997	1/31/2003	Completed---Published as NCHRP Report 491
17-17	Development of Guidelines for Nighttime Road Work to Improve Safety and Operations	Last Resource	249,929	1/15/1997	9/30/2000	Completed---Report not published; included in Project 17-17(02)
17-17(02)	Development of Guidelines for Nighttime Road Work to Improve Safety and Operations	Last Resource	222,599	10/1/2000	5/28/2004	Completed---Published as NCHRP Reports 475 and 476; summarized in NCHRP Research Results Digest 293; available on CRP-CD-50
17-18	AASHTO Strategic Highway Safety Plan Implementation Support	Northwestern University	49,989	9/15/1998	8/14/1999	Completed---Report not published; information included in Project 17-18(02) write-up on CRP website
17-18(02)	Implementation of the AASHTO Strategic Highway Safety Plan - Website	Texas A&M University	30,992	11/1/2000	5/1/2002	Completed---Website transferred to AASHTO
17-18(03)	Guidance for Implementation of the AASHTO Strategic Highway Safety Plan	CH2M Hill	4,271,630	3/22/2000	6/30/2009	Completed---Published as NCHRP Report 500, Volumes 1-23
17-18(03)A	Pooled Fund Study 2 (209): Enhanced Guidance for Implementing Safety Strategies in Support of NCHRP Project 17-18(03)	CH2M Hill	150,000	5/7/2004	12/31/2006	Completed---Provided technical assistance to state DOTs
17-18(04)	Highway Safety Manual	Bellomo-McGee, Inc.	199,996	1/4/2001	10/31/2003	Completed---Summarized in NCHRP Research Results Digest 286; agency report available as NCHRP Web-Only Document 62
17-18(05)	Integrated Management Process to Reduce Highway Injuries and Fatalities Statewide	iTRANS Consulting, Inc.	268,438	8/28/2001	3/31/2003	Completed---Published as NCHRP Report 501
17-18(05)A	Integrated Safety Management Process--Iowa Technical Support	iTRANS Consulting, Inc.	30,300	5/27/2003	9/26/2003	Completed---Report not published
17-18(05)B	Integrated Safety Management Process--Technical Support	iTRANS Consulting, Inc.	498,604	9/12/2003	12/31/2006	Completed; assisted state DOTs
17-18(06)	AASHTO Strategic Highway Safety Plan Case Studies	Transportation Safety Management Systems	25,000	2/1/2001	6/30/2001	Completed---Summarized in NCHRP Research Results Digest 265
17-18(07)	AASHTO Strategic Highway Safety Plan - Technology Transfer Plan	Roy Jorgensen Associates, Inc.	150,000	7/3/2001	12/30/2002	Completed---Report not published

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
17-18(08)	Comprehensive Human Factors Guidelines for Road Systems	Westat, Inc.	200,031	9/28/2001	1/31/2005	Completed---Summarized in NCHRP Research Results Digest 296; agency report available as NCHRP Web-Only Document 70
17-18(09)	Coordinated Safety Research Approach	Transportation Research Corporation	49,971	10/23/2001	2/28/2003	Completed---Workshop summary report available on request
17-18(09)A	Coordinated Safety Research Approach	TRB Studies and Special Programs Division	200,000			Completed---Published as TRB Special Report 292
17-18(09)B	Coordinated Safety Research Approach	TRB Studies and Special Programs Division	75,000			Completed---Additional search capability added to TRIS
17-18(09)C	Coordinated Safety Research Approach	TRB Technical Activities Division	75,000			Completed---Summarized in NCHRP Research Results Digest 302
17-18(10)	Safe Landscaping Awareness Course/Landscape Architect Training	University of North Carolina - Chapel Hill	38,000	3/21/2003	3/20/2004	Completed---Training materials provided to FHWA
17-18(11)	Marketing Plan and Products	Van Ryan Banks, Inc.	265,365	4/15/2003	9/30/2005	Completed---Newsletters and one-page summaries of NCHRP Report 500 volumes published
17-18(11)A	Publication of Documents	Synergy Incorporated	8,069	5/22/2003	12/31/2003	Completed
17-18(11)B	Publication of Documents	Synergy Incorporated	4,201	5/22/2003	12/31/2003	Completed
17-18(11)C	Publication of Documents	Synergy Incorporated	2,699	8/28/2003	12/31/2003	Completed
17-18(11)D	Implementation Products	Van Ryan Banks, Inc.	32,529	4/24/2006	2/24/2007	Completed---One-page summaries of NCHRP Report 500 volumes published
17-18(12)	Rewrite of the Unsignalized Intersection Guide for Local Agencies	Wilson, Eugene	25,000	7/4/2003	11/25/2003	Completed---Report available on request
17-18(13)	Integrated Safety Management Process/Safety-Conscious Planning Coordination	TRB Technical Activities Division	20,000	9/12/2003	6/30/2007	Completed
17-18(14)	Lane Departure Video	Van Ryan Banks, Inc.	36,840	5/6/2005	9/5/2005	Completed---Video distributed to state DOTs
17-18(15)	Local Highway Agency Safety Guides	CH2M Hill	365,057	6/2/2006	6/30/2012	Contractor's final report overdue; awaiting contractor edits
17-18(16)	Safety Workshops and Case Studies	Mercer Consulting Group	107,284	9/14/2006	10/31/2007	Completed---Final reports available on request
17-18(17)	Facilitating Safety Leadership Forum III	Howard/Stein-Hudson Associates	8,000	4/11/2007	5/15/2007	Completed; provided service
17-18(18)	Safety Report Summaries	Ferguson International LLC	24,570	10/29/2007	12/31/2008	Completed---Reports available on request
17-18(19)	White Paper on Alternate Strategies for Safety Improvement Investments	CH2M Hill	60,198	10/27/2008	7/31/2009	Completed---Summarized in NCHRP Research Results Digest 345

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
17-19	Implementation of Model Deployment Strategies In AASHTO's Strategic Highway Safety Plan	-----	750,000			Continued under Project 17-18(03); \$750k transferred
17-20	Research for the AASHTO Task Force on Roadside Safety	Various	200,000			Completed---See individual tasks
17-20/Task 01	Publication of the Year 2000 Roadside Design Guide	Trauner Consulting Services	34,999	11/15/2000	11/30/2001	Completed---Final report delivered to AASHTO for use in updating the Year 2000 Roadside Design Guide
17-20/Task 02	Identification of Specific References Used in Developing Criteria and Recommendations in the Roadside Design Guide	Nystrom, Kimberly	55,900	7/8/2002	6/30/2004	Completed---Sent to AASHTO TFORS
17-20/Task 03	Research for the AASHTO Task Force for Roadside Safety	University of Nebraska - Lincoln	50,000	10/10/2003	2/9/2005	Completed---Sent to AASHTO TFORS
17-20/Task 04	Safety Evaluation and Crash Testing of Secure Mailboxes	George Washington University	25,000	5/16/2002	2/28/2003	Completed---Sent to AASHTO TFORS
17-20/Task 05	Full Scale Crash Test to Evaluate the Safety Performance of Secure Mailboxes	George Washington University	25,000	2/4/2004	1/27/2005	Terminated
17-21	Safety of U-Turns at Unsignalized Median Openings	Midwest Research Institute	320,000	11/6/2000	1/30/2004	Completed---Published as NCHRP Report 524
17-22	Identification of Vehicular Impact Conditions Associated with Serious Ran-Off-Road Crashes	University of Nebraska - Lincoln	634,521	8/15/2001	8/31/2009	Completed---Published as NCHRP Report 665
17-23	Safety Profile and Other Implications of Changed Speed Limits on High Speed Roads	Charles River Associates	350,000	7/23/2002	4/1/2006	Completed---Summarized in NCHRP Research Results Digest 303
17-24	Use of Event Data Recorder (EDR) Technology for Highway Crash Data Analysis	Rowan University	249,715	5/1/2002	6/30/2004	Completed---Summarized in NCHRP Research Results Digest 298; agency report available as NCHRP Web-Only Document 75
17-25	Crash Reduction Factors for Traffic Engineering and ITS Improvements	University of North Carolina - Chapel Hill	550,000	8/1/2003	2/29/2008	Completed---Published as NCHRP Report 617
17-26	Methodology to Predict the Safety Performance of Urban and Suburban Arterials	Midwest Research Institute	1,096,403	6/2/2003	3/31/2008	Completed---Chapter 10 of Highway Safety Manual to NCHRP Project 17-36 contractor; agency report available as NCHRP Web-Only Document 129
17-26(02)	Software Development of Highway Safety Manual Multilane Rural Highway and Urban/Suburban Arterial Crash Prediction Algorithms	ITT Corporation	66,424	12/14/2007	12/13/2008	Completed---Research continued under 17-26(02)A
17-26(02)A	Software Development of Highway Safety Manual Multilane Rural Highway and Urban/Suburban Arterial Crash Prediction Algorithms	ITT Corporation	128,267	7/16/2009	4/15/2010	Completed---Software included in FHWA's IHSDM

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
17-27	Prepare Parts I and II of the Highway Safety Manual	iTRANS Consulting, Inc.	530,520	5/14/2004	6/30/2007	Completed; chapters 1-7 to NCHRP Project 17-36 contractor
17-28	Pavement Marking Materials and Markers: Safety Impact and Cost-Effectiveness	iTRANS Consulting, Inc.	578,305	2/18/2004	2/17/2007	Completed---Agency report available as NCHRP Web-Only Document 92; summarized in NCHRP Research Results Digest 305
17-29	Methodology to Predict the Safety Performance of Rural Multilane Highways	Texas A&M University	695,937	7/1/2004	4/30/2008	Completed---Chapter 9 of Highway Safety Manual to NCHRP Project 17-36 contractor; agency report available as NCHRP Web-Only Document 126
17-30	Traffic Safety Evaluation of Nighttime and Daytime Work Zones	Texas A&M University	500,000	5/1/2004	7/31/2008	Completed---Published as NCHRP Report 627
17-31	Human Factors Guidelines for Road Systems - Phase 2	Battelle	399,946	8/1/2005	8/31/2008	Completed---Published as NCHRP Reports 600A and 600B; compiled into NCHRP Report 600 Second Edition
17-32	Guidance for the Design and Application of Shoulder and Centerline Rumble Strips	Midwest Research Institute	600,000	6/10/2005	3/31/2009	Completed---Published as NCHRP Report 641
17-33	Effectiveness of Behavioral Highway Safety Countermeasures	Preusser Research Group, Inc.	600,000	3/25/2005	3/31/2008	Completed---Published as NCHRP Report 622
17-34	Prepare Parts IV and V of the Highway Safety Manual	Kittelson & Associates	200,000	6/17/2005	12/31/2006	Completed; published as chapters 11-16 of Highway Safety Manual (NCHRP Project 17-36)
17-35	Evaluation of Safety Strategies at Signalized Intersections	University of North Carolina - Chapel Hill	750,000	11/1/2006	5/31/2011	Completed---Published as NCHRP Report 705
17-36	Production of the First Edition of the Highway Safety Manual	Kittelson & Associates	1,067,034	6/19/2006	2/28/2010	Completed---Published by AASHTO
17-37	Pedestrian Predictive Crash Methodology for Urban and Suburban Arterials	Combined				Completed under Project 17-26; \$400k transferred
17-38	HSM Implementation and Training Materials	Oregon State University	485,502	6/25/2008	5/31/2011	Completed---Published as NCHRP Report 715 and CRP-CD-106
17-39	Implementing a Highway Safety Improvement Program	Deja Program Development	86,459	8/22/2006	5/30/2007	Completed---Report available on request
17-40	Model Curriculum for Highway Safety Core Competencies	Cambridge Systematics	394,720	4/4/2007	6/30/2010	Completed---Published as NCHRP Report 679 and CRP-CD-84
17-41	Human Factors Guidelines for Road Systems-Phase III	Battelle Memorial Institute	400,000	3/5/2008	3/31/2010	Completed---Published as NCHRP Report 600C; compiled into NCHRP Report 600 Second Edition; see also NCHRP Project 17-47

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
17-42	Development of Information and Data to Support Improved Safety Management and Communication of Safety Needs	Travel	330,451			Support for 17-42 activities
17-42(02)	Transportation Safety Web Portal	Penna Powers Brian Haynes	73,088	12/14/2007	12/31/2008	Completed
17-42(02)A	Transportation Safety Web Portal	Penna Powers Brian Haynes	4,559	3/24/2010	12/31/2011	Website development for AASHTO completed
17-42(03)	Strategic Highway Safety Plan Peer Exchange	Mercer Consulting Group	23,745	4/1/2008	2/28/2009	Completed---Final report available on request
17-42(04)	Support for AASHTO Subcommittee on Safety Management	Deja Program Development	72,666	8/1/2008	12/31/2012	Completed---Support for AASHTO committee
17-42(05)	Safety Leadership Forum	Mercer Consulting Group	20,050	10/1/2008	7/31/2009	Completed---Final report available on request
17-42(06)	Support for AASHTO Subcommittee on Safety Management	Deja Program Development	14,500	5/20/2013	12/31/2014	Completed---Final reports sent to AASHTO
17-43	Long-Term Roadside Crash Data Collection Program	Virginia Polytechnic Institute	1,000,000	4/27/2010	6/30/2016	Research in progress; interim report pending
17-44	Factors Contributing to Median Encroachments and Cross-Median Crashes	Midwest Research Institute	500,000	3/6/2009	8/6/2013	Completed---Published as NCHRP Report 790
17-45	Enhanced Safety Prediction Methodology and Analysis Tool for Freeways and Interchanges	Texas A&M Research Foundation	668,954	5/11/2009	8/31/2012	Completed---Final report sent to AASHTO and published as an HSM interim update
17-46	Comprehensive Analysis Framework for Safety Investment Decisions	Cambridge Systematics	912,884	4/14/2010	11/30/2015	Research in progress; contractor's draft final report pending; Phase 3 underway
17-47	Human Factors Guidelines for Road Systems	Battelle Memorial Institute	499,941	10/22/2009	4/30/2014	Completed---Published as NCHRP Report 600 Second Edition; implementation tasks underway, lead states training; coordination activities with FHWA
17-48	Highway Infrastructure and Operations Safety Research Needs	University of North Carolina - Chapel Hill	500,000	4/5/2010	4/30/2013	Completed---Published as NCHRP Report 756
17-49	Guide for Effective Tribal Crash Reporting	University of Wisconsin - Madison	200,000	7/15/2011	6/30/2014	Completed---Published as NCHRP Report 788 and CRP-CD-155
17-50	Lead States Initiative for Implementing the Highway Safety	CH2M Hill	299,000	1/11/2011	12/31/2016	Research in progress; 2 additional peer exchanges and webinars to be scheduled; contractor's draft user guide and final report pending
17-51	Input to the Development of a National Highway Safety Strategy	Travel	450,000			Research in progress; support for 17-51(x) activities
17-51(02)	SHSP Peer Exchange and Safety Forum	Mercer Consulting Group	57,300	9/22/2010	9/21/2011	Completed---Final report available upon request

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
17-51(03)	Communication Plan for the National Highway Safety Strategy	Penna Powers Brian Haynes	100,000	6/24/2011	6/30/2015	Research in progress in conjunction with 17-51(04); see NCHRP project 17-64 for follow-on activity
17-51(04)	Development of a National Strategy on Highway Safety	CH2M HILL	249,941	6/2/2011	6/30/2012	Completed---Contractor's final report sent to AASHTO
17-52	Using Peer Exchanges to Improve the Effectiveness of a State's Strategic Highway Safety Plan	Science Applications International Corporation	199,496	4/15/2011	6/30/2013	Completed---Published as NCHRP Report 764
17-53	Evaluation of the 13 Controlling Criteria for Geometric Design	Midwest Research Institute	600,000	3/28/2011	1/27/2014	Completed---Published as NCHRP Report 783
17-54	Consideration of Roadside Features in the Highway Safety Manual	Roadsafe LLC	800,000	4/4/2011	9/30/2016	Research in progress; Phase 2 underway; initiating Phase 3
17-55	Guidelines for Slope Traversability	Texas A&M Research Foundation	500,000	5/2/2012	3/31/2016	Research in progress; interim report pending
17-56	Development of Crash Modification Factors for Uncontrolled Pedestrian Crossing Treatments	University of North Carolina - Chapel Hill	500,000	11/1/2012	7/31/2015	Research in progress; interim report pending
17-57	Development of a Comprehensive Approach for Serious Traffic Crash Injury Measurement and Reporting Systems	University of Michigan	449,986	5/22/2012	4/30/2015	Research in progress also in coordination with NCHRP project 20-24(37)K; final report pending
17-58	Safety Prediction Models for Six-Lane and One-Way Urban and Suburban Arterials	Texas A&M Transportation Institute	599,910	1/14/2013	1/13/2016	Research in progress; interim report pending
17-59	Safety Impacts of Intersection Sight Distance	Vanasse Hangen Brustlin, Inc.	450,000	5/14/2012	6/30/2015	Research in progress; third interim report pending
17-60	Cost-Benefit Metrics for Behavioral Highway Safety Countermeasures	HDR Engineering, Inc.	499,841	4/16/2012	3/31/2015	Research in progress; interim report pending
17-61	Work Zone Crash Characteristics and Countermeasure Guidance	Texas A&M Research Foundation	600,000	9/19/2012	3/18/2015	Research in progress; final report pending
17-62	Improved Prediction Models for Crash Types and Crash Severities	University of Connecticut	600,000	7/2/2013	1/31/2016	Research in progress; interim report pending
17-63	Guidance for the Development and Application of Crash Modification Factors	University of North Carolina - Chapel Hill	600,000	8/1/2013	2/1/2016	Research in progress; interim report pending
17-64	Guidance for the Implementation of the Toward Zero Deaths National Highway Safety Strategy	-----	500,000			In development; currently on hold pending coordination with AASHTO
17-65	Improved Analysis of Two-Lane Highway Capacity and Operational Performance	University of Florida	499,213	9/22/2014	12/22/2016	Research in progress; interim report pending
17-66	Guidance for Selection of Appropriate Countermeasures for Opposite Direction Crashes	Texas A&M Transportation Institute	350,000	8/27/2014	8/27/2016	Research in progress
17-67	Identification of Factors Contributing to the Decline of Traffic Fatalities in the United States	University of Michigan	299,738	9/22/2014	9/22/2016	Research in progress

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
17-68	Intersection Crash Prediction Methods for the Highway Safety Manual	MRIGlobal	600,000	9/1/2014	9/1/2017	Research in progress
17-69	A Strategic Approach to Transforming Traffic Safety Culture to Reduce Deaths and Injuries	Montana State University	299,989	7/1/2014	7/1/2016	Research in progress; interim report pending
17-70	Development of Roundabout Crash Prediction Models and Methods	Kittelson & Associates	600,000	7/14/2014	11/14/2016	Research in progress; interim report pending
17-71	Development and Preparation of Materials for the Highway Safety Manual and Associated Documents	----	800,000			In development
17-72	Update of Crash Modification Factors for the Highway Safety Manual	----	400,000			In development
17-73	Developing a Systemic Safety Analysis Tool for Pedestrians	----	300,000			In development
AREA EIGHTEEN : MATERIALS AND CONSTRUCTION--CONCRETE MATERIALS						
18-01	Revibration of Retarded Concrete for Continuous Bridge Decks	University of Illinois	103,895	9/1/1967	12/1/1969	Completed---Published as NCHRP Report 106
18-02	Use of Polymers in Highway Concrete	Lehigh University	300,000	10/1/1972	9/30/1975	Completed---Published as NCHRP Report 190
18-02(02)	Polymer Concrete in Highway Bridge Decks	Lehigh University	30,000	1/1/1978	3/15/1979	Completed---Report not published; for avail. see Summary of Progress Through 1988
18-02(03)	Long-Term Rehabilitation of Salt-Contaminated Bridge Decks	Lehigh University	199,900	5/1/1980	4/29/1983	Completed---Published as NCHRP Report 257
18-03	Silica Fume Concrete for Bridge Decks	Construction Technology Laboratories	314,194	3/1/1995	9/30/1997	Completed---Published as NCHRP Report 410
18-04A	Durability of "Early-Opening-to-Traffic" Portland Cement Concrete for Pavement Rehabilitation: Background and Plan for Evaluation	Texas A&M University	42,968	11/15/1997	9/30/1998	Completed---Agency report available on request
18-04B	Durability of "Early-Opening-to-Traffic" Portland Cement Concrete for Pavement Rehabilitation	Michigan Tech University	349,734	4/3/2000	7/15/2004	Completed---Published as NCHRP Report 540
18-05	Relationship of Portland Cement Characteristics to Concrete Durability	Pennsylvania State University	400,000	4/7/1997	4/30/2001	Completed---Summarized in NCHRP Research Results Digest 270
18-06	Service Life of Corrosion-Damaged Reinforced Concrete Bridge Superstructure Elements (Phase I)	Michigan State University	19,675	1/4/2000	8/31/2001	Completed---Phase I only; continued under Project 18-06A
18-06A	Service Life of Corrosion-Damaged Reinforced Concrete Bridge Superstructure Elements	Concorr, Inc.	350,000	4/10/2001	11/30/2005	Completed---Published as NCHRP Report 558
18-07	Prestress Losses in Pretensioned High-Strength Concrete Bridge Girders	University of Nebraska - Lincoln	300,000	6/8/1999	8/31/2002	Completed---Published as NCHRP Report 496

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
18-08	Supplementary Cementitious Materials to Enhance Durability of Concrete Bridge Decks (Phase I)	Purdue University	36,592	8/1/2000	3/31/2002	Terminated
18-08A	Supplementary Cementitious Materials to Enhance Durability of Concrete Bridge Decks	Wiss, Janney, Elstner & Associates	400,000	4/16/2003	12/31/2005	Completed---Published as NCHRP Report 566
18-09	Guidelines for Reducing Premature Deterioration of Hydraulic Cement Concrete Pavements	Cancelled				Project cancelled---Smaller study done under 18-09A
18-09A	Guidelines for Reducing Premature Deterioration of Hydraulic Cement Concrete Pavements: Background and Research Plan	Construction Technology Laboratories	50,000	7/7/2000	7/6/2001	Completed---See NCHRP project web page
18-10	Procedures for Evaluating Air-Entraining Admixtures for Highway Concrete	Construction Technology Laboratories	399,272	2/28/2002	1/31/2006	Completed---Published as NCHRP Report 578
18-11	Improved Specifications and Protocols for Acceptance Tests on Processing Additions in Cement Manufacturing	Construction Technology Laboratories	649,924	2/28/2003	9/30/2007	Completed---Published as NCHRP Report 607
18-12	Self-Consolidating Concrete for Precast, Prestressed Concrete Bridge Elements	Université de Sherbrooke	446,491	8/3/2004	5/16/2008	Completed---Published as NCHRP Report 628
18-13	Specifications and Protocols for Acceptance Tests of Fly Ash Used in Highway Concrete	Michigan Tech University	749,125	7/16/2007	9/14/2012	Completed---Published as NCHRP Report 749
18-14	Evaluation and Repair Procedures for Precast/Prestressed Concrete Girders with Longitudinal Cracking in the Web	University of Nebraska - Lincoln	300,000	5/1/2007	11/30/2009	Completed---Published as NCHRP Report 654
18-15	High-Performance/High-Strength Lightweight Concrete for Bridge Girders and Decks	Virginia Polytechnic Institute	749,862	8/21/2007	1/13/2012	Completed---Published as NCHRP Report 733
18-16	Self-Consolidating Concrete for Cast-in-Place Bridge Components	University of Nebraska - Lincoln	449,831	7/1/2011	2/27/2015	Research in progress
18-17	Entrained Air Void System for Durable Highway Concrete	-----	600,000			In development

AREA NINETEEN : ADMINISTRATION--FINANCE

19-01	Budgeting for State Highway Departments	Ernst & Ernst	45,000	9/5/1967	9/4/1968	Completed---Report not published; summarized in NCHRP Research Results Digest 20
19-02(01)	Develop Performance Budgeting System to Serve Highway Maintenance Management	Booz-Allen & Hamilton	6,000	9/2/1968	10/31/1968	Completed---Working plan; not published
19-02(02)	Develop Performance Budgeting System to Serve Highway Maintenance Management	Ernst & Ernst	6,000	9/2/1968	10/31/1968	Completed---Working plan; not published

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
19-02(03)	Develop Performance Budgeting System to Serve Highway Maintenance Management	Jorgensen & Associates	6,000	9/2/1968	10/31/1968	Completed---Continued under Project 19-02(04)
19-02(04)	Develop Performance Budgeting System to Serve Highway Maintenance Management	Jorgensen & Associates	220,000	2/1/1969	11/30/1971	Completed---Published as NCHRP Report 131
19-03	Economic Effects of Changes in Legal Vehicle Weights and Dimensions on Highways	Wilbur Smith Associates	96,728	9/15/1970	6/14/1972	Completed---Published as NCHRP Report 141
19-04	A Review of DOT Compliance with GASB 34 Requirements	PB Consult, Inc.	323,881	4/24/2002	1/31/2004	Completed---Published as NCHRP Report 522
19-05	Assessing and Mitigating Future Impacts to the Federal Highway Trust Fund such as Alternative Fuel Consumption	Cambridge Systematics	100,000	6/21/2002	7/31/2003	Completed---Published as NCHRP Web-Only Document 121
19-06	Identifying and Quantifying Rates of State Motor Fuel Tax Evasion	Battelle Memorial Institute	399,970	7/29/2004	6/30/2008	Completed---Published as NCHRP Report 623
19-07	GASB 34 - Methods for Condition Assessment and Preservation	PB Consult, Inc.	249,898	3/21/2005	12/1/2007	Completed---Published as NCHRP Report 608
19-08	Costs of Alternative Revenue-Generation Systems	Battelle Memorial Institute	200,000	3/4/2009	12/30/2010	Completed---Published as NCHRP Report 689
19-09	Truck Tolling - The Role of Freight Markets and Industry Characteristics in Decision Making	Combined				Completed---Agency final report available as NCHRP Web-Only Document 185/NCFRP Web-Only Document 3
19-10	Quantifying the Costs and Benefits of Partnering on Projects Delivered Using Traditional and Alternative Contracting Methods	----	400,000			In development
19-11	Changing the Game: Innovative Solutions to Allocate Risk and Deliver Projects Successfully under Constrained Budget Conditions	----	200,000			In development

AREA TWENTY : SPECIAL PROJECTS

20-01	Highway Research Information Service	Highway Research Board	455,000	3/16/1964	10/31/1967	Completed---Informal publication only; service implemented
20-02	Research Needs in Highway Transportation	Tallamy/Smith	98,760	4/1/1966	12/31/1967	Completed---Published as NCHRP Report 55
20-03	Optimizing Freeway Corridor Operation Through Traffic Surveillance, Communication, and Control	Texas A&M University	594,556 a	12/15/1966	1/31/1969	Completed---Results summarized in Project 20-03C report
20-03A	Optimizing Freeway Corridor Operation Through Traffic Surveillance, Communication, and Control	University of Michigan	525,631 b	11/20/1968	5/31/1971	Completed---Results summarized in Project 20-03C report

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-03B	Optimizing Freeway Corridor Operation Through Traffic Surveillance, Communication, and Control---Summary Reporting	Athol, Patrick J.	31,116	7/1/1972	9/27/1974	Project cancelled---No final report
20-03C	Summary of the Lodge Freeway Research	Taragin, Asriel	10,183	11/15/1975	7/15/1976	Completed---Report not published; for avail. see Summary of Progress Through 1988
20-03D	Summary of All Freeway Surveillance, Communication and Control Experience	Voorhees & Associates	40,000	5/15/1977	12/31/1978	Completed---Special publication; for avail. see Summary of Progress Through 1988
20-04	Public Preference for Future Individual Transportation	Chilton Research	195,260	5/2/1967	1/21/1969	Completed---Published as NCHRP Reports 49 and 82
20-04A	Public Preference for Future Individual Transportation	National Analysts	83,911	5/2/1967	1/2/1968	Completed---Published as NCHRP Reports 49 and 82
20-05	Synthesis of Information Related to Highway Problems	TRB Studies and Special Programs Division	1,750,000	c 12/15/1967		Research ongoing; refer to NCHRP Research Results Digest 343 for topic reports published as NCHRP Syntheses
20-06	Legal Problems Arising Out of Highway Programs	TRB Technical Activities Division	300,000	c 11/1/1968		Research ongoing; published as Selected Studies in Transportation Law (CRP-CD-20, volumes 1-4 and 8) and various NCHRP Legal Research Digests
20-07	Research for AASHTO Standing Committee on Highways	Various	1,200,000	c 12/2/1968		Research ongoing---Refer to project write-up at http://www.trb.org/nchrp
20-08	Interactive Graphic Systems for Highway Design	Control Data	49,672	9/1/1970	7/31/1971	Completed---Report not published; for availability see Summary of Progress Through 1988
20-09	Socioeconomic Consequences of Right-of-Way Acquisition Induced Resident Dislocation	RMC Research Corporation	202,579	8/1/1972	12/17/1976	Completed---Report not published; for availability see Summary of Progress Through 1988
20-10	The Benefits of Separating Pedestrians and Vehicles	Stanford University	100,000	8/26/1974	4/30/1976	Completed---Published as NCHRP Report 189
20-10(02)	The Benefits of Separating Pedestrians and Vehicles	SRI International	100,000	9/1/1978	7/31/1981	Completed---Published as NCHRP Report 240
20-11	Toward Environmental Benefit/Cost Analysis---Measurement Methodology	Polytechnic Institute of New York	100,000	9/1/1972	5/31/1974	Completed---Report not published; for avail. see Summary of Progress Through 1988
20-11A	Toward Environmental Benefit/Cost Analysis---Measurement Methodology	Cornell University	27,212	9/1/1975	11/30/1976	Completed---Report not published; for avail. see Summary of Progress Through 1988

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-11B	Toward Environmental Benefit/Cost Analysis: Energy-Flow Analysis (Manual)	Cornell University	140,450	1/24/1977	5/4/1979	Completed---Report not published; for avail. see Summary of Progress Through 1988; summarized in NCHRP Research Results Digest 114
20-11C	Toward Environmental Benefit/Cost Methodology: Energy-Flow Analysis (Study Design)	Cannon Group	14,786	4/1/1977	3/31/1978	Completed---Report not published; for avail. see Summary of Progress Through 1988
20-12	Effects of Air Pollution Regulations on Highway Construction and Maintenance	Howard, Needles, et al.	80,446	4/1/1974	7/31/1975	Completed---Published as NCHRP Report 191
20-13	Beneficial Environmental Effects Associated with Freeway Construction	Pennsylvania State University	49,965	9/3/1974	8/2/1975	Completed---Published as NCHRP Report 193
20-14	Monitoring Carbon Monoxide Concentrations in Urban Areas	Tech Service Corporation	99,973	10/1/1976	3/31/1978	Completed---Published as NCHRP Report 200
20-14A	Statistical Analysis of Ozone Data for Transportation/Air Quality Planning	SRI International	193,907	9/15/1979	12/18/1981	Completed---Published as NCHRP Report 238
20-15	Ecological Effects of Highway Fills on Wetlands	University of Massachusetts	152,085	12/1/1976	12/31/1979	Completed---Published as NCHRP Reports 218A and 218B
20-16	State Laws and Regulations on Truck Size, Weight, and Speed	R. J. Hansen Associates	281,975	10/11/1976	9/1/1978	Completed---Published as NCHRP Report 198
20-17	Statewide Freight Demand Forecasting Procedures	Cambridge Systematics	73,151	4/1/1979	7/31/1980	Completed---Report not published; for avail. see Summary of Progress Through 1988
20-17A	Application of Statewide Freight Demand Forecasting Techniques	R. Creighton Associates	193,500	6/1/1981	1/31/1984	Completed---Published as NCHRP Report 260
20-18	Evaluation of Highway Air Pollution Dispersion Models	SRI International	207,509	3/15/1979	2/28/1982	Completed---Published as NCHRP Report 245
20-19	Pedestrian Convenience and Safety on Suburban and Rural Highways	JHK & Associates	160,000	5/1/1985	12/31/1986	Completed---Published as NCHRP Reports 294A and 294B
20-19(02)	Pedestrian Safety and Convenience on Suburban and Rural Highways---Implementation Phase	JHK & Associates	146,218	9/1/1987	12/31/1989	Completed---Results incorporated into National Highway Institute courses
20-20	SHRP Pre-Implementation Research	AASHTO	500,000	10/1/1984	9/30/1986	Completed---Report not published; for avail. see Summary of Progress Through 1988
20-20(02)	SHRP Overview and Integration Planning	University of Maryland	90,000	3/15/1985	5/31/1986	Completed---Report not published; for avail. see Summary of Progress Through 1988
20-20(03)	SHRP Detailed Planning for Research on Asphalt Properties	ARE, Inc.	115,000	3/15/1985	1/31/1986	Completed---Report not published; for avail. see Summary of Progress Through 1988

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-20(05)	SHRP Detailed Planning for Research on Maintenance Effectiveness	Texas Research and Development Foundation	90,000	3/15/1985	1/31/1986	Completed---Report not published; for avail. see Summary of Progress Through 1988
20-20(06)	SHRP Detailed Planning for Research on Bridge Component Protection	Manning, David G.	80,000	3/15/1985	1/31/1986	Completed---Report not published; for avail. see Summary of Progress Through 1988
20-20(07)	SHRP Detailed Planning for Research on Cement and Concrete	Construction Technology Laboratories/PCA	75,000	3/15/1985	1/31/1986	Completed---Report not published; for avail. see Summary of Progress Through 1988
20-20(08)	SHRP Detailed Planning for Research on Snow and Ice Removal	USA CRREL	73,781	4/21/1985	2/26/1986	Completed---Report not published; for avail. see Summary of Progress Through 1988
20-21	Development of an Automated Field Survey Data Collection System	ARE, Inc./Cooper Tech	200,000	2/3/1986	5/5/1987	Completed---Published as NCHRP Report 295
20-22	Factors to be Considered by Highway Agencies in the Identification and Remediation of Hazardous Waste Sites	HMM Associates	148,015	11/1/1986	7/1/1988	Completed---Published as NCHRP Report 310
20-23	Kinematic Differential GPS Satellite Surveying	GPS Services/National Geodetic Survey	233,503	9/15/1988	9/14/1990	Completed---Report distributed to sponsors; summarized in NCHRP Research Results Digests 185 and 199
20-24	Administration of Highway and Transportation Agencies	Apogee Research	125,000	5/11/1987	9/30/1988	Completed---Report distributed to sponsors; summarized in NCHRP Research Results Digests 170, 183, and 193
20-24(01)	Using Market Research to Improve the Management of Transportation Systems	Apogee Research	199,923	10/1/1988	9/30/1989	Completed---Published as NCHRP Report 329
20-24(02)	Executive Management Information Systems for State Departments of Transportation	Andersen Consulting	100,000	5/1/1989	10/4/1989	Completed---Report distributed to sponsors; summarized in NCHRP Research Results Digest 173
20-24(03)	Expanding the Civil Engineering Pool	Pennsylvania State University	298,780	7/1/1990	6/30/1994	Completed---Phases I and II published as NCHRP Report 347; Phase III published as NCHRP Report 347-Part II
20-24(03)A	Civil Engineering Careers in Transportation---Outreach Program	AASHTO	100,000	5/1/1992	8/31/1993	Completed---Summarized in NCHRP Research Results Digest 196, revised
20-24(04)	Senior Executive Service, Participant's Manual	Braun, Johns & Golden	25,000	1/1/1988	9/30/1991	Completed---Report provided to AASHTO for publication
20-24(05)	Public Outreach in Transportation Management	Frank Wilson & Associates	99,974	8/1/1991	1/31/1993	Completed---Published as NCHRP Report 364
20-24(06)A	Performance Measures for State Highway and Transportation Agencies	Highway Users Foundation	79,394	8/1/1991	6/2/1993	Completed---Published as NCHRP Report 357

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-24(06)B	Business Systems Plan for Highway Engineering Information	Prodata, Inc.	148,431	8/26/1991	10/31/1992	Completed---Report not published; agency report available on request
20-24(06)C	Information Systems for Transportation Agencies	Stone & Webster Transportation Services	185,660	2/15/1995	6/30/1998	Completed---Report distributed to sponsors; agency report available on request
20-24(07)	Alternatives to the Motor Fuel Tax for Financing Surface Transportation Improvements	Cambridge Systematics	300,000	3/1/1992	10/15/1994	Completed---Published as NCHRP Report 377
20-24(07)A	Alternative Approaches to the Taxation of Heavy Vehicles	Cambridge Systematics	200,000	2/1/1996	10/31/1997	Completed---Published as NCHRP Report 416
20-24(08)	Project 20-24 Series---Revisited	Apogee Research	20,000	4/22/1992	12/31/1994	Completed---Agency report available on request
20-24(09)	State Departments of Transportation---Strategies for Change	National Academy of Public Administration	279,841	6/15/1993	12/14/1994	Completed---Published as NCHRP Report 371
20-24(10)	Customer-Based Quality in Transportation	Howard/Stein-Hudson Associates	92,869	2/1/1994	3/31/1995	Completed---Published as NCHRP Report 376
20-24(11)	Asset Management Guidance for Transportation Agencies	Cambridge Systematics	664,234	10/19/1999	11/15/2002	Completed---Published by AASHTO at http://downloads.transportation.org/amguide.pdf ; summarized in NCHRP Research Results Digest 266
20-24(12)	Avoiding Delays During the Construction Phase of Highway Projects	Pennsylvania State University	120,592	4/18/2000	12/15/2001	Completed---Agency report available on request
20-24(12)A	Improving the Time Performance of Highway Construction Contracts	Pennsylvania State University	207,451	9/3/2004	12/31/2006	Completed---No report
20-24(13)	Innovative Financing Clearinghouse	Parsons Brinckerhoff Quade & Douglas	199,359	8/18/2000	9/14/2002	Completed---Website transferred to AASHTO
20-24(14)	Managing Change in State Departments of Transportation	Various		11/10/2000	4/15/2001	Completed---Agency report available as NCHRP Web-Only Document 39
20-24(14)A	Innovations In DOT Communications, Image, And Positioning	Howard/Stein-Hudson Associates	25,000	10/26/2000	4/30/2001	Completed---Agency report available as NCHRP Web-Only Document 39, Scan 4
20-24(14)B	Innovations In Partnering And Relationship Building In State DOTs	HDR Engineering, Inc.	25,000	10/26/2000	4/30/2001	Completed---Agency report available as NCHRP Web-Only Document 39, Scan 7
20-24(14)C	Innovations in Strategic Leadership and Performance Measurement for State DOTs	Poister, Theodore	25,000	10/26/2000	5/31/2001	Completed---Agency report available as NCHRP Web-Only Document 39, Scan 1
20-24(14)D	Innovations in Private Involvement in Project Delivery	Hancher, Donn	22,500	10/26/2000	5/31/2001	Completed---Agency report available as NCHRP Web-Only Document 39, Scan 2
20-24(14)E	Innovations In Institutionalizing Systems Operations	Tarnoff, Philip	22,500	10/26/2000	5/31/2001	Completed---Agency report available as NCHRP Web-Only Document 39, Scan 3

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-24(14)F	Innovations In Workforce Strategies	Texas A&M University	22,500	11/15/2000	5/31/2001	Completed---Agency report available as NCHRP Web-Only Document 39, Scan 5
20-24(14)G	Innovations In Organization Development as a Result of Information Technology	Battelle Columbus	21,375	10/26/2000	4/30/2001	Completed---Agency report available as NCHRP Web-Only Document 39, Scan 6
20-24(14)H	Innovative Finance	Cambridge Systematics	22,500	11/20/2000	5/31/2001	Completed---Agency report available as NCHRP Web-Only Document 39, Scan 8
20-24(14)I	Managing Change in State Departments of Transportation	Johns, Robert	10,500	10/26/2000	5/31/2001	Completed---No report
20-24(14)J	Managing Change in State Departments of Transportation	Lockwood, Stephen	8,000	10/31/2000	5/31/2001	Completed---No report
20-24(15)	Scoping a Comprehensive Process to Serve Reauthorization Programs & a Review of the Condition and Performance Reporting Process	Pisarski, Alan E.	60,000	12/1/2000	12/31/2001	Completed---Report provided to AASHTO
20-24(16)	AASHTO Experience in Transportation Enhancements	Transmanagement, Inc.	33,499	12/15/2000	4/15/2002	Completed---Report sent to AASHTO
20-24(17)	National Conference on Historic Preservation	Transmanagement, Inc.	42,706	6/15/2001	6/15/2003	Completed---Report sent to AASHTO
20-24(18)	Outsourcing of State DOT Delivery of Capital Programs	Science Applications International Corporation	97,924	3/28/2002	4/30/2003	Completed---Agency report available as NCHRP Web-Only Document 59
20-24(19)	State DOTs and E-Business	Booz-Allen & Hamilton	149,437	9/26/2003	9/25/2004	Completed---Contractor's report available on NCHRP project website
20-24(20)	Using Performance Measures to Manage Change in State Departments of Transportation	TransTech Management, Inc.	100,000	4/16/2002	7/31/2003	Completed---Final report published by AASHTO
20-24(21)	Characteristics of the 21st Century Operations-Oriented State DOT	PB Consult, Inc.	100,000	5/29/2002	10/30/2004	Completed---Results provided to AASHTO
20-24(22)	Best Practices in Partnering with Public Resource Agencies	TransTech Management, Inc.	28,000	10/10/2002	6/30/2003	Completed---Brochure published by AASHTO
20-24(23)A	Assessing the Importance of Transportation for Major Industries and Sectors of the U.S. Economy--Agriculture	North Dakota State University	50,000	5/15/2002	11/21/2003	Completed---Report available on agency website at http://www.ugpti.org/forum/
20-24(23)B	Assessing the Importance of Transportation for Major Industries and Sectors of the U.S. Economy--International Trade	California State University	34,069	9/15/2002	3/31/2003	Completed---Agency report available at http://www.metrans.org/calendar.htm
20-24(23)C	Assessing the Importance of Transportation for Major Industries and Sectors of the U.S. Economy--Congestion	UCLA Foundation	50,000	7/30/2003	12/31/2003	Completed---Agency report available at http://www.uclaextension.edu/publicpolicy
20-24(23)D	Assessing the Importance of Transportation for Major Industries and Sectors of the U.S. Economy--Travel, Tourism, and Recreation	Aubrey C. King and Associates	7,500	8/4/2005	12/31/2005	Completed---Final report delivered to AASHTO

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-24(23)D(01)	Assessing the Importance of Transportation for Major Industries and Sectors of the U.S. Economy with a Focus on Travel, Tourism, and Recreation	Aubrey C. King and Associates	42,500	1/9/2006	9/8/2007	Completed---Final report delivered to AASHTO
20-24(24)A	Transportation Mobility, Access, and Safety for an Aging Population	Burkhardt, Jon	15,000	5/23/2003	10/15/2003	Completed---See NCHRP Project 20-24(24) web page
20-24(24)B	Transportation Mobility, Access, and Safety for an Aging Population	Eberhard, John W.	15,000	5/23/2003	12/31/2003	Completed---See NCHRP Project 20-24(24) web page
20-24(24)B(01)	Transportation Mobility, Access, and Safety for an Aging Population	Eno Transportation Foundation	84,274	4/9/2004	9/30/2005	Completed---See NCHRP Project 20-24(24) web page
20-24(25)	Improving Project Costing and Incorporation of New Attributes -- Highways and Transit	AECOM Consulting Transportation Group	124,998	4/3/2002	7/31/2003	Completed---Final report sent to AASHTO
20-24(26)A	Finance Trends -- Trends in Non-Federal Funding and Debt	PB Consult, Inc.	100,000	2/28/2002	8/15/2002	Completed---Final report sent to AASHTO
20-24(26)B	Trends in Non-Federal Funding and Debt	Urban Land Institute	75,000	3/4/2002	8/31/2002	Completed---Final report sent to AASHTO
20-24(27)	Expanded State and National Investment Analysis Capability-Highways	Cambridge Systematics	246,455	2/14/2002	2/28/2003	Completed---Final report sent to AASHTO
20-24(28)	Rate of Return From Highway Investment	Delcan, Inc.	99,998	10/15/2002	7/31/2003	Completed---Final report sent to AASHTO
20-24(29)	CEO Peer Exchange Workshop for Strategic Leadership	University of Minnesota	99,335	11/15/2002	11/14/2003	Completed---Agency report available from AASHTO and website for the AASHTO Standing Committee on Quality
20-24(30)	Performance Measurement In Context Sensitive Design	TransTech Management, Inc.	100,000	7/2/2003	10/1/2004	Completed---Agency report available as NCHRP Web-Only Document 69
20-24(31)	Effective Program Delivery in a Constrained Fiscal Environment	TransTech Management, Inc.	116,029	6/4/2004	6/1/2007	Completed---Final report delivered to AASHTO
20-24(32)	AASHTO CEO Briefing	Tom Warne & Associates, LLC	15,000			Completed---No report
20-24(33)	Transportation Vision 2010 and Beyond	Various				See individual projects below
20-24(33)A	21st Century Freight Mobility	ICF Consulting, Inc.	80,000	9/12/2003	7/30/2004	Completed---See NCHRP Project 20-24(33) web page
20-24(33)B	Transportation, Technology, and the 21st Century Vehicle	Delcan, Inc.	75,000	8/22/2003	8/31/2004	Completed---See NCHRP Project 20-24(33) web page
20-24(33)C	Vision 2010	Tom Warne & Associates, LLC	60,000	9/24/2003	7/31/2004	Completed---See NCHRP Project 20-24(33) web page
20-24(34)	Commuting in America III	Pisarski, Alan E.	100,000	11/17/2003	9/30/2005	Completed---Published jointly as NCHRP Report 550/TCRP Report 110
20-24(35)	Communicating Urban Congestion Information	Texas A&M University	99,006	8/20/2004	11/19/2006	Completed---Agency report available on NCHRP project web page

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-24(36)	Updating AASHTO's Strategic Plan in CY2004	TransTech Management, Inc.	100,000	3/30/2004	9/30/2005	Completed
20-24(36)A	Updating AASHTO's Strategic Plan in CY2004	TransTech Management, Inc.	50,000	6/20/2004	6/23/2004	Workshop support completed
20-24(37)	Strategic Performance Measures for State DOTs: Benchmarking Performance	TransTech Management, Inc.	100,000	3/19/2004	1/31/2006	Completed---Agency report available on NCHRP project web page
20-24(37)A	Measuring Performance Among State DOTs	TransTech Management, Inc.	75,000	9/8/2006	5/7/2007	Completed---Agency report available on NCHRP project web page
20-24(37)A(01)	Measuring Performance Among State DOTs, Sharing Best Practices-- Construction Schedule and Budget Performance Update	High Street Consulting Group	75,000	7/2/2010	7/1/2011	Completed---Final report delivered to AASHTO; see NCHRP project web page
20-24(37)B	Measuring Performance among State DOTs: Sharing Best Practices (International Roughness Index)	Spy Pond Partners	109,999	9/19/2007	5/18/2008	Completed---Agency report available on NCHRP project web page
20-24(37)C	Measuring Performance Among State DOTs -- Safety	Spy Pond Partners	75,000	10/29/2008	7/28/2009	Completed---Final report available on NCHRP project web page
20-24(37)D	Measuring Performance Among State DOTs -- Operations Performance Using Incident Response Time	University of Maryland	75,000	11/19/2009	12/19/2010	Completed---Results provided to AASHTO
20-24(37)E	Measuring Performance Among State DOTs -- Bridge Conditions	Spy Pond Partners	75,000	9/3/2009	8/31/2010	Completed---Report sent to AASHTO
20-24(37)F	Establishment of Comparative Performance Measures Program Infrastructure to Support System Performance Data Collection and Analysis	Spy Pond Partners	50,000	6/17/2010	8/16/2011	Completed---Final report delivered to AASHTO; see NCHRP website
20-24(37)G	Technical Guidance for National Level Performance Measurements	Cambridge Systematics	175,000	6/22/2010	6/22/2011	Completed---Final report delivered to AASHTO; see NCHRP website
20-24(37)H	Workshop on Transportation-System Performance Measures Suitable for National Use	Spy Pond Partners	75,000	10/22/2010	2/21/2011	Completed---Final report delivered to AASHTO
20-24(37)I	Measuring Performance among State DOTs: Sharing Good Practices -- Congestion	Cambridge Systematics	99,975	3/7/2012	8/7/2013	Completed---Final report sent to AASHTO
20-24(37)J	Measuring Performance among State DOTs: Sharing Good Practices -- Pavement Health	ICF Incorporated	100,000	9/20/2012	12/19/2013	Completed---Final report sent to AASHTO
20-24(37)K	Measuring Performance among State DOTs: Sharing Good Practices -- Safety (Serious Injuries)	Cambridge Systematics	75,000	4/3/2012	11/1/2013	Completed---Final report sent to AASHTO
20-24(37)L	Performance Measure Reporting	ICF Incorporated	199,997	3/22/2012	6/21/2013	Research extended under NCHRP Project 20-24(37)L(01)

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-24(37)L(01)	Research, Development and Implementation of MAP-21 Performance Management Requirements by State DOTs	Spy Pond Partners	200,000	6/26/2013	6/25/2014	Completed---Final documents delivered to AASHTO
20-24(38)	CEO Engagement Options for Discussing Strategic Issues and Sharing Best Practices	University of Minnesota	49,654	4/16/2004	1/31/2005	Completed---See NCHRP website
20-24(39)	Alternative Organizational Designs for State Transportation Departments	TransTech Management, Inc.	220,000	9/22/2005	7/31/2008	Completed---Final report delivered to AASHTO
20-24(40)	Analysis and Benchmarking of State DOT Recruitment and Hiring Practices	B.T. Harder, Inc.	41,685	9/21/2004	12/31/2006	Completed---Final report delivered to AASHTO
20-24(41)	Project Summaries for State DOT CEOs	CTC & Associates LLC	8,840	10/13/2006	3/31/2007	Completed---Available on NCHRP project web page
20-24(42)	Comparison of State DOT Quality Management Systems	Oasis Consulting Services	98,850	1/6/2005	7/7/2006	Completed---Final report delivered to AASHTO
20-24(43)	Innovative Contracting for Major Transportation Projects	Trauner Consulting Services	36,498	6/1/2005	11/1/2005	Completed---Final report delivered to AASHTO
20-24(44)	Highway Safety Leadership Organizational Issues: A Survey of States and Recommendations for Sustaining Progress	McGovern, Thomas M.	99,948	10/25/2005	8/31/2007	Completed---Report available on request
20-24(45)	Executive Seminar, Coordinating Transportation and Land Development: Outlook, Challenges, Success	Local Government Commission	60,000	6/17/2005	1/31/2006	Completed---See NCHRP project web page
20-24(46)	Freight Transportation: New Roles for State DOTs	Cambridge Systematics	72,999	4/12/2005	10/31/2008	Completed---Final report delivered to AASHTO
20-24(47)	Racial and Gender Diversity in State DOTs and Transit Agencies: Phase I Benchmark Scoping	University of Minnesota	39,181	7/15/2005	3/15/2006	Completed---Published as NCHRP Report 585/TCRP Report 120
20-24(48)	Analysis and Benchmarking of State DOT Human Resource Activities	ERS Consulting	50,000	12/23/2005	12/31/2007	Completed---Final report delivered to AASHTO
20-24(49)	Future Financing to Meet Highway and Transit Needs	Cambridge Systematics	375,000	11/23/2005	1/22/2007	Completed---Agency report available as NCHRP Web-Only Document 102
20-24(50)	In-Service Training Needs for State DOTs	Tom Warne & Associates, LLC	50,000	4/1/2005	3/31/2006	Completed---Agency report delivered to AASHTO and available on NCHRP project web page
20-24(51)	State DOT CEO Leadership Forum - 2006	University of Minnesota	99,280	12/27/2005	3/26/2007	Completed---Agency report available from AASHTO
20-24(51)A	Evolving Roles and Partnerships of State DOTs	PB Consult, Inc.	15,000	5/4/2006	1/3/2007	Completed---See NCHRP project web page
20-24(51)B	Building Credibility with Customers/Stakeholders	CH2M Hill	15,000	4/25/2006	12/25/2006	Completed---See NCHRP project web page
20-24(51)C	State DOT Funding and Finance	Cambridge Systematics	15,000	4/25/2006	12/25/2006	Completed---See NCHRP project web page

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-24(52)	Future Options for the National System of Interstate and Defense Highways	PB Consult, Inc.	726,037	5/11/2006	12/5/2007	Completed---Final report delivered to AASHTO
20-24(52)A	(Task 14) Developing a Process to Assess Potentially Underestimated Highway Reconstruction Needs in the US DOT Condition and Performance and AASHTO's Bottom Line Reports	Cancelled				Completed---Final report delivered to AASHTO
20-24(53)	Twenty-First Century Leadership and Management Techniques for State DOTs	Oasis Consulting Services	136,000	3/21/2007	11/1/2008	Completed---Final report delivered to AASHTO
20-24(53)B	Continuation of 21st Century Leadership & Management Techniques for State DOTs	Oasis Consulting Services	110,454	8/20/2010	12/31/2012	Completed---Final report provided to AASHTO
20-24(54)	2006 Bottom Line Report State and National Investment Analysis: Highways	Various				
20-24(54)A	Safety Investment Needs Assessment	CH2M Hill	60,000	4/6/2006	10/5/2006	Completed---See NCHRP project web page
20-24(54)B	Right-of-Way and Environmental Mitigation Costs--Investment Needs Assessment	AECOM Consulting Transportation Group	25,086	4/4/2006	12/3/2006	Completed---See NCHRP project web page
20-24(54)C	System Operations Investment Needs, Measurement, and Analysis	Cambridge Systematics	34,569	4/4/2006	10/3/2006	Completed---See NCHRP project web page
20-24(54)E	Inflation Effects on National Investment Requirements	Cambridge Systematics	45,000	4/14/2006	10/13/2006	Completed---See NCHRP project web page
20-24(54)F	2006 AASHTO Bottom Line Scoping	Pisarski, Alan E.	40,000	4/12/2006	4/30/2007	Completed; report to AASHTO
20-24(54)G	2006 AASHTO Bottom Line Report Support	Cambridge Systematics	300,000	11/7/2007	5/6/2009	Completed---Final report delivered to AASHTO
20-24(55)	National Summit on Future Transportation Funding and Finance Strategies: States and Metropolitan Regions	Cambridge Systematics	183,365	1/26/2007	1/25/2008	Completed---Final report delivered to AASHTO
20-24(56)A	National Leadership Retreat for State and Local Officials to Advance a Vision of the Transportation System Required to Meet Future Needs	North Dakota State University	55,868	6/12/2007	5/11/2008	Completed---See NCHRP website
20-24(56)B	National Leadership Retreat for State and Local Officials to Advance a Vision of the Transportation System Required to Meet Future Needs	Housman & Associates	33,310	4/5/2007	10/4/2007	Completed---See NCHRP website
20-24(57)	AASHTO New CEO Briefings	Tom Warne & Associates, LLC	16,639	4/17/2007	7/16/2008	Completed---No reports
20-24(58)	Toward Developing Performance Based Federal-Aid Programs	Cambridge Systematics	590,000	3/4/2008	12/31/2012	Completed---Documents delivered to AASHTO; additional \$115k from FHWA and \$25k from TCRP; see NCHRP website

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-24(59)	Strategies for Reducing the Impacts of Surface Transportation on Global Climate Change	PB Consult, Inc.	150,000	3/18/2008	3/17/2009	Completed---Final report delivered to AASHTO
20-24(60)	Updating AASHTO's Strategic Plan in CY 2008	Gordon Proctor & Associates, Inc.	174,970	3/11/2008	9/10/2009	Completed---Final report delivered to AASHTO
20-24(61)	Issues and Practices in Performance-Based Maintenance and Operations Management	PB Consult, Inc.	150,000	7/24/2008	1/31/2010	Completed---Final report delivered to AASHTO
20-24(62)	Identification of Marketing Tools that Resonate with Lawmakers and Key Stakeholders to Support and Increase Funding and Revenue for the Nation's Transportation System	PB Consult, Inc.	200,000	11/19/2008	6/30/2010	Completed---Final report delivered to AASHTO
20-24(62)A	Communication Strategies to Enhance Public Understanding of Highway and Transit Program Funding Needs	PB Consult, Inc.	162,785	7/22/2010	3/27/2011	Completed---Final report delivered to AASHTO; see NCHRP website
20-24(63)	Partnership Approaches to Identify, Promote, and Implement Congestion Management Strategies	Cambridge Systematics	125,000	3/4/2008	3/3/2009	Completed---Final report delivered to AASHTO and available on project web page
20-24(64)	Implications of Performance Standards, Conformity-Style Approaches, and Other Mechanisms for Assessing Greenhouse Gas (GHG) Reduction Strategies and Integrating GHG Objectives into Transportation Decision Making	ICF Consulting, Inc.	367,000	3/13/2009	3/13/2010	Completed---Agency report available as NCHRP Web-Only Document 152
20-24(65)	Strengthened Economic Basis for Systematic Selection of Highway and Transit Projects	Cancelled				Project cancelled; funds reprogramed under project 20-24
20-24(66)	Update of Technology and Alternative Fuels Assessment	Cancelled				Project cancelled; funds reprogramed under project 20-24(72)
20-24(67)	State DOT CEO Leadership Forum-Spring/Summer 2009; Pilot Study of State Driven Performance Based Management Reporting	University of Minnesota	150,000	11/26/2008	5/25/2010	Completed---Report published by University of Minnesota and delivered to AASHTO
20-24(68)	Estimating the Costs to State Governments Due to Highway-Related Debilitating Injury and Fatal Crashes	NAVIGATS Inc.	132,290	4/6/2009	7/31/2011	Completed---Crash cost calculator posted on AASHTO Safety Portal at USRoadwaySafety.org
20-24(69)	Implementable Strategies for Shifting to Direct Usage-Based Charges for Transportation Funding	ICF Consulting, Inc.	305,286	3/6/2009	11/30/2010	Completed---Phase 1 agency report available as NCHRP Web-Only Document 143; Phase 2 report available as NCHRP Web-Only Document 161
20-24(70)	Update the 2003 Report Reducing Greenhouse Gas Emissions from U.S. Transportation	Pew Center on Global Climate Change	200,000	11/9/2009	1/9/2011	Completed---Report published by Pew Center and delivered to AASHTO

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-24(71)	Expediting NEPA Decisions and Other Practitioner Strategies for Addressing High Risk Issues in Project Delivery	PB Americas, Inc.	399,769	6/22/2010	4/30/2014	Completed---Contractor's Phase 1 and 2 final reports available as NCHRP Web-Only Document 183, Volumes 1 and 2
20-24(72)	Maximizing Highway Operational Strategies to Reduce Greenhouse Gas (GHG) Emissions	Cancelled	150,000			Project cancelled; funds reprogramed under project 20-24
20-24(73)	Economic and Employment Benefits of Highway Investments in Response to Economic Downturns: A Scoping Study	TRB Studies and Special Programs Division	250,000			Completed---Published as TRB Special Report 312
20-24(74)	Risk Management Practices in State Departments of Transportation	ICF Incorporated	49,999	6/16/2010	5/15/2011	Completed---Final report and executive summary delivered to AASHTO; see NCHRP website
20-24(75)	Development of a Performance Management Roadmap	Cancelled	100,000			Project cancelled; funds reprogramed under project 20-24
20-24(76)	Developing Surface Transportation Funding and Financing Solutions for the Coming Decade	Cancelled				Project cancelled; funds reprogramed under project 20-24
20-24(77)	Support for a TRB-sponsored conference on Strategies for Meeting Critical Data Needs for State and Metropolitan Transportation Agencies	TRB Technical Activities Division	50,000			Completed---Partial support for a TRB Division A technical activity; conference held December 2011
20-24(79)	Specifications for a National Study of the Future 3R, 4R, and Capacity Needs of the Interstate System	Cambridge Systematics	75,000	3/1/2013	12/31/2013	Completed---Final report sent to AASHTO
20-24(80)	Assessing the Economic Benefit of Transportation Infrastructure Investment in a Mature Surface Transportation System	Cambridge Systematics	250,000	10/26/2011	9/30/2013	Completed---Agency report delivered to AASHTO and available on project web page
20-24(80)A	A set-aside for research to be identified under current project NCHRP 20-24(80)	----	500,000			Funds transferred to NCHRP 20-24(89)
20-24(81)	Leading in Lean Times: Maximizing Resources in a Constrained Environment	ICF Incorporated	199,997	9/27/2011	6/27/2012	Completed---Contractor's report delivered to AASHTO
20-24(82)	Increasing Consistency in the Highway Performance Monitoring System for Pavement Reporting	PB Americas, Inc.	99,959	5/29/2012	7/28/2013	Completed---Agency report delivered to AASHTO and available on project web page
20-24(83)	Alternative State DOT Organizational Models for Delivering Services	ICF Incorporated	99,992	2/27/2012	8/8/2012	Completed---Final report delivered to AASHTO; see NCHRP website
20-24(84)	State DOT CEO Leadership Forum 2013	University of Minnesota	198,987	5/29/2012	8/28/2013	Completed---Final report published by University of Minnesota and delivered to AASHTO
20-24(85)	Scoping support for new NCHRP 20-24 projects	----	20,000			Reserved for scope development

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-24(86)	Critical Assessment for Future Surface Transportation Needs Analyses (Refresh the Policy Capacity of the Bottom Line/C&P)	Pisarski, Alan E.	160,000	8/12/2013	8/11/2014	Completed---Report given to AASHTO and available on project web page
20-24(87)	State DOT Administration of Local Road Safety Aid	ICF Incorporated	100,000	4/22/2013	6/21/2014	Completed---Report given to AASHTO and available on project web page
20-24(88)	Performance Measure Coordination, Engagement and Reporting (support for task force)	----	100,000			Research completed; conducted as extension of NCHRP 20-24(37)L
20-24(89)	Role and Value of Transportation for U.S. Industries and Sectors	----	385,000			Research in progress; see below
20-24(89)A	Role and Value of Transportation for U.S. Industries and Sectors—Initial Inquiries	Long, Mindy	15,000	12/4/2013	12/31/2014	Completed
20-24(89)B	Role and Value of Transportation for U.S. Industries and Sectors (Project B)	ICF Consulting, Inc.	250,000	8/7/2014	10/6/2015	Research in progress
20-24(90)	Defining and Communicating a National Vision for Transportation	----	300,000			In development
20-24(91)	State DOT CEO Safety Leadership Forum (Support)	Gordon Proctor & Associates, Inc.	50,000	5/1/2013	10/31/2013	Completed---Final report sent to AASHTO
20-24(92)	Evaluation of State-of-the-Art Transportation Funding and Finance Methods	Mercator Advisors LLC	99,983	9/18/2013	3/17/2015	Research in progress
20-24(93)A	Public Communication -- Outreach	Cancelled				See 20-24(93)C
20-24(93)B(01)	Public Communication -- Management (Phase I)	Cambridge Systematics	50,000	9/26/2013	3/25/2014	Completed---Final report sent to AASHTO
20-24(93)B(02)	Communicating Performance Management-State DOTs Continuing To "Tell Their Story"	Spy Pond Partners	124,969	4/16/2014	4/15/2015	Research in progress
20-24(93)C	Public Communication -- Outreach	Parsons Brinckerhoff	124,955	4/30/2014	4/29/2015	Research in progress
20-24(94)	Support for Development of AASHTO's 2013-2018 Strategic Plan	Cambridge Systematics	380,000	10/8/2013	1/7/2015	Research in progress
20-24(95)	Next Generation Workforce Management	----	325,000			In development
20-24(96)	Improving Organizational Traffic Safety Culture in DOTs	Combined	190,000			Research in progress; being conducted as a domestic scan under NCHRP project 20-68A
20-24(97)	Advancing Performance Management under a National Framework	Spy Pond Partners	240,000	6/13/2014	6/12/2015	Research in progress
20-24(98)A	Connected/Automated Vehicle Research Roadmap for AASHTO	University of California - Berkeley	42,500	8/1/2014	4/30/2015	Research in progress
20-24(98)B	Connected/Automated Vehicle Research Roadmap for AASHTO	Kimley-Horn & Associates	42,500	6/25/2014	6/24/2015	Research in progress
20-24(99)A	Teamwork Between a State Transportation Agency and a Transportation Board or Commission	DeCoster, Thomas A.	40,000	10/16/2014	1/15/2015	Research in progress

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-24(99)B	New CEO Orientation and Peer Exchange Workshop	Parsons Brinckerhoff	210,000	10/24/2014	6/23/2015	Research in progress
20-24(100)	State DOT CEO Leadership Forum – a Focus on Transportation Futures	Cambridge Systematics	200,000	8/13/2014	12/12/2014	Completed
20-24(101)	An Introduction to Knowledge Management and Workforce Issues for CEOs: A CEO Leadership Workshop	----	250,000			In development
20-24(102)	Executive Strategies to Deliver Practical Design	----	200,000			In development
20-24(103)	Peer Exchange on Issues and Communication to Support Economic Competitiveness through Transportation Investments	----	100,000			In development
20-25	Training Needs for Highway Construction Personnel	University of Maryland	73,728	6/15/1989	12/31/1990	Completed---Agency report available on request; summarized in NCHRP Research Results Digest 206
20-25(02)	Training for Highway Construction Personnel	SNI International Resources	224,790	11/1/1991	6/30/1996	Completed---Agency report available on request; summarized in NCHRP Research Results Digest 206
20-25(03)	Development of Training Material for Highway Construction Personnel	SNI International Resources	299,998	4/17/1995	8/7/1997	Completed---Agency report available on request; summarized in NCHRP Research Results Digest 228
20-26	Bond and Insurance Coverages for Highway Construction Contractors	Texas A&M University	99,999	6/1/1989	9/30/1990	Completed---Published as NCHRP Report 341
20-27	Adaptation of Geographic Information Systems for Transportation	University of Wisconsin	220,000	3/1/1990	6/30/1993	Completed---Published as NCHRP Report 359; summarized in NCHRP Research Results Digests 180 and 191
20-27(02)	Development of System and Application Architectures for Geographic Information Systems in Transport	University of Wisconsin - Madison	199,982	4/1/1994	8/31/1997	Completed---Part I report summarized in NCHRP Research Results Digest 218; Part II report summarized in NCHRP Research Results Digest 221
20-27(03)	Guidelines for the Implementation of Multimodal Transportation Location Referencing Systems	University of Wisconsin - Madison	136,000	3/1/1998	4/30/2001	Completed---Published as NCHRP Report 460
20-28	Hazardous Wastes in Highway Rights-of-Way	Transportation Research Board	300,000	4/16/1990	2/1/1992	Completed---Published as NCHRP Report 351
20-29	Development of a Multimodal Framework for Freight Transportation Investment: Consideration of Rail and Highway Trade-Offs	Texas A&M University	150,000	5/15/1992	8/31/1994	Completed---Continued under 20-29(02)
20-29(02)	Development of a Computer Model for Multimodal, Multicriteria Transportation Investment Analysis	Texas A&M University	217,500	12/15/1995	5/31/1999	Completed---Summarized in NCHRP Research Results Digest 258

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-30	NCHRP-IDEA Program	TRB Studies and Special Programs Division	1,250,000 c	7/8/1992		Research ongoing; see project write-up on NCHRP website
20-31	Public Policy for Surface Freight Transportation	TRB Studies and Special Programs Division	200,000	12/1/1992	9/4/1996	Completed---Published as TRB Special Report 246
20-32	Development of a Comprehensive Thesaurus for Transportation Research	CDB Enterprises	225,000	12/1/1993	8/31/1996	Completed---Report not published
20-32(02)	Refinement of Transportation Research Thesaurus and Implementation of Updated TRIS Keyword Index	CDB Enterprises	199,965	12/1/1997	9/30/2000	Completed---Published as NCHRP Report 450 and available on CRP-CD-6
20-33	Facilitating the Implementation of Research Findings	RAND Corporation	499,935	1/22/1993	1/15/1996	Completed---Summarized in NCHRP Research Results Digest 207 and NCHRP Report 382
20-33(02)	The Role of Procurement and Contracting Approaches in Facilitating the Implementation of Research Findings	Trauner Consulting Services	297,120	2/15/1997	12/31/1998	Completed---Published as NCHRP Report 428; summarized in NCHRP Research Results Digest 225
20-34	Developing Measures of Effectiveness for Truck Weight Enforcement Activities	Transportation Research Corporation	499,625	1/1/1994	3/18/1998	Completed---Agency report available as NCHRP Web-Only Document 13; summarized in NCHRP Research Results Digest 229
20-35	Plan for SHRP Follow-Up Studies	TRB Cooperative Research Programs	100,000	6/1/1993	9/30/1995	Completed---Agency report available on request
20-36	Highway Research and Technology--International Information Sharing	TRB Cooperative Research Programs	850,000 c	1/26/1993		Research ongoing; see project write-up on NCHRP website
20-36/Tour 2	Transportation Systems Professional Delegation To India	KT Analytics, Inc.	10,000	7/30/2008	2/28/2010	Completed---Final report sent to AASHTO and tour participants
20-36/Tour 2A	Transportation Systems Professional Delegation To India	People To People	76,455	7/29/2008	11/30/2009	Completed---Final report sent to AASHTO and tour participants
20-36A	Scoping Study for a Joint FHWA/AASHTO Scanning Mission to China	Zhang, Wei-Bin	5,000	7/1/2003	9/24/2003	Completed---Agency report available on request
20-36B	Scan on Transportation and Land Use Planning	Cancelled				Contract cancelled handled by AASHTO directly.
20-37	Strategic Direction for the NCHRP and Other AASHTO Research Activities	Apogee Research	243,642	3/1/1994	3/31/1995	Completed---Report not published
20-38	Development of a Manual for State Transportation Research	Reilly, Horowitz, Harder	118,000	9/1/1994	6/30/1997	Completed---Agency report available on request
20-39	Improved User Access to TRIS Through the AASHTO VAN	Texas Transportation Institute	35,944	11/1/1994	7/31/1995	Completed---Report provided to AASHTO
20-39(02)	Improved Transportation Research-In-Progress Data System	Texas A&M Research Foundation	428,303	3/28/2000	12/31/2011	Completed---Contractor's final report available on request

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-40	Conversion of AASHTO Publications to Metric Units	Texas A&M University	1,208,581	11/10/1994	1/31/1999	Completed---Summarized in NCHRP Research Results Digest 240
20-41	Approaches for Increasing Private-Sector Involvement in Highway Innovation Process	TRB Studies and Special Programs Division	62,500	11/1/1994	6/30/1995	Completed---Published as TRB Special Report 249
20-42	Sustainable Transportation	TRB Studies and Special Programs Division	150,000	5/1/1994	7/31/1998	Completed---Published as TRB Special Report 251
20-43	Application of CD-ROM Technology for AASHTO Technical Documents	Applied Research Associates	319,936	1/8/1996	9/30/1998	Completed---Results provided to AASHTO
20-44	Accelerating the Application of NCHRP Research Results	Various	c	8/1/1995	9/30/2018	Support for various implementation activities continuing
20-45	Scientific Approaches for Transportation Research	Georgia Institute of Technology	199,999	3/23/1998	3/31/2001	Completed---Available on CRP-CD-22; NHI course available
20-46	Systems Approach to Evaluating Innovations for Integration into Highway Practice	Worcester Polytechnic Institute	121,866	7/1/1998	6/30/2000	Completed---Published as NCHRP Report 442
20-47	Quality and Accuracy of Positional Data in Transportation	University of Wisconsin	25,000	7/28/1999	7/27/2001	Contract cancelled
20-47(01)	Quality and Accuracy of Positional Data in Transportation	Battelle Columbus	275,000	12/1/2000	6/1/2003	Completed---Published as NCHRP Report 506 and CRP-CD-41
20-48	Accessibility of Non-English Language Transportation Information	AppTek-L&H	174,228	8/24/1999	11/1/2001	Completed---Summarized in NCHRP Research Results Digest 267
20-48(01)	Making the Business Case for Translating Non-English Transportation Information	Metcalf, J.B.	30,000	6/1/2002	3/31/2003	Completed---Summarized in NCHRP Research Results Digest 279
20-49	Support for LTPP Advisory Structure	TRB Division E	400,000	3/9/1998	3/8/2003	Completed
20-50(01)	LTPP Data Analysis: Data Availability and Facilitation	Mohseni, Alaeddin	50,000	2/11/2002	10/31/2002	Services completed
20-50(02)	LTPP Data Analysis: Relative Performance of Jointed Plain Concrete Pavements with Sealed and Unsealed Joints	Hall, Kathleen T.	74,963	7/29/1999	5/1/2001	Completed---Agency report available as NCHRP Web-Only Document 32
20-50(03/04)	LTPP Data Analysis: Effectiveness of Maintenance and Rehabilitation Options	Hall, Kathleen T.	250,000	10/14/1999	3/31/2002	Completed---Agency report available as NCHRP Web-Only Document 47
20-50(05)	LTPP Data Analysis: Variations in Pavement Design Inputs	Consulpav International	249,991	10/13/1999	10/12/2001	Completed---Agency report available as NCHRP Web-Only Document 48
20-50(06)	LTPP Data Analysis: Verification of Pavement Design Values Using Construction Test Data for SPS-1 and SPS-2 Sites	Cancelled				Project cancelled

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-50(07/12)	LTPP Data Analysis: Daily and Seasonal Variations in Insitu Material Properties	University of Tennessee	349,969	2/7/2000	8/31/2003	Completed---Agency report available as NCHRP Web-Only Document 60
20-50(08/13)	LTPP Data Analysis: Factors Affecting Pavement Smoothness	Soil & Materials Engineers, Inc.	199,998	10/25/1999	12/30/2001	Completed---Agency report available as NCHRP Web-Only Document 40; summarized in NCHRP Research Results Digest 264
20-50(09)	LTPP Data Analysis: Feasibility of Using FWD Deflection Data to Characterize Pavement Construction Quality	Consulpav International	174,996	5/2/2000	6/3/2002	Completed---Agency report available as NCHRP Web-Only Document 52
20-50(10)	LTPP Data Analysis: Factors Affecting the Performance of Flexible and Rigid Pavements	Arizona State University	46,387	4/17/2000	10/16/2001	Contract terminated---Continued under Project 20-50(10/16)
20-50(10/16)	LTPP Data Analysis: Influence of Design and Construction Features on the Response and Performance of New Flexible and Rigid Pavements	Michigan State University	299,216	6/27/2002	2/28/2005	Completed---Agency report available as NCHRP Web-Only Document 74
20-50(11)	LTPP Data Analysis: Significance of Traditional Materials Pay Factors to Pavement Performance	Cancelled				Project cancelled
20-50(14)	LTPP Data Analysis: Significance of "As-Constructed" AC Air Voids to Pavement Performance	Applied Pavement Technologies	100,000	6/5/2000	6/28/2002	Completed---Summarized in NCHRP Research Results Digest 269
20-50(15)	LTPP Data Analysis: Confidence of WIM Axle Load Data	Cancelled				Project cancelled
20-51(01)	LTPP Product Development: Workshop on Pavement Smoothness	Soil & Materials Engineers, Inc.	56,000	1/24/2000	12/31/2001	Completed---Agency report available as NCHRP Web-Only Document 42
20-51(02)	LTPP Product Development: PCC Pavement Practice Manual and Workshop	Transferred	100,000			Transferred to FHWA
20-51(03)	LTPP Product Development: Pavement Smoothness Specification for Approaches to WIM Equipment Sites	Transferred	100,000			Transferred to FHWA
20-52	TRAC PAC2 -- A Hands-on Educational Program	Commonwealth of Virginia	350,094	5/30/2000	5/29/2002	Completed---New modules transferred to AASHTO
20-52(01)	Implementing TRAC PAC2 -- A Hands-on Educational Program	TransTech Management, Inc.	199,998	2/24/2003	3/1/2005	Completed---Report sent to AASHTO
20-53	Using Customer Needs to Drive Transportation Decisions	Howard/Stein-Hudson Associates	149,985	5/11/2001	11/30/2002	Completed---Published as NCHRP Report 487
20-54	Accelerating Opportunities for Innovation in the Highway Industry	Ferragut, Ted	170,000	5/1/2000	4/30/2008	Completed
20-55	TRB Study on Future Surface Transportation Agency Human Resource Needs	TRB Studies and Special Programs Division	100,000	9/5/2000	3/31/2003	Completed---Published as TRB Special Report 275
20-56	New Services for AASHTO's World Wide Web Site	Logistics Management Institute	474,144	3/25/2002	10/30/2003	Completed---Results provided to AASHTO

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-56A	Survey of AASHTO Web Site Users	Penn, Schoen & Berland Associates, Inc.	35,000	8/15/2001	10/31/2001	Completed---Results provided to AASHTO
20-57	Analytic Tools Supporting Transportation Asset Management	Cambridge Systematics	749,908	4/24/2002	3/1/2005	Completed---Published as NCHRP Report 545
20-59	Surface Transportation Security Research	Various				
20-59(01)	AASHTO Security Research Workshop and Forum	TransTech Management, Inc.	100,000	1/2/2003	4/30/2004	Completed---Final report sent to AASHTO
20-59(02)	Bridge/Tunnel/Highway Infrastructure Vulnerability Workshops	Science Applications International Corporation	277,000	9/10/2002	6/30/2004	Completed---Published as NCHRP Report 525, Volume 4
20-59(03)	FHWA/AASHTO Blue Ribbon Panel on Bridge and Tunnel Security	Science Applications International Corporation	79,804	10/15/2002	9/18/2003	Completed---Final report available on AASHTO and FHWA websites
20-59(04)	White Paper on Highway Security Issues for Reauthorization	Lockwood, Stephen	25,000	12/19/2002	5/30/2003	Completed---Final report delivered to AASHTO
20-59(05)	National Needs Assessment for Ensuring Transportation Infrastructure Security	Science Applications International Corporation	138,862	5/23/2002	1/31/2003	Completed---Final report available on AASHTO website
20-59(06)	Responding to Threats: A Field Personnel Manual	Science Applications International Corporation	50,000	5/1/2003	12/31/2003	Completed---Published as NCHRP Report 525, Volume 1
20-59(06)A/B	System Security Awareness for Transportation Employees	Rutgers, The State University of New Jersey	250,000	8/20/2004	9/30/2009	Completed---Published as NCHRP Report 525, Volume 7, and CRP-CD-59
20-59(07)	Transportation Security Information Clearinghouse	Premier Technology Group, Inc.	124,950	4/16/2003	7/31/2004	Completed---Final report sent to AASHTO
20-59(07)A	White Paper to Identify and Evaluate Highway Asset ISAC Implementation Options	CACI--Premier Technology, Inc.	25,000	3/31/2004	12/31/2004	Completed---Final report sent to AASHTO
20-59(08)	Emergency Transportation Operations Preparedness and Response Workshop: Adaptations for Rural and International Border Crossing Situations	Science Applications International Corporation	180,000	9/10/2002	3/31/2004	Completed---Final report sent to AASHTO
20-59(09)	Methods for Determining Transportation and Economic Consequences of Terrorist Attacks	Science Applications International Corporation	250,000	3/20/2003	9/30/2005	Completed---Published as NCHRP Report 525, Volume 11
20-59(10)	Secure Communication Infrastructure	McCormick, Taylor and Associates, Inc.	351,000	7/15/2002	6/30/2004	Completed---Published as NCHRP Report 525, Volume 2
20-59(11)	Emergency Traffic Operations Management	Science Applications International Corporation	455,000	3/3/2003	1/31/2007	Completed---Published as NCHRP Report 525, Volume 6
20-59(12)	Follow-up State DOT Transportation Security Survey	----	5,000			Completed---Final report sent to AASHTO
20-59(13)A	Follow-up on A Guide to Updating Emergency Response Plans for Terrorist Incidents	Parsons Brinckerhoff Quade & Douglas	6,000	3/26/2003	4/26/2003	Completed---Final report sent to AASHTO
20-59(13)B	Follow-up on A Guide to Highway Vulnerability Assessment for Critical Asset Identification and Protection	Science Applications International Corporation	35,000	5/20/2002	8/21/2004	Completed---Final report sent to AASHTO

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-59(14)	Research Support to the AASHTO Special Committee on Transportation Security (SCOTS)	TransTech Management, Inc.	223,306	1/22/2003	12/31/2007	Completed---Initial product published as NCHRP Report 525, Volume 5
20-59(14)A	Continuing Research Support for AASHTO's Special Committee on Transportation Security and Emergency Management	High Street Consulting Group	90,999	4/28/2009	9/30/2012	Completed---Final products sent to AASHTO
20-59(14)B	Research Support for the AASHTO Special Committee on Transportation Security and Emergency Management	Countermeasures Assessment & Security Experts, LLC	245,000	8/15/2013	8/14/2015	Research in progress; second interim report pending
20-59(14)B(01)	2013 Transportation Hazards & Security Summit: Presenter	Cowie, Frederick	3,000	8/18/2013	8/24/2013	Completed---Final products sent to AASHTO
20-59(15)	AASHTO Modifications of Consultant Reports	Cancelled				Cancelled
20-59(16)	Preparation of Educational Materials: Outreach	TransTech Management, Inc.	47,297	1/16/2004	2/28/2005	Completed---Final report sent to AASHTO
20-59(16)A	Security Funding Resources: A Reference Guide for State Transportation Agencies	Science Applications International Corporation	50,000	6/16/2004	12/15/2004	Completed---Final report sent to AASHTO
20-59(16)B	Security Framework: Fundamentals of Transportation Security for DOTs	TransTech Management, Inc.	74,973	4/4/2007	10/3/2007	Completed---Final report sent to AASHTO
20-59(17)	Guide to Risk Management of Multimodal Transportation Infrastructure	Science Applications International Corporation	644,751	2/23/2005	9/30/2008	Completed---Published as NCHRP Report 525, Volume 15
20-59(18)	Guidelines for Transportation Emergency Training Drills and Exercises	-----	100,000			Completed---Jointly funded with TCRP; published as NCHRP Report 525, Volume 9
20-59(19)	Transportation Response Options: Scenarios of Infectious Disease, Biological Agents, Chemical, Biological, Radiological, or Nuclear Exposure	Science Applications International Corporation	251,000	10/23/2003	12/31/2005	Completed---Published as NCHRP Report 525, Volume 10
20-59(19)A	Presentation: Transportation Response Options: Scenarios of Infectious Disease, Biological Agents, Chemical, Biological, Radiological, or Nuclear Exposure	Science Applications International Corporation	2,000			Completed---Published as NCHRP Report 525, Volume 10
20-59(20)	Enhanced Communications Interoperability: Assessment of Emerging Voice/Data Integration Tools	Cancelled				Project cancelled
20-59(21)	Continuity of Operations Plans for Transportation Agencies	McCormick, Taylor and Associates, Inc.	200,000	7/21/2004	3/20/2005	Completed---Jointly funded with TCRP; published as NCHRP Report 525, Volume 8
20-59(22)	Guidelines for Emergency Quarantine Closures of Local and State Roads	Midwest Research Institute	200,000	8/30/2006	5/31/2008	Completed---Published as NCHRP Report 525, Volume 13
20-59(23)	A Guide to Emergency Response Planning at State Transportation Agencies	Telvent Farradyne Inc.	324,910	12/4/2006	9/30/2010	Completed---Published as NCHRP Report 525, Volume 16

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-59(24)	A Guide to Transportation and Hazards Resources	University of Colorado - Boulder	75,000	8/17/2007	1/31/2009	Completed---Summarized in NCHRP Research Results Digest 333; jointly funded with TCRP
20-59(25)	Security Research Plan	San Jose State University	75,000	1/25/2007	10/24/2007	Completed---Final report sent to AASHTO
20-59(26)	National Needs Assessment for Ensuring Transportation Infrastructure Security (2009-2015)	Telvent Farradyne Inc.	97,661	3/1/2007	9/30/2008	Completed---Final report sent to AASHTO
20-59(28)	Security 101: Physical Security Standards for Transportation	Countermeasures Assessment & Security Experts, LLC	50,000	11/6/2006	6/30/2008	Completed---Published as NCHRP Report 525, Volume 14
20-59(29)	Security and Emergency Management Research Implementation Plan	High Street Consulting Group	65,000	8/17/2010	4/30/2011	Completed---Final report sent to AASHTO
20-59(30)	Role of Transportation in the Incident Command System Structure and the National Incident Management System Structure	San Jose State University	100,000	9/18/2014	9/17/2015	Research in progress; interim report pending
20-59(31)	Guidelines for Information Sharing Among Transportation Operations-Management and Emergency operations Facilities	Cancelled				Cancelled; funds reprogramed under Project 20-59
20-59(32)	A Transportation Guide for All-Hazards Emergency Evacuation	Louis Berger & Associates	302,280	4/27/2010	3/31/2013	Completed---Published as NCHRP Report 740 and CRP-CD 132, and agency final report available as NCHRP Web-Only Document 196
20-59(33)	Pre-Event Planning to Support Transportation Infrastructure Recovery	Synthosys, LLC	150,000	1/29/2010	11/30/2012	Completed---Published as NCHRP Report 753
20-59(34)	Methodologies to Estimate the Economic Impacts of Disruptions to the Goods Movement System	Georgia Tech Research Corporation	500,000	4/22/2010	4/15/2014	Completed---Published as NCHRP Report 732
20-59(35)	Securing Transportation Structures, Systems, and Facilities – Long-Term R&D Plan	Cancelled				Cancelled
20-59(36)	Managing Catastrophic Transportation Emergencies: A Guide for Transportation Executives	Countermeasures Assessment & Security Experts, LLC	100,000	7/11/2012	3/31/2014	Completed---Agency report available as NCHRP Web-Only Document 206
20-59(37)	Debris Management Handbook for Local and State DOTs	Dewberry & Davis, LLC	149,931	1/19/2012	1/31/2014	Completed---Published as NCHRP Report 781
20-59(38)	Voice and Data Interoperability for Transportation	-----	100,000			In development
20-59(39)	Synthesis of Airport Closings and Emergency Evacuation Problems	Cancelled				Cancelled
20-59(40)	Transit Wireless Communications Joint Council Establishment	-----	50,000			Completed as TCRP Project C-18 at \$322,972
20-59(41)	Legal Definition of 'First Responder'	TRB Technical Activities Division	100,000			Research completed as NCHRP Project 20-06, Topic 17-3; summarized in NCHRP Research Results Digest 385

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-59(42)	A Guide to Regional Transportation Planning for Disasters, Emergencies, and Significant Events	Louis Berger Group	249,925	2/16/2012	12/31/2013	Completed---Published as NCHRP Report 777
20-59(43)	Incorporating Transportation Security Awareness into Routine State DOT Operations and Training	Countermeasures Assessment & Security Experts, LLC	100,000	6/20/2012	6/30/2014	Completed---Published as NCHRP Report 793
20-59(44)	A Guide for Public Transportation Pandemic Planning and Response	Abt Associates	199,220	4/5/2012	12/31/2013	Completed---Published as NCHRP Report 769
20-59(47)	Emergency Exit Signs and Marking Systems for Highway Tunnels	Texas A&M Transportation Institute	200,000	8/15/2013	8/14/2015	Research in progress
20-59(48)	Effective Practices for the Protection of Transportation Infrastructure from Cyber Incidents	Countermeasures Assessment & Security Experts, LLC	300,000	5/2/2013	4/30/2015	Research in progress; jointly funded with TCRP project D-15; contractor's draft report pending
20-59(49)	Facilitation and Coaching Support for the 50 States Exercise	Engineering and Computer Simulations	444,000	6/7/2012	12/31/2016	Research in progress; jointly funded with TCRP A-36; contractor's report available as NCHRP Web-Only Document 200
20-59(50)	Mainstreaming Transportation Hazards and Security Risk Management: CAPTA Update and Implementation	Countermeasures Assessment & Security Experts, LLC	175,000	8/5/2014	9/4/2015	Research in progress; interim report pending
20-59(51)	Next Steps for A Guide to Emergency Response Planning at State Transportation Agencies and Security 101: A Physical Security Primer for Transportation Agencies	-----	200,000			In development
20-59(52)	Communications Worker Credentialing Requirements	-----	75,000			In development
20-59(53)	FloodCast: A Framework for Enhanced Flood Event Decision Making for Transportation Resilience	Dewberry Consultants LLC	248,236	9/2/2014	3/1/2016	Research in progress; interim report pending
20-60	Performance Measures and Targets for Transportation Asset Management	Cambridge Systematics	350,000	7/15/2003	9/30/2005	Completed---Published as NCHRP Report 551
20-61	Study on Transportation of Radioactive Waste	National Research Council	50,000	3/25/2003	3/24/2005	Completed---Published as National Research Council Report, "Going the Distance"
20-62	Study on Long-Term Viability of Fuel Taxes for Transportation Finance	TRB Studies and Special Programs Division	100,000			Completed---Published as TRB Special Report 285
20-63	Performance Measurement Tool Box and Reporting System for Research Programs and Projects	B.T. Harder, Inc.	300,000	1/16/2004	4/28/2006	Completed---Follow-on underway; see 20-63A
20-63A	Development of Research Performance Measurement (RPM) System -- Version 1.1	Texas A&M Research Foundation	79,817	12/11/2006	6/15/2010	Completed---Follow-on work under 20-63B
20-63A(01)	Development of Research Performance Measurement (RPM) System -- Version 1.1	Texas A&M University	2,208	5/3/2010	12/31/2011	Completed---Maintenance support

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-63B	Performance Measurement Tool Box and Reporting System for Research Programs and Projects	ICF Incorporated	367,655	7/20/2010	7/19/2016	Research in progress; final website deployed and maintenance ongoing
20-64	XML Standard for Exchange of Transportation Data (Trans-XML)	Cambridge Systematics	500,000	3/1/2004	10/1/2006	Completed---Published as NCHRP Report 575
20-65	Research for the AASHTO Standing Committee on Public Transportation	-----	450,000			Research in progress---Refer to project writeup on CRP website
20-66	Strategic Plan for Transportation Information Management	-----	250,000			Completed---Published as TRB Special Report 284
20-67	Making Transportation Tunnels Safe and Secure	-----	200,000			Completed---Published as NCHRP Report 525, Volume 12; jointly funded with TCRP J-10G
20-68	US Domestic Scan Program	Cambridge Systematics	50,000	9/30/2004	7/30/2005	Completed---See NCHRP project web page
20-68(01)	US Domestic Scan Program Pilot	Cambridge Systematics	211,277	1/20/2006	4/19/2008	Completed---See NCHRP project web page
20-68A	US Domestic Scan Program	Arora and Associates, P.C.	3,223,839	12/27/2007	6/26/2014	Research continued under NCHRP project 20-68A(02); includes \$294K from FHWA
20-68A(02)	US Domestic Scan Program	Arora and Associates, P.C.	2,110,592	12/28/2012	12/26/2016	Research in progress
20-68B	Accelerating the Rate of Innovation Among State DOTs	Various	45,715			Completed; see NCHRP website
20-68B(01)	Accelerating the Rate of Innovation Among State DOTs--Tracing Domestic Scan Impacts	CTC & Associates LLC	24,998	2/27/2009	2/27/2010	Completed---Agency report available on NCHRP project web page
20-68B(02)	Accelerating the Rate of Innovation Among State DOTs--Tracing Domestic Scan Impacts	CTC & Associates LLC	88,285	5/20/2010	5/19/2014	Completed; see NCHRP website
20-68C	Research on Innovation Networks--Domestic Scans	Rosenkopf, Lori	31,000	12/29/2010	6/30/2012	Completed---Contractor's report available on NCHRP project web page
20-69	Guidance for Transportation Project Management	Edwards & Kelcey, Inc.	249,943	2/7/2006	9/30/2009	Completed---Agency report available as NCHRP Web-Only Document 137
20-70	Transportation Research Thesaurus Improvements	-----	90,000			Completed---Results integrated with the Transportation Research Thesaurus
20-71	Effective Experimental Design and Data Analysis in Transportation Research	Michigan State University	247,367	4/23/2007	12/22/2010	Completed---Published as NCHRP Report 727
20-72	Tools to Aid State DOTs in Workforce Issues	T.Y. Lin Inter. BASCOR, Inc.	350,000	3/1/2007	12/31/2010	Completed---Initial report published as NCHRP Report 636; website to AASHTO

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-73	Accelerating Transportation Project and Program Delivery: Conception to Completion	Edwards & Kelcey, Inc.	299,960	4/2/2007	2/28/2010	Completed---Published as NCHRP Report 662
20-74	Developing an Asset Management Plan for the Interstate Highway System	Cambridge Systematics	499,992	4/2/2007	1/1/2009	Completed---Published as NCHRP Report 632
20-74A	Development of Service Levels for the Interstate Highway System	Dye Management Group	400,000	3/31/2008	9/30/2010	Completed---Published as NCHRP Report 677
20-75	Implementing Transportation Knowledge Networks	Spy Pond Partners	274,998	3/27/2007	3/1/2010	Completed---Published as NCHRP Report 643
20-76	Development of Standards and Models of a Disparity/Availability Study Standard for State DOT Disadvantaged Business Enterprise (DBE) Programs	National Economic Research Associates, Inc.	278,997	4/5/2007	5/30/2009	Completed---Published as NCHRP Report 644
20-77	Transportation Operations Training Framework	University of Maryland	296,289	7/11/2007	9/10/2009	Completed---Results available at www.ntrr.dot.gov
20-78	Communicating the Value of Research	NuStats LLC	307,123	3/30/2007	2/28/2010	Completed---Published as NCHRP Report 610
20-79	Expansion of the Transportation Research Thesaurus	CDB Enterprises	80,000	7/3/2008	12/31/2009	Completed---Posted on TRB website
20-80(01)	Background Information on National Transportation Research for the AASHTO Standing Committee on Research	CTC & Associates LLC	49,878	8/22/2007	12/21/2007	Completed---Contractor's final report used by SCOR
20-80(02)	Longer-Term, Strategic Issues Facing the Transportation Industry Workshop	ICF Consulting, Inc.	93,184	6/27/2008	12/26/2008	Completed---Final report sent to AASHTO SCOR
20-81	Guide to Implementing Strategies to Attract and Retain a Capable Transportation Workforce	ICF Consulting, Inc.	350,000	3/4/2009	7/31/2011	Completed---Published as NCHRP Report 685
20-82	Next Generation of the Transportation Pooled Fund (TPF) Website	Science Applications International Corporation	400,000	2/3/2009	10/31/2012	Website deployed; maintenance completed
20-82A	Next Generation of the Transportation Pooled Fund (TPF) Website	Science Applications International Corporation	99,784	10/23/2012	10/22/2016	Maintenance ongoing
20-83	Long-Range Strategic Issues Facing the Transportation Industry	-----				Research in progress; refer to individual projects
20-83(01)	Economic Changes Driving Future Freight Transportation	Massachusetts Institute of Technology	998,894	10/21/2009	7/31/2012	Completed---Published as NCHRP Report 750, Volume 1
20-83(02)	Expediting Future Technologies for Enhancing Transportation System Performance	RAND Corporation	999,780	10/22/2009	5/30/2013	Completed---Published as NCHRP Report 750, Volume 3
20-83(03)	Long-Range Strategic Issues Affecting Preservation, Maintenance, and Renewal of Highway Infrastructure	Texas A&M Research Foundation	378,183	6/29/2010	8/29/2014	Completed---Project reports available on project web page; related work will continue as NCHRP Project 20-83(03)A
20-83(03)A	Long-Range Strategic Issues Affecting Preservation, Maintenance, and Renewal of Highway Infrastructure	-----	500,000			In development

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-83(04)	Effects of Changing Transportation Energy Supplies and Alternative Fuel Sources on State Departments of Transportation	RAND Corporation	998,238	1/12/2010	8/30/2013	Completed---Published as NCHRP Report 750, Volume 5
20-83(05)	Climate Change and the Highway System: Impacts and Adaptation Approaches	PB Americas, Inc.	1,030,000	12/28/2009	8/31/2013	Completed---Published as NCHRP Report 750, Volume 2
20-83(06)	Effects of Socio-Demographics on Travel Demand	NuStats LLC	998,664	6/2/2010	6/1/2014	Completed---Published as NCHRP Report 750, Volume 6
20-83(07)	Sustainable Transportation Systems and Sustainability as an Organizing Principle for Transportation Agencies	Booz-Allen & Hamilton	992,591	4/22/2010	4/21/2013	Completed---Published as NCHRP Report 750, Volume 4
20-83A	Workshop on Long Term Strategic Issues and Scan of Scientific or Technological Advances Having Implications for State DOTs 30-50 Years in the Future	Resource Systems Group, Inc.	150,000	9/2/2010	5/1/2011	Completed---Report sent to AASHTO
20-83B	Communicating the Results of NCHRP Strategic Transportation Issues Research	Burns & McDonnell Engineering Company Inc.	349,837	7/11/2013	7/11/2016	Research in progress
20-83C(01)	Technical Assistance for NCHRP Report 750, Vol. 2, "Climate Change, Extreme Weather and the Highway System: Impacts and Adaptation Approaches"	----	30,000			Contract pending
20-83C(02)	Technical Assistance for NCHRP Report 750, Vol. 6, "The Effect of Socio-Demographics on Future Travel Demand"	----	20,000			In development
20-83C(03)	Webinar for NCHRP Report 750, Vol. 5, "Preparing State Transportation Agencies for an Uncertain Energy Future"	Cambridge Systematics	20,000	6/13/2014	11/12/2014	Completed
20-83C(04)	Technical Assistance for NCHRP Report 750, Vol. 3, "Expediting Future Technologies for Enhancing Transportation System Performance"	----	20,000			In development
20-83C(05)	Technical Assistance for NCHRP Report 750, Vol. 4, "Sustainability as an Organizing Principle for Transportation Agencies"	Parsons Brinckerhoff	30,000	9/15/2014	4/15/2015	Research in progress
20-84	Improved Right-of-Way Procedures and Business Practices	Texas A&M Research Foundation	500,000	6/16/2010	10/31/2013	Completed---Published as NCHRP Report 771
20-85	Renewable Energy Guide for Highway Maintenance Facilities	Science Applications International Corporation	499,851	7/21/2010	7/31/2013	Completed---Published as NCHRP Report 751
20-86	Attracting, Recruiting, and Retaining Skilled Staff for Transportation System Operations and Management	ICF Consulting, Inc.	225,000	4/6/2010	10/31/2011	Completed---Published as NCHRP Report 693 and agency report available as NCHRP Web-Only Document 182

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-87	A Potential Process for the Development and Implementation of a National, Coordinated, Multi-Modal Transportation Research Framework: A Policy Study	TRB Studies and Special Programs Division	500,000			Completed---Published as TRB Special Report 313
20-88	Examining International Research Institutes and Other Models of Collaboration to Link Knowledge Creation and Knowledge Application: A Policy Study	TRB Studies and Special Programs Division	500,000			Combined with NCHRP Project 20-87
20-89	Intellectual Property Management Guide for State Departments of Transportation	Applied Research Associates	350,000	8/31/2011	9/15/2014	Completed---To be published as NCHRP Report 799
20-90	Improving Management of Transportation Information	Cambridge Systematics	349,994	3/22/2011	4/21/2013	Completed---Published as NCHRP Report 754
20-91	NCHRP Participation in European Road Association (ERA) ERA-NET Road Research Program	Cancelled				Cancelled
20-92	Improving Access to International Transportation Research Information	TRB Technical Activities Division	150,000			Completed---Workshop summary pending
20-93	Development of a Guide for Transportation Technology Transfer	Pennoni Associates Inc.	159,946	4/9/2012	12/9/2013	Completed---Published as NCHRP Report 768
20-94	Development of a Formalized Process for the Adoption, Development, Maintenance, and Enhancement of TransXML Schemas	TRB Technical Activities Division	27,556			Completed---Proceedings posted on the NCHRP project web page
20-95	Identifying Successful Practices in the FHWA Disadvantaged Business Enterprise (DBE) Program	Colette Holt & Associates	249,625	6/3/2013	9/3/2015	Research in progress
20-96	Leadership Guide for Strategic Information Management for State Departments of Transportation	Spy Pond Partners	250,000	4/16/2014	4/15/2015	Research in progress
20-97	Improving Findability and Relevance of Transportation Information	Spy Pond Partners	500,000	4/18/2014	10/17/2015	Research in progress
20-98	A Guide to Agency-Wide Knowledge Management for State Departments of Transportation	Spy Pond Partners	185,000	2/19/2014	4/18/2015	Research in progress
20-99	Communication Guidelines for State Departments of Transportation	Parsons Brinckerhoff	300,000	6/30/2014	6/20/2016	Research in progress
20-100	Return on Investment in Transportation Asset Management Systems and Practices	----	400,000			In development
20-101	Framework for Analyzing the Costs and Benefits of Adaptation Measures in Preparation for Extreme Weather Events and Climate Change	----	300,000			In development
20-102	Impacts of Connected and Automated Vehicles on State and Local Transportation Agencies	----	1,000,000			In development

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
20-103	Guidance for Development and Management of Sustainable Information Portals	----	250,000			In development
20-104	Capturing and Learning Essential Consultant-Developed Knowledge within Departments of Transportation	----	250,000			In development
20-105	Ahead of the Curve: Mastering the Management of Transportation Research Training Program—Developing Course Outlines and Offering One-Day Pilot	----	60,000			In development
20-106	Framing Surface Transportation Research for the Nation's Future	----	750,000			In development
AREA TWENTY-ONE : SOILS AND GEOLOGY--TESTING AND INSTRUMENTATION						
21-01	Instrumentation for Measurement of Moisture	Research Triangle Institute	35,027	8/25/1969	2/24/1971	Completed---Published as NCHRP Report 138
21-02	Instrumentation for Moisture Measurement---Bases, Subgrades, and Earth Materials (Sensor Development)	Southwest Research Institute	64,976	2/1/1972	1/31/1974	Completed---Report not published; included in Project 21-02(03) report
21-02(02)	Instrumentation for Moisture Measurement---Bases, Subgrades, and Earth Materials (Sensor Development)	State University of New York - Buffalo	29,953	4/1/1972	9/30/1973	Completed---Report not published; included in Project 21-02(03) report
21-02(03)	Instrumentation for Moisture Measurement---Bases, Subgrades, and Earth Materials (Sensor Evaluation)	Southwest Research Institute	154,452	9/3/1974	12/31/1979	Completed---Report not published; summarized in NCHRP Research Results Digest 121; for avail. see Summary of Progress Through 1988
21-03	Instrumentation for Measuring Scour at Bridge Piers and Abutments	Ayres Associates	915,918	12/4/1989	3/31/1997	Completed---Phase I report summary in NCHRP Research Results Digest 189; no Phase II report; Phase III published as NCHRP Reports 396, 397A, and 397B
21-04	Sealing Geotechnical Exploratory Holes to Protect the Subsurface Environment	Strata Engineering Corporation	344,510	3/1/1991	11/30/1995	Completed---Published as NCHRP Report 378
21-05	Determination of Unknown Subsurface Bridge Foundations	Olson Engineering	350,000	4/27/1992	8/28/1995	Completed---Agency report summarized in NCHRP Research Results Digest 213
21-05(02)	Unknown Subsurface Bridge Foundation Testing	Olson Engineering	380,000	2/15/1996	6/30/2001	Completed---Agency final report available on request
21-06	Corrosion in the Soil Environment: Soil Resistivity and pH Measurements	Corrpro Companies, Inc.	599,449	4/3/2000	8/31/2008	Completed---Agency final report available on request
21-07	Development of Portable Scour Monitoring Equipment	Ayres Associates	299,938	5/2/2000	12/31/2002	Completed---Published as NCHRP Report 515
21-08	Assessment of Innovative Load Testing of Deep Foundations	Geosciences Testing & Research, Inc.	200,000	8/23/2000	6/30/2004	Completed---Agency report available as NCHRP Web-Only Document 84

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
21-09	Intelligent Soil Compaction Systems	Colorado School of Mines	599,879	8/30/2006	2/28/2010	Completed---Published as NCHRP Report 676
21-10	Manual on Subsurface Investigations -- Update	GeoSyntec Consultants of North Carolina PC	299,912	6/17/2014	12/17/2015	Research in progress; interim report pending
AREA TWENTY-TWO : DESIGN--VEHICLE BARRIER SYSTEMS						
22-01A	Testing and Evaluation of Bridge Rail Concepts	Texas A&M University	40,000	3/1/1974	5/30/1975	Completed---Report not published; for avail. see Summary of Progress Through 1988; summarized in NCHRP Research Results Digest 81
22-02	Traffic Barrier Performance and Design	Southwest Research Institute	205,000	1/1/1972	3/31/1975	Completed---Task 1 reports not published; summarized in NCHRP Research Results Digests 84 and 102; Task 2 report published as NCHRP Report 153
22-02(02)	Multiple Service Level Highway Bridge Railings---Performance and Design Criteria	Southwest Research Institute	195,000	8/1/1976	4/30/1979	Completed---Agency reports on Phase I and Phase II available on request
22-02(03)	Multiple Service Level Highway Bridge Railings---Selection Procedures	Southwest Research Institute	200,000	1/1/1979	5/31/1981	Completed---Published as NCHRP Report 239
22-02(04)	Procedures for Testing Highway Appurtenances	Southwest Research Institute	30,000	5/1/1979	2/28/1981	Completed---Published as NCHRP Report 230
22-03	Field Evaluation of Vehicle Barrier Systems	Calspan Corporation	25,000	1/1/1974	2/15/1975	Completed---Report not published; summarized in NCHRP Research Results Digest 76
22-03A	Field Evaluation of Vehicle Barrier Systems	Elliott, Arthur L.	10,000	7/1/1974	12/31/1974	Completed---Report not published; summarized in NCHRP Research Results Digest 76
22-04	Performance of Longitudinal Traffic Barriers	Southwest Research Institute	503,954	7/1/1983	7/15/1987	Completed---Published as NCHRP Report 289
22-05	Develop Performance Standards & Hardware for Low Service Level Guardrail Systems	Southwest Research Institute	200,000	5/1/1985	3/15/1992	Completed---Continued under Project 22-05A
22-05A	Warrants for the Installation of Low Service Level Guardrail Systems	Wilbur Smith Associates	100,000	5/1/1990	1/31/1992	Completed---Agency report summarized in NCHRP Research Results Digest 194
22-06	Roadside Safety Design for Small Vehicles	Texas A&M University	350,000	6/1/1985	11/30/1988	Completed---Published as NCHRP Report 318
22-07	Update of "Recommended Procedures for Safety Performance Evaluation of Highway Appurtenances"	Texas A&M University	200,000	6/1/1989	8/31/1992	Completed---Published as NCHRP Report 350
22-08	Evaluation of Performance Level Selection Criteria for Bridge Railings	Texas A&M University	200,000	4/15/1989	12/31/1995	Completed---Agency report available on request

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
22-09	Improved Procedures for Cost-Effectiveness Analysis of Roadside Safety Features	Texas A&M University	250,000	9/1/1991	10/31/1998	Completed---Report not published; to be included in Project 22-09(02)
22-09(02)	Roadside Safety Analysis Program (RSAP)-Engineer's Manual	Mak, King	65,200	6/4/2001	11/30/2002	Completed---Published as NCHRP Report 492; software available on CRP-CD-33
22-09(03)	Roadside Safety Analysis Program (RSAP) Technical Assistance	Mak, King	89,970	2/11/2004	3/31/2006	Cancelled
22-09A	Roadside Safety Analysis Program	Khasnabis, Snehamay	25,000	4/15/1997	4/30/1998	Completed---Report not published
22-10	Updated Materials for a Traffic Barrier/Small Sign Support Hardware Guide	Momentum Engineering	379,145	1/2/1991	12/31/1996	Completed---Two guides published by AASHTO
22-11	Evaluation of Roadside Features to Accommodate Vans, Mini-Vans, Pickup Trucks, & 4-Wheel Drive Vehicles	Texas A&M University	399,997	6/1/1994	6/30/2001	Completed---Published as NCHRP Report 471
22-12	Guidelines for the Selection, Installation, and Maintenance of Highway Safety Features	Texas A&M University	430,218	6/1/1995	10/31/2000	Terminated---Transferred to Project 22-12(02)
22-12(02)	Selection Criteria and Guidelines for Highway Safety Features	University of Nebraska - Lincoln	64,592	9/12/2003	5/10/2007	Completed---Published as NCHRP Report 638
22-12(03)	Recommended Guidelines for the Selection of Test Levels 2 Through 5 Bridge Rails	Roadsafe LLC	350,000	7/20/2010	5/31/2014	Completed---Final report sent to AASHTO; publication decision pending
22-13	In-Service Performance Of Traffic Barriers	University of Iowa	520,000	4/1/1996	2/28/1999	Completed---Report not published; included in Project 22-13(02)
22-13(02)	Expansion and Analysis of In-Service Barrier Performance Data and Planning for Establishment of a Database	Worcester Polytechnic Institute	280,000	4/1/1999	9/30/2002	Completed---Published as NCHRP Report 490
22-14	Improvement of Procedures for the Safety-Performance Evaluation of Roadside Features	Texas A&M University	250,000	3/1/1997	5/31/2001	Completed---Report not published; recommended 22-14(02)
22-14(02)	Improvement of Procedures for the Safety-Performance Evaluation of Roadside Features	University of Nebraska	833,940	8/9/2002	6/30/2008	Completed---Published by AASHTO as "Manual for Assessing Safety Hardware (MASH)"
22-14(03)	Evaluation of Existing Roadside Safety Hardware using Updated Criteria	Texas A&M University	530,000	4/16/2007	6/30/2010	Completed---Summarized in NCHRP Research Results Digest 349 and agency report available as NCHRP Web-Only Document 157
22-14(04)	Testing of Cable Median Barrier in a Narrow Ditch	Texas A&M Research Foundation	100,000	3/17/2011	8/1/2015	Research in progress; revised scope approved; interim report pending
22-15	Improving the Compatibility of Vehicles and Roadside Safety Hardware	George Washington University	300,000	2/8/1999	3/31/2003	Completed---Agency report available as NCHRP Web-Only Document 61

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
22-16	Development and Testing of a New Guardrail System	West Virginia University	200,000	7/16/1999	6/30/2002	Completed---Summarized in NCHRP Research Results Digest 273
22-17	Recommended Guidelines for Curb and Curb-Barrier Combinations	Worcester Polytechnic Institute	500,000	4/19/2000	4/18/2004	Completed---Published as NCHRP Report 537
22-18	Crashworthy Work-Zone Traffic Control Devices	Texas A&M University	300,000	9/1/2000	8/31/2005	Completed---Published as NCHRP Report 553
22-19	Aesthetic Concrete Barrier and Bridge Rail Designs	Texas A&M University	579,992	9/1/2002	9/5/2005	Completed---Published as NCHRP Report 554
22-20	Design of Roadside Barrier Systems Placed on MSE Retaining Walls	Texas A&M University	600,000	7/1/2004	8/31/2009	Completed---Published as NCHRP Report 663
22-20(02)	Design Guidelines for TL-3 through TL-5 Roadside Barrier Systems Placed on Mechanically Stabilized Earth (MSE) Retaining Walls	Texas A&M Research Foundation	610,000	5/14/2010	3/31/2015	Research in progress; revised work plan approved; added TL-5 crash test completed
22-21	Median Cross-Section Design for Rural Divided Highways	Midwest Research Institute	782,830	1/24/2006	1/23/2009	Completed---Work continuing under project 22-21A
22-21A	Median Cross-Section Design for Rural Divided Highways	Midwest Research Institute	17,170	6/8/2010	12/7/2010	Completed---Published as NCHRP Report 794
22-22	Effectiveness of Traffic Barriers on Non-Level Terrain	Texas A&M Research Foundation	79,843	12/12/2006	6/12/2010	Completed---Work continuing under NCHRP Project 22-22(02)
22-22(02)	Effectiveness of Traffic Barriers on Non-Level Terrain	Texas A&M Research Foundation	420,742	6/12/2012	6/11/2015	Research in progress
22-23	Criteria for Restoration of Longitudinal Barriers	Virginia Polytechnic Institute	300,000	6/1/2006	12/31/2009	Completed---Published as NCHRP Report 656
22-24	Guidelines for Verification and Validation Procedures for Computer Simulation used in Roadside Safety Applications	Worcester Polytechnic Institute	300,000	4/5/2007	3/31/2010	Completed---Agency report available as NCHRP Web-Only Document 179
22-25	Development of Guidance for the Selection, Use and Maintenance of Cable Barrier Systems	George Washington University	399,717	4/28/2008	7/31/2011	Completed---Published as NCHRP Report 711
22-26	Identification of Factors Related to Serious Injury and Fatal Motorcycle Crashes into Traffic Barriers	Virginia Polytechnic Institute	500,000	5/1/2009	12/31/2015	Research in progress; added additional driving season for added crash records; draft final report pending
22-27	Roadside Safety Analysis Program (RSAP) Update	Roadsafe LLC	600,000	1/28/2009	12/21/2012	Completed---Final report and RSAP program sent to AASHTO for balloting; webinar held
22-28	Criteria for Restoration of Longitudinal Barriers, Phase II	Roadsafe LLC	300,000	1/2/2012	6/30/2015	Research in progress; interim report approved; Phase 2 in progress
22-29	Performance of Longitudinal Barriers on Curved, Superelevated Roadway Sections	George Washington University	345,002	6/6/2011	9/13/2013	Terminated---Follow-on activity pending

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
22-29A	Evaluating the Performance of Longitudinal Barriers on Curved, Superelevated Roadway Sections	George Mason University	250,000	7/28/2014	10/28/2015	Research in progress
22-30	In-Service Performance Evaluation of W-beam End Terminals	Cancelled				To be conducted as a TRB Policy Study
22-31	Development of Guidelines for the Selection and Placement of Test Levels 2 through 5 Median Barriers	-----	300,000			In development
AREA TWENTY-THREE : SOILS AND GEOLOGY--PROPERTIES						
23-00	No Projects	No Projects				
AREA TWENTY-FOUR : SOILS AND GEOLOGY--MECHANICS AND FOUNDATIONS						
24-01	Manual on Subsurface Investigations	Haley & Aldrich	75,000	4/2/1979	12/31/1980	Completed---Report published by AASHTO
24-02	Reinforcement of Earth Slopes and Embankments	Dames & Moore	150,000	8/22/1983	5/21/1987	Completed---Published as NCHRP Report 290
24-03	Laboratory Evaluation of Piles Installed with Vibratory Drivers	University of Houston	200,000	1/6/1986	8/31/1988	Completed---Published as NCHRP Report 316
24-04	Load Factor Design Criteria for Highway Structure Foundations	Virginia Polytechnic Institute	459,152	9/1/1987	2/28/1991	Completed---Published as NCHRP Report 343
24-05	Downdrag on Bitumen-Coated Piles	Texas A&M University	385,000	6/15/1988	8/31/1994	Completed---Published as NCHRP Report 393
24-06	Expert System for Stream Stability and Scour Evaluation	University of Washington	514,931	3/15/1993	6/30/1999	Completed---Published as NCHRP Report 426
24-07	Countermeasures to Protect Bridge Piers from Scour	University of Minnesota	400,000	5/1/1995	10/31/1998	Completed---Agency report available on request
24-07(02)	Countermeasures to Protect Bridge Piers from Scour	Ayres Associates	815,000	4/1/2001	12/31/2006	Completed---Published as NCHRP Report 593
24-08	Scour at Bridge Foundations: Research Needs	University of Louisville	146,250	2/1/1995	1/31/1997	Completed---Agency report available on request
24-09	Static and Dynamic Lateral Loading of Pile Groups	Auburn University	499,962	6/15/1997	12/31/2000	Completed---Published as NCHRP Report 461
24-10	Thermally Sprayed Metallic Coatings to Protect Steel Pilings	Ocean City Research Corporation	300,000	7/2/1999	2/28/2003	Completed---Published as NCHRP Report 528
24-10(02)	Thermally Sprayed Metallic Coatings to Protect Steel Pilings	Corrpro Companies, Inc.	60,215	10/7/2005	1/31/2009	Completed---Summarized in NCHRP Research Results Digest 344
24-11	Guidelines for Geofoam Applications in Embankment Projects	University of Illinois	199,979	7/7/1999	8/30/2002	Completed---Published as NCHRP Report 529 and NCHRP Web-Only Document 65
24-11(02)	Guidelines for Geofoam Applications in Slope Stability Projects	University of Memphis	300,000	10/2/2006	11/30/2011	Completed---Summarized in NCHRP Research Results Digest 380

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
24-12	Controlled Low-Strength Material for Backfill, Utility Bedding, Void Fill, and Bridge Approaches	Delaware Transportation Institute	176,506	9/1/1998	8/31/2001	Completed---Contract transferred to University of Texas
24-12(01)	Controlled Low-Strength Material for Backfill, Utility Bedding, Void Fill, and Bridge Approaches	University of Texas - Austin	279,352	3/10/2000	12/31/2006	Completed---Published as NCHRP Report 597
24-13	Evaluation of Metal Tensioned Systems in Geotechnical Applications	D'Appolonia	500,000	8/15/1998	3/31/2002	Completed---Published as NCHRP Report 477
24-13(01)	Evaluation of Metal Tensioned Systems in Geotechnical Applications	D'Appolonia Engineering Division	38,100	5/17/2002	11/30/2002	Completed---Workshop materials available on request
24-13(02)	Evaluation of Metal Tensioned Systems in Geotechnical Applications	D'Appolonia	2,980	5/21/2003	5/31/2003	Completed
24-13(03)	Evaluation of Metal Tensioned Systems in Geotechnical Applications	D'Appolonia	4,657	8/14/2003	12/31/2003	Completed
24-14	Scour at Contracted Bridge Sites	University of Louisville	500,000	3/16/1998	8/31/2004	Completed---Agency report available as NCHRP Web-Only Document 83
24-15	Pier Scour and Contraction Scour in Cohesive Soils	Texas A&M University	350,000	2/1/1999	11/30/2002	Completed---Published as NCHRP Report 516
24-15(02)	Abutment Scour in Cohesive Materials	Texas A&M University	498,942	6/25/2004	9/30/2010	Completed---Publication decision pending completion of 24-20(02)
24-16	Methodology for Predicting Channel Migration	Ayres Associates	549,981	1/11/1999	6/30/2003	Completed---Published as NCHRP Report 533, NCHRP Web-Only Document 67, CRP-CD-48, and CRP-CD-49
24-17	LRFD Deep Foundation Design	University of Massachusetts - Lowell	300,000	5/13/1999	9/30/2002	Completed---Published as NCHRP Report 507 and CRP-CD-39
24-18	Countermeasures to Protect Bridge Abutments from Scour	University of Mississippi	80,082	7/9/2001	8/1/2003	Terminated; completed under NCHRP project 24-18A
24-18A	Countermeasures to Protect Bridge Abutments from Scour	Michigan Tech University	363,116	8/29/2003	12/31/2006	Completed---Published as NCHRP Report 587
24-19	Environmentally Sensitive Channel- and Bank-Protection Measures	Salix Applied Earthcare	349,811	5/30/2001	11/30/2004	Completed---Published as NCHRP Report 544
24-20	Prediction of Scour at Bridge Abutments	University of Iowa	699,611	4/12/2002	9/30/2010	Completed---Publication decision pending completion of 24-20(02)
24-20(02)	Evaluation of Abutment-Scour Equations from NCHRP Projects 24-15(2) and 24-20 Using Field Data	US Geological Survey	245,000	10/1/2012	7/1/2015	Research in progress; interim report pending
24-20(02)A	Evaluation of Abutment-Scour Equations from NCHRP Projects 24-15(2) and 24-20 Using Field Data	Ettema, Robert	10,000	12/16/2013	12/16/2014	Completed
24-20(02)B	Evaluation of Abutment-Scour Equations from NCHRP Projects 24-15(2) and 24-20 Using Field Data	Briaud, Jean-Louis	10,000	7/10/2014	7/10/2015	Research in progress; interim report pending

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
24-21	LRFD Soil Nailing Design and Construction Specifications	GeoSyntec Consultants	199,968	6/20/2003	7/31/2010	Completed---Published as NCHRP Report 701
24-22	Selecting Backfill Materials for MSE Retaining Walls	Geo Testing Express, Inc.	689,973	7/23/2003	5/31/2013	Completed---Agency report to be made available as an NCHRP web-only document
24-23	Riprap Design Criteria, Specifications, and Quality Control	Ayres Associates	349,995	4/1/2003	9/30/2006	Completed---Published as NCHRP Report 568
24-24	Criteria For Selecting Numeric Hydraulic Modeling Software	Ocean Engineering Associates	174,957	6/16/2004	12/31/2006	Completed---Agency report available as NCHRP Web-Only Document 106
24-25	Guidelines for Risk-Based Management of Bridges with Unknown Foundations	GKY & Associates, Inc.	200,000	6/16/2004	11/15/2006	Completed---Agency report available as NCHRP Web-Only Document 107
24-26	Effects of Debris on Bridge-Pier Scour	Ayres Associates	603,000	6/18/2004	1/31/2010	Completed---Published as NCHRP Report 653
24-27	Evaluation of Bridge Scour Research	Various				Conducted as NCHRP Projects 24-27(01) through 24-27(04)
24-27(01)	Evaluation of Bridge Scour Research: Pier Scour Processes and Prediction	University of Iowa	174,997	10/17/2007	3/31/2011	Completed---Agency report available as NCHRP Web-Only Document 175
24-27(02)	Evaluation of Bridge Scour Research: Abutment and Contraction Scour Processes and Prediction	Georgia Institute of Technology	175,000	1/16/2008	9/30/2011	Completed---Agency report available as NCHRP Web-Only Document 181
24-27(03)	Evaluation of Bridge Scour Research: Geomorphic Processes and Prediction	Ayres Associates	129,592	6/18/2009	7/31/2011	Completed---Agency report available as NCHRP Web-Only Document 177
24-27(04)	Facilitation of NCHRP Workshop on Abutment Scour and 5-Year Plan Development	University of Maryland	18,200	6/23/2008	7/31/2008	Completed---Summarized in NCHRP Research Results Digest 334
24-28	LRFD Metal Loss and Service-Life Strength Reduction Factors for Metal-Reinforced Systems in Geotechnical Applications	McMahon & Mann Consulting Engineers PC	600,000	6/1/2006	6/30/2010	Completed---Published as NCHRP Report 675
24-28A	Validate the Results of NCHRP Project 24-28	McMahon & Mann Consulting Engineers PC	125,000	12/30/2009	9/30/2011	Completed---Summarized in NCHRP Research Results Digest 364
24-29	Scour at Bridge Foundations on Rock	MACTEC Engineering and Consulting, Inc.	749,898	8/22/2006	7/31/2011	Completed---Published as NCHRP Report 717
24-30	Improving the Lateral Capacity of Highway Bridge Foundations in Weak Soils	Brigham Young University	499,391	6/2/2006	1/30/2011	Completed---Published as NCHRP Report 697
24-31	LRFD Design and Construction Specifications of Shallow Foundations for Highway Bridge Structures	Geosciences Testing & Research, Inc.	379,344	1/30/2007	9/30/2009	Completed---Published as NCHRP Report 651
24-32	Scour at Wide Piers and Long Skewed Piers	Ocean Engineering Associates	298,982	6/15/2007	6/30/2010	Completed---Published as NCHRP Report 682
24-33	Development of Design Methods for In-stream Flow Control Structures	University of Minnesota	600,000	9/2/2008	10/31/2013	Completed---Published as NCHRP Report 795

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
24-34	Risk-Based Approach for Bridge Scour Prediction	Ayres Associates	500,000	4/21/2010	6/28/2013	Completed---Reference Guide published as NCHRP Report 761; agency final report available on project web page
24-35	Guidelines for Certification and Management of Flexible Rockfall Protection Systems	Yeh & Associates	249,999	6/15/2012	7/31/2015	Research in progress; interim report under review
24-36	Scour at the Base of Retaining Walls and Other Longitudinal Structures	University of Minnesota	500,000	11/15/2012	5/14/2015	Research in progress; draft final report pending
24-37	Combining Individual Scour Components to Determine Total Scour	Georgia Tech Research Corporation	600,000	10/1/2012	9/30/2015	Research in progress; draft final report pending
24-38	Development of Bridge Foundation Movement Criteria	North Dakota State University	28,593	8/14/2012	2/13/2015	Terminated---Work continuing under NCHRP project 12-103
24-39	Evaluation and Assessment of Environmentally Sensitive Stream Bank Protection Measures	Ayres Associates	500,000	6/1/2013	12/1/2015	Research in progress; draft final report pending
24-40	Design Hydrology for Stream Restoration and Channel Stability at Stream Crossings	Colorado State University	350,000	7/22/2013	1/21/2016	Research in progress; interim report pending
24-41	Defining the Boundary Conditions for Composite Behavior of Geosynthetic Reinforced Soil (GRS) Structures	University of Texas - Austin	500,000	9/1/2014	9/1/2017	Research in progress; interim report pending
24-42	Underwater Installation of Filter Systems for Scour and other Erosion Control Countermeasures	Ayres Associates	300,000	6/30/2014	9/1/2016	Research in progress; interim report pending
24-43	Relationship between Erodibility and Fundamental Geotechnical Properties of Geomaterials	-----	300,000			In development
24-44	Guidebook for Managing Subsurface Differing Site Conditions Risk in Design-Build Projects	-----	350,000			In development
24-45	Dynamic Properties of Earth Material during Rolling Compaction	-----	500,000			In development

AREA TWENTY-FIVE : TRANSPORTATION PLANNING--IMPACT ANALYSIS

25-01	Effects of Highway Runoff on Wetlands	Rexnord, Inc.	162,189	2/16/1981	3/16/1984	Completed---Published as NCHRP Report 264
25-02	Predicting Stop-and-Go Traffic Noise Levels	Vanderbilt University	63,145	1/18/1988	5/31/1989	Completed---Published as NCHRP Report 311
25-03	Guidelines for the Development of Wetland Replacement Areas	URS Consulting	311,102	4/1/1989	9/30/1997	Completed---Published as NCHRP Report 379
25-04	Determining Economic Impacts on Adjacent Businesses Due to Restricting Left Turns	Cambridge Systematics	300,000	6/15/1992	3/31/1995	Completed---Summarized in NCHRP Research Results Digest 231
25-05	Remote Sensing and Other Technologies for the Identification and Classification of Wetlands	Normandeau Associates	299,770	6/1/1992	2/21/1996	Completed---Report not published

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
25-06	Intersection Air Quality Modeling (HYROAD)	Systems Applications International	2,630,000	2/1/1993	1/31/2003	Completed---Agency documentation available as CRP-CD-32; HYROAD model listed as alternative model on US EPA website for downloading
25-07	Improving Transportation Data for Mobile Source Emissions Estimates	University of Tennessee	200,000	12/1/1993	10/31/1995	Completed---Published as NCHRP Report 394
25-08	Impact of Highway Capacity Improvements on Air Quality and Energy Consumption	TRB Studies and Special Programs Division	100,000	3/1/1993	7/30/1995	Completed---Published as TRB Special Report 245
25-09	Environmental Impact of Construction and Repair Materials on Surface and Ground Waters	Oregon State University	1,355,373	3/1/1994	6/30/2000	Completed---Published as NCHRP Reports 443 and 448 and available on CRP-CD-7
25-09(01)	Environmental Impact of Construction and Repair Materials on Surface and Ground Waters--Outreach and Training	Oregon State University	99,957	5/16/2002	12/31/2004	Completed---Workshop materials available on request
25-10	Estimating the Indirect Effects of Proposed Transportation Projects	Louis Berger & Associates	287,666	12/1/1993	5/31/1996	Completed---Published as NCHRP Report 403
25-10(02)	Continuation Funding for Estimating the Indirect Effects of Proposed Transportation Projects	Louis Berger & Associates	199,181	5/20/1999	5/1/2001	Completed---Published as NCHRP Report 466
25-11	Development of a Modal-Emissions Model	University of California - Riverside	2,342,604	8/15/1995	9/30/2000	Completed---Published as NCHRP Web-Only Document 122; Comprehensive Modal Emissions Model available at http://www.cert.ucr.edu/cmeme
25-12	Wet Detention Pond Design for Highway Runoff Pollution Control	Washington State University	580,218	4/15/1996	2/2/2002	Completed---Report not published; agency report available on request
25-13	Assessments of Impacts of Bridge Deck Runoff Contaminants on Receiving Waters	CH2M Hill	129,556	3/15/1997	12/31/2001	Completed---Summarized in NCHRP Research Results Digest 235
25-13(02)	Assessments of Impacts of Bridge Deck Runoff Contaminants on Receiving Waters	CH2M Hill	254,280	10/1/1999	12/31/2001	Completed---Published as NCHRP Report 474
25-14	Heavy-Duty Vehicle Emissions	Cambridge Systematics	500,000	12/1/1998	10/31/2002	Completed---Report not published
25-15	Short-Term Monitoring for Compliance with Air Quality Standards	CH2M Hill	200,000	12/1/1998	6/15/2002	Completed---Published as NCHRP Report 479
25-16	Guidance for Selecting Compensatory Wetland Mitigation Options	A.D. Marble & Co., Inc.	224,425	3/1/1999	7/1/2002	Completed---Summarized in NCHRP Research Results Digest 251; published as NCHRP Report 482
25-17	Transportation Effects of the 1997 Changes to the National Ambient Air Quality Standards (NAAQS)	ENVIRON International Corporation	539,995	3/1/1999	11/30/2002	Completed---Agency report available on request
25-18	Particulate Matter (PM2.5 and PM10) Apportionment for On-Road Mobile Sources	ARCADIS Geraghty & Miller	1,199,986	4/1/1999	5/31/2006	Completed---Agency report available on request

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
25-19	Evaluation of Methods, Tools, and Techniques to Assess the Social and Economic Effects of Transportation Projects	University of Iowa	199,935	3/29/1999	4/1/2001	Completed---Published as NCHRP Report 456
25-20	Management of Runoff from Surface Transportation Facilities -- Synthesis and Research Plan	GKY & Associates, Inc.	149,889	4/14/1999	3/31/2001	Completed---Agency report available as NCHRP Web-Only Document 37; CD-ROM desk reference available upon request
25-20(01)	Evaluation of Best Management Practices for Highway Runoff Control	Oregon State University	699,826	8/22/2002	5/31/2006	Completed---Published as NCHRP Report 565
25-20(02)	Identification of Research Needs Related to Highway Runoff Management	Venner Consulting	49,993	4/22/2003	12/31/2003	Completed---Published as NCHRP Report 521
25-21	Assessment of Short-Term Versus Long-Term Air Quality Effects of Traffic Flow Improvement Projects	Dowling Associates	375,000	10/19/1999	4/30/2003	Completed---Published as NCHRP Report 535
25-22	Technologies to Improve Consideration of Environmental Concerns in Transportation Decisions	CH2M Hill	179,926	3/10/2000	12/15/2001	Completed---Available as CRP-CD-14
25-22(02)	Technologies to Improve Consideration of Environmental Concerns in Transportation Decisions	CH2M Hill	248,451	5/7/2004	4/30/2006	Completed---Summarized in NCHRP Research Results Digest 304
25-23	Environmental Information Management and Decision Support System for Transportation	Booz-Allen & Hamilton	247,166	5/19/2000	8/19/2002	Completed---Published as NCHRP Report 481
25-23(02)	Software for an Environmental Information Management and Decision Support System	Cambridge Systematics	400,000	6/2/2004	12/31/2006	Completed---Summarized in NCHRP Research Results Digest 317
25-24	Monitoring, Analyzing, and Reporting on the Environmental Streamlining Pilot Projects	Vanasse Hangen Brustlin, Inc.	299,988	7/13/2001	9/30/2005	Completed---Summarized in NCHRP Research Results Digest 300; agency report available as NCHRP Web-Only Document 79
25-25	Research for the AASHTO Standing Committee on the Environment	----	600,000			Research in progress---Refer to project writeup on CRP website and individual tasks
25-26	Development of a Low Impact Development Design and Construction Manual for Transportation Systems	Combined				Combined (\$400k) with 25-20(01); \$100k returned to program
25-27	Evaluation of the Use and Effectiveness of Wildlife Crossings	Utah State University	643,996	6/1/2004	5/31/2008	Completed---Published as NCHRP Report 615
25-28	Predicting and Mitigating Hydroacoustic Impacts on Fish from Pile Installation	Battelle Memorial Institute	449,999	11/23/2005	6/30/2011	Completed---Summarized in NCHRP Research Results Digest 363
25-29	Developing Design and Management Guidelines for Historic Road Corridors	Otak, Inc.	102,437	4/7/2006	11/16/2007	Terminated as of 16 Nov 2007
25-29A	Guidelines for Design and Management of Historic Roads	TranSystems Corporation	215,655	3/27/2008	3/31/2012	Completed---Agency report available as NCHRP Web-Only Document 189

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
25-30	Use of Temporary Bridging to Avoid Impacts to Waters and Wetlands During Highway Construction	Mulkey Engineers & Consultants	100,000	6/5/2006	5/31/2008	Completed---Summarized in NCHRP Research Results Digest 330
25-31	Guidelines for Evaluating and Selecting Modifications to Existing Roadway Drainage Infrastructure to Improve Water Quality in Ultra-Urban Areas	GeoSyntec Consultants	299,937	8/8/2008	12/31/2011	Completed---Published as NCHRP Report 728 and CRP-CD-116
25-32	Measuring and Removing Dissolved Metals from Storm Water in Highly Urbanized Areas	University of Texas - Austin	299,822	6/21/2010	9/30/2013	Completed---Published as NCHRP Report 767
25-33	Evaluation of the Methodologies for Visual Impact Assessments	Avenue Design	200,000	3/31/2010	8/30/2012	Completed---Published as NCHRP Report 741
25-34	Supplemental Guidance on the Application of FHWA's Traffic Noise Model (TNM)	Harris Miller Miller & Hanson Inc.	449,965	3/25/2011	9/30/2014	Completed---Published as NCHRP Report 791
25-35	Guidebook for Designing and Managing Rights-of-Way for Carbon Sequestration and Biomass Generation	Good Company	349,235	7/20/2011	5/31/2014	Completed---Publication decision pending
25-36	Impacts of Land Use Strategies on Travel Behavior in Small Communities and Rural Areas	University of North Carolina - Chapel Hill	649,995	3/23/2011	9/30/2014	Completed---Handbook to be available as an NCHRP web-only document
25-37	A Watershed Approach to Mitigating Stormwater Impacts	Low Impact Development Center, Inc.	598,540	7/1/2012	8/30/2015	Research in progress; final report pending
25-38	Input Guidelines for Motor Vehicle Emissions Simulator Model	Cambridge Systematics	649,966	2/15/2012	9/15/2014	Completed---Agency final report and guidebooks to be available as NCHRP web-only documents
25-39	Environmental Performance Measures for State Departments of	High Street Consulting Group	500,000	8/15/2012	4/3/2015	Research in progress; final report pending
25-40	Long-Term Performance and Life-Cycle Costs of Stormwater Best Management Practices	RBF Consulting	549,824	4/23/2012	6/23/2014	Completed---Published as NCHRP Report 792
25-41	Guidance for Achieving Volume Reduction of Highway Runoff in Urban Areas	GeoSyntec Consultants	249,852	6/5/2012	9/1/2014	Completed---To be published as NCHRP Report 802
25-42	Bridge Runoff Treatment Analysis and Treatment Options	RBF Consulting	299,558	10/18/2012	3/17/2014	Completed---Published as NCHRP Report 778
25-43	Navigating Multi-Agency NEPA Processes to Advance Multimodal Transportation Projects	Parsons Brinckerhoff	249,988	6/3/2013	7/1/2015	Research in progress; final report pending
25-44	Field Evaluation of Reflected Noise from a Single Noise Barrier	Resource Systems Group, Inc.	349,969	9/4/2013	5/4/2015	Research in progress; final report pending
25-45	Mapping Truck Noise Source Heights for Highway Noise and Barrier Analysis	Illingworth & Rodkin, Inc.	499,969	6/4/2013	3/3/2015	Research in progress; Phase II measurements completed
25-46	Deploying Clean Truck Freight Strategies	ICF Incorporated	500,000	6/10/2014	10/10/2016	Research in progress

TABLE 7 (continued)

Project						
No.	Title	Research Agency	Contract Amount	Starting Date	Completion Date	Project Status*
25-47	Strategies to Reduce Agency Costs and Improve Benefits Related to Highway Access Management	-----	600,000			In development
25-48	Combined Interface for Project Level Air Quality Analysis	Resource Systems Group, Inc.	499,706	4/24/2014	7/23/2016	Research in progress; interim report pending; additional \$80,000 from Federal Highway Administration
25-49	Enhancement of Construction Noise Prediction Tool (RCNM Version 2)	-----	250,000			In development
25-50	Prioritization Method for Proposed Road-Rail Grade Separation Projects along Specific Rail Corridors	-----	350,000			In development
25-51	Limitations of the Infiltration Approach to Stormwater Management in the Highway Environment	-----	500,000			In development
25-52	Guidelines for the Consideration of Atmospheric Effects for Improved Noise Modeling	-----	270,000			In development

* Information on all projects initiated under the NCHRP from its inception in 1962 through 1988 is included in NCHRP Web Document 7: Special Edition of Summary of Progress through 1988. Links to NCHRP Web Document 7 and information about projects initiated subsequent to 1988 are available on the NCHRP website at <http://www.trb.org/nchrp> under "All Projects".

^a NCHRP funds obligated under the \$314,340 four-way agreement among the National Academy of Sciences, Michigan Department of State Highways, Wayne County, and the City of Detroit.

^b NCHRP funds obligated under the \$70,000 five-way agreement among the National Academy of Sciences, Michigan Department of State Highways, Wayne County, the City of Detroit, and the University of Michigan.

^c Continuing activity. Amount shown is for latest fiscal year in which funding was provided.

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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:

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